

What goes around comes around: Microeconomic effects of international outsourcing on firm export performance.

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This paper tests the assumption that international outsourcing may enhance firm competitiveness in international markets through potential cost-based and revenue-based gains. To this aim, we use a unique dataset on companies established in France in manufacturing industries for the year 1999. These data describe the breakdown of imports (respectively exports) by country of origin (respectively destination) at a product level, indicating the nature of goods that are traded (intermediary inputs vs. final goods) and its sourcing mode (market transaction vs. intra-firm trade). We conclude that international outsourcing boost the export performance while controlling for different firm, industry and country level parameters influencing the export behavior. In addition, we find that the causal relationship between imports of intermediary inputs and exports of final goods is mitigated by different factors. First, adopting a multi-sourcing strategy seems to amplify the effects of international outsourcing. It allows companies to appropriate a diversity of knowledge and to raise their bargaining power and flexibility. There appears also a country-of-origin effect: Importing intermediary inputs from one country increases exports to this same country. In addition, the leverage of external resources combined with intra-sourcing within the firm's boundary seems to generate synergistic gains. Finally, the export experience increases marginal gains from outsourcing abroad. These main findings tend to highlight the role of international outsourcing to achieve global competitive advantages. From an economic policy perspective, they suggest that implementing protectionist measures to improve the balance of trade and safeguard employment could be counter-productive.

Keywords: International Outsourcing; Global Sourcing; Export; MNE; Globalization.

## **Introduction**

*“Yes, I want to be able to huff and puff about complex issues - like outsourcing of jobs to India - without any reference to reality. Unfortunately, in this life, I'm stuck in the body of a reporter/columnist. So when I came to the 24/7 Customer call center in Bangalore to observe hundreds of Indian young people doing service jobs via long distance [...] I was prepared to denounce the whole thing. [...] Well, he (the founder of the company) answered patiently, "look around this office." All the computers are from Compaq. The basic software is from Microsoft. The phones are from Lucent. The air-conditioning is by Carrier, and even the bottled water is by Coke [...] This explains why, although the U.S. has lost some service jobs to India, total exports from U.S. companies to India have grown from \$2.5 billion in 1990 to \$4.1 billion in 2002. What goes around comes around, and also benefits Americans.” (Friedman, 2004)*

The topic of international outsourcing and offshoring called also global sourcing has become more and more debated these recent years.<sup>1</sup> It has drawn increasing attention in popular media, in the policy-market arena as well as in the academic IB and strategic literature (Kotabe and Murray, 2004, Bunyaratavej *et al.*, 2008). Although global sourcing is not a new phenomenon, its pace seems to be accelerating (Helpman, 2006; Doh, 2005; Rasheed and Gilley, 2005). Falling trade barriers, technological progress in communication and transportation as well as higher organizational capabilities of multinational enterprises (MNE) in coordinating geographically dispersed network of activities (Levy, 2005) enables companies to fragment more their production internationally – both within and across firms’ boundary. In addition, global sourcing touches today almost all sectors of the economy, from manufacturing to services industries. This process is reshaping the economic landscape, raising many concerns first of all for workers and governments in developed countries. Global sourcing is frequently associated with job losses in outsourcing firms and the relocation of valuable economic activities in emerging countries, as e.g. India or China. Not surprisingly, the net impact of global sourcing has been the subject of intense and controversial discussion (Farrell 2005; Levy, 2005). Little consensus has been found yet. Viewed as a process of creative destruction (Tyson, 2004), global sourcing could indeed create wealth for developed countries. Farrell (2005) lists three main types of gains: cost savings, repatriated earnings and new revenues from exports. The latter argument relies on the simple idea – developed also by Friedman (see the above citation) – that global sourcing increase the economic growth of developing countries. This in turn boosts their demand of foreign goods and therefore stimulates export growth and job creation in developed countries too. Global sourcing of course does not represent a challenge for countries only. It is perceived by firms as an essential element of their international competitiveness in global markets (Murray *et al.*, 1995 a). Global sourcing allows companies to exploit economic, institutional and cultural differences across

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<sup>1</sup> Along this paper, international offshoring refers to intra-firm trade. International outsourcing corresponds to market transactions.

countries (Ghemawat, 2003). This strategy is however risky, especially when relying on external suppliers. In the particular case of domestic outsourcing Barthelemy (2003) lists 7 “deadly sins”, such as selecting the wrong vendor or writing a poor contract, which could reduce the performance of firms (see also Quelin and Duhamel, 2003). These sins could be both more likely and fatal when sourcing abroad in an unfamiliar environment.

Motivated by this issue, the purpose of this paper is to analyze the impact of international outsourcing on export performance. International outsourcing is simply defined as the purchase of intermediary inputs abroad to independent suppliers.<sup>2</sup> To the best of our knowledge, no study has addressed yet this important question both for companies and policy makers. From the economic policy perspective, we provide a microeconomic foundation to import-export linkages. We argue that imports of intermediary inputs may increase exports of goods not only because of macroeconomic demand effects from exporting countries (of inputs) – as exposed by Farrell (2005) – but also due to efficiency effects in the importing country (of inputs). If international outsourcing improves the efficiency of local firms, then the importing country could expect to export more. This missing microeconomic factor could counterbalance negative effects of international outsourcing in terms of jobs and trade balance. In addition, export performance is of importance for companies. Globalization makes it vital for companies to survive and grow to exploit new sources of revenue in export markets (Majocchi *et al.*, 2005). In this context, international outsourcing could be essential for companies to maintain and develop their global competitive advantages. Outsourcing can be a source of both cost savings and competence acquisition. (Kotabe *et al.*, 2008; Bunyaratavej *et al.*, 2008).

Our contribution to the strategic and IB literature is twofold. First of all, there is still little empirical evidence on international outsourcing (Mol *et al.*, 2005; Katobe *et al.*, 2008).<sup>3</sup> Besides, most of existing research investigates its determinant rather than its impact (e.g. Tavares and Young, 2006; Bunyaratavej *et al.*, 2008). To the best of our knowledge, only Mol *et al.* (2005) evaluate empirically the impact of international outsourcing with the help of hard data. Based on financial and market indicators of domestic performance, they do not find any significant improvement.<sup>4</sup> Second, the question that we address is also related to a vast literature exploring the different determinants of exports (see e.g. Aulakh *et al.*, 2000; Zou and Stan, 1998; Katsikeas *et al.*, 2000; Leonidou *et al.*,

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<sup>2</sup> In this paper, we mainly focus on international outsourcing. First, intra-firm sourcing has been more extensively analyzed by academic researchers and business practitioners. See for example Berry (2008), Bardhan and Jaffee (2004), Murray *et al.* (1995a, 1995b), Kotabe and Swan (1994) or Kobrin (1991). Second, we believe that efficiency effects that we try to evaluate could be distorted in the case of intra-sourcing not only because of MNE practices of transfer pricing, but also due to the degree of dependence that MNE decide to grant to their affiliates.

<sup>3</sup> There is also a lack of empirical studies on the overall performance of outsourcing (Jiang and Qureshi, 2005).

<sup>4</sup> In economics, Görg and Hanley (2005) or Görg *et al.* (2007) get more positive effects. International outsourcing may improve the productivity of firms in Ireland.

2002; see e.g. Bonaccorsi, 1992; Verwaal and Donkers, 2002). However, as noticed by Salomon and Shaver (2005), in spite of the importance of export activities in globalization, the strategic management research on export behavior is still in its infant stage. Microeconomic factors are still under-investigated. We then believe that our paper contributes to fill this empirical gap in the field of export behavior too.

In this context, we empirically test the hypothesis that international outsourcing could enhance export performance through cost-based and revenue-based gains. We also investigate several hypotheses regarding moderating factors in the relationship between imports of intermediary inputs and exports of goods. These factors are related to the nature of international outsourcing and to firm characteristics. To this aim, we use a unique and very rich dataset on French owned companies and foreign subsidiaries established in France in 1999 in manufacturing industries. Manufacturing companies reported in this database account for more than 70% of French manufacturing exports. For each company, the database gives a detailed breakdown of imports (respectively exports) by country of origin (respectively destination) at a product level. It also specifies the sourcing modes (i.e. intra-firm trade versus market-based transactions) and the nature of the goods that are traded (i.e. intermediate inputs versus final goods).

