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**GOOD CONNECTIONS : BANK  
SPECIALIZATION AND THE TARIFF  
ELASTICITY OF EXPORTS**

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Mésonnier

**INTERNATIONAL TRADE AND REGIONAL ECONOMICS**



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# GOOD CONNECTIONS : BANK SPECIALIZATION AND THE TARIFF ELASTICITY OF EXPORTS

## Abstract

In this paper, we show that exporters react more strongly to a tariff cut when their banks have been specializing in funding exports to this country. To make our case, we build upon a theoretical model where an informational advantage provided by the exporter's bank results in a lower distribution cost in the destination country. We test the implications of this model for French exporters using the 2011 free trade agreement between the European Union and the Republic of South-Korea as a quasi-natural experiment. We measure a bank's specialization in Korea using granular information on bank-firm credit lines and firm-level exports in the years preceding the agreement. We compare how customers of different banks react to the trade liberalization episode using detailed information on the bilateral tariff cuts and disaggregated data on French export flows at the firm-product level. We find robust evidence that the specialized lenders help exporters to respond more strongly to changes in tariffs. The effect is strong for all firms along the extensive margin, but only for smaller, less productive exporters along the intensive margin.

JEL Classification: F14, G21

Keywords: Trade Elasticities, bank specialization, trade liberalization

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# Good Connections : Bank Specialization and the Tariff Elasticity of Exports \*

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March 3, 2021

## Abstract

In this paper, we show that exporters react more strongly to a cut in tariffs by a distant country when their banks have already been specializing in funding exports to this country. To make our case, we build upon a theoretical model where an informational advantage provided by the exporter's bank results in a lower distribution cost in the destination country. We test the implications of this model for French exporters using the 2011 free trade agreement between the European Union and South-Korea as a quasi-natural experiment. We measure a bank's specialization in Korea using granular information on bank-firm credit lines and firm-level exports in the years preceding the agreement. We assess how customers of different banks react to this trade liberalization episode using detailed information on the bilateral tariff cuts and disaggregated data on French export flows at the firm-product level. We find robust evidence that the specialized lenders help exporters to respond more strongly to changes in tariffs. The effect is strong for all firms along the extensive margin, but only for less productive exporters along the intensive margin.

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# 1 Introduction.

How do exporting firms react to changes in tariffs in importing countries? The canonical model of trade with heterogeneous firms (Melitz, 2003) imposes a uniform reaction among firms. This is due to the combined use of the functional form of CES demand with the supply-side assumption of atomistic firms. Since at least Melitz and Ottaviano (2008), an active strand of research has investigated the consequences of different dimensions of firm heterogeneity for the elasticity of exports to changes in real exchange rates or tariffs (the so-called trade elasticities). In particular, differences in productivity and pricing-to-market behaviour appear to explain a large share of the differences in individual trade elasticities (Berman et al., 2012; Amiti et al., 2014; Gopinath and Neiman, 2014).

In this paper, we investigate how the characteristics of the banks which fund exporters impinge on firms' individual trade elasticities. We argue that some banks gain a specific knowledge of business conditions in distant markets over time through their repeated interactions with customers which export to these markets. This gives such banks an informational advantage, or a destination-specific specialization, which may benefit other customers in search of funding for new projects of exports to the same markets (Paravisini et al., 2017). Being connected to a specialized bank or not therefore creates an additional source of heterogeneity between exporters targeting a specific market, beyond the heterogeneity in the firms' productivity parameter which is standard in trade models with heterogeneous firms. Controlling for firm-level productivity, we show that tariff cuts in a foreign destination induce a stronger reaction of exporters when they are linked to banks specialized in that destination, along both the extensive margin (i.e., the probability to start exporting for new exporters) and the intensive margin (i.e., the growth rate of exports for incumbent firms). In other words, the trade elasticity of a firm's exports to a distant country increases with the informational advantage of its lenders about this country.

To make our case, we first sketch a theoretical motivation based on a model with monopolistically competitive exporters inspired by Corsetti and Dedola (2005) and Berman et al. (2012). The informational advantage provided by the exporter's bank (reflecting the bank's specialization) is represented by a lower unitary distribution cost in the destination country. In the model, a sufficient statistic – the share of unitary distribution costs in firms' total trade costs – determines exporters' reaction to a change in tariffs, both at

the extensive and intensive margins. Following a cut in foreign tariffs, firms with a lower share of distribution costs are more likely to enter the foreign market, or to increase more their sales when they already operate into that market.

We then test the predictions of this model for French firms using the 2011 Free Trade Agreement (FTA) between the European Union and the Republic of South-Korea as a quasi-natural experiment. The agreement was signed on October 1st 2010 and entered into force on July 1st 2011. It is quite a relevant experiment for our purpose, as negotiations were conducted for the entire European Union by the European Commission, and hardly reflect vested interests of the individual French exporters in our sample. The FTA itself was very ambitious and encompassing: 70% of tariff lines were cut to zero on the first day of implementation, while tariffs were to be dismantled within five years for goods representing 98.7% of the total value of South-Korean imports. Last, the agreement offers a variety of tariff trajectories, with a significant share of product lines facing staggered cuts over periods of 3 to 15 years.

The empirical analysis exploits and merges four disaggregated databases: (1) The French credit register that reports virtually all bank-firm credit relationships (above a very small reporting threshold); (2) the French customs at the firm and product levels; (3) the LiFi (*Liaisons Financières*) database, which we use to consolidate credit and trade data at the level of the business group with which individual firms are affiliated; (4) the detailed EU-Korea tariff schedule contained in the agreement. We combine credit register and Customs data to compute a measure of the geographical specialization of French banks following the approach of [Paravisini et al. \(2017\)](#). A bank is said to be specialized in a country, for instance South-Korea, if its portfolio of corporate loans was strongly tilted in the recent past towards firms which export to this country, so that this bank looks as an outlier in that dimension when compared with other banks. We compute our measure of destination-specific bank specialization and we track bank-firm connections using data for the years 2004 to 2006, i.e., long before the start of trade negotiations between the EU and South-Korea, in order to avoid reverse causality. We then merge the computed bank specialization index with exhaustive data on exports at the firm-product-destination level, and tariffs. While Customs and credit register information is reported at the level of individual firms (legal units), we aggregate exports and credit lines of all French firms affiliated to a same business groups because affiliates of a business group are likely to benefit from the bank connections of the parent company or of other affiliates.

We therefore assume the existence of an active internal capital market within business groups, an issue largely neglected in the literature on trade finance so far.

We then estimate difference-in-difference regressions over the years 2007-2015, where we exploit two sources of variance for identification: (i) changes in tariffs over time, and (ii) firm-level heterogeneity based on the *ex ante* specialization of their banks in the Korean market. We control for various combinations of firm, product and time fixed effects to avoid potential biases associated with obvious confounding factors such as firm-level productivity shocks and product-specific demand shocks. Importantly, while we are interested in explaining differences in individual trade elasticities due to existing bank-firm connections, our theoretical model warns us that differences in firm productivity or size may also interact with tariff cuts and impinge on firms' total reaction to tariff cuts. To address this concern, we split our sample of exporters into two groupings according to their estimated productivity, whereby we gauge a firm's productivity based on its export performance in two benchmark markets for French firms (Belgium and the US).

Our findings first confirm that firm-level exports react positively consecutive to a cut in tariffs, as already found in previous work (Berthou and Fontagné, 2016; Bas et al., 2017; Fitzgerald and Haller, 2018). According to our estimates, the average decrease in import tariffs in Korea faced by French exporters (about 8 percentage points) increased the probability of exports in the reference group by about 0.7 pp and the value of exports by about 8.8%.

We also show that the predictions from our theoretical model are vindicated and that bank-firm connections indeed impinge on individual tariff elasticities. We observe that being connected to a Korea-specialized bank further increases the probability of a successful entry in the Korean market after the FTA. Interestingly, this marginal effect is strong whatever the productivity of the exporter. Regarding the intensive margin for exports, we also find some evidence in support of an enhanced tariff elasticity induced by the Korea-specialization of the lenders. This effect is however mostly significant for less productive firms. We then check for the robustness of these results to different definitions of the Korea-specialization of the bank (based on different threshold values in the distribution of the computed specialization index) and the inclusion of product-time fixed effects among the control variables.

Our study contributes to three strands of the literature. First, we add to the set of

papers estimating heterogeneous responses of trade patterns across different firms. This literature is interested in particular in the estimation of variable pass-through to trade costs shocks, essentially tariffs or exchange rates. In models inspiring the empirical work of, e.g., [Berman et al. \(2012\)](#), [Amiti et al. \(2014\)](#), and [Gopinath and Neiman \(2014\)](#), firms exhibit variable markups, which creates a mapping between the underlying heterogeneity in the firm's core performance (productivity or quality for instance) and its pass-through rate in import/export behavior. These papers find that the demand elasticity perceived by the exporter depends on the size of the firm. This creates heterogeneous incentives to adapt markups to price/cost shocks, and therefore heterogeneous responses to trade cost shocks. Here, our contribution is to account for new dimensions of this heterogeneity: first by measuring heterogeneity regarding the "quality" of a firm's banking connections for an export destination, second by looking at heterogeneous impacts for a specific FTA shock.

As a second contribution, we add to a series of recent studies that investigate the role of banks in promoting global trade and take advantage of the now widespread availability of disaggregated credit register and customs data for a proper identification of causal effects. [Amiti and Weinstein \(2011\)](#) show for instance that the health of Japanese banks hit by the financial crises of the 1990s is an important determinant of Japanese firms' exports during these episodes. [Paravisini et al. \(2015\)](#) exploit international capital flow reversals around the 2008 crisis and data on exposed Peruvian banks to show that negative credit shocks mostly impinge on the intensive margin of exports, but not so much on the entry of firms in new markets. [Bronzini and D'Ignazio \(2017\)](#) find that Italian firms have a higher probability to enter a new, distant market whenever their banks have settled branches in the country beforehand. Last, using country-level information, [Claessens et al. \(2017\)](#) show that the presence of branches of foreign banks in a country enhances the export performance of domestic firms in the home country of the banks. The effect is stronger for firms belonging to industries more dependent on external finance. [Federico et al. \(2020\)](#) show in reverse that trade shocks can lead banks to reallocation credit across their clients. There is also evidence that financial conditions, especially via trade finance instruments, impact micro and aggregate trade patterns, especially during the Great Financial Crisis ([Amiti and Weinstein, 2011](#); [Chor and Manova, 2012](#); [Antràs and Fritz Foley, 2015](#)). Adding to this literature, we show that banks matter not only for explaining the geography of trade flows but also how firms react to trade liberalization.



