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## **Do exporting firms benefit from retail internationalization?**

### **Evidence from France**

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## Abstract

In this paper, we explore the link between globalization of the retail sector and the export activity of firms from their origin country. In a previous paper (Cheptea et al. (2015)), we showed that exporting firm from countries with internationalized retail companies benefit more from this process than firms from other countries. The underlying assumption of this paper is that the main benefits are grasped by the retailers' domestic suppliers. In other words, firms that sell their products under retailers' brands benefit more from the overseas expansion of retailers than other firms. We employ French firm-level data to evaluate the effect for the two types of firms. We identify retailers' suppliers using the certification of French agri-food firms with the private IFS standard, granting them the right to sell their products under a retailer's brand. Our empirical objective is to estimate whether firms with IFS certification have better export performance on markets where French retail companies have established outlets. We find that certified French firms export more than non-certified firms to markets where IFS retailers established outlets (mainly outside Europe). The difference is statistically significant and robust to the use of firm- and country-specific fixed effects. Results are similar for the extensive and the intensive margin of exports.

*Keywords:* Multinational retailers, Firm-level exports, Private standards.

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

# 1 Introduction

All the worlds' largest retailers have established and multiplied their outlets in foreign countries. This trend has accelerated over the last decade and the struggle for new markets remains on the top of these firms' agenda. Their large size, many of these firms being included in the Forbes Global 2000 list of world's biggest companies, and their wide transnational network of outlets and business connections make these firms major regional and global players. Therefore, the overseas expansion of multinational retailers is likely to shape not only domestic and local economies, as suggested by the traditional literature on foreign direct investment, but also the foreign trade of origin and host countries.

In this paper we explore the link between globalization of the retail sector and the export activity of firms from their origin country. The literature on this subject is new and covers only a limited number of issues. Our analysis relates the most to the work of Head et al. (2014) on the impact of multinational retailers established in China on host country exports, and to Nordàs et al. (2008)'s case study analysis of the impact of the arrival of multinational retailers on host country export patterns. In a previous paper (Cheptea et al., 2015), we show that the overseas expansion of a country's retailers fosters its exports to these foreign markets. This can be due to a reduction of trade costs for firms from the origin country supplying retailers, or to a change in consumer preferences in the host country that benefits all origin country firms. In the current paper we use French firm-level data to evaluate the relative importance of these two channels. We argue that fixed and/or variable exporting costs are lower for the domestic suppliers of multinational retail companies than for the rest of domestic firms. From this, we build an equation that permits to measure the impact of the foreign activity of multinational retailers on the export capacity of firms from its origin country, and especially of those identified as retailer suppliers. This impact is disentangled from the one due to an increase in consumers' preference for origin country goods and benefiting to all agri-food firms. We use data on French agri-food firms and find that being a supplier for a multinational retail company on the domestic market increases the firms' export capacity to a foreign market where the retailer operates, both in terms of the probability to export and the volume of exports.

## 2 Stylized facts

### 2.1 IFS certification to identify retailers' suppliers

Our objective is to see whether retailers' suppliers have better export performance on markets where French retail companies have established outlets. Although information on retailers' suppliers is highly confidential, data on the certification of agri-food firms with private standards required by retailers is a good way to overcome this difficulty. French firms willing to sell their products in retailers' outlets have two options: sell them under their own brand, or sell products under retailers' brand. Actually, most firms selling under their own brands also sell similar products under retailers' brand. This can be explained, for example, by the attempt of firms to optimize their production capacities, which often exceed their sales. To sell its products under the retailer's label, firms need to comply with some private standards imposed by the latter, through a certification obtained from a private independent organism. Consequently, certification establishes preferential relations between retailers and their suppliers, regardless of their country of origin, and is a good proxy for identifying firms supplying retailers: even if all retail suppliers are not certified, certified firms supply for certain retail companies.

French retailers use the IFS (International Food Standard) certification. The IFS was launched in 2003 by the associated members of the German retail federation. Joined by its French and Italian counterparts in 2004 and, respectively, 2006, the standard drew up a quality and food safety standard for retailer branded food products, named the IFS Food, intended to allow the assessment of suppliers' food safety and quality systems, according to a uniform approach. Indeed, under the EU food law, retailers and brand owners have a legal responsibility for their brands. Private standards are, hence, designed to assist retailers and brand owners to produce food products of consistent safety and quality. In particular, they facilitate the standardization of quality, safety and operational criteria, and the fulfilment of legal obligations by manufacturers. Accordingly, these standards are appropriate tools for the application of the due diligence principle, i.e. the obligation to perform an investigation before contracting.

