

# With a Little Help from My Friends: Multinational Retailers and China's Consumer Market Penetration

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## Abstract

We investigate the supply-side repercussions on Chinese imports after the entry of multinational retailers in China. We exploit sector- and origin-country level import data for a panel of Chinese cities between 1997 and 2012, and differentiate between retailer and non retailer goods and across countries of origin of imports. We find that international global retail presence in Chinese cities produces a disproportionate rise in retail good imports from the retailers' country of origin. Our results point to a trade-cost reducing role of Western retailers that make it easier for foreign retail-good producers from their home country to export to China. Global retailers then act as a bridgehead for the penetration of the Chinese market by producers from their home country, in a way that goes beyond higher sales of imported retail goods by the retailers themselves.

Keywords: Multinational retailers, China, Imports.

JEL codes: L81, F14, F23.

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# 1 Introduction

China is in the midst of an economic makeover aimed at rebalancing its economy through the increase of private domestic consumption. Consumption is replacing investment as China's main engine of economic growth, creating significant opportunities in the retail market. China overtook the United States in 2011 to become the world's largest market for grocery shopping. Penetrating the highly profitable and rapidly growing Chinese retail market is now even more the key objective for most Western producers and retailers.

Multinational hypermarkets were established only recently in China, but have developed very quickly. The number of foreign grocery retailers outlets in the Chinese market went from zero in 1995 to 126 in 2000 and reached 2,516 in 2014 (Planet Retail, 2014). The extent to which this expansion has helped producers from the retailers' home country to penetrate the Chinese consumer market is however unclear. Foreign retailers in China mainly propose locally-sourced products: 90% and 95% of the products offered in Chinese Carrefour and Walmart stores respectively are produced in China (Moreau, 2008). In contrast to the well-studied case of Mexico (Durand, 2007), foreign retailers in China may not bring significant imports from their home country with them.

We here investigate the extent to which foreign global retailers can nevertheless act as bridgehead for the penetration of the Chinese market by their home exporters. Our empirical analysis relies on sector-country level import data for 287 cities over the 1997-2012 period.<sup>1</sup>

We consider the five leading foreign grocery retailers in China (Auchan, Carrefour, Metro,

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<sup>1</sup>China is divided into four municipalities (Beijing, Tianjin, Shanghai and Chongqing) and 27 provinces which are further divided into prefectures. As is common in the literature, we use the terms city and prefecture interchangeably, even though prefectures include both an urban and a rural part.

Tesco and Walmart)<sup>2</sup> and use a difference-in-differences specification. We rely on differences in the expected impact of international retailer presence between retailer and non-retailer goods to isolate a causal effect on imports. We furthermore investigate whether international global retail presence in Chinese cities produces a disproportionate rise in imports from the retailers' country of origin.

This paper contributes to the emerging literature on the economic implications in the home and host countries of overseas retail expansion. Most of the existing literature has focused on the impact of global retail on the host countries' economic performance. A first effect is local firm productivity: global retail chain entry has been shown to fuel productivity improvements in supplier firms in Romania (Javorcik and Li, 2013) and Mexico (Iacovone et al., 2015; Javorcik et al., 2008). A second channel is exports from the host economy: increased exposure to multinational retailers raises exports by enhancing the general export capabilities of the location (Head et al., 2014). In contrast, we here investigate whether the presence of multinational retailers affects host location imports, and thus consider additional ways in which retailers influence international trade. More specifically, one of our questions is whether international expansion by retailers contributes to their home countries' export competitiveness.

Our paper relates to the work on the importance of imports for retailers (Raff and Schmitt, 2015). Evidence from direct import activities by US retailers stresses that larger retail firms tend to import more, and that retailers are especially active in importing low-

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<sup>2</sup>We started with the ranking of global retailers provided by Deloitte in 2009 (<http://www.deloitte.com>), which lists the major global retailers by countries of operation. We looked at the top 20 retailers and identified six with operations in China. We excluded Home Depot, which ranked fifth, from our analysis as it is a specialist retailer, in contrast to the other five chains, and because it did not enter China until 2006 (Head et al., 2014).

value products, predominantly from China (Bernard et al., 2010a). Basker and Van (2010b) go beyond direct imports and identify a positive link between the growth of large retailers and that of imports of consumer goods across US sectors.<sup>3</sup> They show that the largest retail chains have a much greater propensity than smaller retailers to import from less-developed countries, first and foremost China, and that their greater sourcing of cheap (durable and semi-durable) products (especially from China) helps these large chain retailers dominate local retail markets. Our focus here is different since we look at Western retail presence in China, the country from which hypermarkets typically source a large share of their non-food products. In the specific context of China, the opening of Western hypermarkets is less likely to result in greater imports of non-food consumer products to be displayed on its shelves. China is hence a very good setting to identify more indirect channels through which multinational retailers contribute to the international opening of the domestic consumer market.

Our work hence contributes to the recent empirical evidence on the positive effects of a country's overseas retail presence on its exports to those markets. Cheptea et al. (2015a) consider bilateral agri-food exports for a large panel of countries over the 2000-2010 decade and find that higher sales by a retailer in a country are associated with more imports by that country from the retailer's home country. Two broad mechanisms can be at play here. First, the establishment or extension of operations abroad by a retailer from a given country reduces the export costs of the home-country firms exporting to these markets. Multinational retailers may continue to work with their domestic suppliers in their international operations.

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<sup>3</sup>As their import data is only at the product level, they need to make a number of challenging assumptions to map imports to retail sub-sectors.

In addition, their foreign activities may generate informational externalities that benefit home-country exporters. Second, multinational retailers may influence consumer demand and give rise to new consumption behaviors. More generally, they can improve the global image of their home country among the population they serve and generate greater demand for goods (not only retail) originating from their home country. Our analysis aims to clean out the latter channel pertaining to demand and preferences and focuses on the supply side, whereby the expansion of multinational-retailer activities in China reduces the trade costs foreign producers face to export to China, and so boosts their exports to China.

Focusing on a single country like China, instead of an international panel of countries, is relevant for a number of reasons. First, the country's opening to multinational retail chains is recent, so that our analysis covers the emergence from scratch of the now largest retail market in the world. Second, using cross-regional data from a single country, instead of cross-country data, mitigates data-compatibility problems that are typical in cross-country regressions. Third, the large size of the country and the differences in entry timing of multinational retailers across cities provide substantial variation that we exploit to identify the causal effect of the presence of multinational retailers on imports.

Our analysis builds on recent efforts to address the problem of the endogenous location of multinational retailers. It seems likely that the timing and specific location choice of the opening of foreign hypermarkets in China were correlated with various broader economic variables, as well as specific ties with retailers' origin countries which likely affect import propensity. Foreign retailers clearly opened their first stores in well-developed regions, such as the Eastern metropolis of Shanghai, the busy port of Shenzhen or the capital Beijing. Another problem comes from reverse causality: greater trade openness affects the structure

of the retail industry. Two recent theoretical models suggest that trade liberalization is associated with greater market concentration in retailing, so that large-scale and cost-effective chain retailers expand (Basker and Van, 2010a; Raff and Schmitt, 2012). We then risk over-estimating the positive effects that hypermarket opening have on imports.

Our main strategy to deal with endogeneity exploits variations in the expected impact of the opening of global retail chains by product categories and import origin. We hence consider the differences in the speed of expansion of the five leading foreign grocery retailers across 287 cities, and the fact that only retail goods should be affected by hypermarkets. We pay particular attention to potential confounding factors, such as the effect of differential demand growth. As Chinese cities develop at different rates, their income and preferences evolve in such a way that there is different demand growth for the type of goods multinational retailers provide. Those cities with higher demand growth for retail goods are likely to have higher imports of retail goods and also host more retail stores. Our baseline specification includes city-product-country fixed effects, product-country-year fixed effects and city-country-year fixed effects to account for bilateral-trade shocks between a city and its international partner. We also add separate city-specific time trends in retail and non-retail goods to capture the heterogeneous shift in demand towards imported retail goods across cities as they develop.