We find that international outsourcing boost the export performance of outsourcing firms. These findings are robust to different measures of outsourcing or to the use of different methodologies. Moreover, we observe that the adoption of multi-sourcing strategy amplifies the effects of international outsourcing. It allows companies to appropriate a diversity of knowledge and to raise their bargaining power and flexibility. There appears also a country-of-origin effect: Importing intermediary inputs from one country increases exports to this same country. In addition, the simultaneous use of external resources and intra-sourcing seems to be beneficial. Finally, the export experience raises marginal gains from outsourcing abroad. These findings suggest that international outsourcing help firms to achieve global competitive advantages. From the point of view of policy makers, the existence of efficiency gains from international outsourcing stresses that implementing protectionist measures to improve the balance of trade and safeguard employment could be counter-productive.

The article proceeds as follows: section II develops our theoretical framework and our main hypotheses. Section III describes data. Section IV reports the methodology and explanatory variables, while section V discusses our main empirical findings. Conclusions are drawn in the last section.

## **II. Theoretical framework and hypotheses**

International outsourcing is a complex and controversial phenomena. It may bring important benefits but also risks for outsourcing companies. Outsourcing in general provides companies with two main types of advantages (Katobe *et al.*, 2008; Barthelemy, 2003; Quelin and Duhamel, 2003). First, it enables firms to reduce their production costs. Outsourcing companies may purchase intermediate inputs at a lower cost and/or of higher quality than in-house. They may take profit from the higher specialization and larger scale economies of external providers (Rasheed and Gilley, 2005). By servicing many customers, suppliers may achieve lower costs than outsourcing companies. They may also afford to invest more in new technologies and innovative practices related to the production of these inputs. Outsourcing firms also gain more flexibility by being less committed to a specific type of technology (Rasheed and Gilley, 2005). Cost savings are supposed to increase when the competition among suppliers becomes tougher and switching costs are lower. Second, outsourcing represents a means of accessing supplier capabilities and acquiring new external knowledge that could otherwise be inaccessible (Kotabe *et al.*, 2003; Katobe *et al.*, 2008; Cousins and Lawson, 2007). When the growing complexity of products requires various capabilities, outsourcing enables firms to tap new technological know-how and to complement their stock of resources (Grant, 1991). It also allows firms to (re-) allocate resources to the best possible use within the company. As suggested by the resource-based view, saved resources can be invested in those activities which constitutes the core competences of companies and for which they have unique, valuable, non-substitutable and non-imitable competitive advantages (Jian and Qureshi, 2006; Espino-Rodriguez and Padron-Robaina, 2007). These predicted cost-based and revenue-based gains are present both for domestic and international outsourcing. They are however *a priori* more important in the case international outsourcing. If we believe that the country environment – such as the capital and labor endowment or the institutional and judicial system – shapes firm-specific organizational and technological capabilities, then the fact that outsourcing companies could choose among more suppliers located in different countries could enhance potential benefits from outsourcing. For example, the international trade of intermediary inputs is recognized as being a major channel for the diffusion and adoption of technology across countries (Kasahara and Rodrigue, 2005). Firm-specific technological or organizational know-how are frequently embodied in firm goods (Berry, 2008, Kobrin, 1991).

This strategy of outsourcing is nevertheless subject to many risks and challenges. Barthelemy (2003) lists 7 “deadly sins” likely to reduce the performance of firms: (1) outsourcing activities that should not be outsourced; (2) selecting the wrong vendor; (3) writing a poor contract; (4) overlooking personnel issues; (5) losing control over the outsourced activity; (6) overlooking the hidden costs of outsourcing; and (7) failing to plan an exit strategy. Part of these costs is related to transaction costs.

Costs of sourcing indeed include not only direct procurement costs, but also transaction costs (Park, 2000). Companies have to pay for transaction costs ex-ante (costs of searching and negotiation) and ex-post (costs for monitoring and enforcing the contract) as fully explained by the transaction cost literature. This literature emphasizes the crucial role of asset specificity, contract incompleteness and opportunistic behavior in the existence of transaction costs (Williamson, 1971, 1985; Leiblein *et al.*, 2002). Outsourcing could lead firms to be more dependent on their suppliers (Quelin and Duhamel, 2005) and to lose essential technological and organizational expertise in the long run. While gains from international outsourcing were thought to be higher, costs of international outsourcing could be assumed to be larger (Mol *et al.*, 2005; Rangan, 2000). In an unfamiliar context, the different issues raised by outsourcing, such as the selection of providers or the writing of a good contract, are amplified. The discovery process of suppliers and their control are more expensive in geographic and culturally distant markets, especially when companies are lacking of international experience.

If firms are profit maximizing and acting rationally, then outsourcing gains are expected to outweigh outsourcing costs when companies decide to purchase intermediary inputs abroad, which increases their overall efficiency.<sup>5</sup> These general efficiency effects should improve the domestic performance of outsourcing firms but also their international competitiveness. Outsourcing firms could be predicted to leverage their new organizational and technological edges on foreign markets (Ito, 1997; Ito and Pucik, 1993; Dhanaraj and Beamish, 2003), thereby improving their export performance. This is expressed as below:

**Assumption 1:** International outsourcing could enhance export performance.

Different factors could moderate the impact of international outsourcing on export performance. The first factor that we investigate is the extent to which outsourcing firms decide to diversify (or to concentrate) their supplying of intermediary inputs. This refers to the strategy of international multi-sourcing. Note that to our knowledge, no paper has explored this dimension yet. In general, multi-sourcing could be defined as the use of multiple providers for a given function (see Levina and Su, 2008). On the one hand, the possibility to select suppliers from different countries increases the likelihood to find the best suppliers. It offers companies the opportunity to tap into differentiated resources from multiple suppliers located in heterogeneous countries. This may lead to cross-

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<sup>5</sup> It could be profitable for companies to outsource both in high and low income countries. If business media tend to show outsourcing cases in emerging countries, the difference in performance is not obvious. Sourcing in high-income countries might enable firms to access higher expertise and new knowledge or to improve the quality of inputs, while sourcing in low-income countries could increase more short-term cost savings, especially in terms of wage. In addition, transaction costs are very likely to be higher in emerging markets characterized by institutional voids.

fertilization of technologies and to new knowledge combination.<sup>6</sup> The ability that firms could develop to acquire, coordinate and synthesize resources from different countries may be the source of valuable, scarce and non-imitable resources (Doh, 2005; Kogut and Zander, 1992). In addition, the use of multi-sourcing diversifies the risk of disruption in the supply chain that is increased with international outsourcing (Mol *et al.*, 2005; Choi and Krause 2006; Burke *et al.* 2007). Firms gain more flexibility. They become less dependent on a specific supplier. Finally, the multi-sourcing strategy stimulates competition among suppliers by rising and lowering orders depending for instance on the evolution of wages and exchange rates. On the other hand, managing a portfolio of different suppliers is expected to increase coordination costs between companies and their multiple suppliers and the overall burden of transaction costs. It could involve less specific investment from both outsourcing firms and their different suppliers (Levina and Su, 2008). We however assume that the different gains of diversifying internationally sourcing may offset potential costs:

**Assumption 2:** The impact of international outsourcing on export performance could be higher when outsourcing companies diversify internationally their sourcing.

In addition to the diversification of sourcing, a second attribute of intermediary inputs could matter. The assumption 1 states that importing intermediary inputs from one or several countries could increase exports of companies in one or several countries. The effect of international outsourcing could actually be more pronounced when the country of import and the country of export coincide. By definition, this country-of-origin effect of international outsourcing is strictly specific to the export performance. This would illustrate from a microeconomic perspective strictly the anecdote developed by Friedman (2004) according to which U.S. imports of Indian intermediary inputs could boost U.S. exports to Indian too. Importing intermediary inputs from the country to which firms wish to export gives two main advantages. First, these imported inputs do not need to be adapted and tailored to the local market condition (e.g. technical standard or local taste). Customization costs could be substantial when penetrating new export markets (Head, 2007). Locally established suppliers could be more responsive to changes in their home market environment too. Second, when screening for the best suppliers or when negotiating with local suppliers, companies could get the opportunity to acquire new knowledge on this local market and its functioning. Consequently, we set the following assumption:

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<sup>6</sup> See, for instance, works inspired by Jacobs (1969) on the role of diversity in knowledge sources in the innovation process.