## 2.2 A French Agri-food firms database, distinguishing certified and non certified firms

We build a original dataset of French agri-food firms, using different sources. First, we use the AMADEUS dataset to define a sample of French agri-food firms.<sup>1</sup> This database, that records comparable financial and business information for public and private firms across Europe, allow us to have a large sample of both exporting and non exporting firms, that is necessary to analyze the export behavior of firms. It also permits to restrict our sample to the agri-food industry. This choice is motivated by the fact that goods from this industry are sold in all retailer outlets and, therefore, the investigated effects should be the strongest on the international trade in this type of products. Considering a specific industry has also the advantage of limiting the importance of unobserved factors expressed at the industry level on the firm's export behavior.<sup>2</sup> Second, we combine these data with an exhaustive list of certified firms supplied by the IFS organization. This dataset allow us to identify the French firms that were IFS certified since the launching of the certification in 2003. Third, to supplement information on the export behavior of firms, we merged our dataset with the French customs data, through the unique identification number of the firm in AMADEUS. The French Customs Register reports the volume and the quantity of exports of all French exporting firms, by product (at the 8-digit level of the HS classification) and destination country. We aggregate these data at the firm and country level, keeping exports of grocery products sold in supermarkets, corresponding to HS2 chapters 1 to 24. Finally, we combined our obtained dataset with data on the volume of sales of French retailers in each country of the world from the Planet Retail database, grouping together all grocery products sold in retailers' outlets.<sup>3</sup>

We end up with a dataset of about 25,000 agri-food firms for each year between 2004 and 2011. The introduction of the IFS certification in 2003 sets the lower limit of the investigated time period. The availability of grocery sales of multinational retailers restricts us from expanding our analysis beyond the year 2011. Figure 1 illustrates the number of firms in our sample, according to their exporting status and to whether they are certified or not. It shows that a vast majority of the firm of our sample do not export (this fact has been well documented in the literature REF), and furthermore that certified firms represent a small share of agri-food firms whatever the year (4% in

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<sup>1</sup>Amadeus is provided by Bureau van Dijk. We employed the version of the AMADEUS database covering French firms operating in the agri-food sector in 2012.

<sup>2</sup>wholesalers and retailers are excluded from the sample

<sup>3</sup>This database records the grocery sales by the world's top hundred individual retail companies in each country. The five French retail companies are in this top hundred.

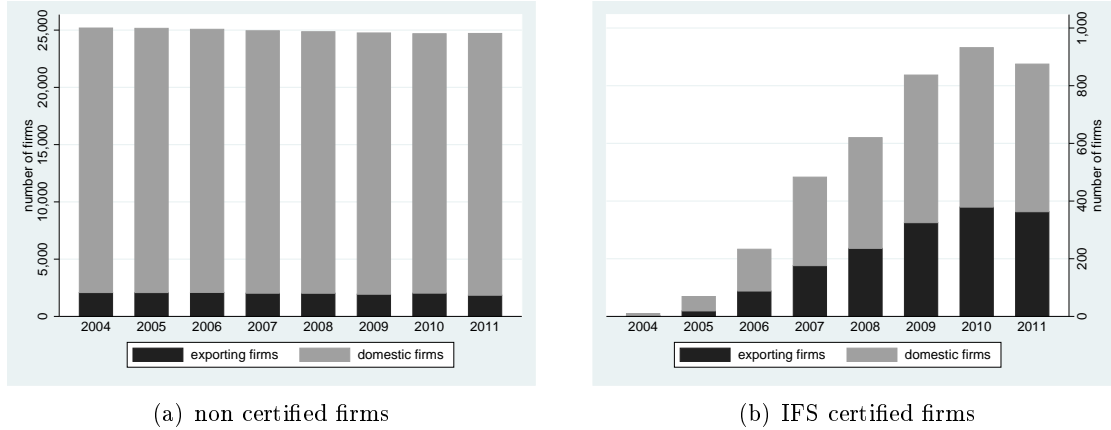


Figure 1: Number of French agri-food firms in our sample  
Notes: Authors' computation using Amadeus, Planet retail and French Customs.

average).

### 2.3 IFS certified firms are more export oriented, in particular to countries hosting French retail companies

The combination of the French custom database with the Planet Retail data allows to compare French agri-food firms performance according to whether the destination country is hosting French retail companies or not. Figure 2 provides the number of exporting markets and the mean exported value by French exporting firms, distinguishing markets with and without French retailers. What we observe is in line with the main finding of Cheptea et al. (2015): the internationalization of retail companies increase the competitiveness of origin country exports, both at the extensive (number of destinations) and at the intensive (value exported) margin.

The exhaustive IFS database allows to distinguish certified firms who benefits from preferential relations with retailers, from other firms. As previously, we assess the extensive margin of trade by computing the number of destination markets by firm in figure 3(a) (restricting our analysis to exporting firms). The average number of destinations is higher for certified firms for the whole period. Figure 3(b) shows that exporting certified firms exhibit in average higher export values (intensive margin). The high values at the beginning of the period is explained by the fact that very few firms of the sample of exporting firms are certified these years. All these figures suggest that benefiting from a certification is linked with better export performance for French agri-food firms. This result is confirmed when considering the whole sample of firms of the Amadeus database (not only exporting firms). While IFS certified firms represent on average 4% of the firm of the sample