Our main finding is a relative rise in imports of retail goods following greater top five multinational retailer activity in China. Exploiting information on the country of origin of imports, we find that only retail-good imports from retailers' country of origin are affected by the presence of the multinational chains. This is in line with the results in Cheptea et al. (2015a), and suggests that retail expansion triggers various falls in transaction costs that

specifically benefit home-country producers. Our results are robust to a variety of checks, including an instrumental-variable strategy, a number of placebo tests with the random assignment of products across retail and non-retail categories, as well as the false assignment of the retailers' countries of origin.

We identify two main mechanisms through which the expansion of multinational retailer activities in China may have reduced the trade costs foreign producers face in exporting to China, and so boost their exports to China. First, we find evidence of higher sales of imported groceries by the Western retailers themselves. A major difference between foreign and domestic supermarkets in the sourcing of products concerns food: in domestic supermarkets, imported food products are very rare while they are much more common in foreign stores. We split the relative rise in retailer-good imports into food and non-food products, and find that the observed effect is mainly driven by food products. This is in line with the relatively higher import propensity of foreign retailers, notably for food products (USDA, 2008). This is also consistent with the long-lasting and trusting relationships between retailers and home-country food producers, as well as with the importance of own-brand products in food. Most multinational retailers engage in an own-brand strategy. Own-brand products are supplied by firms that have to comply with private standards defined by retail companies and certified by a private independent entity. For example, Carrefour, Auchan and Metro use IFS (International Food Standard) certification to ensure the quality and safety of the products for which they have legal responsibility. This tight contractual relationship between retailers and suppliers implies that these bilateral links persist with the retail companies' international expansion. We also obtain consistent findings when looking at the rise in imports for each of the top-five retailers separately, which differ in terms of the relative importance

of own-brand products. Compared to its European counterparts, Walmart proposes food products with much less national gastronomic positioning. This may explain why we find a smaller effect of Walmart hypermarkets on food imports from the US.

Second, the pro-import effect of multinational retailers that we measure goes beyond higher sales of imported grocery by the Western retailers themselves. Our results suggest that multinational retailers generate spillover effects and reduce the trade costs and informational transaction costs restricting imports from other distributors. We find the pro-trade indirect effect of retailers to be more salient when they locate in areas with greater barriers to international business. We find a larger effect for differentiated goods, for which the informational costs of trading are more substantial.

Overall, our results show that global retailers seem to act as a bridgehead for the penetration of the Chinese market by home-country producers.

The remainder of the paper is structured as follows. Section 2 describes the developments of multinational retailer activity in China and presents our measure of retailer presence in Chinese cities for the top-five multinational retailers. It also discusses the mechanisms whereby the growth in global retailers' Chinese activities can reduce trade costs for foreign goods producers and boost their exports to China. Section 3 describes the import data and the empirical specification relating import intensity and multinational retailer presence. Section 4 presents the results of the regression linking multinational retail presence and imports. Last, Section 5 concludes.

## 2 Multinational retailer activity in China

### 2.1 China's opening to multinational retailers

Western retailers expanded in China after 1995, following the deregulation of retailing in China (Wang and Zhang, 2006). The opening of China's retail market was gradual, with restrictions that forced multinational retailers to choose different entry locations. Up to 1995, only 11 designated zones could accept foreign retailers, with a maximum of two per zone (Head et al., 2014). These restrictions also applied to retailers from Greater China, i.e. Hong Kong, Macao and Taiwan. As a result Western retailers were forced to employ different strategies to locate their first hypermarket in mainland China. Our analysis takes advantage of the uneven exposure of Chinese cities to multinational retailers due to spatial differences in timing and extent.

Our study focuses on hypermarkets. The hypermarket format in which the five selected multinational retailers (Walmart, Carrefour, Tesco, Metro and Auchan) operate is quite concentrated, much more so than other grocery channels. Besides domestic retailers (notably China Resources Vanguard and Lianhua), the big-box retail format is dominated by foreign operators. The five western retailers we consider dominate the market, with only residual market shares for Asia-based retailers such as Lotus (Thailand), RT-Mart (Taiwan) and Aeon (Japan).

As shown in Table 1, France-based Carrefour (the second-largest world retailer and the largest in the EU) stepped in first in 1995 with a hypermarket in Beijing. American Walmart (the world's largest retailer) and German Metro followed the next year with hypermarkets in Shenzhen and Shanghai respectively. UK-based Tesco entered in 1998 and France-based

Table 1: Information on Western retail chains

Western Hypermarket chain	Country of origin	Year of entry	Location of entry	Market share in 2010	Number of Hypermarkets in 2012
Auchan	France	1999	Shanghai	13.3%	56
Carrefour	France	1995	Beijing	10.4%	226
Metro	Germany	1996	Shanghai	3.4%	64
Tesco	UK	1998	Shanghai	3.4%	111
Walmart	USA	1996	Shenzhen	10.4%	401

Market shares in 2010 are calculated using information on grocery sales from Planet retail.

Table 2: Summary statistics

Variable	Year	Zero value	Positive value				
		Obs	Obs	Mean	Std. Dev.	Min	Max
Western Retail Stores <sub>it</sub>	1997	280	7	1.57	1.13	1	4
Western Retail Stores <sub>it</sub>	2012	138	149	5.49	9.54	1	80

Auchan in 1999, both opening in Shanghai.

Table 2 reports the main characteristics of the Western retailers. It lists the year and location of entry in China, and provides information on sales and store numbers to show their relative presence in China. In 2010, Auchan and Carrefour accounted for 13.3 and 10.4% respectively of Chinese hypermarket grocery retail sales. Walmart is third with 10.4%, followed by Metro and Tesco with 3.5% each (Planet Retail, 2014). These market shares are significant, even in comparison with those of Chinese retailers. Two Chinese retailers stand out: the China Resources group (Vanguard hypermarkets) and the Linhua company (Century Mart, Lianhua and Hualian brands). These accounted for respectively 26% and 22% of 2010 Chinese hypermarket grocery sales (Planet Retail, 2014).

## 2.2 Retail store distribution

The annual store distribution of each of the five multinational retailers was collected from various websites. The two main sources are the retailers' websites and the Chinese web site *linkshop*.<sup>4</sup> We measure retailers presence as the hypermarket store count for each retailer in a location.<sup>5</sup>

Figure A-1 in the Appendix shows that the timing and extent of multinational retailer presence vary across Chinese cities. Comparing 1997 to 2012 highlights the rapid growth in the number of stores of the top five multinational retailers in China. In 1997, the first year of our sample, retailer activities were very limited and concentrated in a few, mostly coastal, cities. By 2012, the last year in our sample, the number of hypermarkets had expanded to 818, including inland locations.

## 2.3 Potential impacts of multinational retailers on trade costs

Multinational retailers expansion in China may change shopping and eating preferences (Coe and Hess 2005), and consequently impact imports through changes in consumption habits. In this paper, we focus on the supply-side repercussions on imports post-multinational retailer entry, and leave the demand effect to one side by controlling for it in the empirical analysis.

Two main mechanisms explain how the expansion of multinational retail activities in China may have reduced the trade costs foreign producers face in exporting to China and so

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<sup>4</sup>See Table A-1 in the Appendix. The Chinese website <http://www.linkshop.com.cn/> focuses on the retail industry.

