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Brokers vs. Retailers: Evidence from the French Imports Industry of Fresh Produce.

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Brokers vs. Retailers: Evidence from the French Imports Industry of Fresh Produce

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Abstract

There is little discussion in the literature about trade intermediaries because data is rare. Using very original data, our article sheds light on the behavior of trade intermediaries when importing fresh fruit and vegetables in France. To do so, we distinguish among direct and indirect imports respectively operated through brokers or retailers. We then investigate the impact of country level data on the share of indirect/direct flows of imports by country of origin at the 8-digit level that enter the french market. We show that brokers are more likely to operate in context when fixed and variable costs to trade are high whereas retailers are sensitive to tariffs and product sensitivity.

JEL codes: Q17

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1 Introduction

In response to recent food scares, countries have strengthened their food safety standards and their oversight. In the US, safety risks associated with the consumption of domestic and imported seafood motivated the introduction of a mandatory Hazard Analysis Critical Control Points (HACCP) in 1997 (Anders & Caswell, 2009). In the same time, private standards have been developed and proliferated, operating alongside public standards to guarantee food quality and/or safety. This has resulted in an increasingly complex network where both public and private standards take prominent role in global food markets and thus in international trade in regulating food product quality and safety. Those private standards have been firstly developed by retailers in order to comply with new regulations and to reinforce their mission of gatekeepers and guarantor of product quality. Private standards are the most well developed in the fresh produce industry, namely fruit and vegetables with the GLOBAL-GAP scheme that has led to the adoption of good agricultural practices in several countries (Henson *et al.*, 2010). As a consequence voluntary private standards have influenced the whole supply chain. Many scholars have focused on the impact of private standard on transformation of food retailing particularly on producers in developing countries. This literature provides much evidence that increased private food safety standards are appealing protectionist tools and are generally considered to be barriers to trade that disadvantage developing countries (Fulponi, 2006). The impact of private standards on the food supply chain in developed countries has not been assessed yet. However, private standards would also impact trade and food suppliers in developed countries. For instance, private standards would be a new security for direct imports from foreign growers by retailers because they would reduce information asymmetries and transactions costs (search and monitoring costs) as regards compliance to public food quality standards. In the long run, indirect imports (through brokers) should disappear because retailers would directly import produce for their own supply chain.

In this paper, we consider the activity of importing in an active way focusing on the agent who imports. We particularly shed light on the behavior of brokers and retailers when importing fresh fruit and vegetables in France. From 1995 to 2005, we observe the persistence of agricultural imports (country of origin/product) through French brokers which has led us to focus on their specific role and to highlight the differences between direct (through retailers) and indirect imports (through brokers).

In the new new international economics literature, whereas exporting behavior is well documented there is virtually no research analyzing the decision for firms to import. To our knowledge, the few existing theoretical and empirical articles have mostly focused on the decision of exporters to rely or not on trade intermediaries

(assumed as a technology) (Ahn *et al.*, 2010; Antràs & Costinot, 2010). The more productive the firm, the less the need for intermediaries. We look at the flip side of the coin focusing on the trade flows of fresh produce imported in France through two identified channels, direct and indirect imports in France.

To do so, we first distinguish among direct and indirect imports respectively operated through brokers or retailers. We stick on the definition of trade intermediaries the business literature provides which refers to the ownership of products (Spulber, 1996). Brokers who don't buy any products are defined as matchmakers. Their economic activity represents the share of indirect imports. We show that brokers are more likely to operate in context when fixed and variable costs to trade. Then, we consider retailers that would directly import products purchasing them for their own supply chain to be distributed to consumers and highlight they are sensitive to tariffs and product sensitivity to pesticides.

This article is organized as follows: The second section presents the related literature on the activity of trade intermediaries and the reading done by the new international economics literature. In the third section we describe data and highlight empirical facts on the French trade of fresh produce. In the fourth section, we highlight the impact of a set of country variables on the share of imports for retailers (direct imports) and brokers (indirect imports). We provide some conclusions in the last section.