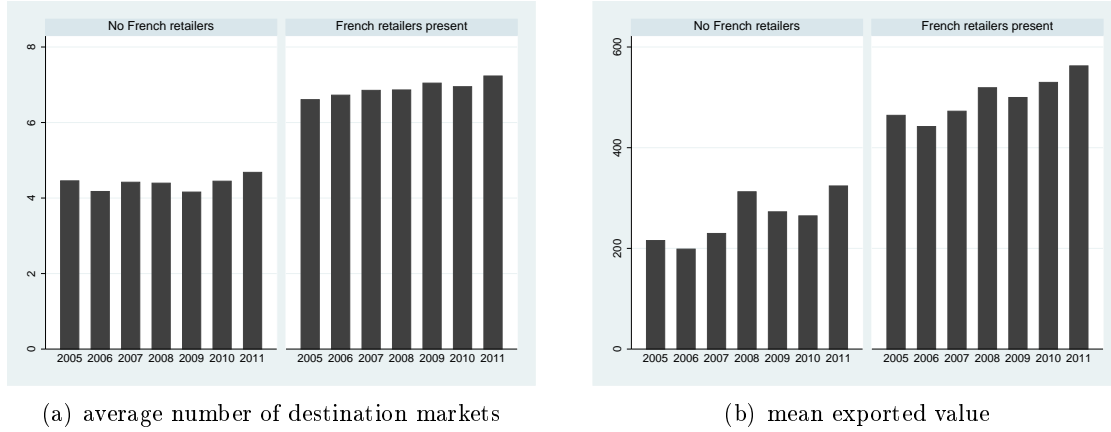


Figure 2: French agrifood firms' exports according to the destination country

Notes: Authors' computation using Amadeus, Planet retail and French Customs.

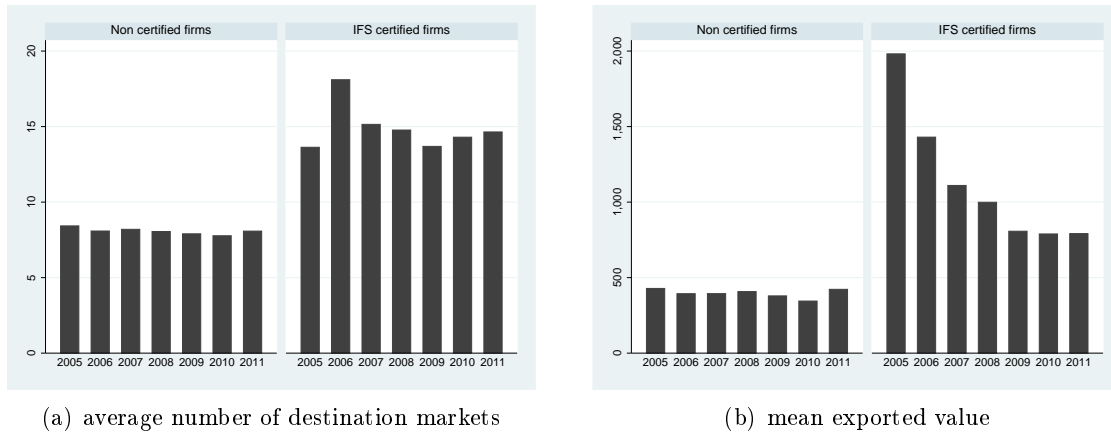


Figure 3: French agrifood firms' exports according to their certification

Notes: Authors' computation using Amadeus, Planet retail and French Customs.

for the whole period, they constitute 15% of the exporting firms and 33% of the French agri-food exports.

Finally, we investigate the trade performance of firms according to the presence of French retailers in the destination countries and to their certification. Figures 4(a) and 4(b) displays the average export value and number of markets for IFS and non-certified firms, on markets with and without French retailers. The previous result concerning the impact of French retailers of exports holds when distinguishing certified and non-certified firms: the presence of French retailers encourages exports for all the firms, whether certified or not. On the other side, the higher export performance observed for certified firms as compared to non-certified firms is only confirmed on markets hosting French retail companies, both at the extensive margin and at the intensive margin. No significant



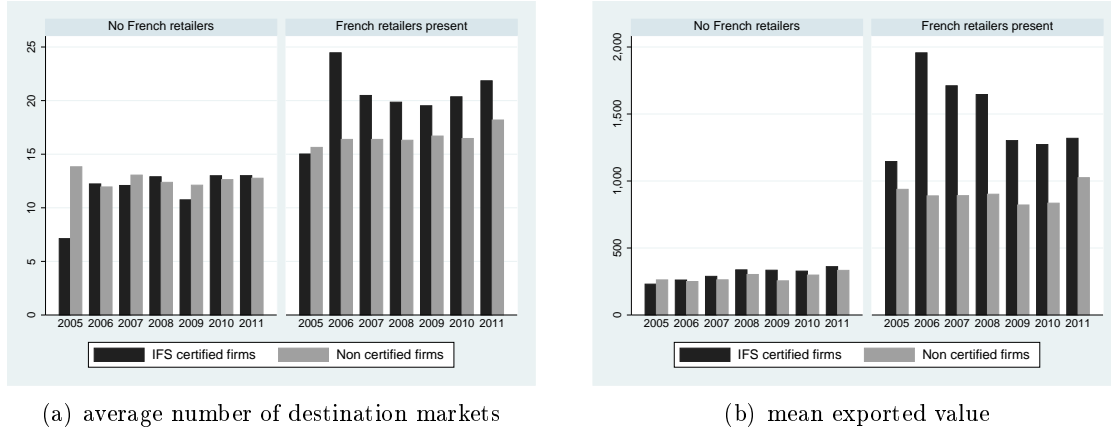


Figure 4: French agrifood firms' exports according to their certification and their destination country  
Notes: Authors' computation using Amadeus, Planet retail and French Customs.

difference appears between IFS certified and non certified firms on markets without French retailers.