<sup>5</sup>Following the literature we only consider the big-box retail format that sells the widest range of retail goods and omit specialty and convenience stores, as they differ in product coverage and have much smaller sales areas (Head et al., 2014). We ensured that our data properly accounted for the store closures. Most of the closures happened after 2012, the last year for which we have trade data.

boost their exports to China. The export-enhancing effect of lower trade costs and information costs may yield higher sales of imported groceries by the Western retailers themselves, as well as greater imports by other distributors. These can be referred to as the direct and indirect repercussions respectively. Regarding the direct-sales effect in the retailers aisles, the presence of foreign retailers provides foreign producers with access to Chinese customers while avoiding some of the trade costs related to communication, culture and institutions that hinder the creation of business relationships and the exchange of information about foreign sales opportunities. The presence of supermarkets allows foreign producers to access Chinese consumers without having to bear the costs of prospecting for new partners and exchanging information on the characteristics of the products on the one hand and the characteristics of local demand on the other hand. The knowledge that global retailers have about imported goods and their producers, particularly when they come from their country of origin, considerably reduces the barriers traditionally faced by producers in developing new outlets abroad. Sales are made without producers having information on local demand conditions and having to seek out new distributors and explain the characteristics of their products to them.

The direct-sales gains should be enhanced for the fellow-national producers of the retailers, due to the accumulated knowledge of the product and the practices of the producer from business carried out in the home country. A home-country effect would also result from the own-brand strategy pursued by the five global retailers in our analysis, which entails privileged links between retailers and their traditional home-country suppliers. To offer own-brand products, retail chains establish contractual relationship with their suppliers and ensure the quality and safety of products through private-certification labels. Difficulties in

finding local suppliers who can satisfy the requirements of these standards may lead retail chains to keep their traditional suppliers for the offer of their own-brand products in their international stores (Reardon et al., 2007). The importance of own-brand products has a structural effect on hypermarkets' sourcing strategies. For example, Cheptea et al. (2015b) show that the benefits of French overseas retail expansion on French agrifood exports are reaped by the retailers' domestic suppliers, which have private-retail certification.

The second channel is indirect, whereby multinational retailers generate spillover effects and reduce the trade costs and informational transaction costs impeding the imports of other distributors. Exporting to China involves many fixed costs. Before foreign products, and especially food, can appear for the first time in the aisles of a multinational retailer in a given city, the producer has to obtain various certifications for their activities between the production and final selling points. For example, exporters of dairy products have to comply with specific safety standards at all of the different stages of production, transportation, storage and distribution in order to sell to the Chinese market. Once exporters have registered with Chinese authorities and have benefited from certification and their relationship with authorized importers in order to sell to multinational retailers in China, their access to other local distributors is much easier, as they do not have to pay these fixed costs all over again.

Another significant part of import costs can be thought of as informational transaction costs (Leda Pateli, 2016). On the importers' side these include the costs related to acquiring information about the availability, price, quality and technical characteristics of foreign products, as well as their fit to local customer demand. Sales of foreign (grocery) products by international retailers may help other local distributors either off-trade (grocery,

independent retail etc.) or on-trade (bars, restaurants etc.) to identify potential suppliers. Foreign producers may also benefit as they acquire information on local sales opportunities, and familiarize themselves with a different business environment and learn how to overcome barriers in terms of communication, culture and institutions. A growing literature on trade spillovers suggests that the exchange of information between firms exporting to the same destination fosters trade via both the extensive and intensive margins (Aitken et al., 1997; Rauch and Watson, 2004; Krautheim, 2012). As the number of exporters to a given location grows, other potential exporters benefit from lower transport costs through economies of scale and from learning about delivery procedures, infrastructure and regulatory issues, which are substantial in the Chinese market. The presence of their products in foreign retailers' aisles can moreover help foreign businesses shore up their reputation with local clients and increase their capacity to find appropriate local distributors.

In the specific context of China, the small fraction of imported goods in the sales of Western retail stores in China restricts the possibility of a dominant direct-sale effect. Although the data is rather sketchy there is a clear consensus that, although hypermarkets are a major sales venue for imported (food) products in China, imported goods rarely account for more than 5% of the goods proposed by Western retailers (USDA China Retail Report 2014). By comparison, the share of imports in purchases in Walmart in Mexico is 55% (Durand, 2007).

As the indirect-spillover channel posits that multinational retailers generate spillover effects by reducing the fixed trade costs and informational transaction costs faced by foreign exporters to reach customers outside their stores, the effect should be more salient when retailers locate in areas with greater barriers to international business. A larger effect is furthermore expected for differentiated goods, for which the informational costs are more

substantial.

## 3 Empirics

### 3.1 Import flows

We use Chinese customs data from 1997 to 2012. China’s import flows are listed by foreign country of origin and destination city in China. Chinese customs regulations require importers to report the place of consumption of their imports, which may differ from the port of entry or the location of the importing firm. We use 4-digit (prefecture-level city) location information. We observe import flows by detailed product classification (Harmonized System 6-digit) and by trade regime (ordinary or processing trade).<sup>6</sup> We aggregate HS6 products into retail or non retail categories by HS2. Our analysis relies on the fact that only retail good imports under the ordinary regime should be affected by the chains’ presence. Our baseline results hence exclude processing activities.

We use the Broad Economic Categories (BEC) classification of goods to identify products representing retailer goods. These include food products for household consumption, corresponding to primary and processed food and beverages (categories 111 and 112) and non-food products, corresponding to semi-durable and non-durable consumer goods (categories 62 and 63). Our dataset is constructed to differentiate between three categories of products in bilateral imports by a Chinese city from a country of a HS2 sector. The first two categories include products offered in the big-box retail format of multinational

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<sup>6</sup>Processing sector operations involve importing inputs to process them in China and re-exporting the final products.

retailers (food and non-food products). The third category includes non-retailer goods and constitutes the control group in our regressions.<sup>7</sup> We hence generate a panel of city-product-country-year observations where products refer to a given category at the HS2 level. We obtain a nomenclature of 159 products across 97 HS2 chapters.

### 3.2 Empirical specification

Our empirical analysis asks whether greater multinational retailer presence boosts local imports. Specifically, we see whether differences in retailer good relative import growth across Chinese cities are linked to the uneven geographical expansion of global retailers in China. We identify the causal import effect of multinational retailer presence by using sector and destination-country level import data for a panel of Chinese cities, and rely on the fact that only retail-good imports should be affected by the chains' presence. In a second step, we exploit information on the multinational retailers' headquarter countries, so that our identification exploits variations in the expected impact of multinational retailers both by product and import country of origin.

We estimate the following equation on our panel of product-level bilateral import data for 287 cities over 1997-2012:

$$\begin{aligned} \ln \text{Imports}_{ipct} = & \beta \text{Western Retail Stores}_{it} \times \text{Retail}_p \\ & + \lambda_{ipc} + \mu_{pct} + \nu_{ict} + \sum_i \gamma_i t \times \text{Retail}_p + \epsilon_{ipct} \end{aligned} \quad (1)$$

where  $\text{Imports}_{ipct}$  denotes imports of product  $p$  by city  $i$  from country  $c$  in year  $t$ .<sup>8</sup> Our

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<sup>7</sup>In 1997, retail goods constituted 2.5% of imports in the 287 cities in our sample. This proportion rose to 3.2% in 2012.

<sup>8</sup>Our dataset is constructed to provide observations every year from 1997 to 2012 on any city  $i$ , country

sample contains 159 products, defined as categories (non-retailer goods, retailer food goods and retailer non-food goods) in an HS2 category. Our explanatory variable of interest is Western Retail Stores $_{it}$ , which is the number of hypermarkets established in city  $i$  by the five top global retailers: Auchan, Carrefour, Metro, Tesco and Walmart. We focus on the interaction between this measure and the retailer goods dummy (Retail $_p$ ). This latter equals one for food and non-food retailer goods within HS2 groups.

