

Economic Performance under NAFTA: A Firm-Level Analysis of the Trade-productivity Linkages

RAFAEL E. DE HOYOS
and LEONARDO IACOVONE*
World Bank, Washington, USA

Summary. — Did North American Free Trade Agreement (NAFTA) make Mexican firms more productive? If so, through which channels? This paper addresses these questions by deploying a robust microeconomic approach that disentangles the various channels through which integration with the global markets can affect firm-level productivity. The results show that NAFTA stimulated the productivity of Mexican plants via: (1) increase in import competition and (2) positive effect on access to imported intermediate inputs. Crucially, the impact of trade reforms was not identical for all integrated firms, with fully integrated firms (i.e., firms simultaneously exporting and importing) benefiting more than other integrated firms.

© 2012 Elsevier Ltd. All rights reserved.

Key words — firm-level productivity, trade reforms, Latin America, Mexico

1. INTRODUCTION

In the past two or three decades most Latin American countries have redefined their development strategies, moving away from import-substitution regimes toward policies promoting integration with the global economy through exports and Foreign Direct Investments (FDI). This important shift has been accompanied by an intense academic debate regarding the relationship between integration with the international markets and domestic growth. Despite the general presumption of a positive impact of trade liberalization on economic growth, there is still disagreement among economists about the nature of this relationship (Baldwin, 2000). Most of the controversy is explained by the difficulty in identifying the underlying mechanisms driving this relationship (Winters, 2004). Furthermore, since trade liberalization is often just one element of a more comprehensive set of market-oriented reforms it is hard to disentangle its effect from the impact of other policies.

This paper contributes to this debate by developing a robust microeconomic approach that can disentangle the various channels through which integration with the global markets — via international trade — can affect firm-level productivity. Our empirical analysis is based on Mexican firm-level data covering 1993–2002,¹ a period of economic integration between Mexico, the US, and Canada within the North American Free Trade Agreement (NAFTA). The present study, defines NAFTA as a process of economic integration that goes beyond a simple tariff-reduction scheme and, instead, encompasses a set of institutional rules within which foreign trade and investment take place. The objective of this paper is to measure the impact of NAFTA on the productivity of Mexican plants.

The present study is related to various strands of literature. The pioneer set of studies collected in Roberts and Tybout (1996) analyzed the evolution of firm-level productivity dynamics in response to trade reforms and economic integration for various developing countries. More recently, the interest has moved toward the identification of the different channels and mechanisms behind the impact of trade reforms on productivity (Aghion, Burgess, Redding, & Zilibotti, 2004; Amiti & Konings, 2007; Fernandes, 2007; Girma, Greenaway,

& Kneller, 2004; Pavcnik, 2002; Tybout, 2001). Our research also draws on the lessons learned from the industrial organization literature examining the impact of increased competition on industry dynamics (Olley & Pakes, 1996). Furthermore, the present study explicitly builds on the recent theoretical literature on trade models with heterogeneous firms.² All of these studies provide important theoretical underpinnings for understanding the mechanisms through which economic integration affects productivity dynamics at the firm-level. Finally, the present study complements the large body of research of NAFTA which has focused both on the firm-level impact of liberalization (Alvarez & Robertson, 2004; Lopez-Cordova, 2003), wages and income (Easterly, Fiess, & Lederman, 2003; Esquivel & Rodriguez-Lopez, 2003; Krueger, 2000; Lederman, Maloney, & Serven, 2003) and trade flows (Besedes, 2011; Romalis, 2007).

The present study builds a conceptual framework to analyze the relationship between economic integration and firm-level productivity distinguishing four transmission mechanisms: (1) enhanced competition, (2) access to intermediate inputs, (3) exports, and (4) FDI. Following a difference-in-difference estimation procedure, we are able to capture the productivity growth differentials between integrated and nonintegrated firms during a period before and after NAFTA. Contrary to previous studies, our approach allows for a heterogeneous productivity impact between firms with different integration status. In other words, the productivity effects of trade liberalization will be different between firms whose only link with the international markets is given via the import of intermediate inputs, firms whose link is through export of final goods, and

*The authors are grateful to Alejandro Cano, Abigail Duran, Gerardo Leyva and Gabriel Romero for granting access and showing how to use the industrial data at the offices of INEGI in Aguascalientes. We also thank the Editor and three anonymous referees for their very useful comments. Furthermore, we thank Alan Winters, Gustavo Crespi, Sherman Robinson, Beata Javorcik, Valeria Arza, Nick Von Tunzelmann, Jorge Mattar, and seminar participants at the University of Sussex, SPRU, IADB, INEGI, ECLAC, and Anahuac University for their valuable comments. The authors gratefully acknowledge the ESRC and LENTISCO financial support. Final revision accepted: September 7, 2012.

firms that are importing inputs and exporting the final produce, that is, *fully integrated* firms.

Our results show that NAFTA stimulated the productivity of Mexican plants via: (1) an increase in import competition and (2) a positive effect on access to imported intermediate inputs. However, the impact of trade reforms was not identical for all integrated firms with fully integrated firms benefiting more than other integrated firms. Contrary to previous results, once self-selection problems are solved, we find a rather weak relationship between exports and productivity growth.