Descriptive statistics suggest that the installation of French retailers abroad benefit all French Agri-food firms, offering then an improved market access, both in terms of entry and of value of trade. These positive impact of retailers appears to be greater for certified firms, that exhibit higher export performance on these markets.

### 3 Estimation of the impact of the foreign sales of French retailers on the exports of French agri-food firms

#### 3.1 Empirical strategy and data

In this section we estimate the impact of French retailers' sales on the exports of French agri-food firms to the host country, distinguishing the effect on the export of retailers' suppliers from the effect on other firms' exports. To this end, we employ data on the IFS certification of French firms to identify retailers' domestic suppliers.

We estimate the impact of retailers' overseas activity separately on the probability of firm  $f$  to export to country  $j$  (the extensive margin), and on the volume of its exports to this destination (the intensive margin). We use the same explanatory variables to estimate the effect on both export margins. These include in particular, the certification status of the firm,  $IFS_{ft}$ , the activity of French retailers in export market  $j$ ,  $\ln Sales_{jt}$ , and an interaction (product) of these two variables. The impact of this interaction term points out whether the probability to export and the volume of exports to markets where French retail companies established outlets is higher for retailers' suppliers.

This is the main variable of the analysis that catches the link between retailers and their suppliers we are looking for.

In the model for the extensive export margin, the dependent variable is binary:  $I(Exports_{fjt} > 0)$  is equal to one for observations with positive export flows and to zero otherwise:

$$\begin{aligned} I(Exports_{fjt} > 0) = & \beta_0 + \beta_1 IFS_{ft} + \beta_2 \ln Sales_{jt} + \beta_3 (\ln Sales_{jt} \times IFS_{ft}) \\ & + \Delta X_{ft} + \Theta Y_{jt} + \varepsilon_{fjt} \end{aligned} \quad (1)$$

$X_{ft}$  and  $Y_{jt}$  are the full sets of firm- and, respectively, country-specific fixed effects,  $\Delta$  and  $\Theta$  are the associated vectors of parameters, and  $\varepsilon$  is a zero-mean error term.

We estimate a similar model for the intensive margin. In this case the explanatory variable is strictly positive. We express it in logarithms and interpret coefficients  $\alpha_2$  and  $\alpha_3$  as elasticities.

$$\begin{aligned} \ln Exports_{fjt} = & \alpha_0 + \alpha_1 IFS_{ft} + \alpha_2 \ln Sales_{jt} + \alpha_3 (\ln Sales_{jt} \times IFS_{ft}) \\ & + \Gamma X_{ft} + \Xi Y_{jt} + \epsilon_{fjt} \end{aligned} \quad (2)$$

The data panel used for estimations covers the exports of French agri-food firms of edible grocery products sold in supermarkets between 2004 and 2010. The data sources and the construction of the panel are explained in detail in section 2. We aggregate the export data across products in order to obtain the overall value of agri-food exports of each firm to each country. The volume of sales of all French retailers in each importing country are obtained by summing the sales of individual French retail companies. The empirical strategy proposed to properly measure the impact of the interaction term previously presented is to use alternative sets of fixed effects. Mixing time-invariant and time-varying fixed effects for each firm and/or country in the estimations provides results within or across firms, within or across countries (following Kruger and Verhoogen, 2009). This strategy helps to fully understand the way retailers' suppliers benefit from retailers overseas expansion. The use of fixed effects is also a relevant way to avoid selection biases linked to the availability and observability of firm characteristics for non-random (selected) sub-panels of firms. Equation (1) is estimated using a linear probability model because of capacity constraints of estimating a Probit or Logit model with a large set of fixed effects.<sup>4</sup> Equation (2) is estimated with OLS.

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<sup>4</sup>Our data panel covers 25,726 firms, of which 3,459 export at least once, and 204 destination markets.

### 3.2 Extensive export margin

We start by investigating the impact of certification and retailers' foreign activity on the extensive export margin, i.e. the probability of a firm to export to a given market. Table 1 displays the results of the estimation of equation (1) using a linear probability model. Our dependent binary variable takes the value one for all observations with positive exports, and the value zero otherwise. In order to correctly estimate the impact on the extensive margin, we need to include nil exports of each firm in our panel. Therefore, our estimation panel corresponds to the full matrix of French firms, years, and destination markets. As we use a linear probability model, the size of estimated coefficients is not directly interpretable as a change in firms' probability to export, but the sign of coefficients is a plausible indicator of a positive or negative change in export probability.

The five columns of Table 1 correspond to five different specifications, using different sets of firm- and country-specific fixed effects. In the regression reported in column 1 we use time-varying country fixed effects alone. This permits us to compare effects across firms, for a given destination and year. The sales of French retailers on the import market are collinear with the importer fixed effects and are dropped from the estimation. We find a positive significant coefficient for the IFS certification variable and for the interaction term. This indicates that certified firms have a higher probability to export, and this probability increases with the sales of French retailers on the destination market.