Our specification includes city-product-country fixed effects,  $\lambda_{ipc}$ , to account for specialization patterns at the bilateral level. A city may have a natural inclination to import specific goods from a given international source for historical reasons or the presence of immigrants from that country. Product-country-year fixed effects,  $\mu_{pct}$ , are further introduced to capture country-level variations in the supply of goods to the Chinese market over time. These account for shocks that are common to all cities relating to the international links between China and its partners, whether they are product-specific (tariffs) or not (exchange rate movements).

We further control for time-varying city-specific factors by including a set of city-country-year fixed effects,  $\nu_{ict}$ . These pick up the uneven economic development and retail-market regulations across Chinese cities, and control for shocks to market conditions in a given location that affect the demand for all products in the city equally. Most importantly, they eliminate any simultaneity bias that might arise from the endogenous location of multinational chains. They also help to distinguish the impact of foreign retail chains from general shocks to the bilateral links between a city and a foreign country. Our findings do not then

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$c$  and product  $p$  triad which recorded a positive import flow at some point over this period. Some import figures will thus be zero in some years. The dependent variable is  $\ln(1+\text{Imports}_{ipct})$ , so as to include these zero import figures.

solely reflect the repercussions of foreign direct investment in city  $i$  from country  $c$ . Note that were the impact of global retailers to be to familiarize local consumers with the overall reliability and quality of imported goods, or even to promote the specific global image of the retailers' home country, then this would be picked up in our city-country-year fixed effects. Our specification hence focuses on the differential response of retail product imports.

One inherent empirical challenge in identifying the effect of multinational retailers on imports is dealing with the potential endogeneity of multinational retailer presence, and a key concern relates to the confounding effect of demand. The different growth rates of Chinese cities could indeed lead their income and preferences to change, producing differential demand growth for the type of goods that multinational retailers provide. Those cities with high demand growth for retail goods are likely to have higher imports of retail goods and also host more retail stores. Our empirical strategy aims to focus on the supply side post multinational retailer entry. It is hence key to control for the demand effects that will produce an upward bias.

Our baseline includes separate city-specific time trends for retail and non-retail goods,  $\sum_i \gamma_i t \times \text{Retail}_p$ , to capture any different demand dynamics for retail and non-retail goods in each city. These help account for the heterogeneous shift in demand towards imported retail goods across cities as they develop. It is likely that the retailer's choice of where to establish a store depends not only on current local demand (for retail goods) but also the growth potential. Including separate city-specific linear time trends for retail and non-retail goods hence controls for any underlying differences between the (treated) retail products and the (control) non-retail products. This control nonetheless does assume that these potential confounding factors affect our outcome variables in a linear way.

To see whether the import impact is specific to the retailers' home country, we exploit import origin and interact our variable of interest, the interaction  $\text{Western Retail Stores}_{it} \times \text{Retail}_p$ , with a dummy for the imports originating from the headquarter country of the locally-established multinational retailers. Our empirical strategy to identify the causal effect of multinational retailing on imports thus amounts to a triple difference, which focuses on a greater relative rise in retail good imports in cities with multinational retailers for imports from the retailer's country of origin. We include city-product-year fixed effects, which allow us to improve the identification of the impact with respect to potential endogeneity, without including city-specific time trends.

We then zoom in on the products that are the most likely to benefit from the expansion of Western retailers, food products for household consumption, and interact our multinational-retailer presence measure with dummies for retail food products and retail non-food products. We also estimate retailer-specific effects and include the number of hypermarkets (and their interactions) for the four main countries (France, Germany, the UK and the US) simultaneously. Last, we test whether the pro-trade impact of Western retailers is more salient when they locate in areas with higher barriers to international business, and for differentiated goods, for which informational costs are more substantial.

We cluster standard errors at the location level to take into account that retail presence is measured at the city-level (although it is time-varying) and address potential serial correlation (Bertrand et al., 2004).

## 4 Results

### 4.1 Baseline

Table 3 reports our baseline estimates. In columns 1 and 2, we estimate Equation 1 without city-country-year fixed effects,  $\nu_{ict}$ , to assess the overall association between city import intensity and the number of multinational retailers. Column 2 adds the key interaction between Western retail presence and the retail goods dummy. The results show that the interaction  $\text{Western Retail Stores}_{it} \times \text{Retail}_p$  attracts a positive and significant coefficient, while the variable  $\text{Western Retail Stores}_{it}$  on its own has a positive but insignificant coefficient. In line with our expectations, the results then suggest that only retail-good imports are affected by the presence of the chains. Column 3 adds city-country-year fixed effects, causing the number of Western retail stores to drop out. The city-country-year fixed effects pick up time-varying city-level demographic and economic conditions that may affect both city-level imports and multinational retailers' location choice. These fixed effects also control for any effect from the local presence of domestic retailer chains and all time-varying bilateral factors that are common to all goods. Their inclusion slightly reduce the size and the significance of our  $\beta$ , but our result remains: western retail expansion has brought about a relative rise in imports for the goods offered in hypermarkets.

In column 4, we refine our specification to exploit information on retailer country of origin and investigate whether the effects from retailer presence at the city level on imports differ for those from multinational retailer headquarter countries. We expect a larger rise for these imports for two reasons. First, the presence of hypermarkets from the home country may reduce export trade costs, by lowering the costs of market prospecting, information

Table 3: Baseline specification: retailer expansion and imports

Dependent variable	ln Imports <sub>ipct</sub>				
	(1)	(2)	(3)	(4)	(5)
Western Retail Stores <sub>it</sub>	-0.005 (0.008)	-0.011 (0.008)			
Western Retail Stores <sub>it</sub> × Retail <sub>p</sub>		0.020 <sup>a</sup> (0.006)	0.010 <sup>c</sup> (0.005)	0.009 (0.005)	
Western Retail Stores <sub>it</sub> × Retail <sub>p</sub> × Home <sub>c</sub>				0.039 <sup>a</sup> (0.007)	0.053 <sup>a</sup> (0.009)
Observations	4,044,080	4,044,080	3,958,537	3,958,537	3,875,661
R-squared	0.58	0.58	0.63	0.63	0.68
City-trend by product-type	Yes	Yes	Yes	Yes	No
Product-Country-Year fixed effects	Yes	Yes	Yes	Yes	Yes
City-Product-Country fixed effects	Yes	Yes	Yes	Yes	Yes
City-Country-Year fixed effects	No	No	Yes	Yes	Yes
City-Product-Year fixed effects	No	No	No	No	Yes

Heteroskedasticity-robust standard errors appear in parentheses. These are clustered at the city-year level in columns 1 to 4 (where the presence of city-level trends by product-type does not allow clustering at the city level) and at the city level in column 5. Imports<sub>ipct</sub> denotes imports of product  $p$  in city  $i$  from country  $c$  in year  $t$ . Products are defined as categories (non-retailer goods, retailer food goods and retailer non-food goods) within an HS2. <sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate significance at the 1%, 5% and 10% confidence levels.

and logistics for exporters. Second, multinational retailers may have particular links to their home suppliers and continue to work with them in their international operations. We thus test whether Chinese imports from France are correlated with the geographic spread of Carrefour and Auchan in China, and imports from Germany, the United Kingdom and the US are in turn linked to the geographic spread of Metro, Tesco, and Walmart. To do so, we interact our key variable Western Retail Stores<sub>it</sub> × Retail<sub>p</sub> with a dummy for the imports originating in the local hypermarket’s headquarter country. Hence if Metro and Carrefour are both present in city  $i$ , the dummy Home<sub>c</sub> is 1 for imports from France and Germany. Only the interaction term Western Retail Stores<sub>it</sub> × Retail<sub>p</sub> × Home<sub>c</sub> attracts a positive and significant coefficient, suggesting a relative rise in retail good imports in cities with multinational retailers only for imports from the retailer’s home country.