**Assumption 3:** The impact of international outsourcing on export performance could be higher in countries of export destination where companies import intermediary inputs.

While assumption 2 and 3 investigate the nature of international outsourcing, the next assumption explores the role of intra-sourcing. MNE may procure their components in-house (Kotabe and Murray, 2004). In this context, the impact of international outsourcing could depend not only on the combination of resources from multiple suppliers, but also on the use of internal resources from affiliates located abroad. Again, to our knowledge, very few papers have addressed this question with the exception of Rothaermel *et al.* (2006). Rothaermel *et al.* (2006) name the simultaneous use of internal and external inputs “taper integration”. This strategy takes profit from advantages of integration (i.e. tighter control and coordination especially in the case of strategic technological knowledge) and outsourcing (i.e. access to knowledge created beyond the firm’s boundary). The leverage of external knowledge combined with internal resources has the potential to generate synergistic gains. On the other hand, as for international multi-sourcing, this strategy could increase the complexity of the production process and raise coordination costs. This idea of complementarities of internal and external resources is also supported by the R&D literature (Cassiman and Veugelers, 2006; Cassiman, 1997). In-house technological resources contribute to the development of absorptive capacity which is necessary to fully screen and exploit external expertise (Cohen and Levinthal, 1993). Hence, we predict:

**Assumption 4:** The impact of international outsourcing on export performance could be higher when companies also import intermediary inputs - within the firm boundary - from foreign subsidiaries.

Lastly, the international experience, in particular the export experience accumulated by companies, could play an important role in the performance of international outsourcing. Kotabe and Murray (2004) point out that logistics, inventory management, distance, nationalism or e.g. a lack of working knowledge on business practices abroad are recognized as major operational difficulties associated with international sourcing. In this context, being already familiar with foreign environment and cross-border transactions could allow companies to overcome these problems and to coordinate more efficiently geographically dispersed tasks (Levy, 2005). Similarly, the ability of searching and evaluating foreign suppliers may depend on export experience. Companies need to develop their knowledge of foreign markets when choosing the country of export destination and adapting their export strategy to the local market. During this discovery process, companies are likely to acquire



essential information on the foreign markets of intermediary inputs (Mol *et al.*, 2005).<sup>7</sup> Export experience could therefore contribute to the development of absorption capacity (Zahra and George, 2002). Experienced firms could select the best fit suppliers for export expansion and be able to assimilate and leverage these external resources in export markets. We then propose the following assumption:

**Assumption 5:** The improvement in export performance could be positively related to the export experience of companies.

### **III. Data description**

For this study, we use two main databases. The first database is called Echanges Internationaux Intra Groupe (EIIG). It was collected by the French ministry of Industry (SESSI). This confidential firm-level survey provides very rich and detailed information on the trade organization of firms resident in France for the year of reference 1999. This includes French owned companies but also foreign affiliates established in France in manufacturing and wholesale trade sectors. Almost all French owned companies report to be located both in France and abroad meaning that they should be classified as MNE.<sup>8</sup> This is likely to bias our findings since MNE are supposed to possess specific ownership advantages compared to purely domestic firms (Dunning, 1993). However, we believe that the interest of using this dataset is not attenuated. Indeed, it covers around 60% of total French imports and exports. This figure is even higher (around 70%) for manufacturing industries only.

For each company, the database describes the breakdown of imports (respectively exports) by country of origin (respectively destination) of trade flows at a product level. For each transaction undertaken by companies, it indicates the value and specifies the sourcing mode. These transactions could be established with independent suppliers (i.e. arm's length transactions and long-term contractual relationship) or affiliates (i.e. intra-firm trade).<sup>9</sup> Note that the database does not identify the

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<sup>7</sup> As justified by Mol *et al.*, 2005, it could be important for companies to understand the local market of inputs when exporting. First, local suppliers could provide domestic (or foreign) rivals with major competitive advantages. Second, local suppliers could potentially become new competitors in a near future.

<sup>8</sup> This survey was addressed only to companies trading more than one million Euros (or more than 500 thousands Euros when exporting to developing countries).

<sup>9</sup> In our final sample, around 60 % of firms do not report any intra-firm transactions. Among transactions with independent suppliers, the database separates spot market (i.e. arm's length) transactions from long-term contractual relationship (like alliances or franchising). We include both these types of transactions with independent suppliers when calculating our measure of international outsourcing. First, long-term contractual relationship accounts for a very small share of transactions. Around 12% of firms report to be engaged in long-term contractual relationship. This figure, surprisingly low, could stem from a misinterpretation of the question addressed to companies in this survey. Second, excluding long-term contractual relationship from our sample does not change our findings. Studying them separately introduce new econometric issue – especially selection bias.

counterparty involved in the transaction deal. Finally, it also distinguishes the nature of goods that are traded, decomposing goods into intermediate inputs and final goods.<sup>10</sup>

Using these data, we examine the causal relationship between import of intermediary inputs from independent suppliers and export of final goods to customers. For the purpose of our study, we exclude from our sample companies (around 500) in wholesale trade sectors. These companies face different considerations when outsourcing intermediate products. We also remove around 140 firms which do not import any intermediary inputs from independent suppliers. This does not affect our main assumption 1, but practically this allows us to keep the same sample along this paper when testing then assumptions 2, 3, 4 and 5.

The EIIG database is then matched with another survey called Enquête Annuelle d'Entreprise (EAE). The EAE database is collected each year by the French ministry of industry (SESSI) and is available from 1990. This second source of data gives information on the balance sheet and income statement of firms resident in France in manufacturing industries.<sup>11</sup> Our final matched sample includes more than 2000 companies. Finally, when assessing country-level determinants, we reduce our sample to more 70 *exporting* countries. Countries selected in our sample should present no missing value for three basic controlling variables: the geographic (source: CEPII) and cultural distance (source: Hofstede<sup>12</sup>) and the GDP (source: World Bank). We point out that the computation of our main variable accounting for international outsourcing (see the next section) is not affected by this restriction. Companies source intermediary inputs from more than 140 *importing* countries.

#### **IV. Methodology and variables**

The objective of this study is to evaluate the impact of international outsourcing on the export performance of firms. To measure the export performance, we choose as the dependant variable the value of exports to each country of our sample for each firm. This variable is denoted *Export*.<sup>13</sup> Export intensity (i.e. the ratio export on total sales) does not measure the effects that we wish to investigate from an economic policy perspective. Furthermore, the use of export intensity could lead to unclear conclusions in terms of firm performance if international outsourcing modifies domestic sales without affecting exports. We could indeed expect an enhancement of domestic performance. We then take the

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<sup>10</sup> This database also provides information on the geographic decomposition of turn-over and employees of the MNE group among 10 different geographic areas. However, these data are available for around 400 companies. This additional information will then be used only when testing the robustness of our findings (see appendix C).

<sup>11</sup> The dataset includes the aggregated level of exports. There is no indication on imported goods.

<sup>12</sup> <http://www.geert-hofstede.com>

<sup>13</sup> For each firm, we sum the value of transactions per country of destination. This value does not include intra-firm trade.

logarithm of the variable *Export* as this has revealed to be the best fit to data in the empirical trade literature. As said before, our data take into account for each firm more than 70 countries of export destination. Consequently, our dependent variable contains a large number of zeros. Computing the logarithm of exports will exclude a substantial number of observations, removing some important information about the export behavior of companies across different countries. As often, we therefore use the simple transformation  $\log(Export+1)$  and employ in this cross-section analysis an Ordinary Least Squares model with robust standard errors. This will be our benchmark estimation. We will however test the robustness of our main results by using different alternative econometric approaches (see appendix B).