In column 2 we add time-invariant firm fixed effects. This permits us to compare the effects of the overseas activity of French retailers within the firm, for a given destination market and year. We find a significant effect only for the interaction term. Results show that becoming certified does not increase the firm's probability to export on markets without French retailers (the coefficient of the IFS certification dummy is not significantly different from zero), but it does increase the probability to export to markets where French retailers operate. Moreover, the second coefficient shows that certified firms benefit more from an increase in the foreign sales of French retailers.

The estimation reported in column 3 includes only time-varying firm-specific fixed effects. This enables us to evaluate the effects across different export destinations for a given firm and year. The IFS certification dummy is dropped from the estimation due to collinearity with fixed effects. Results show that the foreign sales of French retailers increase the probability to export for all French firms in the agri-food sector. This finding is in line with Cheptea et al. (2015), who show that the overseas expansion of retailers fosters the exports of their country of origin to the retailers' host countries. The effect is larger for certified firms, as pointed by the positive and significant

coefficient for the interaction term.

In column 4 we use time-varying firm effects together with time-invariant country fixed effects. Compared to the estimation in column 3, we now control for the main differences between import markets (the ones that remain constant in time). The coefficient of the interaction term is again positive and statistically significant, confirming that certified firms are more likely to export to foreign countries where invest French retailers. The effect is stronger the larger the sales of French retailers. The coefficient on the sales of French retailers in the import market corresponds to the effect on the export probability of non-certified firms. The negative value of this coefficient indicates that non-certified firms are less likely to export to countries where French retailers have established outlets, although the magnitude of the effect is very small. These findings indicate that only certified firms benefit from the overseas activity of French retailers.

In column 5 we use time-varying fixed effects for firms and import countries. This permits us to control for all possible observable and non-observable firm- and country-specific factors. The only coefficient estimated in this case is that of the interaction term. The certification dummy and retailers' sales in the import country are dropped because of collinearity with the included fixed effects. Results validate our finding from the previous columns that certified firms have a higher probability to export to destinations with high sales of French retailers.

To sum up, in all columns of Table 1 the coefficient of our variable of interest (the interaction term  $\ln Sales_{j,t} \times IFS_{ft}$ ) is always positive and statistically significant. The magnitude of the effect almost does not change, proving the robustness of the effect. This supports our prediction that certified firms benefit more than their non-certified counterparts from the activity of French retailers on foreign markets. Certified firms that can sell their products via retailers' network of outlets are more likely to export to countries where are located these outlets than non-certified firms from the same country of origin.

### 3.3 Intensive export margin

We turn now to the analysis of the intensive margin of trade and evaluate how multinational retailers and certification affect firms' volume of exports to each market. We estimate the intensive export margin equation (2) and report results in Table 2. The five columns of Table 1 correspond to the same specifications displayed in the five columns of Table 1. As in the case of the extensive margin (Table 1), the coefficient of the interaction term variable is positive and statistically significant for all specifications. Hence, the activity of French retailers on foreign markets increases not only

Table 1: Extensive margin

	(1)	(2)	(3)	(4)	(5)
Certification IFS	0.03*** (0.00)	-0.00*** (0.00)			
ln Sales			0.11*** (0.00)	0.01*** (0.00)	
Certification IFS x ln Sales	0.06*** (0.00)	0.06*** (0.00)	0.05*** (0.00)	0.06*** (0.00)	0.06*** (0.00)
Firm FE	no	yes	no	no	no
Country FE	no	no	no	yes	no
Firm x time FE	no	no	yes	yes	yes
Country x time FE	yes	yes	no	no	yes
Nb observations	35,007,193	35,007,193	35,007,193	35,007,193	35,007,193
R <sup>2</sup>	0.02	0.16	0.15	0.16	0.16

Notes: Clustered (by firm) standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

the probability of French certified firms to export to these destinations, but also the value of their exports.

Comparing these results to those on the probability to export shows some differences in the coefficient of the IFS certification dummy and of French retailers' sales in import countries. For the specification in column 2, which places the analysis within the firm, for a given destination market and year, we find that becoming certified decreases the volume of exports to markets with no French retailers. This means that certified firms concentrate their exports on markets where French retailers operate, leading to a decrease of export to other markets. This trade diversion effect is found only for the volume of exports, but not the export probability. The overall impact of IFS certification on firms' export to a specific market depends on the activity of French retailers in that market. When French retailers are absent from the destination market, the interaction term vanishes and IFS certification has a negative impact on the exports of French agri-food firms. More precisely, becoming certified leads to a 9% [=  $(1 - \exp(-0.09)) * 100$ ] drop in firm's exports to all markets not served by French retailers. The IFS impact on exports to countries hosting French retailers is proportional to retailers' sales in each of these countries:  $-0.09 + 0.17 * \ln Sales$ . As French retailers enter a foreign market, the IFS effect increases gradually and becomes positive when the volume of sales reaches USD 1.61 million. IFS certification has a positive overall effect on exports only for the largest seventeen destination countries served by French retailers (out of the 99 foreign countries hosting a French retailer), absorbing between 38% and 59% of French agri-food exports, depending on the year. Figure 5 illustrates this effect graphically.