In column 5, we estimate our home-country specification adding city-product-year fixed effects to fully absorb the demand-related confounders. This is the ultimate way of cleaning

out unobserved differential changes in demand for retail and non-retail goods. According to our results, one additional multinational retailer is estimated to produce a relative rise in retail good imports of 5.3% from the multinational retailers' headquarter countries.

Finding that multinational retailer presence in Chinese cities yields a disproportionate rise in imports from the retailer's home country matches the finding in Cheptea et al. (2015a, b) that retailer expansion produces lower transaction costs that particularly benefit home-country producers.<sup>9</sup>

## 4.2 Robustness checks

In this section, we propose a number of complementary approaches to address the issue of endogeneity. We use an instrumental-variable strategy and conduct a variety of placebo tests with the random assignment of products across retail and non-retail categories and the false assignment of the retailers' countries of origin.

Our IV strategy exploits variations in the expansion patterns of the retailers due to changes in the policy that limited entry by foreign retailers. Chinese authorities adopted an incremental approach to China's retail-market deregulation, so that the barriers facing multinational retailers that wanted to operate in the Chinese retail market were not eliminated simultaneously across cities (Head et al., 2014). A few designated areas opened to foreign retailers as early as 1992 (with the number of foreign retailers restricted to one or

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<sup>9</sup>Regional productivity for retail goods could improve as retailers from advanced countries transfer knowledge to their upstream local Chinese suppliers (Javorcik and Li, 2013). Moreover, local suppliers have an incentive to upgrade the quality of their products, especially from a sanitary point of view, if they want to be selected by retailers (Reardon et al., 2007). Any such positive relationship between the presence of multinational retailers and local productivity in retail goods would however work against there being a positive relationship between the number of retailers and imports of retail goods. Our estimates thus represent a lower bound for the import-promoting effect of global retailers.

two).<sup>10</sup> Entry into all provincial capitals was allowed in 1999, before all restrictions were lifted after 2005 (Wang and Zhang, 2006). Our IV strategy exploits these policy changes that resulted in retailers differentially entering Chinese locations for non-demand reasons. We use the number of years since deregulation as an instrument.

Column 1 of Table 4 applies our instrumental-variable approach to the home-country specification in column 5 in Table 3, instrumenting  $\text{Western Retail Stores}_{it} \times \text{Retail}_p \times \text{Home}_c$  by the interaction of the number of years since the first opening of a multinational retailer in the city, the retail dummy and the home-country dummy. We continue to find a positive and significant impact of multinational-retailer presence on retail good imports from the retailers' headquarters countries. Having only a single instrument, we cannot test model overidentification and check the exogeneity of our instrument. However, the bottom of the table shows tests of both underidentification and weak identification. The latter comes from the F-test on the excluded instrument in the first-step regression. This F-statistic is over 10, which is the informal threshold suggested by Staiger and Stock (1997) to assess instrument validity. This suggests that our instrument is not weak. The validity of our instrument is supported by the rejection of underidentification (a low p-value for the Kleibergen-Paap rk LM statistic). The results of the first-step estimation appear in Appendix Table A-2: these reveal a positive and significant correlation between the instrument and the local number of Western retailers' stores, as expected. We report at the foot of column 1 of Table 4 the test for the exogeneity of  $\text{Western Retail Stores}_{it} \times \text{Retail}_p \times \text{Home}_c$ . The p-value of the Hausman Wu test (over 0.1) indicates that - under the assumption that our instrument is

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<sup>10</sup>These consisted of six cities (Beijing, Shanghai, Tianjin, Guangzhou, Dalian and Qingdao) and five Special Economic Zones (Shenzhen, Zhuhai, Shantou, Xiamen and Hainan).

Table 4: Retailer expansion and imports: robustness checks (1)

Dependent variable	ln Imports <sub>ipct</sub>					
Specification	(1)	(2)	(3)	(4)	(5)	(6)
	IV		Falsification checks			
Western Retail Stores <sub>it</sub> × Retail <sub>p</sub> × Home <sub>c</sub>	0.114 <sup>a</sup>					
	(0.054)					
Western Retail Stores <sub>it</sub> × Retail <sub>p</sub> <sup>False</sup> × Home <sub>c</sub>		0.0002				
		(0.009)				
Western Retail Stores <sub>it</sub> × Retail <sub>p</sub> × Home <sub>c</sub> <sup>False</sup>			-0.006	-0.011	0.025	0.018
			(0.023)	(0.024)	(0.020)	(0.015)
R-squared	0.68	0.68	0.68	0.68	0.68	0.68
Product-Country-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
City-Product-Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
City-Country-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
City-Product-Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Underidentification	8.738					
Weak identification F-test	10.956					
Weak identification p-value	0.0031					
Hausman Wu test p-value	0.265					

The sample size is 3,875,661. Heteroskedasticity-robust standard errors clustered at the city level appear in parentheses. Imports<sub>ipct</sub> denotes imports of product  $p$  in city  $i$  from country  $c$  in year  $t$ . Products are defined as categories (non-retailer goods, retailer food goods and retailer non-food goods) within an HS2. <sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate significance at the 1%, 5% and 10% confidence levels. The results of the first step appear in column 1 of Table A-2. See text for the description of the false assignment of products into non-retailer goods and the false assignment of the retailers country of origin.

valid - there is no significant difference between the OLS and IV estimates. This suggests that the inclusion of our four categories of fixed effects (city-product-country, product-country-year, city-country-year, city-product-year) captures to a large extent the reasons why a city hosts multinational stores. We thus cannot reject the null hypothesis that, in the presence of these fixed effects, there is no endogeneity problem with the OLS estimators. For this reason, OLS is retained as the preferred specification for the remainder of the paper.

We propose a falsification test with the random assignment of products across retail and non-retail categories to further check whether our results are biased due to the omission of factors that vary differently by city-year for retail and non-retail products.<sup>11</sup> Specifically, in our regression sample 67 products are categorized as retail out of 159 products. We first randomly select 67 products from the total 159 products and assign them as retail products,

<sup>11</sup>For similar placebo practices, see for example Cai et al. (2016) and La Ferrara et al. (2012).

with the remainder being non-retail products. We then construct a false treatment variable, i.e.  $\text{Western Retail Stores}_{it} \times \text{Retail}_p^{False} \times \text{Home}_c^{False}$ .

The randomization means that this newly-constructed regressor of interest should have no effect on import flows. In other words, any significant results would indicate that there are significant omitted variables. We conduct this random data-generating process 500 times to avoid contamination by rare events. The results from our home-country specification appear in column 2 of Table 4. These correspond to the mean value of the estimates from the 500 random assignments. The mean value is not different from zero (with a mean of 0.0002 and standard deviation of 0.009). This indicates that our true estimates are clear outliers in the placebo tests, and suggests that they are not strongly biased by omitted variables.

We also run a series of falsification tests in which we falsely assign the retailers' countries of origin. In the first group we set the "false" retailer country of origin to the closest (in terms of cultural distance) neighboring country to the hypermarket's headquarter country of origin. In column 3 of Table 4,  $\text{Home}_c$  is 1 for imports from Benelux (instead of France) for Carrefour and Auchan, it is 1 for imports from Canada (instead of the US) for Walmart, it is 1 for imports from Ireland (instead of Great Britain) for Tesco, and it is 1 for imports from Netherlands (instead of Germany) for Metro. In column 4, we check that the results are identical when the dummies are set to 1 for Spain for Carrefour and Auchan, and to Poland for Metro. In all cases, the estimated coefficients on the key variable  $\text{Western Retail Stores}_{it} \times \text{Home}_c$  was insignificant.