2 Intermediaries in trade: Related literature

There are several strands of literature that have focused on the recourse of intermediaries or middlemen in transactions (the two terms have been used by authors interchangeably). For some scholars, middlemen are more present in markets where there is some lack of information between buyers and sellers. Rubinstein & Wolinsky (1987) have explained that intermediaries act as matchmakers and reduce transaction costs between buyers and sellers. They also act as "guarantor of quality" or "experts" when it is difficult to judge of the quality of the product (Biglaiser, 1993; Biglaiser and Friedman, 1994). For Spulber (1996) the type of information imperfection in the markets will determine the activities of the intermediary: price setting and market clearing, providing liquidity and immediacy, matching and searching or guaranteeing and monitoring. More recently, Antràs and Costinot (2010) have developed a theoretical model of trade with the presence of a technology of intermediation. They show that the presence of intermediaries facilitates the realization of the gains from trade. Moreover, intermediaries can gain advantages over direct exchanges by pooling and diversifying risk (Spulber, 1996). For Spulber (1996) intermediaries can be defined as "an economic agent who purchases from suppliers for resale or who helps sellers and buyers to meet

and transact". Some authors as Hackett (1992) clearly identify two types of intermediaries. On the one hand, matchmakers who never own the product and work on a commission basis and, on the other hand, traders who are merchants. They trade products for their own account. The definition provided by those authors converges and depends on the ownership of the product intermediaries deal with. In the following, we use this definition to distinguish among intermediaries. We consider brokers who don't buy any products and are defined as matchmakers whereas retailers will purchase product for their own supply chain to resale it to consumers.

In the new new international economics literature, there is a burgeoning literature that explores the great role played by intermediaries in the trade process (see Rauch, 2001; Feenstra & Hanson, 2004). Scholars mostly focus on the determinants of the export mode chosen by firms using firm level data. Either firms would export directly or they would use an intermediary (Ahn *et al.*, 2010; Blum *et al.* 2009). In Bernard *et al.* (2010), intermediaries are non producing or consuming firms and they are intermediaries of sales (Bernard *et al.*, 2010). Bernard *et al.* (2010) then compare manufacturers and intermediaries in all Italian sectors that are respectively assumed to directly/indirectly export. They show that firms have direct profit according to the export mode they choose. Low productivity firms will choose the intermediation technology, the more productive ones will export directly. The respective share of indirect vs direct export will depend on the export destination, as more productive firms will be able to overcome high trade cost. Ahn *et al.* (2010) modify a model of heterogenous firm *à la* "Melitz" by introducing an intermediation technology. Firms' choice to export would depend on the characteristics of the destination country (size of the foreign country, cultural distance, etc) and on their own characteristics, namely their productivity. The least productive firms would export using importers. The underlying hypothesis is that fixed costs to export using intermediation technology are lower than the direct exporting fixed costs. In their empirical setting they consider intermediary as all Chinese firms which have "trade" in their name and consider that exports that pass through those firms are indirect exports. Based on this assumption, they show that exports via the intermediation technology will be larger in countries with small market size, higher variable costs and higher fixed costs of exporting. In others words, those studies have considered that the activity of intermediaries had been maintained because of firms that are less productive than firms that could directly export. However, results are difficult to compare because none of these papers use the same definition of trade intermediaries (Bernard *et al.*, 2010) and they consider trade intermediaries as an homogeneous type.

In the following, we bring those two strands of literature together. On the one hand, we will consider brokers who are firms who do not buy the products they deal

with. They are matchmakers and their share of imports would represent the share of indirect imports. On the other hand, we will consider retailers (supermarkets) who do buy product they will resale to retail them in their own supply chain. We will consider their imports share as direct imports. This allows us to introduce heterogeneity in the wide definition of trade intermediaries at the product level in the imports industry of fresh produce.

3 French fresh produce trade

In the following, we originally consider the import side of trade, and the role of intermediaries (brokers vs. retailers) in importing fresh fruit and vegetable in France. As we have already described, import flows of fruits and vegetables will be differentiated between direct imports by retailers (intermediaries that sell directly the products to consumers without any transformation¹) and indirect imports by brokers (intermediaries that never own the produce but who are matchmakers²).

3.1 Data

We have combined three dataset that allow us to provide valuable insights on French direct/indirect import of fresh produce. First, we use french customs dataset of imports that covers the period 1995-2005 and document all transactions from foreign country to french firms (since we focus on imports). For each firm which has imported we have the annual value and volume of imports disaggregated by country of origin at the 8-digit product level. Second, we must distinguish between trade operators (firms with the main activity is to trade) and other firms that do import produce in French customs data (for instance manufacturers who transforms fresh produce). Using the identification of the firm (SIREN) we merge the customs dataset with the section "Trade" of the "Enquete Annuelle d'Entreprises" that records economical informations for firms (total sales, employees, etc.) for which "trade" is their general activity. At this step, our dataset contains all the french firms which **import AND trade** fresh produce. They are trading firms.