Last, we contribute to recent efforts at identifying forms of geographic specialization of internationally active banks and understanding their effects. The industry specialization of banks within a country and its consequences for credit supply have been studied for long.<sup>1</sup> In contrast, interest in the geographic specialization of banks and its role in understanding international trade is quite new. In a pioneering study, [Paravisini et al. \(2017\)](#) show that some Peruvian banks specialize in catering credit to exporters to some countries. These banks tend then to shield more borrowers which export to these countries from adverse funding shocks while they also accommodate more changes in their demand for credit. We go further by showing in the case of France that the type of informational advantage that banks, which are specialized in a distant country, can convey to their customers makes them more able to enter this new market or expand their activity there whenever bilateral tariffs are dismantled.

The rest of the paper proceeds as follows. Section 2 presents a theoretical model that motivates our empirical exercise. Section 3 describes the disaggregated data we use, the 2011 trade agreement between the EU and Korea and how we construct our *ex ante* measures of market-specific bank specialization. Section 4 presents our empirical model and section 5 details the results of our regressions. Section 6 concludes.

## 2 Model

Our setup adapts the model of exporters faced with additive distribution costs proposed by [Corsetti and Dedola \(2005\)](#) to explain incomplete pass-through. It was extended by [Berman et al. \(2012\)](#) to introduce heterogeneous firms and generate incomplete *and heterogeneous* pass-through. We augment this baseline setup so as to: 1) account for tariffs in the vector of trade costs, and focus on this price shifter, and 2) bring in a distribution cost at the exporter-market level, which can vary based on bank-firm relation. We assume that the distribution cost is reduced when the bank of the exporter has an information advantage on a specific market.

Monopolistically competitive firms face CES demand in a destination  $d$ . Firm  $i$  has

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<sup>1</sup>For instance, [Ongena and Yu \(2017\)](#) find that multi-industry firms tend to borrow from a larger number of banks, and that they tend to pick up banks according to their industry specialization. [De Jonghe et al. \(2019\)](#) find that Belgian banks hit by the Lehman shock tend to shore up borrowers in industries where the bank is dominant and industries where it is specialized.

marginal production cost  $c(i)$ , independent of the country where the product is sold. It then faces an ad-valorem trade cost  $\tau_d$  (which includes tariffs) and a unitary distribution cost  $f_d(i)$ . As discussed above, we interpret  $f_d(i)$  as a distribution cost, although, technically, any additive transport cost would have the same effect (Martin, 2012; Crozet et al., 2012). In the export data, we observe FOB values for each exporter in each market, together with quantities shipped, which gives us a FOB price (the unit value). The delivered price to the consumer (CIF) adjusts to the mill (FOB) price in the following way:

$$p_d^{\text{cif}}(i) = p_d^{\text{fob}}(i)\tau_d + f_d(i). \quad (1)$$

Conditional on serving  $d$ , the exported quantity takes the classical form of:

$$q_d(i) = [p_d^{\text{fob}}(i)\tau_d + f_d(i)]^{-\sigma} X_d P_d^{\sigma-1}, \quad (2)$$

where  $X_d P_d^{\sigma-1}$  is total expenditure ( $X$ ) weighted by the CES ideal price index ( $P$ ), which captures all relevant factors affecting competition on market  $d$ . The presence of  $f_d(i)$  changes the pricing decision relative to the classical Dixit-Stiglitz setup, in that markups will not be constant. The profit-maximizing FOB price of firm  $i$  is:

$$p_d^{\text{fob}}(i) = \frac{\sigma}{\sigma-1}c(i) + \frac{f_d(i)}{\tau_d(\sigma-1)}. \quad (3)$$

Note that the classical markup rule is augmented by a term that grows with the unitary distribution cost, and falls with the ad-valorem component of overall delivery cost. Using the pricing equation, one can easily calculate the elasticity of price to a change in trade costs:

$$\varepsilon^p(i) = \frac{\partial \ln p_d^{\text{fob}}(i)}{\partial \ln \tau_d} = -\frac{f_d(i)}{\sigma c(i)\tau_d + f_d(i)}. \quad (4)$$

In the classical setup where  $f_d(i) = 0$  (a firm with minimal distribution costs here), the FOB price does not respond to trade costs. High  $f$  firms on the contrary reduce their FOB price. In the limit if distribution costs are really important, firms reduce one-for-one their mill price when trade costs increase.

Using the pricing rule together with equilibrium quantity sold by firm  $i$  we obtain the quantity elasticity:

$$\varepsilon^q(i) = \frac{\partial \ln q_d(i)}{\partial \ln \tau_d} = -\sigma \left( \frac{c(i)\tau_d}{c(i)\tau_d + f_d(i)} \right). \quad (5)$$

This elasticity goes to  $-\sigma$  as the share of distribution costs goes to 0. Therefore firms with a good access to local distribution networks in  $d$  (for instance because they are related to specialized banks in that market) will exhibit a response to trade cost changes that is larger in absolute value than the ones with a very high  $f_d(i)$ .

As  $f_d(i)$  falls, there is therefore an increase of the absolute level of trade costs elasticity on volumes exported, and a decrease in the elasticity of prices. The elasticity of exported values,  $\varepsilon^x = \varepsilon^p + \varepsilon^q$  could therefore be ambiguous. Let us define a variable  $\text{shr}(i) \equiv \frac{c(i)\tau_d}{c(i)\tau_d + f_d(i)}$ , representing the share of ad-valorem components  $c(i)\tau_d$  in total unitary delivery cost. The exported value elasticity then writes

$$\varepsilon^x(i) = - \left( \frac{1 - \text{shr}(i)}{\sigma \text{shr}(i) + (1 - \text{shr}(i))} + \sigma \text{shr}(i) \right). \quad (6)$$

Figure 1 traces the three elasticities  $\varepsilon^p(i)$ ,  $\varepsilon^q(i)$  and  $\varepsilon^x(i)$  against the firm-level share of variable costs (a low weight of  $f_d(i)$ , a large  $\text{shr}(i)$ , which should be associated to having a good access to banks knowledgeable about  $d$ ). This is done for an illustrative  $\sigma = 5$ , which also directly reveals the elasticity of quantities exported with  $\text{shr}(i) = 1$ . In Figure 1, we see that the elasticity of export values with respect to trade costs gets stronger in absolute value with  $\text{shr}(i)$ , motivating our main hypothesis that connected exporters (with a lower  $f_d(i)$ , and therefore a larger  $\text{shr}(i)$ ) should see a larger boost in export values following a trade liberalization in their export market.

Note that this hypothesis implicitly holds constant the marginal cost  $c(i)$ . The reverse thought experiment which holds  $f_d(i)$  constant but varies  $c(i)$  shows that a lower  $c(i)$  (a higher productivity) means a lower  $\text{shr}(i)$  and therefore small export volume and value elasticities (in absolute value). It is therefore critical to control for a firm fixed effect in empirical tests of this model, so as to disentangle the effects of low distribution costs from the effects of high production costs/a low productivity. Indeed, both low distribution costs and low productivity *ex ante* tend to increase the export elasticities in absolute value. It is also clear from equation (5) that the impact of any change in the distribution costs  $f_d(i)$  on the trade elasticity will vary with  $c(i)$ .<sup>2</sup> This clearly points to an interaction

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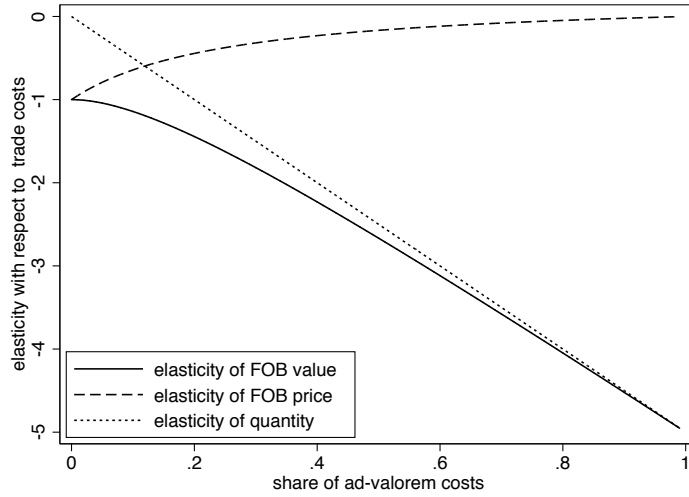
<sup>2</sup>The value of  $\tau$  has the same effect, but we consider only one destination, Korea, in the paper.

effect with productivity. The interaction is ambiguous since

$$\frac{\partial \varepsilon^q(i)}{\partial f_d(i)} = -\sigma \times \frac{\partial \text{shr}(i)}{\partial f_d(i)} = \sigma \left( \frac{c(i)\tau_d}{[c(i)\tau_d + f_d(i)]^2} \right),$$

which equals  $\sigma/c(i)\tau_d$  for negligible fixed costs and 0 for large fixed costs. This suggests to interact our main variables of interest, such as tariffs and bank-induced distribution costs, with some proxy for firm productivity.

Figure 1: Trade elasticities in a CES-MC model with additive distribution costs.



