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Export dynamics and sales at home[☆]

Nicolas Berman [a,b,*], Antoine Berthou [c,d,1], Jérôme Héricourt [e,d,2]

[a] Graduate Institute of International and Development Studies, Switzerland
[b] CEPR, United Kingdom
[c] Banque de France, France
[d] CEPII, France
[e] University of Lille, LEM-CNRS (UMR 9221), France

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ABSTRACT

How do firms' sales interact across markets? Are foreign and domestic sales complements or substitutes? Using a French firm-level database combining balance-sheet and product-destination-specific export information over the period 1995–2001, we study how demand conditions in foreign markets affect domestic sales through variations in exports. We identify a number of exogenous shocks affecting the firms' demand on foreign markets, including product-destination specific imports or tariff changes, and large foreign shocks such as financial crises or civil wars. Our results show that exogenous variations in firm-level exports positively impact domestic sales, even after controlling for domestic demand conditions. A 10% exogenous increase in foreign sales generates a 1 to 3% increase in domestic sales in the short-run. This result is robust to various estimation techniques, instruments, controls, and sub-samples. It is also supported by the natural experiment of the Asian crisis in the late 1990's.

1. Introduction

The sales of a firm are distributed across several markets, each of these markets being identified by a specific location and a particular product. Empirical evidence shows that large, productive firms explore more markets and have larger average sales. How sales between these different markets interplay, and in particular how demand shocks in a given market affect firms' sales in their other markets remains unclear, although it may be a significant determinant of firm-level dynamics and have important implications for the transmission of foreign shocks to the domestic economy.

This paper provides an empirical investigation of this question through the lens of the relationship between French firms' exports and domestic sales. As sales decisions in each market are likely to be simultaneously determined by common — idiosyncratic or aggregate — demand and supply shocks, we develop a strategy that identifies variations in the foreign demand addressed to the firms to predict exogenous changes in exports, and estimate their effect on the firms' domestic sales. The different dimensions of our data allow us to build instruments that capture the demand specifically addressed to each firm in its foreign markets (destinations and products), while controlling for the demand it faces in the domestic market. Based on this strategy, we test different instruments to ensure the stability of our estimates.

Our empirical analysis relies on a firm-level dataset containing both firm-level trade data from the French customs and balance-sheet information over the period 1995–2001, at a yearly frequency. In particular, the balance-sheet data contain information about domestic and foreign sales, our main variables of interest. The customs data report firm-level exports by product and destination. This information is used to identify

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* Corresponding author at: Graduate Institute of International and Development Studies, Maison de la Paix, Chemin Eugene Rigot 2, 1211 Geneva, Switzerland. Tel.: +41 22 908 5935.

E-mail addresses: nicolas.berman@graduateinstitute.ch (N. Berman), antoine.berthou@banque-france.fr (A. Berthou), jerome.hericourt@univ-lille1.fr (J. Héricourt).

[1] Address: Banque de France, 39 rue Croix des Petits Champs 75001 Paris, France. Tel.: +33 1 42 92 28 76.

[2] Address: USTL, Faculte des Sciences Economiques et Sociales, Cite Scientifique — Bat SH2, 59655 Villeneuve d'Ascq Cedex, France. Tel.: +33 1 53 68 55 14.

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variations in the demand addressed to firms in both foreign and domestic markets. Demand addressed to firms in foreign markets is used to instrument for firms' exports, while the domestic demand is used to control for home market conditions. As our baseline instrument, we use the sum of imports in the products-destinations served by the firms, weighted by the share of each product-destination in the firm's total exports. Alternatively, we consider firm-specific tariff changes and transportation costs, as well as exposure to large foreign shocks such as financial crises or civil wars.

We find that a 10% exogenous increase in exports coming from foreign demand variations is associated with a 1 to 3% increase in domestic sales in the short-run. We show that this complementarity is stronger in firms that are more exposed to foreign shocks due to a higher exports to total turnover ratio. Our results are valid for both increases and declines in foreign demand, with the effect being larger in the latter case. These findings imply that foreign demand shocks can be transmitted to the domestic economy through the relation between exports and domestic sales, a *within-firm* transmission channel.

A substantial part of the paper is devoted to exploring the sensitivity of our results to alternative empirical strategies. We use a variety of alternative instruments, different weighting schemes, and test the robustness of our results to the use of several sub-samples of destinations or populations of exporters. These tests validate our main empirical methodology, and exclude other channels that could possibly generate a positive correlation between firm-level exports and domestic sales, such as cross-border business cycle synchronization or unobserved firm-level productivity shocks.

Our work has direct consequences regarding the channels through which international trade in goods might lead to greater business cycle synchronization (with trading partners/with the rest of the world). The significant correlation between trade openness and the synchronization of business cycles is generally attributed to the strong input–output linkages across borders, with demand shocks in one country being transmitted to other countries through the purchase of final or intermediate goods.[3] Our results imply that foreign business cycles may also be transmitted to domestic markets through the complementarity between firms' domestic and foreign sales.