One step further is to distinguish among the different types of fresh produce trade intermediaries, that is brokers who do not buy the product and retailers who buy and resale produce in their own supply chain. In other words, we must distinguish among direct imports through retailers and indirect imports through brokers. In the main dataset, we thus identify firms which operate in the French

¹We rule out of our sample all manufacturers since they are not at the core of our analysis.

²Brokers get a commission which is about (in average) 6 or 7% of the total value they import in the French market.

import industry of fresh produce as brokers and from which we have collected data covering 100 firms³ during the summer 2006. Brokers were asked questions, face-to-face, about the firm situation in 2005, and particularly about characteristics such as total amount of sales, main produce, specialisation. We then identify the 90 firms which concern "retailers supply chain".⁴

Our final dataset is thus made of the 190 French firms who import fresh fruit and vegetables in France. For all of those firms we have the total volume and value of fresh produce imported from 1995 until 2005 and their economic characteristics (total sales, number of employees, value added) for the year 2005. For the year 2005, trade intermediaries (that is all the trading firms) represent 58% of total French imports of fresh fruits and vegetables (in value). Thus this category of operator is significant in F&V french imports. Among them, brokers and retailers (i.e. 190 identified firms) represent 64% of value made by trade intermediaries (1063 firms) and 37% of whole French imports (still in value) whereas others trading firms (873 firms) than brokers and retailers represent 21% of the total value of imports.

An important characteristics of fresh fruit and vegetables is that these products are very sensitive to pesticides. In order to take into account this sensitivity of fresh produce, we refer to the list of the most sensitive products to pesticides published by the Environmental Working Group (<http://www.ewg.org/>). According to this list, we are able to classify fruit and vegetables according to their sensitivity to pesticides. According to the list provided by the EWP, we distinguish three classes: 13 most sensitive products (tomatoes, strawberries), 14 less sensitive (onions, mangos) and all others that we have considered as sensitive.

3.2 Empirical facts

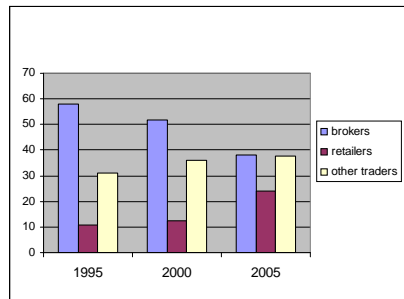
As we have noticed in the introduction, the development of private standards, mostly imposed by supermarkets in the fresh produce industry, could have led brokers activity to disappear from the economic activity because private standards would have reduced the asymmetry of information on produce between producers and retailers. Private standard would have act as a security between growers and retailers weakening the need of borkers as "guarantor of quality" as suggested by Biglaiser (1993).

From Graph 1 and Graph 2, we can observe that brokers are more likely to import products from countries outside of the EU whereas retailers would more likely to directly import product for the EU countries. We can also observe that brokers'

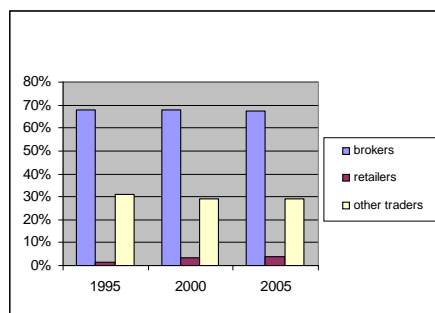
³The survey gathers data on almost all brokers located in the Perpignan and Rungis market which are the main imports market of fresh fruits and vegetables in France.

⁴We have compiled data from firms with the French APE code (main activity) 511P, 521D, 521F.

share in the EU is decreasing between 1995 and 2005 whereas they maintain their activity outside the EU where retailers are mostly absent.



Graph 1: Imports from EU by trade intermediaries



Graph 2: Imports from non-EU by trade intermediaries.

To deepen this observation, we have considered the share of the 1995 and 2005 total french imports directly imported by supermarkets and by brokers from the 13 most important exporter countries of fresh produce in value (Table 1, Table 2).

We can observe that brokers mostly import products from less developed countries than retailers (on the basis of the Human Development Index provided by the UN). Moreover from Table 1 and Table 2 we observe that importers cannot be ignored in flows of fresh produce imported from South Africa (66% in 2005), Israel (98% in 2005) or Ivory Coast (86% en 1995; 91% en 2005).