In column 4, where we analyze the effect within destination countries for a given firm and year,

Table 2: Intensive margin

	(1)	(2)	(3)	(4)	(5)
Certification IFS	0.55*** (0.09)	-0.10*** (0.03)			
ln Sales			0.45*** (0.02)	0.02 (0.02)	
Certification IFS x ln Sales	0.22*** (0.04)	0.18*** (0.03)	0.19*** (0.04)	0.19*** (0.03)	0.20*** (0.04)
Firm FE	no	yes	no	no	no
Country FE	no	no	no	yes	no
Firm x time FE	no	no	yes	yes	yes
Country x time FE	yes	yes	no	no	yes
Nb observations	147,625	147,625	147,625	147,625	147,625
R <sup>2</sup>	0.093	0.469	0.373	0.502	0.505

Notes: Clustered (by firm) standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

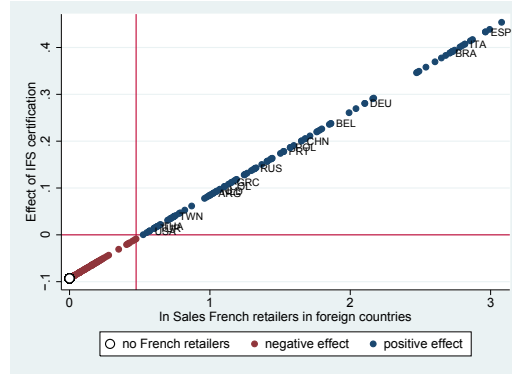


Figure 5: The overall effect of IFS certification on firms' exports to specific markets

the sales of French retailers' in the import market does not have a significant impact. Thus, although non-certified firms are less likely to export to countries where French retailers invest, the volume of their exports is unaffected. The "driving effect" is positive for certified firms, as revealed by the positive and statistically significant coefficient of the interaction term. Firms that already supply French retailers on their domestic market benefit more from retailers' internationalization, which opens them the access to new markets and allows them to export more in value terms.

### 3.4 Robustness of results

#### 3.4.1 Impact of sales of retailers from other origin

We saw in the previous section that IFS certification has a positive impact on exports to countries hosting French retailers. To test whether this impact is really due to the presence of French retailers in particular and not to the presence of foreign retail company in general, we run equation 1) and

equation 2) adding retail activity from other origin than France. We test the impact of US and British retail sales<sup>5</sup> on French Firm exports, distinguishing certified and non certified firms as previously. With one of the biggest retail companies (Walmart, Tesco), US and British retailers are highly internationalized and have established outlets in several countries. Their sales may impact French agrifood exports, by changing consumers tastes in favor of prepared and western products.

Results provided in column 3 of table 3 shows that French Agrifood firms exports more to countries with high US retail sales, but that this effect is smaller than those of French retail sales. Moreover, the coefficient of the crossed variable is negative, that means that this positive impact of US retail activity is smaller for certified firms (but still positive as the sum of the coefficients is positive). For its part, British sales have negative impacts on French agrifood exports, with no difference between certified and non certified firms. These results, confirmed by the other specifications of table 3, suggest that the retail activity of other countries than France may impact French exports to host countries, but that this effect is smaller (or not different in the case of British retail sales) for certified firms as compared to other firms. Consequently, the results on overall French retail sales' impact identified in 3.3 can be generalized to foreign retailers, but the specific impact on certified firms only appears for French retailers' sales: these firms, that benefits from their relationship with French retail companies concentrate their exports on markets with high French retail sales.

Table 4 reports the results on the extensive margin. It appears that British and US retail activity in host countries do have similar impacts on French firms exports than French retail sales: sales increase the probability to export and this effect is higher for certified firms, whatever the specification. This result suggests that the positive impact of retail sales on extensive margin is not specific to French retailers, and that US and British retail sales also improve French firms' Agrifood access to foreign markets, in particular for certified firms. However, the impact of retail sales on the probability to trade is higher in the case of French retailers than for British or US companies.

### 3.4.2 Selection bias

A general result of the recent literature on international trade with heterogeneous firms, is that only a fraction of firms, the most productive ones, export. This is due to the fact that exporting implies a specific fixed cost, which can be supported only by firms on the right side of the productivity distribution. Another finding confirmed by many empirical trade studies is the variability of fixed export costs across destinations. The existence of bilateral sunk export costs implies that the

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<sup>5</sup>data from the Planet Retail database.

Table 3: Effect of others origins - intensive margin

	(1)	(2)	(3)	(4)	(5)
Certification IFS	0.4540*** (0.10)	-0.0747** (0.04)			
ln Sales French retailers			0.5755*** (0.02)	-0.0544 (0.04)	
ln Sales US retailers			0.3013*** (0.03)	0.1738*** (0.06)	
ln Sales British retailers			-0.1600*** (0.05)	0.2488*** (0.09)	
Certification IFS x ln Sales French retailers	0.2897*** (0.04)	0.2521*** (0.03)	0.2392*** (0.04)	0.2628*** (0.04)	0.2747*** (0.04)
Certification IFS x ln Sales US retailers	-0.0162 (0.05)	-0.1712*** (0.05)	-0.2098*** (0.05)	-0.2066*** (0.05)	-0.1984*** (0.06)
Certification IFS x ln Sales British retailers	-0.1289 (0.10)	-0.1360* (0.08)	-0.1029 (0.10)	-0.1297 (0.09)	-0.1272 (0.09)
Firm FE	no	yes	no	no	no
Country FE	no	no	no	yes	no
Firm x time FE	no	no	yes	yes	yes
Country x time FE	yes	yes	no	no	yes
Nb observations	127,573	127,573	127,573	127,573	127,573
R <sup>2</sup>	0.09	0.47	0.42	0.51	0.51