In two additional falsification tests, we restricted the reshuffling of the assigned country of origin to be the closest country of the original four origin countries (USA, GBR, FRA and GER). After setting Germany as the "false" origin country for French supermarkets, we set

France as the origin country for Metro, the USA for Tesco and Great Britain for Walmart. Alternatively, we set the USA as the origin country for Metro and France as the origin for Tesco. The results appear in columns 5 and 6 of Table 4 respectively. In both cases, we find an insignificant additional rise in retail imports in cities with multinational retailers from the retailer’s “false” home country.

Table 5 proposes a number of complementary robustness checks using different samples. Column 1 excludes imports flows from Hong Kong, Taiwan and Macao. These Greater China territories, especially Hong Kong, play a particular role in intermediating trade between China and the rest of the world (Feenstra and Hanson, 2004). Part of the imports originating from these well-known “entrepot” and import-export platforms may in fact be re-imported Chinese goods. Excluding the 300,000 observations corresponding to imports from these three partners does not change our estimates. Column 2 excludes import flows from countries without global retail chains<sup>12</sup>, and column 3 those from cities in the West of China. The Western part of China differs significantly from the rest of the country: it is poorer, less urbanized and virtually without any foreign hypermarkets. In column 4 we exclude the first cities who received foreign retailers (i.e. Shanghai, Beijing and Shenzhen). Removing these different countries or cities does not change our results.<sup>13</sup>

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<sup>12</sup>From Planet Retail 2014

<sup>13</sup>In unreported results available upon request we check that our main findings are robust to accounting for the unbalanced nature of our dataset. We successively use the city-sector pairs that import continuously over the period and the city-sector-country triads that import continuously over the period. The point estimates are virtually unchanged. We also ensure that our results do not depend on the particular aggregation level: our main findings continue to hold when using data aggregated at the four-digit instead of the two-digit level.

Table 5: Retailer expansion and imports: robustness checks (2)

Dependent variable	ln Imports <sub><i>ipct</i></sub>			
	(1)	(2)	(3)	(4)
Sample	No greater China origin	No countries w/o retailers	No Western cities	No first cities
Western Retail Stores <sub><i>it</i></sub> × Retail <sub><i>p</i></sub> × Home <sub><i>c</i></sub>	0.055 <sup><i>a</i></sup> (0.010)	0.051 <sup><i>a</i></sup> (0.010)	0.053 <sup><i>a</i></sup> (0.010)	0.068 <sup><i>a</i></sup> (0.016)
Observations	3,582,914	3,234,575	3,517,683	3,540,733
R-squared	0.68	0.68	0.68	0.66
Product-Country-Year fixed effects	Yes	Yes	Yes	Yes
City-Product-Country fixed effects	Yes	Yes	Yes	Yes
City-Country-Year fixed effects	Yes	Yes	Yes	Yes
City-Product-Year fixed effects	Yes	Yes	Yes	Yes

Heteroskedasticity-robust standard errors clustered at the city level appear in parentheses. Imports<sub>*ipct*</sub> denotes imports of product *p* in city *i* from country *c* in year *t*. Products are defined as categories (non-retailer goods, retailer food goods and retailer non-food goods) within an HS2. Column 1 excludes imports flows from Hong Kong, Taiwan and Macao. Column 2 excludes import flows from countries without global retail chains. Column 3 excludes Western Chinese cities. Column 4 excludes the first cities with foreign retailers. <sup>*a*</sup>, <sup>*b*</sup> and <sup>*c*</sup> indicate significance at the 1%, 5% and 10% confidence levels.

### 4.3 Food and retailer-specific effects

We build on our triple difference approach to investigate the specific effects for food and non-food products separately. We use two dummies, Food<sub>*p*</sub> and Non Food<sub>*p*</sub>, for the type of goods available for sale in hypermarkets and interact them with the interaction between the city-level count of Western retail stores and the Home<sub>*c*</sub> dummy. In column 1 of Table 6, both interaction terms attract positive and significant coefficients, the triple interaction Western Retail Stores<sub>*it*</sub> × Food<sub>*p*</sub> × Home<sub>*c*</sub> entering with a coefficient which is thrice as large as that on Western Retail Stores<sub>*it*</sub> × Non Food<sub>*p*</sub> × Home<sub>*c*</sub>. As such, our previous retailer relative import expansion from the headquarter country is mainly driven by the food sector.

This result is consistent with the relatively greater import propensity of foreign retailers notably for food products. In China, foreign retailers differ from domestic supermarkets in that they offer a much larger share of imported food products (USDA, 2008). This is also in line with the privileged relationship between retailers and their home-country suppliers, which is especially relevant for food products due to safety issues and to the importance of

own-brand products in food.

Column 2 of Table 6 considers retailer-specific effects. It follows the specification of column 1, distinguishing the impact of Western hypermarkets on food and non-food imports by retail chain. The import promotion effect of retail companies, and notably the relative gains for food and non-food products, may differ by the country where the chain is headquartered, due to different product specialization and companies' strategies. For example, whereas food products represent 5.5% of Chinese imports from France, they amount to only 0.7% of imports from Germany.  $\text{Tesco Stores}_{it}$ ,  $\text{Metro Stores}_{it}$ ,  $\text{Walmart Stores}_{it}$  and  $\text{Carrefour-Auchan Stores}_{it}$  are respectively the count of Tesco, Metro, Walmart and Carrefour-Auchan hypermarkets in city  $i$  at year  $t$ .<sup>14</sup> All interacted variables enter with a significant and positive coefficient, suggesting that all western retail chains foster imports from their headquarter country, both for food and non-food products.

The import promotion effect for food appears higher than for non-food products for Auchan, Carrefour, Metro and Tesco. We observe a different pattern for Walmart whose expansion has a similar effect for food and non-food products. This result is in line with the strategy of the different retail chains in terms of product offer. Auchan, Carrefour, Metro and Tesco have been engaged for many years in an own-brand strategy, and own-brand products now represent a considerable part of their hypermarket sales, in particular for food products (43% for Tesco, 30% for Carrefour and Auchan on average). For example, to capitalize on the appeal of French food, Carrefour offers, as well as the classic Carrefour-branded goods, more than 200 food products and 40 wines under the label "Reflets de France" in international

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<sup>14</sup>Carrefour and Auchan stores are counted together, as they are both French retail chains and follow the same supply strategy.