Let us now turn to the extensive margin. Using the pricing equation, we have

$$p_d^{\text{fob}}(i) - c(i) = \frac{c(i)\tau_d + f_d(i)}{\tau_d(\sigma - 1)} = \frac{p_d^{\text{cif}}(i)}{\sigma\tau_d}, \quad (7)$$

which can be used in the profit equation to reveal that variable profits are a simple function of the export flow valued at the price paid by the consumer.

$$\pi_d(i) = [p_d^{\text{fob}}(i) - c(i)] q_d(i)\tau_d - F_d(i) = \frac{p_d^{\text{cif}}(i)q_d(i)}{\sigma} - F_d(i), \quad (8)$$

where  $F$  is the fixed export costs to  $d$ , allowed to vary across firms. Therefore in very general terms, any factor affecting the delivered value of exports (such as tariffs) will affect in a qualitatively similar way the probability of exporting.

More precisely, a firm will export if its marginal cost is below a threshold  $c(i)^*$ , defined by the zero profit condition on market  $d$ :

$$G(c^*(i), \tau_d) \equiv C [c^*(i)\tau_d + f_d(i)]^{1-\sigma} X_d P_d^{\sigma-1} - F_d(i) = 0, \quad (9)$$

where  $C = \sigma^{-\sigma}(\sigma - 1)^{\sigma-1}$  is a constant term. The elasticity of the cutoff associated with tariff changes can be computed as

$$\frac{d \ln c^*(i)}{d \ln \tau_d} = -\frac{\frac{\partial G(c^*(i), \tau_d)}{\partial \tau_d}}{\frac{\partial G(c^*(i), \tau_d)}{\partial c^*(i)}} \times \frac{\tau_d}{c^*(i)}.$$

We are making the assumption that the fixed export cost are a function of firm efficiency such that  $\frac{\partial F_d(i)}{\partial c^*(i)} > 0$ . Using (9), one obtains

$$\frac{d \ln c^*(i)}{d \ln \tau_d} = -1 - \frac{\frac{\partial F_d(i)}{\partial c^*(i)}}{\frac{(1-\sigma)G'(c(i)^*, \tau_d)\text{shr}(i)}{c^*(i)} - \frac{\partial F_d(i)}{\partial c^*(i)}},$$

where  $G'(c(i)^*, \tau_d) \equiv C [c(i)^*\tau_d + f_d(i)]^{1-\sigma} X_d P_d^{\sigma-1}$  is the variable part of the cut-off equation. This can be rewritten as

$$\frac{d \ln c^*(i)}{d \ln \tau_d} = -1 - \frac{\frac{\partial \ln F_d(i)}{\partial \ln c^*(i)}}{\frac{(1-\sigma)G'(c(i)^*, \tau_d)\text{shr}(i)}{F_d(i)} - \frac{\partial \ln F_d(i)}{\partial \ln c^*(i)}}.$$

Since by the definition of the cutoff for positive exports we have  $G'(c(i)^*, \tau_d) = F_d(i)$ , the elasticity of the cutoff can finally be written as

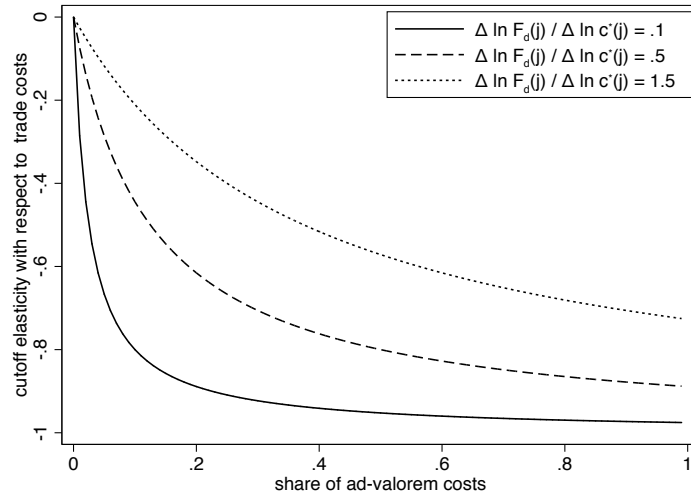
$$\frac{d \ln c^*(i)}{d \ln \tau_d} = -1 - \frac{1}{\frac{(1-\sigma)\text{shr}(i)}{\partial \ln F_d(i)/\partial \ln c^*(i)} - 1}. \quad (10)$$

When fixed export costs and marginal production costs are not correlated,  $\frac{\partial \ln F_d(i)}{\partial \ln c^*(i)} = 0$ , and the elasticity becomes  $\frac{d \ln c^*(i)}{d \ln \tau_d} = -1$  as in the classical Melitz (2003) framework, as well as in Berman et al. (2012) (despite the presence of additive distribution costs in the latter).

Figure 2 plots equation (10) for three different values of  $\frac{\partial \ln F_d(i)}{\partial \ln c^*(i)} > 0$  (maintaining  $\sigma = 5$  as in figure 1). When the association of fixed export costs to productivity is weak, the cutoff response to tariffs will be very flat and close to -1 for most firms. On the contrary,

with stronger associations of both types of costs, the cutoff elasticity will be more variable across firms. Firms with the lowest additive distribution costs have a large share of ad valorem costs and are on the right part of this plot, with stronger response of their probability of entry with respect to a change in tariffs.

Figure 2: Cutoff elasticity with respect to trade costs



As with the intensive margin, the presence of  $\text{shr}(i)$  in equation (10) suggests the need for an interaction term with production costs / productivity in the regression explaining the entry decision.

### 3 Data and construction of the main variables

In this section, we present our data and explain how we construct the variables used in the subsequent analysis. We use and merge four large disaggregated datasets. First, from the official text of the 2011 FTA between the EU and South-Korea, we retrieve the complete trajectories of Korean tariff rates for European exports, measured at a fine disaggregation level (six digits in the international HS classification, or HS6) over the years 2007-2015. Second, we obtain from the French Customs fully disaggregated information on the individual exports of goods by all French firms to all foreign destinations over the years 2004-2015. Third, the credit register of the French central bank gives us access to

virtually all bilateral credit exposures of all banks resident in France vis-à-vis all domestic firms, with quarterly frequency. We consider for our purpose credit connections over the period 2004-2006. Last, the LiFi dataset of the French statistical institute (INSEE) provides us with a mapping of affiliated firms with their parent companies within business groups as of 2007.

In what follows, we first briefly present the 2011 FTA and give a sense of the usefulness of this event for our purpose. Second, we present the Customs data we use, and explain our selection of firms and export flows. Third, we explain how we construct a measure of the banks' geographic specialization based on both customer's exports and bank-customer credit links over 2004-2006. Having singled out Korea-specialized banks, we then derive a dummy variable that identifies exporters which were connected to such banks before the FTA. Last we present descriptive statistics of the two final estimation samples, a larger sample used for analyzing the extensive margin and a smaller one relevant for analyzing the intensive margin of exports.

### **3.1 Tariffs: the 2011 FTA between the EU and South-Korea**

We use a trade policy shock that affect French exporters during a period over which we observe both individual export flows and linkages with banks. The shock is the signature of the EU-Korea free trade agreement, that was signed on October 1st 2010 and entered into force on July 1st 2011. This is an interesting event in several respects:

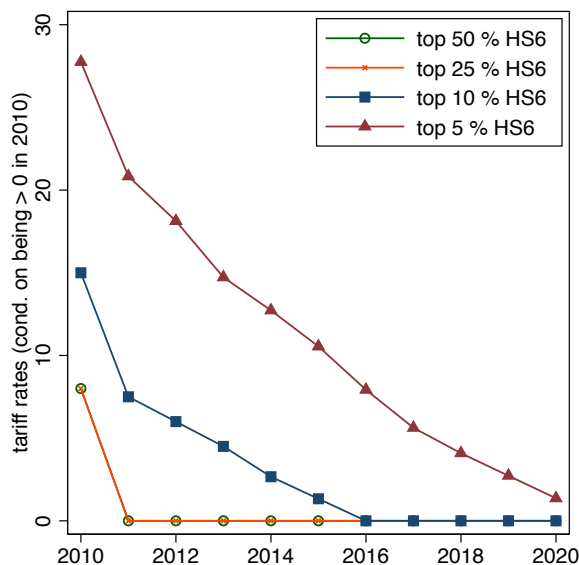
1. The decision to sign the agreement and the schedule of tariff cuts by Korea is arguably exogenous to individual French firms, since it is negotiated by the EU as a whole, with a large variance in the sectoral specialization that drive the political economy of trade policy. While France was in 2010 the second largest economy in the EU after Germany, it accounted for only 16% of the GDP of the whole Union.
2. The FTA was a sizable positive shock for EU exporters, with a majority of tariff lines being brought down from an average of 8% to 0% within only a few years. Besides, South-Korea is a relatively large (ranking 13th globally in terms of GDP at PPP in 2014), and very open economy (imports amounted at the time to about a third of GDP). Last, even before the FTA, the EU ranked among its top trade partners (second supplier, after China and before Japan).

3. The official document of the agreement witnesses a large variance in the initial level of tariffs across goods, as well as in the phasing-out period.
4. Korea is located very far from France and culturally very different. Hence, before the FTA, exporting to Korea was quite an exclusive activity, and only highly performing firms could successfully enter this market. The shock is therefore expected to induce large responses of French exports at both the intensive and extensive margins.
5. The EU-Korea FTA gives European firms a discriminatory advantage over firms from other large trade partners of Korea. This is quite important for identifying the effects of changes in tariffs. Would Korea have unilaterally liberalized its trade with all partners in the same year, the *relative* access of French exporters to this country would not have changed much. On the contrary, bilateral tariffs between South-Korea and its other major trade partners, China, the USA and Japan, were kept unchanged in 2011, the year when the EU-Korea FTA entered into force. The US case is interesting since the US-Korea FTA entered into force the following year, on March 15, 2012. There is therefore a period of several months where EU firms experienced a large advantage over their US rivals on the Korean market. While China, Japan and South Korea have been negotiating a free trade agreement for a long time, talks were still ongoing in 2016, at the end of our period of study.

Figure 3 describes the evolution of tariffs applied by Korea to EU exports as reported in the official text of the free trade agreement. The figure shows the observed changes in four groups of tariffs (as aggregated at the HS6 level). Tariff lines in the highest percentiles start close to 30% and decline slowly towards 0% in about a decade. The products with tariffs at the median rate face an average 2010 level of 8%, and fall to 0% rapidly, essentially in the first year of implementation of the agreement. There are therefore two relevant dimensions for identifying the impact of tariffs on exports: a fall in tariffs over time within a given sector as well as differences in tariff rates across sectors at each point in time. We exploit these two sources of variance for identification in our empirical regressions.