Notes: Clustered (by firm) standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 4: Effect of others origins - extensive margin

	(1)	(2)	(3)	(4)	(5)
Certification IFS	0.0178*** (0.00)	-0.0009 (0.00)			
ln Sales French retailers			0.0077*** (0.00)	-0.0014*** (0.00)	
ln Sales US retailers			0.0018*** (0.00)	0.0009*** (0.00)	
ln Sales British retailers			0.0030*** (0.00)	0.0015*** (0.00)	
Certification IFS x ln Sales French retailers	0.0475*** (0.00)	0.0475*** (0.00)	0.0461*** (0.00)	0.0473*** (0.00)	0.0475*** (0.00)
Certification IFS x ln Sales US retailers	0.0046*** (0.00)	0.0046*** (0.00)	0.0043** (0.00)	0.0046*** (0.00)	0.0045** (0.00)
Certification IFS x ln Sales British retailers	0.0281*** (0.00)	0.0281*** (0.00)	0.0280*** (0.00)	0.0279*** (0.00)	0.0280*** (0.00)
Firm FE	no	yes	no	no	no
Country FE	no	no	no	yes	no
Firm x time FE	no	no	yes	yes	yes
Country x time FE	yes	yes	no	no	yes
Nb observations	35,749,997	35,749,997	35,749,997	35,749,997	35,749,997
R <sup>2</sup>	0.02	0.15	0.15	0.16	0.16

Notes: Clustered (by firm) standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

productivity threshold for exporting varies across destination markets. For these reasons, the effects identified in Table 2 of the previous section may be subject to a selection bias.

To address this issue, we use the Eaton and Kortum (2002) (EK) Tobit estimation approach. To



Table 5: The overall effect on both margins: Eaton-Kortum tobit

	(1)	(2)	(3)	(4)	(5)
Certification ISF	1.96*** (0.16)	-0.19 (0.17)			
ln Sales			4.50*** (0.05)	-0.06 (0.18)	
Certification IFS $\times$ ln Sales	0.97*** (0.17)	0.55*** (0.13)	0.32** (0.15)	0.60*** (0.13)	0.59*** (0.13)
Firm FE	no	yes	no	no	no
Country FE	no	no	no	yes	no
Firm x time FE	no	no	yes	yes	yes
Country x time FE	yes	yes	no	no	yes
Nber observations	326942	326942	326942	326942	326942
ll	-81319.6	-67580.7	-80888.4	-67328.1	-66756.8

Notes: Clustered (by firm) standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

apply this estimation technique, we need to identify a variable that has the same variability as our selection bias. We observe that the above-mentioned selection bias vanishes if we compare certified firms with non-certified exporting to the same country. Therefore, the variable we are searching for, should vary across countries of destination and be correlated to the bilateral fixed export costs or the productivity threshold values for exporting. To avoid any limit induced by the definition, computation, or estimation of threshold productivity levels, or imposing additional assumptions with respect to the structure of export costs, we use the lowest firm-level volume of exports to each destination market.

Recall that most of our specifications in Tables 1 and 2 require the use of firm-level fixed effects. To make tractable the computation of EK-Tobit estimates under these circumstances, we need to reduce substantially the number of firms in our panel. We estimate the model on 1,000 different randomly-selected sub-panels of 1,000 firms. Results are quantitatively different than those in Tables 1 and 2, but the main conclusions are confirmed.

### 3.4.3 Endogeneity of retail sales and certification

Another problem that we may face is endogeneity. We identify two possible sources of endogeneity in our model.

In a previous paper, we show that the retailers' sales in foreign markets and exports to these markets have common determinants (Cheptea et al. (2015)). This endogeneity issue, however, is less likely to affect the results of the current paper, due to differences in the disaggregation level of the data: the overseas sales of French retailers vary only across destination markets, while the volume of exports varies across firms. However, to test the robustness of our results, following Cheptea et al.

(2015), we instrument the volume of sales of French retailers in each market with (i) the annual growth rate of all modern retail sales in the destination country and (ii) the participation of women to the labor market. The first Instrumental Variable (IV) reflects the level of saturation of the retail market in the destination country, and the second is a proxy for the demand for retail services in the destination country.<sup>6</sup>

We focus on the trade specification including both types of time-varying fixed effects, corresponding to column (5) in Tables 1-5, as the most accurate measure of the impact of French retailers' presence in overseas markets on the exports of French firms is obtained when we control for both firm and country characteristics. We estimate equations (1) and (2) with two-stage least squares (2SLS) and report results in columns (1) and (4) of Table 6.<sup>7</sup> When we focus on the intensive export margin, the non-significant endogeneity test indicates that controlling for endogeneity is not necessary. The chosen instruments are valid (significant weak identification and underidentification tests) and not redundant (non-significant overidentification test). In column (1) of table 6 we focus on the probability of firms to export to a given destination. The computed overidentification test statistic is significant, suggesting that the two instruments should be used separately. Using only one of the two instruments yields a non-significant endogeneity test, confirming the exogeneity of our variable of interest.<sup>8</sup> The large coefficient of the interaction term in column (1) is also due to overidentification and can not be trusted. We obtain much smaller estimates when the two instrumental variables are used separately.