Country	HDI ₍₁₉₉₅₎	Total	Tde Intrm (%)	Retailer(%)	Broker (%)
Spain	0.914	1066671	571475.2 (54%)	40679.02 (7%)	426840.9 (75%)
Belgium	0.933	275006.4	77139.32 (28%)	22293.73 (29%)	4964 (6%)
Morocco	0.562	239921.9	68943.82 (29%)	400.89 (1%)	48280.54 (70%)
Netherlands	0.938	220321.5	77840.11 (35%)	17381.59 (22%)	10207.99 (13%)
Italy	0.906	220158.2	77319.76 (35%)	4143.41 (5%)	34200.16 (44%)
Ivory Coast	0.456	146381	60195.45 (41%)	2422.06 (4%)	52041.95 (86%)
United States	0.939	113731.4	50408.31 (44%)	1638.38 (3%)	10823.91 (21%)
Turkey	0.730	91709.04	32540.21 (35%)	39.15 (0%)	6033.993 (19%)
Israel	0.883	91135.65	56558.4 (62%)	109.68 (0%)	54346.96 (96%)
South Africa	0.688 ₍₂₀₀₀₎	86877.43	69169.14 (80%)	19.64 (0%)	67287.82 (97%)
Cameroon	0.520	85568.88	32652.69 (38%)	0 (0%)	1251.4 (4%)
Germany	0.919	52988.67	20467.95 (39%)	5695.226 (28%)	8169.638 (40%)
Argentina	0.824	51584.5	25200.44 (49%)	114.75 (0%)	15685.32 (62%)
Chile	0.822	48731.44	19384.71 (40%)	444.48 (2%)	10960.6 (57%)

Table 1: Imports from trade intermediaries by country of origin in 1995

Country	HDI ₍₂₀₀₅₎	Total	Tde Intrm (%)	Retailer(%)	Broker (%)
Spain	0.949	1642837	1141502 (69%)	283435 (25%)	585651 (51%)
Morocco	0.640	441552.2	270606.7 (61%)	7543 (3%)	241550.8 (89%)
Belgium	0.947	361464.8	193433.6(54%)	43614 (23%)	5193,238 (3%)
Italy	0.947	302102.2	161024.6 (53%)	18985 (12%)	43150 (27%)
Netherlands	0.958	269452.4	141932.3 (53%)	48447.86 (34%)	9532 (7%)
Israel	0.929	223405.1	208287 (93%)	850.478 (0%)	204519.6 (98%)
United States	0.955	184070.5	67070.3 (36%)	14.686 (0%)	8544 (13%)
Ivory Coast	0.480	168858.8	118986.2 (70%)	1316.506 (1%)	107887 (91%)
Turkey	0.796	105385.8	57646 (55%)	398.215 (1%)	6692 (12%)
South Africa	0.678	98551.3	68407 (69%)	2678 (4%)	45264 (66%)
Germany	0.942	88859.77	48478 (55%)	16184 (33%)	4622 (10%)
Argentina	0.855	67010.5	51803 (77%)	6524 (13%)	28654 (55%)
Chile	0.872	67691.09	51803 (61%)	1499 (4%)	20210 (49%)

Table 2: Imports from trade intermediaries by country of origin in 2005

As suggested by Graph 1, supermarkets are dominant in flows of produce that come from Europe (In 2005: Belgium 23%, the Netherlands 22% and Germany 33%). Table 1 shows that imports from Spain and Morocco are mostly dominated by brokers. However, we observe that the share of retailers in the flow of produce from Spain is about 25% in 2005 but they do not directly import produce from Morocco whereas the two countries exports more or less similar produce and they are not too far away one from each other. In 2005, flows from Morocco are mostly

captured by brokers whom represent 90% of the total value. In the same way, we have considered the product sensitivity effect when considering either brokers or retailers. In 1995, brokers imported 70,56% of the value of the whole set of products sensitive to pesticides. In 2005, the share of sensitive products imported by them was of 59,50%. The share of sensitive products imported by retailers was respectively of 7,76% of value in 1995 and 8,15% in 2005.

Descriptive statistics show us a persistence of some agricultural imports through French brokers but for particular product from particular country. Taking note of this allows us to hypothesize a specific role for brokers: they act as a filter to enter the French market and would support some kind of risk directly link to the product imported and the country of origin.

4 Intermediation in trade of fresh produce: econometric analysis

In section 3, we have shown that brokers differ from retailers in terms of country of origin, regions and product. In this section, we investigate the impact of country level data on the share (in value) of imports by country of origin at the 8-digit level that enter the French market through brokers or retailers.

We follow the specification of Ahn *et al.* (2010) to study the share of intermediaries in French imports flows. The estimated equation is

$$s_{ik}^{Fj} = \alpha + \beta X_i' + \gamma X_k' + \varepsilon_{ik} \quad (1)$$

with s_{ik}^{Fj} the share in French imports of intermediaries j from country i in product k (8 digit level) ; j represents either brokers or retailers. The variables X_i describes the country of origin of the product, and X_k describes the products (especially the sensibility to pesticides of the product). We integrate a product-level fixed effect.