Table 6: Food and company specific effect: retailer expansion and imports

Dependent variable	ln Imports <sub>ipct</sub>		
	(1)	(2)	(3)
Sample	All	All	W/o beverage
Western Retail Stores <sub>it</sub> × Food <sub>p</sub> × Home <sub>c</sub>	0.107 <sup>a</sup> (0.021)		
Western Retail Stores <sub>it</sub> × non Food <sub>p</sub> × Home <sub>c</sub>	0.036 <sup>a</sup> (0.012)		
Carrefour-Auchan stores <sub>it</sub> × Food <sub>p</sub> × Home <sub>c</sub>		0.112 <sup>a</sup> (0.021)	0.142 <sup>a</sup> (0.024)
Carrefour-Auchan stores <sub>it</sub> × non Food <sub>p</sub> × Home <sub>c</sub>		0.028 <sup>c</sup> (0.015)	0.028 <sup>c</sup> (0.014)
Walmart stores <sub>it</sub> × Food <sub>p</sub> × Home <sub>c</sub>		0.055 <sup>c</sup> (0.033)	0.066 <sup>c</sup> (0.035)
Walmart stores <sub>it</sub> × non Food <sub>p</sub> × Home <sub>c</sub>		0.028 <sup>c</sup> (0.016)	0.029 <sup>c</sup> (0.016)
Tesco stores <sub>it</sub> × Food <sub>p</sub> × Home <sub>c</sub>		0.229 <sup>a</sup> (0.036)	0.243 <sup>a</sup> (0.033)
Tesco stores <sub>it</sub> × non Food <sub>p</sub> × Home <sub>c</sub>		0.052 <sup>b</sup> (0.022)	0.052 <sup>b</sup> (0.022)
Metro stores <sub>it</sub> × Food <sub>p</sub> × Home <sub>c</sub>		0.525 <sup>a</sup> (0.178)	0.678 <sup>a</sup> (0.192)
Metro stores <sub>it</sub> × non Food <sub>p</sub> × Home <sub>c</sub>		0.282 <sup>a</sup> (0.082)	0.287 <sup>a</sup> (0.083)
Observations	3,875,661	3,875,661	3,841,889
R-squared	0.68	0.68	0.68
Product-Country-Year fixed effects	Yes	Yes	Yes
City-Product-Country fixed effects	Yes	Yes	Yes
City-Country-Year fixed effects	Yes	Yes	Yes
City-Product-Year fixed effects	Yes	Yes	Yes

Heteroskedasticity-robust standard errors clustered at the city level appear in parentheses. Imports<sub>ipct</sub> denotes imports of product  $p$  in city  $i$  from country  $c$  in year  $t$ . Products are defined as categories (non-retailer goods, retailer food goods and retailer non-food goods) within an HS2. Column 3 excludes imports from the beverage sector (chapter 22). <sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate significance at the 1%, 5% and 10% confidence levels.

markets.<sup>15</sup> These products developed via long-lasting and trusting relationships between the French retailer and many home-country food producers are proposed in China-based Carrefour stores for Chinese consumers to discover French gastronomy. Auchan has a similar strategy and proposes French regional products under the label “Les Produits Régionaux” and some gourmet products beside the basic Auchan-branded goods. Tesco has no such label, but proposes products with British characteristics, especially those sold under Tesco Finest, the retailer’s premium range of branded goods. These particularities are likely to encourage imports from France and the UK in order to have these typical French and British products in Chinese stores. Metro has also developed its own brand, but more recently (in 2009), which can explain the narrower difference between the coefficients for food and non-food products for Metro, as compared to Auchan, Carrefour, and Tesco. As far as Walmart is concerned, it proposes a premium retail brand, called Sam’s Choice, that covers a wide range of food products with little national gastronomic positioning. This could explain why there is no significant difference between the estimates for food and non food imports.

#### **4.4 Evidence of a spillover effect**

So far our results are consistent with a direct sales effect in the retailers’ aisles. Exporters from the country of origin of the retailers can benefit from reduced informational costs and from knowledge to reach markets through their national retailers (same language and same business practices). However, in the specific context of China, the very small fraction of imported goods in the sales of western retail stores in China limits the case for a dominating

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<sup>15</sup>Set up in 1996, Reflets de France (<http://www.refletsdefrance.com/>) offers high-quality local products from French regional producers including cheese, charcuterie, canned goods and wine. This label is a retail brand, but the products do not show the retail name on their packaging.

direct sale effect. Although the data is rather sketchy there is a clear consensus on the fact that although hypermarkets are a major sales venue for imported (food) products in China, imported goods rarely account for more than 5% of the goods proposed in western retailers (USDA China Retail Report 2014). Walmart for example states on its corporate website that “Over 95% of the merchandise in our stores in China is sourced locally” (<http://www.walmartchina.com/english/walmart/>). Imported products in Metro, which is the retailer with the widest selection of imported products, allegedly contribute for 10% of sales revenue (USDA China Retail Report 2012). By comparison, the share of imports above purchases of Walmart in Mexico is 55% (Durand, 2007).

To better understand the mechanisms at play, and notably the role of the indirect spillover channel, we perform two separate exercises. If multinational retailers generate spillover effects and reduce the trade costs and informational transaction costs restricting imports from other distributors, the pro-trade indirect effect of retailers should be more salient when they locate in areas with greater barriers to international business; it should also be larger for differentiated goods, for which the informational costs are more substantial than for homogeneous goods.

In the absence of direct measures of trade barriers that vary at both the product and city level, we exploit a robust finding in the trade literature of a positive association between intermediary prevalence and trade barriers. A higher share of intermediated exports is consistently found for destination markets that are harder to penetrate (Ahn et al., 2011; Akerman, 2017; Bernard et al., 2010a, 2010b). We hence use the share of intermediated imports in a city-product pair as a proxy for the associated import barriers. We use 2005 data, which is the first year in which firms wishing to trade directly in China were allowed to

Table 7: Spillover effect: retailer expansion and imports

Dependent variable	ln Imports <sub><i>ipct</i></sub>	
	(1)	(2)
Western Retail Stores <sub><i>it</i></sub> × Retail <sub><i>p</i></sub> × Home <sub><i>c</i></sub>	0.034 <sup><i>b</i></sup> (0.015)	0.076 <sup><i>a</i></sup> (0.010)
Western Retail Stores <sub><i>it</i></sub> × Retail <sub><i>p</i></sub> × Home <sub><i>c</i></sub> × Barriers <sub><i>it</i></sub>	0.040 <sup><i>c</i></sup> (0.021)	
Western Retail Stores <sub><i>it</i></sub> × Retail <sub><i>p</i></sub> × Home <sub><i>c</i></sub> × $\sigma_p$		-0.003 <sup><i>a</i></sup> (0.001)
Observations	3,318,659	3,846,319
R-squared	0.68	0.68
Product-Country-Year fixed effects	Yes	Yes
City-Product-Country fixed effects	Yes	Yes
City-Country-Year fixed effects	Yes	Yes
City-Product-Year fixed effects	Yes	Yes

Heteroskedasticity-robust standard errors clustered at the city level appear in parentheses. Imports<sub>*ipct*</sub> denotes imports of product *p* in city *i* from country *c* in year *t*. Products are defined as categories (non-retailer goods, retailer food goods and retailer non-food goods) within an HS2. <sup>*a*</sup>, <sup>*b*</sup> and <sup>*c*</sup> indicate significance at the 1%, 5% and 10% confidence levels.

do so (Ahn et al., 2011). We adopt the common practice in the literature of identifying intermediary firms based on the Chinese characters that have the English-equivalent meaning of “importer”, “exporter”, and/or “trading” in the firm’s name (Ahn et al., 2011). Column 1 of Table 7 adds the interaction between Western Retail Stores<sub>*it*</sub> × Retail<sub>*p*</sub> × Home<sub>*c*</sub> and our proxy of import barriers. This attracts a positive and significant coefficient, so that import gains are enhanced in more difficult markets. This is consistent with an effect of multinational retailers that goes beyond higher sales of imported groceries in their aisles: once a foreign producer has complied with all the administrative requirements to sell its products in a multinational retail outlet it can expand its sales through other local distributors with no additional procedures. The resulting sales expansion through other distributors is naturally greater in markets that the producer would not have considered initially due to their prohibitive entry costs.