The export performance could be explained by different firm-level characteristics (see tables 1 to 4 in appendix A for statistics and correlation description of our variables). First, we include as a regressor our main variable of interest denoted *Outsourcing*. This variable is calculated as the aggregated value per firm of intermediary inputs (across countries of import) from independent suppliers divided by total sales. We normalize by sales to control for size effects and reduce the level of correlation with the variable *Size* that is also included in our evaluation. We discuss the robustness of this measure in appendix B where we decompose for instance our measure of outsourcing by location areas as suggested by Mol *et al.* (2005). We consider several controlling variables likely to influence export performance.<sup>14</sup> Note that all variables are converted in French currency (KFrancs) and are expressed in logarithm.<sup>15</sup> As just explained, we introduce the firm size (e.g. Filatotchev *et al.*, 2001). The variable *Size* is measured by the total number of employees. There could be a threshold level of development which is required for a firm to export goods abroad. Large firms could exploit scale and scope economies in the management of production and/or export abroad. We then include a measure of export experience (e.g. Majocchi *et al.*, 2005; Erramilli, 1991; Cadogan *et al.*, 2002). This variable *Export Experience* indicates the number of years that firms are engaged in business export. Firms need some specific knowledge to sell abroad successfully. The gains (respectively costs) of exporting could be higher (respectively lower) for companies which are already familiar with foreign markets. More generally, this variable accounts for the international experience of firms. We expect that both the size and overseas experience of firms increase the level of exports. Moreover, we add in our estimation the variable *Unit Labor Cost* as calculated by the ratio labor cost on value added. We prefer this single measure to the inclusion of the two related variables labor cost per worker and labor productivity because of their high level of correlation. *Ceteris paribus*, higher unit labor costs reduce cost

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<sup>14</sup> Note that as Salomon and Shaver (2005), we do not include advertising spending. Advertising could be country-specific expenditures. In addition, the variable advertising is not available for all manufacturing firms.

<sup>15</sup> For variables taking zero values, we do the simple transformation  $\log(X + a)$  where the positive value of  $a$  is very small relative to  $X$ .

advantages of companies and their ability to compete successfully abroad. The unit labor cost could vary independently of outsourcing decisions because of innovation process or new management practices, therefore influencing export performance. Finally, we control for two main country level factors: the size of the exporting market (variable *GDP*), as defined by the value of GDP and the geographic distance between countries (variable *Geographic Distance*). The geographic distance corresponds to the geographic distance between the capitals of the two countries. Firms are predicted to export more to bigger and nearer markets (e.g. Ghemawat, 2001). In addition to these different explanatory variables, we introduce in regressions fixed sector dummies. Industry fixed effects consider permanent unobserved differences across industries. They could reflect industry characteristics influencing export activity, like fiscal policy orientation or the institutional framework. This set of variables will serve as our main controlling variables to test our first assumption according to which international outsourcing could enhance export performance. Due to a higher degree of correlation with these basic variables or a too high number of missing values, we include only in a subset of equations the following variables: the capital intensity (i.e. the ratio productive assets on number of employees) which accounts for the technology function of companies (variable *Capital Intensity*); the cultural distance (variable *Cultural Distance*) between countries following Morosini et al. (1998); an indicator of contract enforcement (variable *Legal Environment*) as evaluated by the legal system of property rights (source: Fraser Institute). Because of higher transaction costs, we expect lower international business in riskier and too culturally distant markets.

To investigate the hypotheses 2, 3, 4 and 5, we construct several specific interactive variables. For the hypothesis 2, we compute for each company a mean index of diversification (variable *Diversification*). This index is calculated at a product level.<sup>16</sup> This variable corresponds to the degree of diversification (or concentration) of input sourcing per product across countries. The higher the value of the variable *Diversification* is, the lower the extent of diversification is. We then make it interact with the variable *Outsourcing* (variable *Outsourcing \* Diversification*). For the hypothesis 3, we calculate for each country of export destination the share of imported intermediary goods, i.e. the ratio imported inputs by country on total imported inputs. We make this variable *Share Input* interact with the variable *Outsourcing* (variable *Outsourcing \* Share Input*). This should tell us to what extent importing inputs from one country could facilitate exports to this same country. To investigate the hypothesis 4, we simply create a dummy variable *Intra Sourcing* and the related interactive variable *Outsourcing \* Intra Sourcing*. This variable takes the value 1 if the company imports goods within the firm's boundary and 0 otherwise. Less than half of our companies are relying on intra-sourcing. Finally, the

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<sup>16</sup> Based on the Herfindhal-Hirschman index, we calculate for each firm and each imported product the sum of the squares of share of each country of import. We then compute for each firm the mean of this index for all imported intermediary inputs.

variable *Outsourcing \* Export Experience* captures the differential impact of international outsourcing in function of the export experience. In appendix C, we discuss the robustness when using alternative measures for testing assumptions 2, 3, 4 and 5.

## **V. Empirical results**

We implement OLS estimations with robust standard errors to estimate the potential effect of international outsourcing on export performance. As seen in table 1, the variable *Outsourcing* is positive and significant in columns 2, 4, 6 and 8. This first finding is verified across our different specifications in table 1 and table 2, therefore supporting the hypothesis 1: International outsourcing is likely to improve the export performance through revenue-based and cost-based gains. In appendix A, we provide a sensitivity analysis confirming this hypothesis when using different measures or methodologies.

In table 2, we first introduce sequentially the specific variables allowing us to test the hypothesis 2, 3, 4 and 5. To begin with, we investigate the nature of international outsourcing. In column 1, we introduce the interactive variable between *Outsourcing* and *Diversification* (i.e. the variable *Outsourcing \* Diversification*). This variable is negative and significant, which is consistent with our hypothesis 2. Adopting a multi-sourcing strategy enables firms to appropriate a diversity of knowledge and to increase their bargaining power and their flexibility. This in turn increases gains from outsourcing in export markets. In column 2, we specifically test the hypothesis 3 according to which importing goods from one given country enhance the export level toward this country. The variable *Outsourcing \* Share Input* displays a positive and significant sign, confirming our hypothesis 3. Hypothesis 4 states that inputs acquired through market transactions when combined with intra-sourcing within the firm's boundary are likely to generate synergy gains. The fact that companies import also intermediary inputs through affiliates seems to influence positively the use of international outsourcing. The variable *Outsourcing \* Intra Sourcing* is positive and significant in column 3. Similarly, the export experience allows companies to benefit more from international outsourcing, as display by the positive sign of *Outsourcing \* Export Experience* in column 4. Finally, all hypotheses are simultaneously validated when jointly estimating interactive variables (see columns 5 to 7 in table 2). In appendix B, we test with success the robustness of these findings.

Finally, note that our controlling variables have the predicted signs. It underscores the good overall fit of our empirical model. At a firm level, the unit labor cost displays a negative sign, while the firm size, the export experience and the capital intensity tends to increase exports. At a country level, the

geographic and cultural distance by raising transportation and transaction costs impedes export flows. On the other hand, as expected, bigger and less risky markets as assessed respectively by the variables *GDP* and *Legal Environment* stimulate exports.