A second possible source of endogeneity arises from the fact that firms' decision to certify may be linked to their decision to export. This issue may bias our results, since both decisions are taken within the same firm, and possibly even simultaneously. To correct for this bias, we need to identify a variable that affects the firm's decision to certify, but not its decision to export. A good candidate is the certification of neighbor firms producing similar products. For each firm in our sample, we compute the share of sales of certified firms from the same sub-national region (*département*), excluding the firm itself. 2SLS estimates are displayed in columns (2) and (5) of

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<sup>6</sup>A rapidly expanding retail sector indicates that the country's demand for retail services is not saturated and that retailers face a weak level competition, leaving place for established and incoming retailers to expend their sales in this market. A high share of employment among women leads to a broader, more intensive substitution of traditional housework tasks (such as cooking) with less time-consuming alternatives that imply larger expenditures in retail-type outlets (e.g. an increase of purchases of processed food in the detriment of unprocessed products in traditional marketplaces).

<sup>7</sup>Technically, since our endogenous variable  $\ln Sales_{jt}$  is collinear with the country-specific fixed effects and drops from the estimation, we instrument the interaction term  $\ln Sales_{jt} \times IFS_{ft}$  and multiply each instrumental with the certification dummy.

<sup>8</sup>Estimation results with only one instrumental variable are provided upon request.

Table 6: Endogeneity of IFS certification and ln Sales: 2SLS estimations

Explained variable: Endogeneous variable(s):	Extensive margin			Intensive margin		
	ln Sales	IFS	IFS & ln Sales	ln Sales	IFS	IFS & ln Sales
	(1)	(2)	(3)	(4)	(5)	(6)
Certification IFS x ln Sales	0.7209*** (0.0488)	0.0247* (0.0135)	0.1109 (0.0858)	-0.33 (0.32)	0.21*** (0.04)	-0.51 (0.43)
Nb obs	24,697,065	3,007,409	2,041,599	145,837	147,149	135,761
Nb country $\times$ time FE	971	1438	971	971	1438	971
Nb firm $\times$ time FE	203411	16729	16729	17245	14892	14430
Nb clusters (by firm)	25726	3462	3462	3212	2974	2902
1 <sup>st</sup> stage $R^2$ of excl. IV	0.0051	0.8320	0.0043	0.0104	0.8683	0.0056
2 <sup>nd</sup> stage $R^2$	0.1479	0.2830	0.1966	0.5208	0.5102	0.5117
Endogeneity test				2.51	0.76	2.55
$p$ -value				0.113	0.384	0.110
Overid. test	14.586		1.772	2.305		2.640
$p$ -value	0.0001		0.1832	0.1289		0.1042
Weak id. test	310000	841.35	879.03	49.84	12533.95	31.01
Identification test	1053.88	21793.33	10319.13	217.74	275.65	176.50
$p$ -value	0.000	0.000	0.000	0.0000	0.000	0.000

Notes: Clustered (by firm) standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

table 6.<sup>9</sup> The large test statistics for underidentification and weak identification, combined with the 1<sup>st</sup> stage  $R^2$  greater than 0.80 testify of the strong explanatory power of our instrument. The large  $p$ -value of the endogeneity test shows that the data rejects our initial assumption of the endogeneity of firms' decision to certify, for both export margins. Indeed, the 2SLS coefficient of the interaction term is positive and similar to the coefficients obtained with OLS column (5) of tables 1 and 2.

In columns (3) and (6) of table 6 we test the joint endogeneity of variables  $\ln Sales_{jt}$  and  $IFS_{ft}$ . We multiply the share of sales of certified neighbor firms with the growth rate of modern retail sales in the destination country, and with share of employed women, and use the obtained variables as instruments. Computed statistical tests reject once more the endogeneity of our variable of interest. We conclude that the main results identified in sections 3.2 and 3.3 do not suffer from an endogeneity bias.

<sup>9</sup>Like retailers' sales, the certification dummy drops from the estimation due to collinearity. Therefore, the instrumented variable is again the interaction term  $\ln Sales_{jt} \times IFS_{ft}$ , and the identified instrument is multiplied with variable  $\ln Sales_{jt}$ .

## 4 Conclusions

Our results provide evidence that the positive impact of the internationalization of retailers on trade is more due to a reduction in trade cost for retail suppliers, than to a change in consumers' preferences in the host country. Hence, this paper calls for a discussion on the central role of retailers in the supply chain. Other papers have considered the relationship between retailers and their suppliers, in particular in the case of an overseas expansion (Wrigley and Lowe (2010), Dawson (2007)). Certification can be seen as a “formal or implicit contract” that defines the “preferential supplier” of retailers, according to Reardon et al. (2003). Our work suggests extending this discussion to other empirical strategies highlighting the central role of retailers in international trade.

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