Column 2 of Table 7 investigates whether the import gains are greater for differentiated than homogeneous goods, for which latter the informational costs are smaller. We estimate

the effect of Western retailers on imports according to the degree of product differentiation. We interact the variable  $\text{Western Retail Stores}_{it} \times \text{Retail}_p \times \text{Home}_c$  with  $\sigma_p$ , the elasticity of substitution measured for the corresponding HS2 group. Our data on  $\sigma_p$  are taken from Broda and Weinstein (2006).<sup>16</sup> The variable attracts a negative and significant coefficient, suggesting that the pro-import effect of multinational retailers falls with the degree of homogeneity. This is consistent with multinational-retailer presence helping exporters overcome the informational barriers that hinder the further development of their sales in the local market.

Overall our results are consistent with Western retail companies acting as a bridgehead for the penetration of the Chinese market by producers, over and above their own sales. They bring in their luggage domestic producers with which they have long-standing relationships and for which they reduce the fixed costs of entry into the Chinese market. These continuing relationships facilitate the further penetration of the Chinese market for these foreign producers. The underlying benefit is particularly high for producers facing larger trade costs and greater informational barriers.

## 5 Conclusion

This paper assesses whether multinational-retailer expansion has facilitated consumer-market penetration in China. Exploiting data on the five largest global retailers in China (Auchan, Carrefour, Metro, Tesco and Walmart) we find that the growth in global retailers' Chinese activities reduces trade costs for their home-country producers and boost their retail-goods

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<sup>16</sup>We use the average at the HS2 level of the HS3 elasticities. The elasticities for China are taken from [www.columbia.edu/~dew35/TradeElasticities/TradeElasticities.html](http://www.columbia.edu/~dew35/TradeElasticities/TradeElasticities.html).

exports to China. Our results suggest that this pro-import effect of multinational retailers goes beyond higher sales of imported retail goods by the retailers themselves. This shows that global retailers act as a springboard for the penetration of the Chinese market by producers from their home country.

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Table A-1: Data source of hypermarket locations

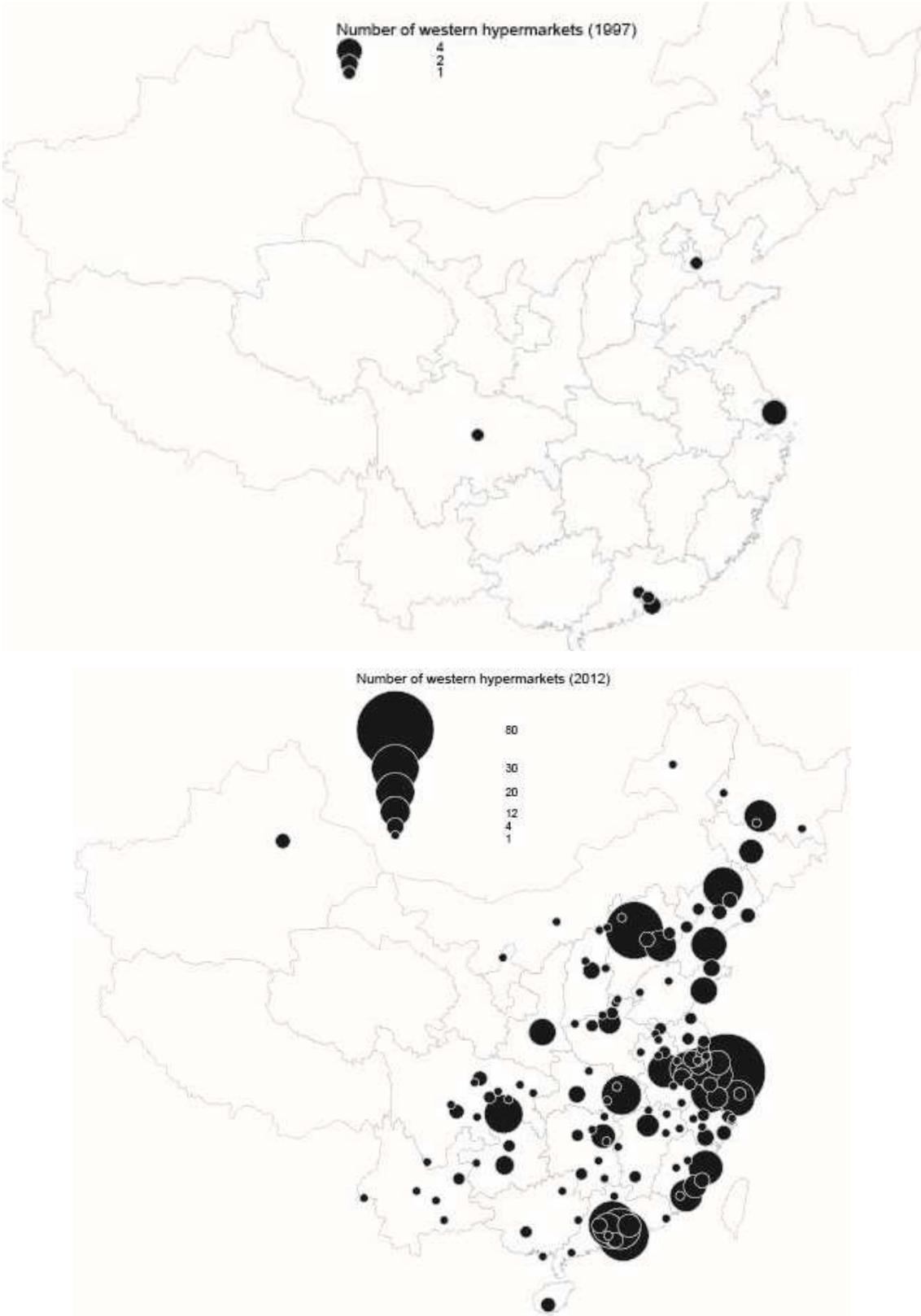
Retailer	Source
Auchan	<a href="http://www.linkshop.com.cn/web/archives/2014/280981.shtml">http://www.linkshop.com.cn/web/archives/2014/280981.shtml</a>
Carrefour	<a href="http://www.carrefour.com.cn/Store/Store.aspx">http://www.carrefour.com.cn/Store/Store.aspx</a>
Metro	<a href="http://www.metro.com.cn/public/home-cn/our_store">http://www.metro.com.cn/public/home-cn/our_store</a>
Tesco	<a href="http://www.cn.tesco.com/Stores_index.html">http://www.cn.tesco.com/Stores_index.html</a>
Walmart	<a href="http://www.wal-martchina.com/walmart/wminchina_map.htm">http://www.wal-martchina.com/walmart/wminchina_map.htm</a>

Table A-2: IV estimation, first step

Dependent variable	Western Retail Stores $_{it}$ $\times$ Retail $_p$ $\times$ Home $_c$ (1)
No. years since deregulation $_{it}$ $\times$ Retail $_p$ $\times$ Home $_c$	0.358 <sup>a</sup> (0.108)
Observations	3,875,661
R-squared	0.898
Product-Country-Year fixed effects	Yes
City-Product-Country fixed effects	Yes
City-Country-Year fixed effects	Yes
City-Product-Year fixed effects	Yes
Partial R-squared	0.074
F-test excluded instrument	10.96

Heteroskedasticity-robust standard errors clustered at the city level appear in parentheses. Imports $_{ipct}$  denotes imports of product  $p$  in city  $i$  from country  $c$  in year  $t$ . Products are defined as categories (non-retailer goods, retailer food goods and retailer non-food goods) within an HS2. <sup>a</sup>, <sup>b</sup> and <sup>c</sup> indicate significance at the 1%, 5% and 10% confidence levels. The results of the second step appear in Column 1 of Table 4. The F-test on the excluded instrument is equal to the weak identification test.

Figure A-1: Number of hypermarkets of the five leading international retailers in China, 1997 and 2012



The number of hypermarkets is the total store count by location of the five Western retailers considered here (Auchan, Carrefour, Metro, Tesco and Walmart).