Figure 3: Tariffs faced by EU firms in Korea



## 3.2 French exports to Korea

### 3.2.1 Extensive margin

The historical database of the French Customs gives us access to the exhaustive record of all exported goods sold by all domestic firms over the years 2004-2015. We focus in what follows on the years 2007-2015 (in-sample) and use data on previous years (2004-2006) to construct the bank specialization index as detailed below.

Export flows are recorded in this database at the finest, 8-digit product level (European Combined Nomenclature CN8) with a monthly frequency, together with an identifier for the exporter and the destination country. As far as extra-European destinations are concerned, a minimal reporting threshold of either 1,000 euro in value or 1,000 kg in volume is applied per each product-firm-country-month quadruplet up to 2010. The threshold has been lifted thereafter.<sup>3</sup> We first treat this methodological break by dropping all individual export flows at the product-firm-month level that would fall below these

<sup>3</sup>For a detailed presentation of the methodological aspects regarding French Customs disaggregated data, cf. Bergounhon et al. (2019), <http://isabellemejean.com/FrenchCustomsData.html>.

thresholds after 2010.<sup>4</sup> We then aggregate export flows in the product dimension, so that our observations are defined at the 6-digit level of the HS classification (HS-6). Beyond the fact that this shrinks the number of observations to a more manageable size, this aggregation is also vindicated by the fact that, up to the HS-6 digit level, all countries classify products in the same way.<sup>5</sup>

Exporters are identified in the Customs filings at the level of the reporting legal entities. Many of these individual firms (legal units), even small ones, belong to larger business groups. Defining exporting firms at the level of these groups is more relevant for our purpose, since we cannot observe intra-group financial flows: an exporting subsidiary of a small group may not be a direct customer of a specialized bank but may however benefit from this connection through the parent company, which is for instance a relationship borrower of this bank. To avoid such measurement bias, we (pseudo-)consolidate individual exporting legal entities into the corporate groups they are affiliated with (strictly speaking, we aggregate their export flows at the group-product-destination level). For simplicity, we denote these corporate groups as firms throughout. For the purpose of this consolidation, we use the LIFI dataset, as provided by the French National Statistical Institute, which links each legal unit to a single parent company (“tête de groupe”). The consolidation step is then straightforward as we simply need to sum gross exports at the level of the business group for the holding company.<sup>6</sup>

We take also special care in adjusting the timing of observations to the timing of the FTA when constructing our dataset. More precisely, since the FTA entered into force in July 2011, we redefine in what follows the calendar years into event-related years that cover a period of 12 months from July to June. Concretely, an observation for, e.g., the year 2010 in a figure or a table actually refers to the 12-month period starting in July 2010 (from July 2010 to June 2011).

Analyzing the extensive margin of French exports to Korea requires to define the universe

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<sup>4</sup>See the appendix for details.

<sup>5</sup>To give a sense of the level of details we consider, note that the first two digits (HS-2) identify the chapter the goods are classified in, e.g. 09 = Coffee, Tea, Maté and Spices. The next two digits (HS-4) identify groupings within that chapter, e.g. 09.02 = Tea, whether or not flavored. The next two digits (HS-6) are even more specific, e.g. 09.02.10 Green tea (not fermented). Cf. <https://unstats.un.org>.

<sup>6</sup>The version of LIFI (standing for *LIens FI*nanciers, in English: financial links) we could access and were allowed to merge with proprietary Banque de France data dates back to the year 2007. This is however not a major issue as such since we freeze our map of bank-firm links in 2006 in order to warrant the exogeneity of bank-firm matching to the 2011 FTA.

of firm-product pairs that are deemed relevant for the Korean market in the first place. Considering the whole universe of all exported products sold by any French firm worldwide at any time would however lead to a very large, hardly manageable database. Besides, this would imply oversizing the population of control observations relative to the sample or realized export flows to Korea, by including products and firms that have virtually no chance of being present on the Korean market.

We circumvent this issue by considering as “eligible” for our purpose all firm-product-year triplets for which we can observe at least one export flow to either Korea or the United States over the period of 2007 to 2015. We choose the US as a relevant “control” destination because it is a major destination among OECD, non-EU, countries for French exports. Although the US are quite distant from France, the size of the US market and the higher degree of cultural proximity makes it an easier destination for French exporters. Basically, we therefore assume that any firm that managed to export a given good to the US on a given year could also sell the same good to South-Korea on the same year.

Last, note that, in theory, the observed tariff elasticity of exports should depend on a combination of firm-specific distribution costs (assumed to hinge at the geographic specialization of the firm’s lenders) and firm productivity (cf. equation (5) above). Controlling for the interaction of the latter and tariffs is therefore key for a proper identification. However, we do not observe income statements and balance sheets of the pseudo-consolidated corporations we define as individual exporters, but only their detailed exports flows. We therefore need to construct some proxy for productivity based on measures of export performance on some easy-to-reach, reference markets where French firms frequently sell their production in practice.

We therefore consider as an additional source of information the firm-level exports to Belgium for all the firms in our sample. Indeed, Belgium is probably the easiest export destination for French firms, as it is a French-speaking, contiguous country and also a member of the euro area.

We then assume that firms which constantly stand out as top exporters (on average across all their products) to both the US (an “easy” but distant market) and Belgium (an “easy” and near market) can be dubbed high performers or, in other words, highly productive firms.<sup>7</sup>

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<sup>7</sup>See section A.1 in the online appendix for more details.

We analyze the extensive margin using a final sample which includes some 690,000 observations on 16,175 individual firms and 4,218 (HS-6) products sold in, or relevant for, Korea over mid-2007 to mid-2016 (2007-2015 in terms of event time).<sup>8</sup> Some 10% of these observations correspond to realized export flows to Korea, while the rest defines the set of relevant controls. On average, each firm-product pair appears 5.9 years in the sample (and is associated either with a realized export flow to Korea or with no export). The median firm sells 2 products to either the US or Korea over this period of nine years, while firms in the last quartile export at least 5 goods and firms in the last decile sell more than 14 different products.

Importantly for the external validity of our microeconomic evaluation, our estimation sample covers the bulk of total French exports to Korea. For instance, the export flows included in our analysis of the extensive margin of trade account for some 87% of total exports between July 2010 and June 2011 (84% of the total over mid-2011 to mid-2012).<sup>9</sup>

Once interacted with the population of firms present in the Belgian market over the same period of time, the estimation sample shrinks by some 20%. We then end up with some 456,000 observations for low performance (or less productive) exporters and some 93,000 for highly productive exporters.

### 3.2.2 Intensive margin

As far as the analysis of the intensive margin of exports to Korea is concerned, we simply consider a subsample of the above database. We therefore restrict the analysis to firm-product pairs that correspond to at least 2 realized export flows to Korea over the (event-time) years 2007 to 2015 (i.e., at least one flow before the FTA and one flow thereafter). This leaves us with a sample of close to 39,627 observations of export flows to Korea at the firm-product-year level. The subsample used to analyze the intensive margin of export variations covers 2,173 exporting firms and 1,855 products. This however accounts for 83% of total value of French exports of goods to South-Korea over the period from July 2010 to June 2011.<sup>10</sup>

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<sup>8</sup>Note that we exclude here firm-product pairs that appear only once and are then wiped out when we include firm-product fixed effects in the regressions.

<sup>9</sup>By aggregating the genuine dataset from the Customs, we evaluate total French exports to South-Korea over this period of 12 months at EUR 3,87 bns.

<sup>10</sup>And for 80% of the total over the next 12 months.

Again, intersecting this sample with the population of firms exporting at least once in Belgium over the same period of time somewhat reduces the number of observations available. We this time end up with a sample of some 24,000 observations as far as less productive firms are concerned, and of some 13,000 observations for highly productive firms, which corresponds to a marginal reduction in sample size (by some 8% only).

### 3.3 The geographic specialization of banks

#### 3.3.1 Measuring the geographic specialization of banks

Following Paravisini et al. (2017), thereafter denoted PRS, we define an index of a bank's specialization in funding exports to destination  $d$  (keeping the same notation as in the theory section and omitting time subscripts for the sake of simplicity) as:

$$S_{bd} = \frac{\sum_i L_{ib} X_{id}}{\sum_{d'} \sum_i L_{ib} X_{id'}} \quad (11)$$

where  $L_{ib}$  denotes the amount of outstanding loans (in euros) between the lending bank  $b$  and an exporter  $i$  borrowing from this bank and  $X_{id}$  denotes the value (in euros) of exports sold by firm  $i$  to destination  $d$ . In order to motivate this measure of geographical bank specialization, Paravisini et al. (2017) present a simple model of bank lending where (i) firms have a collection of activities to fund (here, exports of a given good to various destination countries  $d$ ), (ii) banks are heterogenous in their ability to fund these activities, so that different sources of credit are not perfect substitutes. In their paper, Paravisini et al. (2017) notably show that banks tend to specialize in funding the activities (i.e., exports to the destinations) for which they are more productive.<sup>11</sup>

To construct an empirical equivalent of this measure of geographical bank specialization, we merge three large microeconomic datasets. First, the French credit register, which is managed by the Banque de France, provides us with a quasi-exhaustive information on bilateral bank-firm lending relationships in France. Second, the French Customs data on individual exports already mentioned. Last, remember that we consolidate individual exporting firms (defined at the legal unit level, as observed in the Customs and the credit

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<sup>11</sup>In other words, considering two banks  $b$  and  $b'$  that have the same productivity parameter  $\gamma$  for all activities but two, say  $d$  and  $d'$ , such that  $\gamma_{bd} = \gamma_{b'd'} > \gamma_{bd'} = \gamma_{b'd}$ , then, one gets:  $S_{bd} > S_{b'd}$ .

register) into the corporate groups they are affiliated with (see above).