**Table 1: Assumption 1**

	-1	-2	-3	-4	-5	-6	-7	-8
Size	0.368*** (0.007)	0.361*** (0.007)	0.360*** (0.007)	0.355*** (0.007)	0.360*** (0.007)	0.355*** (0.007)	0.374*** (0.007)	0.369*** (0.007)
Unit Labor Cost	-0.286*** (0.016)	-0.295*** (0.016)	-0.226*** (0.016)	-0.243*** (0.016)	-0.226*** (0.016)	-0.243*** (0.016)	-0.237*** (0.017)	-0.255*** (0.017)
Export Experience	0.038*** (0.001)	0.037*** (0.001)	0.037*** (0.001)	0.036*** (0.001)	0.037*** (0.001)	0.036*** (0.001)	0.039*** (0.001)	0.038*** (0.001)
Geographic Distance	-0.475*** (0.007)	-0.475*** (0.007)	-0.475*** (0.007)	-0.475*** (0.007)	-0.425*** (0.007)	-0.425*** (0.007)	-0.426*** (0.008)	-0.426*** (0.008)
GDP	0.318*** (0.004)	0.318*** (0.004)	0.318*** (0.004)	0.318*** (0.004)	0.326*** (0.004)	0.326*** (0.004)	0.339*** (0.004)	0.339*** (0.004)
Outsourcing		0.063*** (0.004)		0.058*** (0.004)		0.058*** (0.004)		0.062*** (0.005)
Capital Intensity			0.083*** (0.007)	0.071*** (0.007)	0.083*** (0.007)	0.071*** (0.007)	0.087*** (0.008)	0.074*** (0.008)
Cultural Distance					-0.461*** (0.022)	-0.461*** (0.022)	-0.434*** (0.023)	-0.434*** (0.023)
Legal Environment							0.057*** (0.020)	0.057*** (0.020)
Constant	-3.801*** (0.099)	-3.603*** (0.099)	-4.238*** (0.107)	-3.993*** (0.108)	-4.402*** (0.107)	-4.157*** (0.108)	-4.900*** (0.120)	-4.637*** (0.120)
Observations	147241	147241	147241	147241	147241	147241	137156	137156
R-squared	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15
Robust standard errors in parentheses								
* significant at 10%; ** significant at 5%; *** significant at 1%								
Sector fixed effects are included								

**Table 2: Assumption 1 to 5**

	-1	-2	-3	-4	-5	-6	-7
Size	0.359*** (0.007)	0.320*** (0.006)	0.365*** (0.007)	0.361*** (0.007)	0.318*** (0.006)	0.321*** (0.006)	0.321*** (0.006)
Unit Labor Cost	-0.292*** (0.016)	-0.268*** (0.016)	-0.293*** (0.016)	-0.295*** (0.016)	-0.266*** (0.016)	-0.264*** (0.016)	-0.265*** (0.016)
Export Experience	0.037*** (0.001)	0.036*** (0.001)	0.037*** (0.001)	0.048*** (0.003)	0.036*** (0.001)	0.036*** (0.001)	0.044*** (0.003)
Geographic Distance	-0.475*** (0.007)	-0.378*** (0.007)	-0.475*** (0.007)	-0.475*** (0.007)	-0.378*** (0.007)	-0.378*** (0.007)	-0.378*** (0.007)
GDP	0.318*** (0.004)	0.253*** (0.003)	0.318*** (0.004)	0.318*** (0.004)	0.254*** (0.003)	0.254*** (0.003)	0.254*** (0.003)
Outsourcing	0.038*** (0.005)	0.314*** (0.043)	0.040*** (0.005)	0.059*** (0.004)	0.291*** (0.043)	0.270*** (0.043)	0.267*** (0.043)
Diversification	-0.585*** (0.067)				-0.368*** (0.065)	-0.319*** (0.065)	-0.316*** (0.065)
Outsourcing * Diversification	-0.149*** (0.026)				-0.090*** (0.025)	-0.066*** (0.025)	-0.065*** (0.025)
Share Input		0.133*** (0.005)			0.131*** (0.005)	0.131*** (0.005)	0.131*** (0.005)
Outsourcing * Share Input		0.014*** (0.002)			0.013*** (0.002)	0.013*** (0.002)	0.013*** (0.002)
Intra Sourcing			0.081*** (0.027)			0.064** (0.027)	0.062** (0.027)
Outsourcing * Intra Sourcing			0.066*** (0.009)			0.058*** (0.009)	0.057*** (0.009)
Outsourcing * Export Experience				0.004*** (0.001)			0.003*** (0.001)
Constant	-3.698*** (0.100)	-0.335** (0.147)	-3.647*** (0.100)	-3.614*** (0.099)	-0.421*** (0.148)	-0.457*** (0.148)	-0.464*** (0.148)
Observations	147241	147241	147241	147241	147241	147241	147241
R-squared	0.14	0.17	0.14	0.14	0.17	0.17	0.17
Robust standard errors in parentheses							
* significant at 10%; ** significant at 5%; *** significant at 1%							
Sector fixed effects are included							

## **Conclusion**

This paper investigates the impact of international outsourcing on the firm competitiveness in international markets. Using a unique dataset on companies established in France in manufacturing industries for the year 1999, we find that international outsourcing boost the export performance while controlling for different firm, industry and country level parameters influencing the export behavior. In addition, the causal relationship between imports of intermediary inputs and exports of final goods appears to be mitigated by different factors. First, adopting a multi-sourcing strategy seems to amplify the effects of international outsourcing. It allows companies to appropriate a diversity of knowledge and to raise their bargaining power and flexibility. There appears also a country-of-origin effect: Importing intermediary inputs from one country increases exports to this same country. In addition, the leverage of external resources combined with intra-sourcing within the firm's boundary seems to generate synergistic gains. Finally, the export experience increases marginal gains from outsourcing abroad. These main findings tend to emphasize the role of international outsourcing to achieve global competitive advantages. From an economic policy perspective, they suggest that implementing protectionist measures to improve the balance of trade and safeguard employment could be counter-productive.



## Appendix A

**Table 1: Statistics - Firm level variables**

Variable	Mean	Std. Dev.
Size	557.6229	2896.153
Unit Labor Cost	.6754383	.2090078
Export Experience	5.041302	2.188134
Capital Intensity	918.867	8246.445
Outsourcing	.1470274	.1678775
Outsourcing EU	.104805	.134709
Outsourcing Non-EU	.041233	.0908144
Outsourcing OECD	.126139	.1492786
Outsourcing Non-OECD	.019899	.0646115
Diversification	.8636477	.1340576
Intra Sourcing	.4173955	.4931309

**Table 2: Statistics - Country level variables**

Variable	Mean	Std. Dev.
Geographic Distance	5655.493	4177.929
GDP	2.37e+09	7.43e+09
Cultural Distance	2.505933	.7844219
Legal Environment	6.476878	1.921193
Share Input	.013442	.0850256

**Table 3: Correlation – Firm level variables**

	Size	Unit Labor Cost	Export Experience	Capital Intensity	Outsourcing	Diversification	Intra Sourcing
Size	1.0000						
Unit Labor Cost	-0.0275	1.0000					
Export Experience	0.0836	0.0274	1.0000				
Capital Intensity	0.0127	-0.1290	0.0273	1.0000			
Outsourcing	0.0121	-0.0247	0.0295	-0.0031	1.0000		
Diversification	-0.0873	0.0355	-0.1107	-0.0035	-0.3074	1.0000	
Intra Sourcing	0.0211	-0.0040	0.0779	0.0183	0.0388	-0.0040	1.0000

**Table 4: Correlation – Country level variables**

	Geographic Distance	GDP	Cultural Distance	Legal Environment	Share Input
Geographic Distance	1.0000				
GDP	0.0041	1.0000			
Cultural Distance	0.2563	0.0414	1.0000		
Legal Environment	-0.3319	0.2895	0.0122	1.0000	
Share Input	-0.1398	0.1882	-0.0631	0.1705	1.0000

## **Appendix B**

We run several sensitivity tests to check the robustness of our results. We modify either our variables or the methodology. We first change the dependant variable, examining the effect of international outsourcing on export intensity (i.e. the ratio export on total sales). The impact of international outsourcing is still significantly positive. Because of potential endogeneity, we present in table1 in appendix B results with and without the variable *Size*.

Second, we investigate further our main variable of interest, i.e. the variable *Outsourcing*. We point out that using the level – and not the intensity – of outsourcing provides similar findings. We however prefer the intensity measure because of a too high level of correlation with the variable *Size*. Interestingly, we get the same findings when using a different measure of outsourcing intensity as outsourcing spending divided by total wages (where total wages account for the production of *local* in-house inputs) or outsourcing expenditure on total sourcing (i.e. intra-sourcing plus outsourcing). Results are available on request. Besides, we wonder whether the impact of international outsourcing could vary across countries of import. Country location advantages are however ambiguous. Importing from developing countries (rather than from developed countries) could generate more cost savings, especially in terms of labor costs. On the other hand, it could increase transaction costs and reduce the quality of intermediary inputs and the extent of knowledge embodied in imported goods (Mol et al., 2005; Rangan, 2000). For similar reasons, it is not obvious to predict the effect of the European Union. To this aim, we decompose the variable *Outsourcing* into outsourcing from European Union countries (variable *EU Outsourcing*) and non-European Union countries (variable *non-EU Outsourcing*) or from OECD and non-OECD countries (respectively variables *OECD Outsourcing* and *non-OECD*

*outsourcing*). We could notice that in all cases international outsourcing boosts exports. The variable *Outsourcing non-EU* is significantly higher (at 1% when applying a Wald test) than the variable *Outsourcing EU*. However, for the split OECD versus non-OECD countries, this difference is not statistically significant anymore, suggesting that sourcing in low wage countries does not increase more performance. We get identical results when dividing our sample according to the mean of GDP per capita. Finally, in table 3 in this appendix B, we also wonder if results are robust when splitting our sample into foreign affiliates and French owned companies. We do not observe any major differences.