We regress the share of brokers and retailers for each product-country pair on the four usual gravity variables to proxy for market size and variable and fixed costs of trade (in log): GDP, distance, the number of documents to export from the country of origin and tariffs. As usual, we use the standard variables the gravity literature provides. Total GDP id from the World Bank and approximate market size and geographical distance approximate transportation costs. We use tariffs applied by France to country of origin at the 8 digit level. This data is available from the TARIC database. As suggested by Ahn *et al.* (2010) and Bernard *et al.* (2010) we approximate the country-level fixed costs using the number of documents for exporting from a country of origin and that is available from the World Bank Doing Business dataset. Specific to this study, we have also added a product

effect, considering if the product imported is sensitive or not to pesticides. Table 3 reports the econometrics results using a product-level fixed effects estimator.

	Brokers	Retailers
Constant	0.0488 (0.361)	0.25 (0.379)
Country characteristics		
Log GDP	-0.026**(0.010)	0.002 (0.011)
Log applied tariff	0.056*** (0.016)	0.081*** (0.018)
Log distance	0.064*** (0.017)	0.007 (0.019)
Log number of documents to export from origin country	0.144** (0.067)	0.046 (0.078)
Product sensitivity		
Level 1	<i>Ref.</i>	<i>Ref.</i>
Level 2	0.018 (0.046)	-0.092* (0.048)
Level 3	0.032 (0.047)	-0.083* (0.08)
Product fixed effects	Yes	Yes
Number of observation	700	928
Adjusted R-squared	0.28	0.09

***, **, *: significant at 1%, 5% and 10% respectively

Table 3: Determinants of the imports share of brokers and retailers in 2005

For brokers, import share is declining in log GDP. Products from small markets are more likely to enter the French market through brokers. Country variable costs of imports (tariffs and distance) have significant and positive effect on the share of imports. The more distant the country of origin, the higher the recourse to indirect imports. The number of documents needed to export to France is considered as a proxy of fixed costs and has a significant and positive impact on brokers' share. Also there is no product sensitivity effect.

As for retailers, the results show that only two variables have a significant effect. First, tariffs as a variable cost is positively correlated (as for brokers) with the traders' share of imports. We need to deepen this result to better explain the role of tariffs on the respective share of brokers and traders. And finally, we can observe the sensitivity product effect. The more sensitive the product to pesticides, the less likely the product to be imported directly by retailers.

The results concerning brokers are consistent with previous studies by Ahn *et al.* (2010), Bernard *et al.* (2010) and Crozet *et al.* (2010) provided for the export share of intermediaries. Indeed, those studies show that brokers are more likely to operate in context when fixed and variable costs to trade are high. In our setting, the higher variable and fixed costs of trade, the higher the share of indirect imports through brokers. Our results for the imports reinforce the fact that brokers are important agents in international trade and that their behaviour need to be documented as a specific category of intermediaries. However, direct

imports (caught here through retailers) do not seem to follow the same pattern. Retailers are sensitive to variable costs (only tariffs) and product sensitivity.

5 Conclusion

Using very original data, we consider the activity of trade intermediaries who imports in an active way. And particularly, we shed light on the behavior of trade intermediaries when importing food and particularly fresh fruit and vegetables in France. To do so, we follow the definition of intermediaries provided in the literature, distinguishing between two ways of importing. First, we consider brokers that won't buy products they deal with. Second, we consider retailers that would directly purchase products for their own supply chain to be distributed to consumers. Retailers are more likely to develop private standards on their own. We assume that those intermediaries would not play the same role in trade because of this difference in ownership of products. To stick on the recent development of the new new international economics literature we assume that brokers would be considered as a channel of indirect imports. They are matchmakers and imports product in the name of a customer and they get a commission to do so. As for retailers, they represent the direct imports channel highlighted in the literature.

We have thus established that brokers and retailers do not play the same role in trade. Brokers act as a filter for some country-product pairs to enter the market. Especially for fruit and vegetables that come from small and distant countries. Retailers do not follow the same pattern and are more sensitive to variable costs (only tariffs) and product sensitivity to pesticides. The safer the product the higher the share of direct imports through retailers. Further work need to be done to better understand specificities in the behaviour of brokers as economic agents especially the link between characteristics of the brokers (as productivity or size) and the country-product pair imported.

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