The French credit register records detailed credit information on all bilateral bank-firm exposures with an outstanding amount above a small threshold. An exposure is defined as the total of disbursed loans, unused credit commitments and guarantees given by the lender.<sup>12</sup> This information is collected with monthly frequency. We are interested in measuring bank specialization, as derived from existing credit relationships between banks and exporting firms in France, long enough before the completion of the EU-South Korea trade agreement so as to ensure exogeneity. We therefore focus on the years 2004 to 2006, before the international financial crisis which also induced a large contraction of international trade in 2009. The credit register covers lending operations of all credit institutions operating in France, including many small, specialized institutions which are a priori irrelevant for our purpose, like leasing, factoring, consumer credit or real estate institutions. Based on additional information provided by the French bank supervisor on the main business of chartered credit institutions, we identify these specialized entities and keep only institutions registered as commercial and mutualist banks (including saving banks).<sup>13</sup>

Furthermore, a number of bank mergers took place over the years 2004 to 2006, most of them involving either small foreign institutions or regional banks within cooperative networks. We use information on mergers from the French supervisor (Autorité de Contrôle prudentiel et de Résolution) in order to reconstruct backward the merged banks. This reconstruction affects 34 banks in the final dataset of the 283 banks that fund exporters.

For each year, we compute the average amount of the outstanding credit exposure between each bank and each (pseudo-consolidated) firm, including unused credit lines and guarantees. We then merge this detailed bilateral credit information with the firms' exports, that we previously collapsed at the firm-year-destination level, and keep in our sample of credit relationships only (consolidated) firms that have some exporting activity over the period 2004-2006. For each bank, destination and year, we then construct the

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<sup>12</sup>The reporting threshold was EUR 76,000 before 2006 and is only EUR 25,000 since then, as measured at the level of bank branches vs individual firms. We iron out this reporting break by setting a credit exposure cutoff of at least EUR 76,000 between each individual bank (before correcting for bank mergers) and a consolidated firm.

<sup>13</sup>To be precise, we keep credit institutions with CRB code between 100 and 299 (CRB stands for "Code de réglementation bancaire"). We also dropped a few institutions belonging to two major state-owned development banks (CDC and BPIFrance), as well as Dexia, a Belgian-French bank that was bailed out in 2008 and went finally bankrupt in 2012. Dexia was specialized into lending to municipalities.

PRS measure of the bank’s specialization in funding exports to this destination in that year as in (11). We keep bank-destination pairs with at least two yearly PRS values over 2004-2006 and collapse the data in the time dimension by averaging individual bank-destination-specific PRS specialization index over the years 2004-2006. This ensures that our measure of bank specialization is robust to potential cyclical effects affecting trade with such or such country.

At this stage, we have a measure of banks’ geographic specialization for 283 banks operating in France, with respect to 231 possible export destinations. To get a sense of what drives the variability of this measure, we first conduct a simple variance analysis of annual PRS indexes (in log) over all available country-bank pairs from 2004 to 2006. The log of the PRS index indeed writes as the sum of three terms, a first one that varies along the bank-time dimension, a second one that varies along the country-time dimension, last, a third term that varies in the bank-country-time dimension.<sup>14</sup> This last term reads as the average exports of a bank’s customers towards destination  $d$  (scaled by total exports to  $d$ ), weighted by the credit share of each customer in the portfolio of the bank (scaled by total credit supplied to exporters by this bank). Using the properties of the OLS estimator, simple regressions of each of these component on the total (log) PRS yield estimates of their share in total variance.<sup>15</sup> We find that the country-specific term accounts for some 57% of the total variance, and that the bank-country-specific term accounts for one third. Bank characteristics alone only explain some 10% of the PRS variance for France in this period. Therefore, we can rule out that our main driver of interest is mostly driven by bank size or overall internationalization.

Our main analysis focuses on the 283 commercial, cooperative or foreign-owned banks of this sample which were connected to France-based exporters over the period 2004-2006, among which 224 (close to 80%) had customers selling goods to Korea (hence a strictly positive PRS index as regards Korea). These individual banks are affiliated to 92 banking

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<sup>14</sup>Rearranging the numerator of the PRS index and taking logs (before time averaging), one obtains:

$$\ln(S_{bdt}) = \underbrace{\ln\left(\sum_i l_{ibt}x_{idt}\right)}_{bdt \text{ term}} + \overbrace{\ln(X_{dt})}^{dt \text{ term}} + \underbrace{\ln(L_{bt}) - \ln\left(\sum_{d'} \sum_i L_{ibt}X_{id't}\right)}_{bt \text{ term}},$$

where  $l_{ibt} = L_{ibt}/L_{bt}$  and  $x_{idt} = X_{idt}/X_{dt}$ .

<sup>15</sup>Cf. for details Bernard et al. (2019).

groups, including all major French banking groups and several foreign-owned institutions. They account for 72% of bank credit to resident non-financial firms in France and for nearly 80% of credit to French exporters.

Table 1: Descriptive statistics for banks funding exporters, averages over 2004-2006.

	Nb.Obs.	Mean	Std.Dev.	Min.	p25	Median	p75	Max.
Share of credit to firms (pp)	283	0.253	0.908	0.00	0.02	0.06	0.21	9.74
Share of credit to exporters (pp)	283	0.280	1.414	0.00	0.00	0.01	0.04	16.38
PRS spec. index for KR (*100)	283	0.647	2.014	0.00	0.05	0.35	0.70	32.23
Av. nb customers exp. to KR	283	43.693	148.491	0.00	1.00	6.67	32.33	1511.00
Av. nb cust. export. to KR and receiv. EC	283	0.417	3.301	0.00	0.00	0.00	0.00	48.33

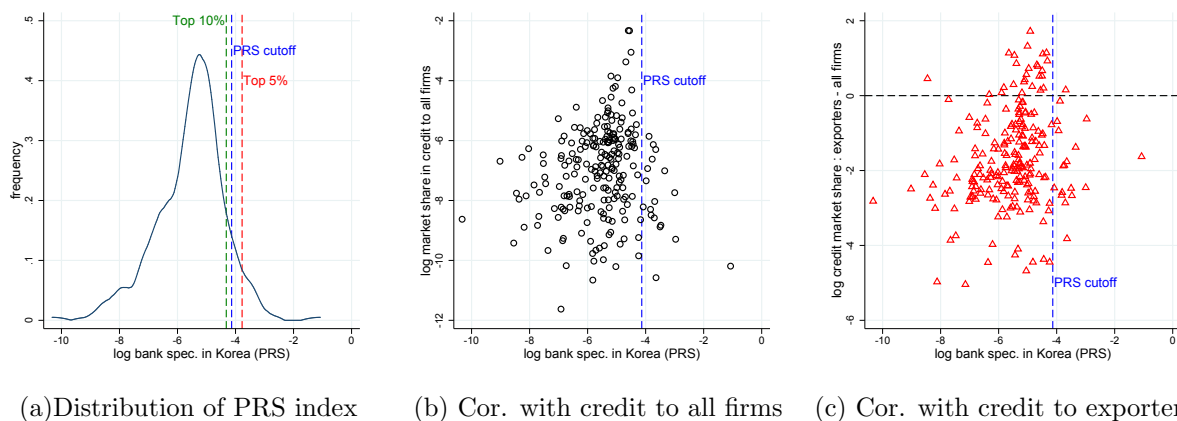
Table 1 provides some descriptive statistics of our sample of banks. The distribution of bank size is very skewed: the average bank exhibits a market share in total domestic credit to firms of 0.25% over the 2004 to 2006 period, about four times the share of the median bank (0.06%), while the largest player weighs some 10% of this domestic market. The pattern is roughly similar when looking at the size distribution of selected banks in terms of their market share of credit to exporting firms. The largest lender stands for some 16% of the market, while 75% of the banks each account for a market share amounting to less than 0.04% of this market. The table also shows the distribution across banks of their specialization towards Korea (the PRS index). The computed index of banks' Korea-specialization ranges between zero and about 32% (the density of this distribution is also plotted in panel (a) of Figure 4). Interestingly, the most specialized bank in our sample appears to be an affiliate of a Korean bank. Korea-specialization does not appear to be much correlated with bank size (as measured in terms of credit market shares), as shown in Figure 4 panels (b) and (c). This further dampens concerns that specialization towards distant markets could simply be a proxy for large international banks.

Following Paravisini et al. (2017), we denote a bank as specialized towards the Korean market whenever this bank stands out as an outlier in the distribution of the PRS index for Korea. For the sake of robustness, we consider in what follows alternative ways to identify outliers: (i) using the “PRS cutoff”: banks with values of the PRS index above the 75th percentile plus 1.5 times the interquartile range (19 banks, accounting for 1.5% of domestic corporate credit over 2004-2006 on average), (ii) banks with values of the PRS index above the 90th percentile (29 banks, 7.2% of corporate credit), (iii) and banks with a PRS index above the 95th percentile (14 banks). In Figure 4, panel (a) shows that the PRS cutoff is quite close in our dataset to the top decile of that specialization



index (for Korea).

Figure 4: Distribution of Korea-specialization and correlation with measures of bank size, averages over 2004-2006



Note: Banks with clients exporting to Korea over the 2004-2006 period. Credit market shares are computed over all loans to non-financial corporations and all exporters, respectively. The PRS cutoff singles out outlier PRS values (beyond 1.5 times the interquartile range above the 75th percentile of the PRS distribution for Korea).

### 3.3.2 Measuring the bank-induced geographic advantage of exporters

We derive firm-level measures of the bank-induced competitive advantage on the Korean market by collapsing the information on the Korea-specialization of each firm's lenders. In our model, being linked to a specialized bank in Korea leads to lower unitary distribution costs  $f_{KR}(i)$  for firm  $i$ . We construct *ex ante* measures of this firm-specific competitive advantage for all exporting firms with reported bank links in the credit register in the pre-FTA year 2006.

More precisely, we define a dummy  $D_{KR}^{max}(i)$  which takes the value of one whenever at least one lender of  $i$  as of 2006 is a specialized bank regarding the Korean market. Note that this definition of the firm's competitive advantage does not depend on the intensity of the pre-existing credit relationship between the firm and its specialized banks.