In addition to changes in our variables, we examine the sensitivity of our results when using alternative methodologies.<sup>17</sup> When analyzing export behavior, the first issue is how to treat the excess in zeros of the dependant variable *Export*. For each firm, we indeed report positive or zero value of export to more 70 countries. Some companies (around 200) do not export at all. We however keep them since the zero value provides us with important information on export behavior. To test to what extent it influences our main assumption 1, we first run our regressions only for positive flows of export at a country-firm and firm level (see table 4). For the firm level analysis, we simply aggregate all flows of export by firms. In this case, we are not able to control for country level factors. As seen in table 4, we come to the same conclusion.<sup>18</sup>

The second econometric strategy to perceive the influence of the excess in zeros is to implement Tobit estimations and Heckman two-step procedure (see table 5). We do not report the calculation of the mill ratio appearing in columns 5 to 8 in table 5. Note also that we use the average size of exporting companies per country of destination as an instrument. It could be viewed as a proxy of country-specific fixed costs. It is therefore supposed to influence more the decision of exporting than the level of exports. For both alternative methodologies, the positive effect of outsourcing is still persisting.

In our study, there exists a second econometric problem which is related to the decision of outsourcing. The strategy of outsourcing could be endogenous. To control for this potential reciprocal relationship between exports and imports, we use the standard two-stage least squares - 2SLS - approach (Salomon and Shaver, 2005). The table 6 shows the robustness of our main assumption. To identify equations, we select:

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<sup>17</sup> We also test – without noticing qualitative changes – when standard errors are clustered. Error terms are then assumed to be independent across, but not necessarily within clusters.

<sup>18</sup> Note that at this firm level we also estimate the impact of outsourcing in 1999 on the aggregate level of exports in 2000 using the EAE database. It could be thought that outsourcing has not an immediate effect on export. However, we observe also a positive and significant sign of the variable *Outsourcing*. Results are available on request.

- In the column 1: for exports, the geographic distance and GDP to countries of export destination; for outsourcing, the geographic distance and GDP of countries of import. GDP of countries of import could account for market thickness, i.e. the number of suppliers in the country of import.
- In the column 2: for exports, the geographic distance and GDP to countries of export destination; for outsourcing, the geographic distance and labor costs per employee (source: World Bank) of countries of import.
- In the column 3: for exports, the geographic distance and GDP to countries of export destination; for outsourcing, the geographic distance and an indicator of tax rate (source: World Tax Database - OTPR) of countries of import.
- In the column 4: for exports, the geographic distance and GDP to countries of export destination; for outsourcing, the geographic distance and the contractual environment (variable *Legal Environment*) of countries of import.

Lastly, we also lagged one year controlling variables as e.g. *Size* or *Unit Labor Cost* at the firm level or *GDP* at the country level without observing changes in our empirical estimations.

**Table 1: Export intensity**

	-1	-2	-3	-4	-5	-6	-7	-8
Size	-0.618*** (0.007)	-0.614*** (0.007)	-0.614*** (0.007)	-0.602*** (0.007)				
Unit Labor Cost	0.549*** (0.017)	0.511*** (0.017)	0.511*** (0.017)	0.501*** (0.018)	0.333*** (0.017)	0.241*** (0.018)	0.241*** (0.018)	0.236*** (0.019)
Export Experience	0.032*** (0.001)	0.032*** (0.001)	0.032*** (0.001)	0.034*** (0.001)	0.001 (0.002)	0.003* (0.002)	0.003* (0.002)	0.005*** (0.002)
Geographic Distance	-0.475*** (0.007)	-0.475*** (0.007)	-0.425*** (0.007)	-0.426*** (0.008)	-0.475*** (0.007)	-0.475*** (0.007)	-0.425*** (0.008)	-0.426*** (0.008)
GDP	0.318*** (0.004)	0.318*** (0.004)	0.326*** (0.004)	0.339*** (0.004)	0.318*** (0.004)	0.318*** (0.004)	0.326*** (0.004)	0.339*** (0.004)
Outsourcing	0.045*** (0.004)	0.049*** (0.004)	0.049*** (0.004)	0.054*** (0.005)	0.015*** (0.005)	0.027*** (0.005)	0.027*** (0.005)	0.033*** (0.005)
Capital Intensity		-0.053*** (0.008)	-0.053*** (0.008)	-0.049*** (0.008)		-0.134*** (0.008)	-0.134*** (0.008)	-0.129*** (0.008)
Cultural Distance			-0.461*** (0.022)	-0.434*** (0.023)			-0.461*** (0.022)	-0.434*** (0.023)
Legal Environment				0.057*** (0.020)				0.057*** (0.022)
Constant	-10.525*** (0.100)	-10.231*** (0.109)	-10.395*** (0.109)	-10.872*** (0.121)	-14.008*** (0.094)	-13.207*** (0.107)	-13.372*** (0.107)	-13.790*** (0.119)
Observations	147241	147241	147241	137156	147241	147241	147241	137156
R-squared	0.19	0.19	0.19	0.19	0.12	0.12	0.13	0.13
Robust standard errors in parentheses								
* significant at 10%; ** significant at 5%; *** significant at 1%								
Sector fixed effects are included								

**Table 2: Location of country sourcing**

	-1	-2	-3	-4	-5	-6	-7	-8
Size	0.333*** (0.007)	0.328*** (0.007)	0.328*** (0.007)	0.340*** (0.007)	0.347*** (0.006)	0.341*** (0.007)	0.341*** (0.007)	0.354*** (0.007)
Unit Labor Cost	-0.275*** (0.016)	-0.234*** (0.016)	-0.234*** (0.016)	-0.244*** (0.017)	-0.292*** (0.016)	-0.243*** (0.016)	-0.243*** (0.016)	-0.255*** (0.017)
Export Experience	0.033*** (0.001)	0.033*** (0.001)	0.033*** (0.001)	0.035*** (0.001)	0.035*** (0.001)	0.034*** (0.001)	0.034*** (0.001)	0.036*** (0.001)
Geographic Distance	-0.475*** (0.007)	-0.475*** (0.007)	-0.425*** (0.007)	-0.426*** (0.008)	-0.475*** (0.007)	-0.475*** (0.007)	-0.425*** (0.007)	-0.426*** (0.008)
GDP	0.318*** (0.004)	0.318*** (0.004)	0.326*** (0.004)	0.339*** (0.004)	0.318*** (0.004)	0.318*** (0.004)	0.326*** (0.004)	0.339*** (0.004)
Outsourcing UE	0.021*** (0.002)	0.019*** (0.002)	0.019*** (0.002)	0.021*** (0.002)				
Outsourcing non-EU	0.041*** (0.001)	0.040*** (0.001)	0.040*** (0.001)	0.042*** (0.001)				
Capital Intensity		0.058*** (0.007)	0.058*** (0.007)	0.060*** (0.008)		0.068*** (0.007)	0.068*** (0.007)	0.071*** (0.008)
Cultural Distance			-0.461*** (0.022)	-0.434*** (0.023)			-0.461*** (0.022)	-0.434*** (0.023)
Legal Environment				0.057*** (0.020)				0.057*** (0.020)
Outsourcing OECD					0.028*** (0.003)	0.025*** (0.003)	0.025*** (0.003)	0.027*** (0.003)
Outsourcing Non-OECD					0.035*** (0.002)	0.035*** (0.002)	0.035*** (0.002)	0.036*** (0.002)
Constant	-3.239*** (0.099)	-3.563*** (0.108)	-3.727*** (0.108)	-4.184*** (0.120)	-3.287*** (0.099)	-3.663*** (0.108)	-3.827*** (0.108)	-4.294*** (0.120)
Observations	147241	147241	147241	137156	147241	147241	147241	137156
R-squared	0.14	0.15	0.15	0.15	0.14	0.14	0.15	0.15
Robust standard errors in parentheses								
* significant at 10%; ** significant at 5%; *** significant at 1%								
Sector fixed effects are included								

