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Productivity, relationship-specific inputs and the sourcing modes of multinationals[☆]

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ABSTRACT

We investigate the roles of productivity and the specificity of inputs for the international sourcing strategy of firms which are part of a multinational network. We present a framework in which firms decide to import from a foreign independent supplier or from their related party abroad according to these two dimensions. We use a detailed survey that provides a detailed geographical breakdown of French firms' imports at the product level as well as the sourcing mode used for each transaction. The dataset also provides information to estimate the firms' productivity and their intensity in relationship-specific inputs. After controlling for countries of origin, products and sectors specific effects, the empirical results provide evidence that for the most productive multinationals the likelihood of trading through an independent supplier is higher especially if they use relationship-specific inputs intensively.

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1. Introduction

According to the [WTO \(1996\)](#), one-third of world trade is intra-group, whereas another third involves the participation of multinationals in one of the two sides of the exchange. In this paper, we use a unique dataset on the trade activities of French multinational companies (MNCs) which are part of a multinational network to understand how they organize their sourcing strategies from abroad. These firms may import their intermediate inputs from their network-based related-parties (intra-group trade) or from independent suppliers (outsourcing). As an illustration, consider the French “motor vehicle” industry which is largely globalized. In 1999, year of our observation, the median firm in this sector realizes 19 import transactions from 7 countries. All firms in this sector are part of an international network such as those of Renault, Peugeot-Citroën (PSA) or Deere & Co. However, we observe large variations in their sourcing modes. About 8% of these firms import intermediate

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inputs exclusively from their foreign related parties, while 47% of them import exclusively from outside foreign suppliers. While firms like Iveco (Fiat trucks division) and Mercedes-Benz Molsheim (Mercedes-Benz trucks) import exclusively from related parties, Heuliez Bus (Renault Trucks) and Smart Car (Mercedes-Benz Cars division) exclusively rely on unrelated suppliers. In this paper, we empirically analyze the firm-level choice of multinationals between outsourcing and intra-group trade.¹

While a vast theoretical literature has been established to examine the determinants of the boundaries of the firm², the majority of empirical studies have focused on sector and host country attributes.³ The role of firm-specific characteristics in explaining the sourcing decision has been under emphasized. We explore how the total factor productivity of a MNC and the intensity of its production process in relationship-specific inputs (henceforth, RSI) affect its choice of organization.

We first develop a model that analyzes the input sourcing choice of MNCs. It builds on the incomplete contracts approach to the theory of the firm. This approach helps in predicting the prevalence of alternative sourcing strategies as a function of productivity variation across MNCs and their intensity in RSI. Our theoretical framework is borrowed from [Antràs and Helpman \(2004, 2008\)](#) from which we derive two empirical propositions. First, the firm's intensity in RSI increases the likelihood of importing an input from an independent supplier rather than from an affiliate. Second, we show that the decision depends on the combination of variation of productivity and variation in RSI across MNCs. Our model predicts that only the most productive MNCs would be able to outsource their intermediate inputs abroad while the least-productive MNCs will necessarily import from a foreign related party. In addition, the likelihood of importing through an independent supplier increases with the firm's productivity, especially if it uses relationship-specific inputs intensively. We use a firm-level survey that provides a detailed geographical breakdown of French firms' imports at product level and their sourcing modes – through outside suppliers and/or related parties. In our empirical analysis, we propose to investigate the links between the productivity and the RSI with the sourcing decision.

The intensity in RSI has been found to positively affect the decision to import intermediate inputs from outside suppliers by [Nunn and Trefler \(2008\)](#) and [Bernard et al. \(2010\)](#) who use aggregate sector or product-level data for the U.S. [Nunn \(2007\)](#) and [Nunn and Trefler \(2008\)](#) identify inputs that require relationship-specific investments as those inputs that are neither bought and sold on an exchange nor reference priced. [Bernard et al. \(2010\)](#) approximate the products' contractibility based on the degree of intermediation. Our paper is taking one step forward by providing an alternative measure to the RSI intensity, which has the advantage to be firm specific and to be directly observable from the firm's balance sheet. We follow the French statistical institute (INSEE) and we define as relationship specific inputs the value of “work based on plans”. It corresponds to inputs for which the MNC provides to the supplier all the technical specifications required for the production of the intermediate inputs he has ordered.⁴ For instance, in the “motor vehicle” industry, it would include inputs which required forging, cutting, stamping and foundry work based on plans provided by the car producers. In the “textile and clothing” industry, it would include the cutting of sheet of cloth based on plans and most of the textiles ennobling subsectors, whose main activity is to provide textile material with the suitable characteristics for their use as an intermediate product. The amounts reported in the balance sheet include the value of intermediate inputs bought from both independent suppliers and affiliates, purchased nationally and internationally. Hence, we can compute a direct measure of the share of relationship-specific inputs on the total value of total inputs. Our novel variable is different from that used in previous studies because it does not rely on external information to classify the different type of inputs. We find a positive correlation between the intensity in RSI and the likelihood to outsource.

There is information in the data that allows to construct firm's total factor productivity (TFP). We analyze whether the variation of firm-level TFP across MNCs influences the choice of organization. We find that the prevalence of outsourcing is higher for firms that have higher productivity levels. For firms that are part of a multinational network, importing inputs from a related party seems less costly in terms of organization. As a consequence, importing from a foreign related party is more appropriate for low productive firms, which cannot incur the fixed organizational costs of outsourcing.⁵ As we evaluate the productivity variation across MNCs, our empirical strategy is different from recent studies using samples that contain information on both independent firms and multinational firms (see [Corcos et al., 2009](#); [Kohler and Smolka, 2009](#);

¹ While the literature usually refers to “intra-firm trade”, we prefer the terminology “intra-group trade” which is more adapted for our purpose. To the best of our knowledge, all empirical studies on this question, including ours, consider data on international trade between related parties, without being able to distinguish between direct or indirect affiliations, e.g. the US Census Bureau's Related Party Database.

² Theoretical contributions include [McLaren \(2000\)](#), [Antràs \(2003, 2005\)](#), [Antràs and Helpman \(2004, 2008\)](#) and [Grossman and Helpman \(2002, 2003, 2005\)](#). See [Spencer \(2005\)](#), and [Helpman \(2006\)](#) for detailed surveys of the literature.

³ See for instance, [Yeaple \(2006\)](#), [Nunn and Trefler \(2008\)](#), [Bernard et al. \(2010\)](#), and [Costinot et al. \(2011\)](#) using aggregate sector or product-level data for the U.S.

⁴ The amount reported in the accounting book refers to a juridical definition. This largely limits the possibility for the product classification to depend on the firm's ownership structure. That would be the case if, as suggested by [Crémer et al. \(2007\)](#), each firm has its own codification and intra-firm transactions required less detailed technical specification. However, the judicial definition is based on observable aspects of the production process, such as the use or not of an industrial mold.

⁵ The survey from which we base our empirical analysis shows that French MNCs perceive outsourcing to be related to higher fixed costs than intra-group trade (Service des études et des statistiques industrielles, [SESSI, 1999](#)). In his seminal book, [Williamson \(1985\)](#) considers that the fixed cost of organization under vertical integration is lower than the one associated with outsourcing because it amalgamates the coordination costs of two firms.

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