### 3.4 Descriptive statistics

Finally, we merge information on the changes in tariffs from the FTA together with the prepared exports datasets (respectively for analyzing the extensive and intensive margins) and the firm-level dummy variable regarding the Korea-specialization of exporters' banks.

Table 2 presents descriptive statistics for the two final datasets which we use to evaluate the response of exports to the FTA. The upper panel refers to the dataset used to analyze the extensive margin, while the lower panel refers to the dataset used to analyze the intensive margin of this response.

Table 2: Descriptive statistics, full sample.

Extensive margin, full sample					
	Nb.Obs.	Mean	Std.Dev.	Median	p90
Export probability	689288	0.098	0.297	0.00	0.00
log(1+tariff)	689288	0.041	0.089	0.00	0.10
SPRS max (top5%)	689288	0.145	0.352	0.00	1.00
SPRS max (outlier)	689288	0.219	0.414	0.00	1.00
SPRS max (top10%)	689288	0.345	0.475	0.00	1.00
Intensive margin, full sample					
	Nb.Obs.	Mean	Std.Dev.	Median	p90
Log value of export	39627	10.621	2.137	10.43	13.55
log(1+tariff)	39627	0.048	0.092	0.01	0.12
SPRS max (top5%)	39627	0.205	0.404	0.00	1.00
SPRS max (outlier)	39627	0.288	0.453	0.00	1.00
SPRS max (top10%)	39627	0.430	0.495	0.00	1.00

Note: Descriptive statistics based on the estimation sample. SPRS is a dummy that takes the value of one when at least one bank of the firm is specialized in the Korean market according to the PRS index, as explained in section 3.3 of the text.

In the full sample, firms face a 10% probability to export a given good in Korea. The average tariff over the period lies at some 4%. About one fifth of observations benefit from the exporter's association with a specialized bank (baseline measure). In the sub-sample of repeated exports (at the firm-product level), the average value of an export flow amounts to some 41,000 euros, close to the median, while 10% of export flows are larger than 767,000 euros. Note also that the probability of benefiting from the support of a Korea-specialized bank is higher for repeated exporters, suggesting some assortative matching between good exporters and specialized banks.

To control for the bias induced by this potential matching, we consider in most of our regressions below a partition of this dataset into two groupings, one for low-productivity firms and the second for high-productivity firms. Table 3 therefore shows a similar set of descriptive statistics, but this time for the partitioned samples. As expected, the probability to export to Korea and the value of exports are somewhat larger for more productive firms. The probability to be connected to a specialized bank is also much higher in the case of more productive firms.

Table 3: Descriptive statistics, by productivity bucket.

	Extensive margin					
	Low productivity			High productivity		
	Nb.Obs.	Mean	Std.Dev.	Nb.Obs.	Mean	Std.Dev.
Export probability	455950	0.09	0.29	92730	0.18	0.39
Log (1+ tariff)	455950	0.04	0.09	92730	0.04	0.08
SPRS max (top5%)	455950	0.13	0.34	92730	0.31	0.46
SPRS max (outlier)	455950	0.21	0.41	92730	0.38	0.48
SPRS max (top10%)	455950	0.34	0.47	92730	0.60	0.49
	Intensive margin					
	Low productivity			High productivity		
	Nb.Obs.	Mean	Std.Dev.	Nb.Obs.	Mean	Std.Dev.
Log value of export	23814	10.32	1.99	12767	11.30	2.30
Log (1+ tariff)	23814	0.05	0.10	12767	0.04	0.07
SPRS max (top5%)	23814	0.15	0.36	12767	0.33	0.47
SPRS max (outlier)	23814	0.24	0.42	12767	0.41	0.49
SPRS max (top10%)	23814	0.34	0.48	12767	0.64	0.48

Note: Descriptive statistics based on the estimation sample. SPRS is a dummy that takes the value of one when at least one bank of the firm is specialized in the Korean market according to the PRS index, as explained in section 3.3 of the text. We approximate productivity by a measure of a firm's average export performance, across all products sold and sample years, in both Belgium and the US, two relatively easy markets and frequent destinations for French exports. *High productivity* firms are defined as firms that belong in the top decile of exporters in these two markets for more than half of their existing product-year pairs.

## 4 Empirical model

We present below the two empirical equations that we estimate at the intensive margin and extensive margin to identify the impact of tariffs and banks' specialization on exports.

At the intensive margin, we estimate the effects of tariffs faced by French exporters in the Korean market on the export value at the firm and product-level. Our second variable of interest beyond the tariff itself is the interaction term between the tariff and the Korea-specialization of exporters' banks:

$$\ln x_{i,k,t}^{\text{fob}} = \beta_1 \ln(1 + \text{tariff}_{k,t}) + \beta_2 \ln(1 + \text{tariff}_{k,t}) \times D_i^{KR} + \gamma_{i,k} + \zeta_t + \epsilon_{i,k,t}, \quad (12)$$

where  $x_{i,k,t}^{\text{fob}}$  denotes the value of products  $k$  exported by firm  $i$  at time  $t$  to Korea and  $D_i^{KR}$  denotes the bank-induced geographic advantage of the firm in Korea. Subscripts for country  $d$  are dropped here as we focus on exports to Korea only. We include firm-product fixed effects to control for all time-invariant firm-product-destination characteristics (including therefore the independent effect of  $D_i^{KR}$ ). We also include time fixed effects in our regressions so as to absorb any confounding macroeconomic demand shock on Korean markets, including the effects of exchange rate fluctuations. As stated above in section 2, we need to control for firm-specific costs (or productivity) interacted with tariffs, since the former may shift the value elasticity of exports independently of local distribution costs. For this reason, we split the sample into two groupings of firms, whereby we contrast low-productivity firms on the one hand and high-productivity firms on the other hand, and run the same regression on each sub-sample separately. As explained above, we approximate productivity by a measure of a firm's average export performance across all products sold in both Belgium and the US over the years of the sample.

Similarly, we test the validity of our hypothesis along the extensive margin using the following linear probability model:

$$z_{i,k,t} = \beta_1^e \ln(1 + \text{tariff}_{k,t}) + \beta_2^e \ln(1 + \text{tariff}_{k,t}) \times D_i^{KR} + \gamma_{i,k}^e + \zeta_t^e + \epsilon_{i,k,t}^e, \quad (13)$$

where  $z_{i,k,t}$  is a dummy variable equal to 1 when  $x_{ikt}^{\text{fob}} > 0$  and 0 otherwise.<sup>16</sup>

Equation 6 in the theory section shows that we should expect  $\beta_1 < 0$  and  $\beta_2 < 0$ , i.e. shipments are boosted by a cut in tariffs, and this effect is larger when distribution costs are low, i.e., here, the Korea-specialization of the firm's relationship lenders is high.

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<sup>16</sup>Section 3 describes the construction of the matrix of zeros flows. To summarize, we consider as "exportable" to Korea the firm-product-year triplets for which we can observe at least one export flow to either Korea or the United States over the period of 2007 to 2015.

Similarly, we expect  $\beta_1^e < 0$  and  $\beta_2^e < 0$ .

## 5 Results

### 5.1 Tariff cuts and exports

#### 5.1.1 Preliminary evidence

As a first visual inspection of the major impact of tariff cuts on exports, we report in panel (a) of Figure 5 a binscatter plot that relates the probability of French firms exporting to Korea and the level of tariffs. We focus on the years 2010-2013 where we can observe the largest shift in import tariffs for French exports in Korea. We need a benchmark and choose as a control group French exporters of the same products in a comparable country where tariffs towards France were kept unchanged over this period: Japan. More precisely, we compute the number of exporters and the log of  $(1 + \text{tariff rate})$  in Korea relatively to the same variables on the Japanese market within each HS6 product category. As expected from the theory, a clear negative relationship exists between these two variables: the (relative) decline in Korean import tariffs has increased the (relative) probability of exports of French firms, especially in product categories with the largest decline in tariffs.

We run the same exercise, this time with a focus on the intensive margin of firm-product exports to Korea and Japan. In panel (b) of figure 5, we see again a strong negative relationship between (relative) tariffs and export values. This effect is reminiscent of the large literature which finds that tariff liberalization affects trade patterns in a strong and robust way.<sup>17</sup>

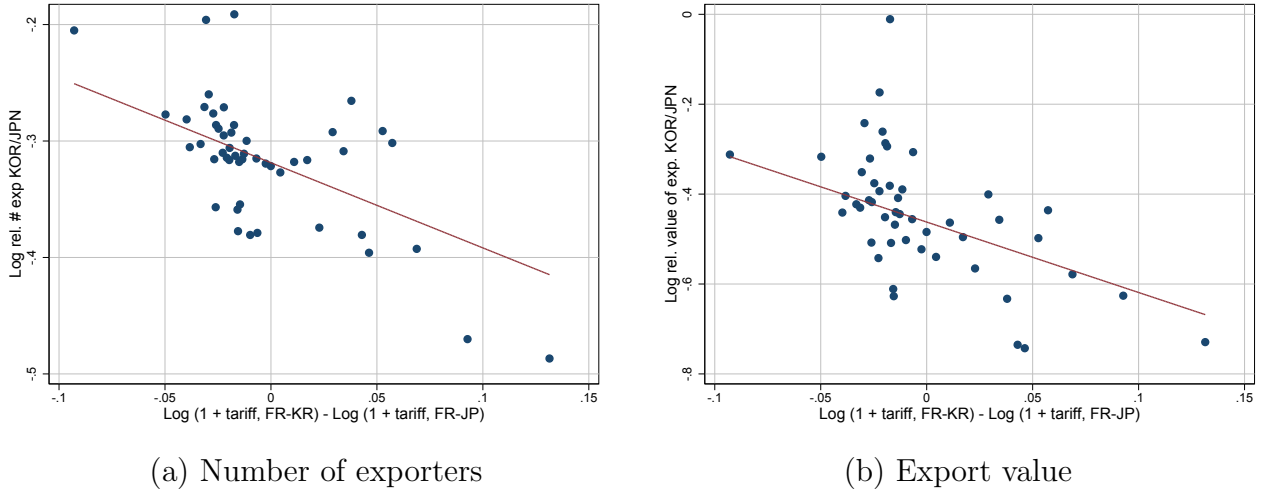
#### 5.1.2 Econometric assessment

Table 4 shows the results of standard regressions, where we investigate the effect of changes in tariffs on both the probability to export to Korea (columns 1-3) and the intensity of exports (columns 4-6). Note that in all regressions we cluster the standard

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<sup>17</sup>Head and Ries (2001), Romalis (2007), Spearot (2013), Berthou and Fontagné (2016), Fitzgerald and Haller (2015), Bas et al. (2017), and Fajgelbaum et al. (2020) are recent examples.