**Table 3: Foreign versus domestic owned firms**

	-1	-2	-3	-4	-5	-6	-7	-8
	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic
Size	0.306*** (0.008)	0.397*** (0.010)	0.299*** (0.008)	0.391*** (0.010)	0.299*** (0.008)	0.391*** (0.010)	0.310*** (0.009)	0.405*** (0.011)
Unit Labor Cost	-0.261*** (0.024)	-0.314*** (0.021)	-0.204*** (0.025)	-0.260*** (0.022)	-0.204*** (0.025)	-0.260*** (0.022)	-0.217*** (0.027)	-0.270*** (0.023)
Export Experience	0.032*** (0.002)	0.043*** (0.002)	0.032*** (0.002)	0.042*** (0.002)	0.032*** (0.002)	0.042*** (0.002)	0.034*** (0.002)	0.043*** (0.002)
Geographic Distance	-0.492*** (0.009)	-0.452*** (0.011)	-0.492*** (0.009)	-0.452*** (0.011)	-0.447*** (0.010)	-0.397*** (0.012)	-0.456*** (0.010)	-0.387*** (0.013)
GDP	0.288*** (0.005)	0.358*** (0.006)	0.288*** (0.005)	0.358*** (0.006)	0.295*** (0.005)	0.367*** (0.006)	0.311*** (0.005)	0.376*** (0.007)
Outsourcing	0.067*** (0.006)	0.063*** (0.007)	0.060*** (0.006)	0.059*** (0.007)	0.060*** (0.006)	0.059*** (0.007)	0.065*** (0.006)	0.063*** (0.007)
Capital Intensity			0.075*** (0.010)	0.079*** (0.011)	0.075*** (0.010)	0.079*** (0.011)	0.079*** (0.011)	0.081*** (0.012)
Cultural Distance					-0.423*** (0.028)	-0.510*** (0.034)	-0.395*** (0.030)	-0.485*** (0.036)
Legal Environment							-0.006 (0.024)	0.138*** (0.032)
Constant	-2.571*** (0.122)	-4.727*** (0.162)	-2.986*** (0.135)	-5.147*** (0.174)	-3.136*** (0.135)	-5.329*** (0.174)	-3.482*** (0.150)	-5.980*** (0.195)
Observations	83220	64021	83220	64021	83220	64021	77520	59636
R-squared	0.14	0.15	0.14	0.15	0.14	0.16	0.14	0.16
Robust standard errors in parentheses								
* significant at 10%; ** significant at 5%; *** significant at 1%								
Sector fixed effects are included								

**Table 4: Positive flows of export only**

	-1	-2	-3	-4	-5	-6
	Firm - Country level	Firm - Country level	Firm - Country level	Firm level	Firm level	Firm level
Size	0.520*** (0.011)	0.509*** (0.011)	0.509*** (0.011)	0.950*** (0.038)	0.897*** (0.037)	0.865*** (0.036)
Unit Labor Cost	-0.488*** (0.043)	-0.345*** (0.044)	-0.357*** (0.045)	-0.905*** (0.147)	-0.883*** (0.146)	-0.624*** (0.145)
Export Experience	0.057*** (0.014)	0.048*** (0.015)	0.048*** (0.015)		0.204*** (0.022)	0.200*** (0.022)
Geographic Distance	-0.224*** (0.009)	-0.231*** (0.009)	-0.202*** (0.013)			
GDP	0.276*** (0.008)	0.275*** (0.008)	0.269*** (0.009)			
Outsourcing	0.068*** (0.009)	0.051*** (0.009)	0.050*** (0.009)	0.169*** (0.032)	0.158*** (0.030)	0.131*** (0.030)
Capital Intensity		0.190*** (0.016)	0.188*** (0.016)			0.353*** (0.057)
Cultural Distance		0.024 (0.026)	-0.016 (0.028)			
Legal Environment			0.236*** (0.065)			
Constant	0.966*** (0.209)	-0.059 (0.228)	-0.604** (0.263)	4.939*** (0.250)	4.959*** (0.242)	3.045*** (0.394)
Observations	14118	14118	13777	1806	1806	1806
R-squared	0.28	0.29	0.29	0.33	0.38	0.39
Robust standard errors in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						
Sector fixed effects are included						



**Table 5: Heckman and Tobit estimations**

	-1	-2	-3	-4	-5	-6	-7	-8
	tobit	tobit	tobit	tobit	heckman	heckman	heckman	heckman
Size	3.114*** (0.057)	3.059*** (0.057)	3.060*** (0.056)	3.030*** (0.057)	0.703*** (0.024)	0.685*** (0.024)	0.791*** (0.030)	0.763*** (0.030)
Unit Labor Cost	-2.506*** (0.141)	-1.984*** (0.152)	-1.985*** (0.152)	-1.993*** (0.154)	-0.635*** (0.047)	-0.459*** (0.047)	-0.528*** (0.048)	-0.524*** (0.049)
Export Experience	0.744*** (0.044)	0.726*** (0.043)	0.726*** (0.043)	0.713*** (0.043)	0.107*** (0.015)	0.095*** (0.016)	0.123*** (0.016)	0.116*** (0.016)
Geographic Distance	-3.650*** (0.055)	-3.650*** (0.055)	-3.222*** (0.056)	-2.906*** (0.069)	-0.454*** (0.029)	-0.451*** (0.028)	-0.541*** (0.032)	-0.460*** (0.030)
GDP	3.430*** (0.043)	3.428*** (0.043)	3.498*** (0.044)	3.332*** (0.047)	0.481*** (0.026)	0.475*** (0.026)	0.604*** (0.034)	0.556*** (0.032)
Outsourcing	0.549*** (0.046)	0.493*** (0.046)	0.497*** (0.046)	0.516*** (0.047)	0.102*** (0.010)	0.081*** (0.010)	0.100*** (0.010)	0.097*** (0.010)
Capital Intensity		0.709*** (0.081)	0.712*** (0.081)	0.704*** (0.082)		0.229*** (0.016)	0.253*** (0.017)	0.246*** (0.017)
Cultural Distance			-4.028*** (0.160)	-4.310*** (0.166)			-0.379*** (0.047)	-0.412*** (0.051)
Legal Environment				2.222*** (0.301)				0.414*** (0.068)
mill					-0.965*** (0.114)	-0.937*** (0.113)	-1.488*** (0.146)	-1.355*** (0.144)
Constant	-94.511*** (2.357)	-99.678*** (2.442)	-101.093*** (2.433)	-103.405*** (2.500)	-4.364*** (1.083)	-5.925*** (1.111)	-10.051*** (1.286)	-9.850*** (1.304)
Observations	147241	147241	147241	137156	14118	14118	14118	13777
R-squared					0.28	0.29	0.29	0.29
Standard errors in parentheses								
* significant at 10%; ** significant at 5%; *** significant at 1%								
Sector fixed effects are included								

**Table 6: 2SLS estimations**

	-1	-2	-3	-4
	GEO DIST ; PIB	GEO DIST; LABOR	GEO DIST ; TAX	GEO DIST ; LEGAL ENVIR
Size	0.293*** (0.008)	0.346*** (0.007)	0.303*** (0.008)	0.306*** (0.007)
Unit Labor Cost	-0.383*** (0.019)	-0.348*** (0.017)	-0.377*** (0.019)	-0.366*** (0.018)
Export Experience	0.030*** (0.002)	0.038*** (0.001)	0.029*** (0.002)	0.031*** (0.002)
Geographic Distance	-0.475*** (0.007)	-0.487*** (0.007)	-0.478*** (0.007)	-0.475*** (0.007)
GDP	0.319*** (0.004)	0.323*** (0.004)	0.320*** (0.004)	0.319*** (0.004)
Outsourcing	0.714*** (0.034)	0.364*** (0.015)	0.644*** (0.032)	0.589*** (0.026)
Constant	-2.215*** (0.280)	-4.682*** (0.299)	-2.566*** (0.274)	-2.764*** (0.260)
Observations	147095	141255	145708	147095
R-squared	0.02	0.12	0.04	0.06
Robust standard errors in parentheses				
* significant at 10%; ** significant at 5%; *** significant at 1%				
Sector fixed effects are included				

## Appendix C

In the second sensitivity analysis, we present results when adding new controlling country level variables (table 1 in appendix C) or when decomposing our sample into foreign affiliates and French owned firms (table 2 in appendix C). Compared to our benchmark, it appears that the variable *Export Experience* plays a larger role for foreign affiliates than domestic owned firms. For domestic firms, the variable *Export Experience* is still positive, but not significant anymore.

