

# Firm-to-Firm Trade

## (Preliminary and Incomplete)

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April 2014

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# 1 Introduction

For a long time economists have exploited readily-available data on bilateral trade flows in different commodities. The aggregate nature of these data guided the first generation of quantitative trade models, which treated the sector as the relevant unit of production and intermediate demand and a representative household as the unit of final demand.

During the last two decades access to firm and plant-level data on export activity revealed the enormous heterogeneity of individual producers even within finely-defined sectors. In particular, many producers in an exporting sector don't export at all, and those that do export typically sell to only one or a small number of destinations. In response to these observations a new generation of trade models emerged in which the firm rather than the sector was the relevant production unit. This literature continued, however, to treat final demand as emanating from a representative agent. Moreover, while the literature recognized producer heterogeneity in the form of efficiency differences, it continued to treat input use as homogeneous among broad classes of firms.

Economists are now beginning to make use of data generated by customs records, the finest unit of trade transactions. These records reveal not only characteristics of the individual sellers but of their individual buyers as well. Perhaps not surprisingly, buyers are as heterogeneous as sellers, and a typical exporter sells to only one or a small number of buyers. Moreover, data on input use shows that firms are heterogeneous not only in terms of their productivity, size, and export status, but in terms of their use of different types of intermediates and workers. Figure 1 illustrates this heterogeneity in depicting the distribution of the labor share and

unskilled labor share among French manufacturing firms.<sup>1</sup>

To capture these additional dimensions of heterogeneity we build a general equilibrium model of product trade through random meetings. Buyers, who may be households looking for final products or firms looking for inputs, meet sellers randomly. At the firm level, the model generates predictions for imports, exports, and the share of labor in production broadly consistent with observations on French manufacturers. At the aggregate level, firm-to-firm trade determines bilateral trade shares as well as labor's share of output in each country.

The model of firm-to-firm trade is complementary to the recent work of Oberfield (2013). Firm production combines the output of a number of tasks with a firm-specific efficiency level. Each task can be performed by the firm's employees or by an intermediate input purchased by the firm. The intermediates available to a firm are determined by a matching process, with the firm replacing its own workers to perform a particular task if a cheap enough intermediate is available. The distribution of prices for intermediates is itself determined by the distribution of costs of the other firms that produce them.

Our work relates to several strands in the literature. Recent papers looking at exports and labor markets (although not at imports) include Hummels, Jorgenson, Munch, and Xiang (2011), Felbermayr, Prat, and Schmerer (2008), Egger and Kreickemeier (2009), Helpman, Itskhoki, and Redding (2010), and Caliendo and Rossi-Hansberg (2012). In addition to Oberfield (2013), other theories of networks or input-output interactions include Lucas

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<sup>1</sup>Note that many manufacturing firms have no workers at all. Even if a firm outsources all of its production, if it is the first seller of a manufactured product the firm is classified in manufacturing. For example, a fashion designer who sells clothes that she has designed is classified as a manufacturer even if she hires other firms, either at home or abroad, to make the clothes.