Figure 5: Impacts of tariffs exports : Korea relative to Japan



Note: Binscatter plot obtained by absorbing product fixed effects.

deviation of residuals by HS-6 product and year ( $p \times t$ ). Along both margins, we find evidence of a strong and significant impact of tariffs on the exporting activity of French firms in Korea. The magnitude of the coefficient estimates along the extensive margin is quite stable across alternative specifications using various sets of fixed effects. This magnitude fluctuates somewhat more along the intensive margin of exports. However, our preferred specification (including both firm-product and time fixed effects) yields an elasticity around unity. In quantitative terms, the typical cut in Korean tariffs enjoyed by French exporters after July 2011 (about 8 percentage points) increased the probability of exports in the reference group by about 0.7 pp and the value of exports by about 8.8% (based on the coefficients reported in columns 3 and 6).

In table 5, we now present estimation results when we split the sample of firms into two groupings sorted by our proxy for productivity. Doing this is of course tantamount to interacting all regressors (including fixed effects) with a dummy for high vs low productivity. In all regressions, we include firm-product and time fixed effects. We find evidence that the impact of tariff cuts on the probability to enter the Korean market is higher for more productive firms. In contrast, along the intensive margin, the effect of tariff cuts on export volumes is stronger for less productive firms. This result confirms that the micro trade elasticity interacts with firm productivity as predicted by the theory and already

Table 4: Impact of tariffs reductions on firm-level exports

Dep. var.	(1)	(2)	(3)	(4)	(5)	(6)
	Export dummy			Log export value		
log(1+tariff)	-0.096 <sup>a</sup> (0.014)	-0.127 <sup>a</sup> (0.010)	-0.097 <sup>a</sup> (0.016)	-0.898 <sup>b</sup> (0.367)	-2.679 <sup>a</sup> (0.235)	-1.095 <sup>a</sup> (0.375)
R <sup>2</sup>	0.18	0.52	0.52	0.53	0.75	0.75
Obs.	689,288	689,288	689,288	39,627	39,627	39,627
Period	2007-15					
Fixed effects	f,p,t	fp	fp, t	f,p,t	fp	fp, t

Note: Significance levels: <sup>a</sup> p<0.01, <sup>b</sup> p<0.05, <sup>c</sup> p<0.1. Standard errors clustered by HS 6-digit product and year.

shown in previous work.

Table 5: Impact of tariff reductions on firm-level exports, comparing high vs low productivity firms

Dep. var.	(1)	(2)	(3)	(4)
	Export dummy		Log export value	
Performance group	Low	High	Low	High
log(1+tariff)	-0.091 <sup>a</sup> (0.018)	-0.249 <sup>a</sup> (0.044)	-1.265 <sup>a</sup> (0.442)	-1.040 <sup>c</sup> (0.559)
R <sup>2</sup>	0.50	0.60	0.72	0.76
Obs.	455,950	92,730	23,814	12,767
Period	2007-15			
Fixed effects	fp, t	fp, t	fp, t	fp, t

Note: we approximate productivity by a measure of a firm’s average export performance, across all products sold and sample years, in both Belgium and the US, two relatively easy markets and frequent destinations for French exports. *High productivity* firms are defined as firms that belong in the top decile of exporters in these two markets for more than half of their existing product-year pairs. See section 3.2.1 in the text for details. Significance levels: <sup>a</sup> p<0.01, <sup>b</sup> p<0.05, <sup>c</sup> p<0.1. Standard errors clustered by HS 6-digit product and year.

## 5.2 Tariff elasticities of exports and the specialization of banks

We now test whether “good” bank connections, which we assume entail lower unitary distribution costs for their customers exporting to Korea, indeed amplify the response of exporters to tariff cuts. We first present results as regards the decision to export in Korea (the extensive margin). We then turn to the estimated effects on export values

sold by continuing exporters (the intensive margin).

### 5.2.1 Extensive margin.

Table 6 displays estimation results along the extensive margin. The upper panel of Table 6 first displays baseline results, where all regressions include both firm-product and time fixed-effects. For each firm type (low or high productivity), we present the results of three regressions, whereby we consider alternatively our three measures of the Korea-specialization of banks. Each measure of bank specialization is based on a different threshold in the right tail of the distribution of banks' Korea-specialization index.

We find strong evidence that being connected to a specialized bank increases the probability that firms enter the Korean market in response to the cut in tariffs, whatever their productivity class. Using for instance our benchmark measure of bank specialization based on PRS outliers identification (column 2), the probability that a less productive firm enters the Korean market following the reduction in tariffs roughly doubles whenever this firm benefits from the support of Korea-specialized banks. The benefit of being connected to specialized banks is even stronger when geographic specialization is defined in a more restrictive way, i.e. taking only the top 5% of banks in terms of Korea-specialization. The effect is strong as well for the most productive firms in our sample of exporters, but it tends to be less significant when we pick up the so-called specialized banks using either the definition of outliers as in (Paravisini et al., 2017) (column 5) or the broader set of banks in the top 10% in terms of Korea-specialization (column 6).

These results are confirmed when we control in the estimation for product-time fixed effects, in which case only the coefficient of the interaction term between the Korea specialization of exporters' banks and the tariff can be estimated. This allows controlling in a cleaner way for product-time supply or demand shocks that could be correlated with the tariff change. The estimation results presented for the extensive margin in the bottom part of Table 6 fully confirm our previous estimation results based on the less demanding empirical specification.



Table 6: Tariffs and exports at the extensive margin: the role of specialized banks

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. var.						
Period				Export dummy		
				2007-15		
Fixed effects				fp, t		
Performance group		Low			High	
log(1+tariff)	-0.070 <sup>a</sup> (0.019)	-0.080 <sup>a</sup> (0.019)	-0.076 <sup>a</sup> (0.019)	-0.185 <sup>a</sup> (0.047)	-0.220 <sup>a</sup> (0.047)	-0.211 <sup>a</sup> (0.054)
log(1+tariff) × SPRS max (top5%)	-0.203 <sup>a</sup> (0.027)			-0.261 <sup>a</sup> (0.057)		
log(1+tariff) × SPRS max (outlier)		-0.074 <sup>a</sup> (0.024)			-0.089 <sup>c</sup> (0.052)	
log(1+tariff) × SPRS max (top10%)			-0.065 <sup>a</sup> (0.020)			-0.072 (0.050)
R <sup>2</sup>	0.50	0.50	0.50	0.60	0.60	0.60
Obs.	455,950	455,950	455,950	92,730	92,730	92,730
Fixed effects				fp, pt		
Performance group		Low			High	
log(1+tariff) × SPRS max (top5%)	-0.215 <sup>a</sup> (0.029)			-0.298 <sup>a</sup> (0.066)		
log(1+tariff) × SPRS max (outlier)		-0.077 <sup>a</sup> (0.025)			-0.176 <sup>a</sup> (0.060)	
log(1+tariff) × SPRS max (top10%)			-0.083 <sup>a</sup> (0.022)			-0.073 (0.058)
R <sup>2</sup>	0.53	0.53	0.53	0.66	0.66	0.66
Obs.	449,597	449,597	449,597	84,226	84,226	84,226

Note: SPRS is a dummy that takes the value of one when at least one bank of the firm is specialized in the Korean market according to the PRS index, as explained in section 3.3 of the text. We approximate productivity by a measure of a firm's average export performance, across all products sold and sample years, in both Belgium and the US, two relatively easy markets and frequent destinations for French exports. *High productivity* firms are defined as firms that belong in the top decile of exporters in these two markets for more than half of their existing product-year pairs. See section 3.2.1 in the text for details. Significance levels: <sup>a</sup> p<0.01, <sup>b</sup> p<0.05, <sup>c</sup> p<0.1. Standard errors clustered by HS 6-digit product and year.

### 5.2.2 Intensive margin.

Table 7 presents estimation results along the intensive margin. The results come out as less significant than before. The impact of bank specialization on the tariff elasticity of exports is negative and significant as expected, but it is only the case for less productive exporters and when we pick up Korea-specialized banks using a looser threshold. The estimated impact of the interaction term is also strengthened when we additionally control for product-time fixed effects, as shown in the lower panel of Table 7. For less productive

firms, being connected to a Korea-specialized bank more or less doubles the tariff elasticity of exports (col. 2, upper and bottom panels). However, being connected to a Korea-specialized banks does not really affect the export performance of highly productive exporters in the Korean market. Regular exporters therefore seem to benefit less from being connected to a Korea-specialized bank than potential new entrants. A reason for this may be that the information advantage brought by the lenders is likely to matter less when the firm is already well established into the Korean market and has already gathered information about potential clients.

