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Plant exit and U.S. imports from low-wage countries

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ABSTRACT

Over the past twenty years, imports to the U.S. from low-wage countries have increased dramatically. In this paper we examine how low-wage country import competition in the U.S. influences the probability of manufacturing establishment closure. Confidential data from the U.S. Bureau of the Census are used to track all manufacturing establishments between 1992 and 2007. These data are linked to measures of import competition built from individual trade transactions. Controlling for a variety of plant and firm covariates, we show that low-wage import competition has played a significant role in manufacturing plant exit. Analysis employs fixed effects panel models running across three periods: the first plant-level panels examining trade and exit for the U.S. economy. Our results appear robust to concerns regarding endogeneity.

1. Introduction

Between 1992 and 2007, U.S. imports increased by a factor of 2.5, climbing above the $2 trillion mark. Over the same period, imports to the United States from low-wage countries grew by a factor of almost 10. Increased global economic integration holds the potential to dramatically change labor market dynamics and industry structure in both developed and developing countries (Baldwin, 2006; Blinder, 2006; Autor et al., 2012). Recent evidence from advanced industrialized economies such as the United States confirms this intuition: workers in these countries have been affected by rising imports in various ways (Kletzer, 2002; Ebenstein et al., 2009). Potential impacts are likely to be largest in relation to trade among economies whose factor endowments are fundamentally different, such as between economies that have an abundance of low-skill labor and those that are abundant in highly-skilled workers (Feenstra, 2008). Following this logic, researchers have found that import competition from low-wage economies like China is associated with a variety of negative labor market effects in developed economies, from job loss, to increases in government transfers, and reduced long-run earnings (Pierce and Schott, 2012; Autor et al., 2013; Kemeny et al., 2015). In keeping with the recent growth of low-wage imports, estimates of these impacts over the 1990s and 2000s are far larger than those documented by researchers looking for trade effects in the 1980s (Lawrence and Slaughter, 1993; Berman et al., 1994; Sachs and Schatz, 1994).

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One way that import competition can affect workers is by inducing the establishments in which they work to shut down, or 'exit' (Bernard et al., 2006; Eriksson et al., 2009; Inui et al., 2009; Colantone and Sleuwaegen, 2010; Baldwin and Yan, 2011; Wagner, 2011; Colantone et al., 2014). Although this relationship has received considerable attention, to date the models that link import competition and plant exit rarely control for unobserved heterogeneity at the plant/firm level. This is an important omission. It is reasonable to assume that a variable such as managerial expertise is effectively fixed over short time-periods within plants/firms and that this variable will be correlated with most measures of plant/firm performance. Resulting estimates using pooled, independent cross-sections will thus be biased and inconsistent (Wooldridge, 2002). We remedy this concern using a three period variant of the traditional fixed effects panel model. The paper also adds value by updating the earlier findings of Bernard et al. (2006) and Bernard and Jensen (2007) for the United States, and by extending the analysis to consider a number of interactions between import competition and plant/firm characteristics for the U.S. economy.

Consistent with past results, notably the findings of Bernard et al. (2006), we find that rising import competition from low-wage economies increases the probability of manufacturing plant-exit. Industry-specific import competition from high wage countries also increases the likelihood of exit, though the size of the effect is much smaller than competition from low-wage countries. Several factors act to insulate plants and protect against exit. Larger plants, older plants and those that export have lower probabilities of exit. In line with Bloom et al. (2011), we find evidence that higher productivity plants, those with higher levels of capital investment per worker and those with higher ratios of capital investment devoted to computing equipment, a proxy for technology, are less likely to exit markets when the intensity of low-wage import competition increases. Like Bernard and Jensen (2007) we report that imports from low-wage countries are more likely to push plants that are part of multi-establishment firms to exit relative to single-plant firms. However, we also show that the plants of firms that have foreign affiliates in low-wage countries are less likely to exit than plants overall. Additional evidence of the protective nature of plant-level productivity within multi-unit firms is found, and new information about how low-wage country import competition interacts with other plant-level and firm-level characteristics is presented. Results are obtained from linear probability models in fixed effects panel form and from panel models incorporating instrumental variables.

The paper is organized in five sections below. In Section 2, the recent theoretical and empirical literature that underpins our analysis is briefly discussed. Section 3 outlines the linked data sets that we have employed. Section 4 presents the analytical approach. In Section 5 the main results of the analysis are detailed and a short conclusion is offered in Section 6.

2. Literature overview

There is growing evidence of firm heterogeneity with respect to trade (Aw and Hang, 1995; Clerides et al., 1998; Bernard and Jensen, 1999). Persistent intra-industry differences in plant and firm performance, differences correlated with export status, are inconsistent with Krugman's new trade theory and its assumption that all firms export. A so-called "new new" trade theory emerged with the work of Melitz (2003), Bernard et al. (2003) and Helpman et al. (2004). At the core of these new theoretical models of trade is firm heterogeneity and an assumption that the sunk-costs of entry into export markets can be borne only by more productive businesses. Though these models generally assume the market structure that they seek to explain, the relationships between firm characteristics, trade and market dynamics that they outline have become standard tools for exploring competition in an increasingly integrated global economy.

For Melitz (2003), entrants to an industry are identical and heterogeneity is generated through a random productivity draw that follows payment of fixed entry costs encouraged, in turn, by the possibility of profit. This productivity draw is consistent with the idea that firms do not know their productivity until they enter the market and begin production. An additional fixed cost to enter export markets partitions firms into exporters or non-exporters depending on their productivity levels. In this fashion, the positive correlation between exporter status and firm productivity is captured. Melitz (2003) shows that trade-based competition lowers the revenues of non-exporting firms as foreign exporters are on average larger and more efficient. Consequently, the least efficient non-exporters may be forced to exit the industry. At the same time, more efficient firms that export gain market-share and capture additional profit.

Bernard et al. (2003) offer a model of production and trade under imperfect competition. By allowing differential plant mark-ups, variations in efficiency give rise to heterogeneity in measures of plant-level productivity, consistent with available data. As in Melitz (2003) initial levels of plant efficiency are established as a random drawn from an efficiency distribution. Assuming that the costs of overcoming trade barriers prevent less efficient plants from exporting, Bernard et al. (2003) establish the positive relationship between plant-level productivity and export behavior. Variable costs and market-size structure the intensity of competition and firm dynamics in this model. Helpman et al. (2004) extend similar arguments about firm heterogeneity, productivity and the costs of serving foreign markets to examine the decision to export or to engage in foreign direct investment. Assuming the fixed costs of FDI exceed those of exporting, they show that only the most productive subset of firms with an international presence invest in a foreign production facility and that decision is made in terms of market access. Head and Ries (2003) provide additional arguments motivating FDI choice. Antras and Helpman (2004) and Antras and Rossi-Hansberg (2008) develop these claims further, exploring how incomplete contracting can help explain the organizational choices of firms that trade. Further extensions of these arguments explore the distribution of exports across countries (Eaton et al., 2008), provide a framework for understanding the scope of heterogeneous firms with

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