We also tested different specifications – not reported here - using different measures for each assumption:

- Hypothesis 2: We measured the variable *Diversification* at a country level.<sup>19</sup> We also calculated more simply the number of country of import per firm (or firm-product pair on average).
- Hypothesis 3: We included a dummy variable taking the value 1 when the country of export destination is also a country of import.
- Hypothesis 4: We calculated the intensity (or the level) of intra-firm trade per firm.
- Hypothesis 5: We replaced the export experience by business experience as reflected by the age of companies. For a limited group of firms (around 400), we also used as an indicator of international experience the number of countries where the MNE group is locally established as well as the share of French turnover (respectively employees) in the total worldwide turnover (respectively employees).

In each case, we get similar qualitative findings. Note that these assumptions are also robust to changes in methodology as exposed in appendix B. Results are available on request.

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<sup>19</sup> Based on the Herfindhal-Hirschman index, we calculate for each firm at a country level – without distinction in terms of imported product - the sum of the squares of share of each country of import.

**Table 1: Additional controlling variables**

	-1	-2	-3	-4	-5	-6	-7	-8
Size	0.352*** (0.007)	0.315*** (0.006)	0.359*** (0.007)	0.355*** (0.007)	0.365*** (0.007)	0.326*** (0.007)	0.372*** (0.007)	0.368*** (0.007)
Unit Labor Cost	-0.238*** (0.016)	-0.222*** (0.016)	-0.238*** (0.016)	-0.243*** (0.016)	-0.250*** (0.017)	-0.233*** (0.017)	-0.249*** (0.017)	-0.255*** (0.017)
Export Experience	0.036*** (0.001)	0.035*** (0.001)	0.036*** (0.001)	0.049*** (0.003)	0.038*** (0.001)	0.037*** (0.001)	0.038*** (0.001)	0.051*** (0.003)
Geographic Distance	-0.425*** (0.007)	-0.333*** (0.007)	-0.425*** (0.007)	-0.425*** (0.007)	-0.426*** (0.008)	-0.331*** (0.008)	-0.426*** (0.008)	-0.426*** (0.008)
GDP	0.326*** (0.004)	0.261*** (0.003)	0.326*** (0.004)	0.326*** (0.004)	0.339*** (0.004)	0.269*** (0.004)	0.339*** (0.004)	0.339*** (0.004)
Outsourcing	0.032*** (0.005)	0.313*** (0.043)	0.034*** (0.005)	0.053*** (0.004)	0.035*** (0.005)	0.313*** (0.043)	0.038*** (0.006)	0.057*** (0.004)
Capital Intensity	0.074*** (0.007)	0.063*** (0.007)	0.076*** (0.007)	0.072*** (0.007)	0.077*** (0.008)	0.066*** (0.008)	0.079*** (0.008)	0.075*** (0.008)
Cultural Distance	-0.461*** (0.022)	-0.426*** (0.021)	-0.461*** (0.022)	-0.461*** (0.022)	-0.434*** (0.023)	-0.409*** (0.023)	-0.434*** (0.023)	-0.434*** (0.023)
Legal Environment					0.057*** (0.020)	0.068*** (0.019)	0.057*** (0.020)	0.057*** (0.020)
Diversification	-0.601*** (0.067)				-0.629*** (0.071)			
Outsourcing * Diversification	-0.149*** (0.026)				-0.158*** (0.027)			
Share Input		0.132*** (0.005)				0.130*** (0.005)		
Outsourcing * Share Input		0.014*** (0.002)				0.014*** (0.002)		
Intra Sourcing			0.080*** (0.027)				0.077*** (0.029)	
Outsourcing * Intra Sourcing			0.068*** (0.009)				0.069*** (0.009)	
Outsourcing * Export Experience				0.004*** (0.001)				0.005*** (0.001)
Constant	-4.269*** (0.109)	-0.857*** (0.153)	-4.228*** (0.109)	-4.171*** (0.108)	-4.754*** (0.121)	-1.279*** (0.162)	-4.709*** (0.121)	-4.653*** (0.120)
Observations	147241	147241	147241	147241	137156	137156	137156	137156
R-squared	0.15	0.17	0.15	0.15	0.15	0.17	0.15	0.15
Robust standard errors in parentheses								
* significant at 10%; ** significant at 5%; *** significant at 1%								
Sector fixed effects are included								

**Table 2: Foreign versus domestic owned firms**

	-1	-2	-3	-4	-5	-6	-7	-8
	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign	Domestic
Size	0.303*** (0.008)	0.394*** (0.010)	0.264*** (0.008)	0.357*** (0.010)	0.309*** (0.008)	0.394*** (0.010)	0.306*** (0.008)	0.397*** (0.010)
Unit Labor Cost	-0.259*** (0.024)	-0.310*** (0.021)	-0.240*** (0.024)	-0.285*** (0.021)	-0.262*** (0.024)	-0.306*** (0.021)	-0.261*** (0.024)	-0.315*** (0.021)
Export Experience	0.032*** (0.002)	0.043*** (0.002)	0.031*** (0.002)	0.042*** (0.002)	0.032*** (0.002)	0.043*** (0.002)	0.055*** (0.005)	0.046*** (0.004)
Geographic Distance	-0.492*** (0.009)	-0.452*** (0.011)	-0.387*** (0.009)	-0.366*** (0.011)	-0.492*** (0.009)	-0.452*** (0.011)	-0.492*** (0.009)	-0.452*** (0.011)
GDP	0.288*** (0.005)	0.358*** (0.006)	0.222*** (0.004)	0.295*** (0.006)	0.288*** (0.005)	0.358*** (0.006)	0.288*** (0.005)	0.358*** (0.006)
Outsourcing	0.035*** (0.007)	0.044*** (0.007)	0.377*** (0.058)	0.254*** (0.062)	0.050*** (0.008)	0.038*** (0.007)	0.056*** (0.006)	0.063*** (0.006)
Diversification	-0.773*** (0.099)	-0.419*** (0.091)						
Outsourcing * Diversification	-0.205*** (0.037)	-0.091** (0.037)						
Share Input			0.141*** (0.007)	0.122*** (0.008)				
Outsourcing * Share Input			0.017*** (0.003)	0.011*** (0.003)				
Intra Sourcing					-0.005 (0.035)	0.271*** (0.051)		
Outsourcing * Intra Sourcing					0.037*** (0.011)	0.104*** (0.016)		
Outsourcing * Export Experience							0.009*** (0.002)	0.001 (0.001)
Constant	-2.689*** (0.123)	-4.798*** (0.162)	0.820*** (0.190)	-1.619*** (0.230)	-2.578*** (0.123)	-4.778*** (0.162)	-2.602*** (0.122)	-4.729*** (0.161)
Observations	83220	64021	83220	64021	83220	64021	83220	64021
R-squared	0.14	0.15	0.17	0.17	0.14	0.15	0.14	0.15
Robust standard errors in parentheses								
* significant at 10%; ** significant at 5%; *** significant at 1%								
Sector fixed effects are included								

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