Implications for the transmission of foreign trade policy, exchange rate shocks or financial crises to the domestic economy are also potentially important. In the case of the 1997–98 Asian crisis, we indeed show that firms that were more exposed to the destinations that experienced the crisis displayed lower domestic sales during the event, confirming our main result. Though we do not evaluate the net macroeconomic impact of foreign demand variations on aggregate sales — which also depends on the reallocation of market shares across firms — this finding suggests that the complementarity between exports and domestic sales may be an important channel of the international transmission of aggregate demand and financial shocks in cases such as the Great Recession and the subsequent eurozone crisis.

Why are firms' domestic sales positively related to these exogenous changes in exports? While providing direct evidence of the precise mechanism(s) underlying our finding is beyond the scope of this study, we briefly discuss in the last section a potential transmission channel. In most international trade models (e.g. Melitz, 2003), domestic and foreign sales are only linked through idiosyncratic productivity shocks and local market conditions. Variations in demand affecting firms' sales in a given location have no effect on sales in other markets. On the other hand, such a transmission of foreign shocks within firms is consistent with downward shifts in the firms' marginal costs following exogenous increases in exports.[4] This would be the case if foreign demand variations affect firms' financing conditions in the short-run, by easing their access to external finance or providing them with internal funds. A large literature has indeed emphasized a strong relationship between firm-level cash flow and investment, supporting the hypothesis that internal liquidity is cheaper than external finance (e.g. Hubbard, 1998). In this context, favorable foreign demand conditions help hiring workers, investing or paying suppliers — and thus support domestic activity. We provide evidence in line with such a liquidity channel: we find that the positive effect of exogenous changes in exports on domestic sales is significantly stronger for small firms, and for firms or sectors relying more on short-run liquidity.

Our paper is related to a recent literature interested in the influence of foreign macroeconomic shocks on firms' activities through factor utilization and productivity. Of particular interest are the papers by Ekholm et al. (2012) and Hummels et al. (2014). Ekholm et al. (2012) show that for Norway, firms that were more exposed to the appreciation of the Krona in the early 2000's (through higher competitive pressure at home or reduced competitiveness on foreign markets) restructured more. Hummels et al. (2014) use micro-level Danish data and a methodology similar to ours to show that positive export shocks lead to an expansion of firms' employment and wages paid to all types of workers. Our results suggest that these gains are not only directly related to foreign shocks, but may also be the indirect consequence of the complementarity between export and domestic sales.[5]

The next section presents the data and some descriptive statistics. Section 3 details our empirical methodology. Section 4 reports our baseline results, a number of robustness checks, a test of our results using the 1997–98 Asian crisis as a natural experiment, and a discussion of potential channels of transmission. The last section concludes.

2. Data and stylized facts

2.1. Data

Our empirical analysis relies on two main datasets that report information at the firm level. The first source is the balance sheet dataset BRN (Bénéfice Réels Normaux), which relies on fiscal declarations by domestic French firms. It is constructed from mandatory reports of French firms to the tax administration, which are in turn transmitted to INSEE (the French Statistical Institute). The reported information includes firms' total sales and export sales, employment, capital stock, value added, the industry, year, and balance-sheet variables. Our data cover the period 1995–2001, for which we have information on both the total sales and export sales. This combined information is used to compute domestic sales. This dataset contains between 650,000 and 750,000 firms per year over the period, which is around 60% of the total number of French firms. Importantly, it is composed of both small and large firms, since no threshold applies on the number of employees.[6] Eaton et al. (2011) provide a more detailed description of the database. Because we are interested in the relationship between export flows and domestic sales, we only keep firms that export at least

[3] Whether international trade causes tighter international business cycle synchronization is theoretically ambiguous. If trade openness leads to greater specialization, and cycles are predominantly sector-specific, trade openness may actually decrease business cycle correlation. However, empirical works have found strong evidence that trade openness amplifies international business cycle correlation. See, among many others, Frankel and Rose (1998) or Baxter and Kouparitsas (2005).

[4] A very recent yet flourishing body of literature use sales in different markets to infer the firms' cost structure (Vannoorenberghe, 2012; Nguyen and Schaur, 2012; Blum et al., 2013; Soderbery, 2014; Ahn and McQuoid, 2015). Our focus is however different: we are not interested in the cost structure of the firms per se but in understanding how exporters are affected by demand external shocks, focusing on the transmission to domestic sales.

[5] To a lesser extent, our paper also contributes to the vast literature interested in the effect of international trade on firm performance, which has been a major area of research since the late 1990's (see early works by Bernard and Jensen, 1999, or more recent contributions such as De Loecker, 2007; Park et al., 2010). Our results imply that export performance may affect domestic performance in the short-term, either through factor accumulation or TFP gains.

[6] The BRN _les contain all firms which sales are at least 763 K euros (230 K euros for services). Smaller firms are however included if they choose to be subject to the normal tax regime.