Table 7: Tariffs and exports at the intensive margin: the role of specialized banks

Dep. var.	(1)	(2)	(3)	(4)	(5)	(6)
Period	Log export value 2007-15					
Fixed effects	fp, t					
Productivity group	Low			High		
log(1+tariff)	-1.258 <sup>a</sup> (0.444)	-1.114 <sup>b</sup> (0.447)	-1.124 <sup>b</sup> (0.451)	-1.225 <sup>b</sup> (0.625)	-1.475 <sup>b</sup> (0.625)	-0.903 (0.669)
log(1+tariff) × SPRS max (top5%)	-0.100 (0.776)			0.572 (0.642)		
log(1+tariff) × SPRS max (outlier)	-1.047 <sup>c</sup> (0.593)			1.087 <sup>c</sup> (0.588)		
log(1+tariff) × SPRS max (top10%)				-0.663 (0.499)		
R <sup>2</sup>	0.72	0.72	0.72	0.76	0.76	0.76
Obs.	23,814	23,814	23,814	12,767	12,767	12,767
Fixed effects	fp, pt					
Productivity group	Low			High		
log(1+tariff) × SPRS max (top5%)	-1.130 (1.033)			0.898 (0.816)		
log(1+tariff) × SPRS max (outlier)	-1.797 <sup>b</sup> (0.765)			0.403 (0.742)		
log(1+tariff) × SPRS max (top10%)				-2.174 <sup>a</sup> (0.653)		
R <sup>2</sup>	0.78	0.78	0.78	0.84	0.84	0.84
Obs.	18,434	18,434	18,434	8,129	8,129	8,129

Note: SPRS is a dummy that takes the value of one when at least one bank of the firm is specialized in the Korean market according to the PRS index, as explained in section 3.3 of the text. We approximate productivity by a measure of a firm's average export performance, across all products sold and sample years, in both Belgium and the US, two relatively easy markets and frequent destinations for French exports. *High productivity* firms are defined as firms that belong in the top decile of exporters in these two markets for more than half of their existing product-year pairs. See section 3.2.1 in the text for details. Significance levels: <sup>a</sup> p<0.01, <sup>b</sup> p<0.05, <sup>c</sup> p<0.1. Standard errors clustered by HS 6-digit product and year.

## 6 Conclusion

Two important streams of recent research in trade economics have shown that (i) the reaction of firm-level exports to changes in tariffs is very heterogenous across firms and (ii) the characteristics of the banks supplying export credit to firms matters for understanding both the volume and the geography of exports. In this paper, we show that these two lines of research speak to each other. More precisely, we argue that being connected to a bank that has previously gained a good knowledge of a distant market - a specialized bank- enhances the odds for an exporter to thrive in this market and notably to reap the benefits of tariff reductions there.

We first propose a simple theoretical framework, where we assume that such “good” bank connections translate into lower distribution costs and show that trade elasticities should be larger for firms connected to specialized banks. We then exploit a recent trade liberalization episode, the 2011 free trade agreement between the EU and South-Korea, as a quasi-natural experiment to test our theory using granular information on the exports and credit links of French firms. We construct a measure of geographic bank specialization based on the idea that repeated credit interactions with large exporters in a given destination contributes to building a specific informational advantage of the bank about this country. We find robust evidence that being already connected to a bank “specialized in Korea” increases the probability for firms to enter this distant and difficult market following to a cut in the tariffs applied to their products. This enhancing effect of the geographic specialization of lenders on the trade elasticity of exports can also be felt along the intensive margin, but it only benefits less productive firms.

Overall, this study sheds new light on how the financial system of a country may contribute to the competitiveness of domestic firms in distant foreign markets. Our results highlight that domestic banks that are experienced about doing business in these markets create a competitive advantage for their home country in a globalized world. This notwithstanding, in this study, we measure the geographic specialization of banks positively, based on their observed supply of loans to exporters in the past, but we do not question why some banks did choose to fund more exports to some countries, hence to gain geographic specialization, in the first place. These lending patterns of banks may reflect history, idiosyncrasies of, e.g., bank and firm managers, or sheer luck. Understanding what drives banks to specialize in a way or another, and how public policy or

financial regulation may influence this, could however prove to be of first order importance in the perspective of enhancing a country's competitiveness. This is but left for further research.

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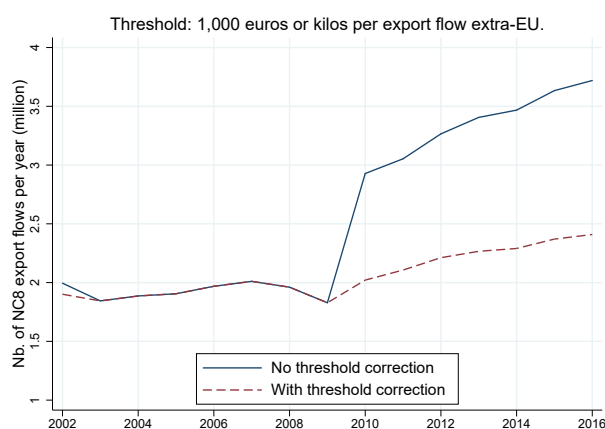
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## A Dealing with reporting breaks in Customs data

The following figures shows the aggregate consequences of the methodological break in the French Customs' reporting framework in 2010 and how we correct for it in the cases of Korea, Japan, Chine and the US. We simply apply after 2010 the reporting thresholds that were prevalent before 2010 at the level of unitary export flows.

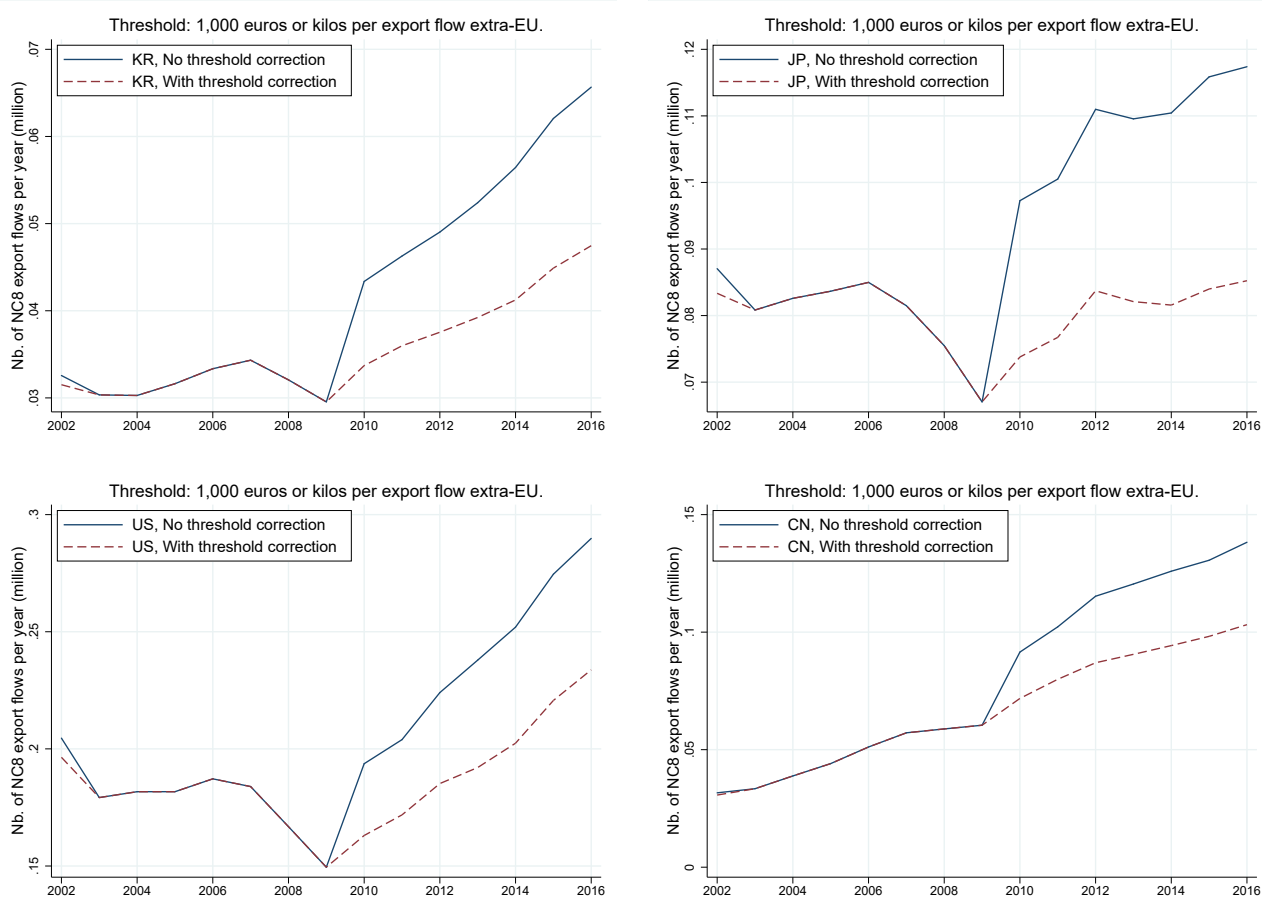
Figure 6: Number of extra-EU27 export flows by French exporters (CN8 products)



Note : Calculations based on the number of annual 8-digit Combined Nomenclature (CN) export flows (values) exported by French firms, extra-EU28. A flow is a siren(firm)-country-CN8(product)-month-year value of export. When the reporting threshold applies, i.e. before 2010, only export flows above 1000 euros or 1000 kilograms are reported. After 2010, no reporting threshold applies.



Figure 7: Number of extra-EU27 export flows by French exporters (CN8 products)



Note : Calculations based on the number of annual 8-digit Combined Nomenclature (CN) export flows (values) exported by French firms, extra-EU28. A flow is a siren(firm)-country-CN8(product)-month-year value of export. When the reporting threshold applies, i.e. before 2010, only export flows above 1000 euros or 1000 kilograms are reported. After 2010, no reporting threshold applies.

## A.1 Assessing firm-level “productivity” using Customs data.

We proceed in two steps for the identification of “high productivity” or “high performing” firms based on the French customs data. For each of the two reference destinations (Belgium and the US), we identify, for each HS2 sector and year, firms with sales ranked in the top 10% among the set of exporters and create a dummy to identify these firms-HS2-years observations. We then take the average of this dummy by firm (over the set of HS2 sectors and years). This gives us a “score” indicating the relative performance of each exporter in that reference market (Belgium or the United States). In each of these reference markets, we define as “high performance exporters” those exporters for which the score is strictly above 0.5, corresponding to constantly large exporters in each destination. To avoid a positive shock that would be only observed in one market, we keep in our final sample of high performance exporters only firms that exhibit a high performance score both in Belgium *and* in the United States. Low performance firms correspond to the rest of firms (including those which we identify as high performers in only one of the two markets).