The paper is organized as follows: Section 2 briefly develops the conceptual framework describing the different trade-productivity transmission channels. The data used for the empirical analysis, Mexico's macroeconomic background, and trends in firm-level productivity are shown in Section 3. Section 4 describes our econometric approach and shows the results of various specifications. This Section also discusses potential endogeneity and selection problems, as well as the difficulties in isolating the impact of NAFTA from the peso devaluation of 1994. Finally, Section 5 concludes.

2. TRADE-PRODUCTIVITY LINKAGES

Economic theory predicts that trade reforms can affect firm-level productivity through several channels. Based on the existing literature, this section describes the theoretical linkages behind these channels, setting the basis for the subsequent empirical analysis. Overall, there is not a unique and well-defined model capturing the trade and productivity linkages, but rather a number of different approaches aimed at capturing different mechanisms through which economic integration can impact firms' performance. In the literature, we can identify four main channels through which trade reforms can influence productivity: competition, intermediate inputs, exports, and FDI. Each one of these channels can affect both internal restructuring, that is, productivity changes within the firm, and external restructuring, that is, productivity changes due to market shares reallocation between firms, exit, and entry. In the next sub-sections we discuss in detail each one of these channels, except the FDI one because, due to data limitations, we are unable to study this channel in our empirical analysis.³

(a) *Competition channel*

Trade liberalization and tariff reductions are expected to increase the competitive pressures to which domestic firms are exposed. This effect is expected to be stronger for import-competing firms and import-competing sectors than for export-oriented ones. In fact, while the reduction of Mexican tariffs under NAFTA increased the exposure to foreign competitors, by the same coin as for export-oriented ones the exposure to foreign competitors does not change, on the contrary, the reduction of US tariffs generates a competitive advantage equal to the additional tariff margins gained.

The first studies to formally explore this argument and relate the increase of the competitive pressures to an improvement of intra-firm efficiency were Martin (1978) and Martin and Page (1983). These authors argued that an increase in competitive pressures would reduce the "X-inefficiency", defined as the gap between actual productivity and the maximum productivity achievable (Leibenstein, 1966, 1978). The intuition behind their argument is that the efficiency of a firm is, *ceteris paribus*, a positive function of the managers' efforts and this, in turn, is

triggered by the exposure to foreign competitors. Following Markusen (1981) who formalized the pro-competitive effect of trade liberalization, Melitz and Ottaviano (2008) is an excellent example of how to model such an effect in the context of an heterogeneous-firm model by allowing markups to respond to import competition. Additionally, various empirical studies such as Pavcnik (2002) and Fernandes (2007) have focused on this channel pointing to substantial productivity gains as a consequence of exposure to foreign competition.

A second productivity effect of increased competition is given by its impact on firm size and size distribution; in fact, traditional trade models with homogeneous goods and identical firms assume that scale effects are the principal drivers of productivity changes following trade liberalization.⁴ In a world where firms are heterogeneous, the import-competing channel can explain changes in aggregate economics through "external restructuring", as less efficient firms are forced to contract or exit (Disney, Haskel, & Heden, 2003). This is shown clearly in Melitz and Ottaviano's (2008) and Bernard *et al.*'s (2007) models, where the increased competition leads to the exit and contraction of less productive firms, while more productive ones expand.

(b) *Intermediate inputs channel*

Economic theory suggests that liberalization of intermediate inputs will increase productivity levels of domestic firms due to an expansion in the menu of available intermediate inputs. This allows individual producers to match more appropriately their technology or product characteristics with the intermediate input used (Feenstra, Madani, Yang, & Liang, 1999).⁵

Another line of thought, linked to the endogenous growth models, suggests that the import of "tangible commodities facilitate the exchange of intangible ideas" (Grossman & Helpman, 1991a, 1991b). More specifically, learning from importing can occur through two distinct channels. First, by incorporating new intermediate products invented abroad into the local production processes (Keller, 2004). Second, the exposure to foreign technology allows for learning about new processes or products (Batiz & Romer, 1991). Related to this, Blalock and Veloso (2007) provide robust empirical evidence, for the case of Indonesian firms, how importing is a driver of international technology transfer.

In Bernard *et al.*'s (2003) model with heterogeneous firms the impact of trade reforms on productivity is given via a reduction in the price of intermediate inputs (i.e., cheaper and technologically superior imported inputs replace domestic ones). All firms benefit from the intermediate inputs price reduction, and this effect goes in hand with market reallocation from less productive firms to more productive ones.

An empirical test of the importance of expanded access to imported intermediate inputs is provided by Amiti and Konings (2007) showing that a 10% point fall in input tariffs leads to a productivity gain of 12% for firms that import their inputs.

(c) *Exports channel*

The literature suggests that the expansion of exports could work as another channel explaining the positive influence of economic integration on firm-level performance. Grossman and Helpman (1991a, 1991b) assume that domestic entrepreneurs enlarge the stock of domestic knowledge by increasing their contacts with foreign buyers. Similarly, Fernandes and Isgut (2005), based on Arrow's (1962) learning-by-exporting model, show that exporting activities have learning externalities.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات