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Heterogeneous responses of firms to trade protection ☆

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ABSTRACT

This paper estimates the effect of antidumping protection on the productivity of domestic import-competing firms. Two key results emerge. First, the productivity of the average firm receiving protection moderately improves, but this is never sufficient to close the productivity gap with firms never involved in antidumping cases. Second, allowing for firm heterogeneity reveals that domestic firms with relatively low initial productivity – laggard firms – have productivity gains during protection, while firms with high initial productivity – frontier firms – experience productivity losses during protection. These results are consistent with recent theories showing that trade policy affects firms differently depending on their initial productivity.

1. Introduction

The effects of trade liberalization on productivity have been widely reported in the literature.[2] But while tariffs on industrial goods have never been lower, their decrease has gone hand-in-hand with a strong increase in newer types of trade protection. In particular, the use of antidumping protection has risen sharply in the last decade. Antidumping protection is supposed to keep "unfair imports" out, but there is a strong suspicion that it is often aimed at fostering the interests of inefficient domestic producers.[3] Therefore, an important question is how antidumping import protection affects the productivity of domestic import-competing firms. For this purpose, we study European antidumping cases where protection is temporary and typically ends 5 years after the starting date.[4]

We identify firms in the European Union (EU)[5] in four-digit sectors directly affected by AD policy and use their firm-level data[6] to obtain output and input measures for estimating total factor productivity (TFP) before and after AD protection. We first estimate firm-level TFP using the methodology of Olley and Pakes (1996) to correct for the simultaneity in the choice of inputs and firm exit.

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[2] Important contributions are Levinsohn (1993), Harrison (1994), Tybout and Westbrook (1995), Head and Ries (1999), Pavcnik (2002) and more recently Trefler (2004).

[3] A few examples include Shin (1998), Veugelers and Vandenbussche (1999).

[4] The EU always had this Sunset clause, the US only adopted this clause after the Uruguay Round.

[5] During the period of our analysis the European Union consisted of 15 countries.

[6] From Amadeus, Bureau Van Dijck.

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Second, we use a difference-in-difference (DD) approach to evaluate the differential productivity effects of AD protection. For this purpose, we apply the matched sampling techniques developed by Heckman et al. (1997),[7] and use various control groups of firms that did not receive protection. We estimate the probability of AD protection by using a multi-nominal logit model similar to the one used by Blonigen and Park (2004) to "match" the protected firms to firms in similar sectors but that never filed for nor received protection. Third, we introduce firm heterogeneity. We examine whether the effects of AD protection depend on firms' initial productivity. For this purpose, we construct a firm-level measure of "distance-to-the-frontier" where distance is an indication of how productive each firm is relative to the most productive firm in its four-digit EU industry at the outset of the sample period.

Our main results can be summarized as follows. Firms that file for protection have, on average, a lower initial productivity than firms in the control groups. We find that AD protection raises the average productivity of the protected firms but that the productivity increase is never sufficient to close the productivity gap with firms in sectors not involved in AD, which casts doubt on the desirability of protection. Analysis of the average AD effect reveals substantial heterogeneity across firms that can be related to the "distance-to-the-frontier-firm". Highly productive firms – frontier firms – are negatively affected by AD protection as their productivity declines during protection. Less productive firms are positively affected by AD protection as their productivity rises during protection. Our results are significant and robust across specifications. On average, we find that AD protection raises the productivity of the protected firms by about 2% to 8% depending on the specification used with the smallest estimates arising when we use the long differences approach as in Trefler (2004). Including multi-sector firms also weakens the results with respect to those obtained by an analysis that includes only single-sector firms.

Measuring total factor productivity is problematic because of the difficulty of distinguishing true productivity effects from price movements. We conduct a number of experiments to show that the effects of AD protection on measured productivity cannot be attributed entirely to price movements. Our data, like most firm-level data, does not have information on output-prices at the firm-level. Instead, we use unit values of goods traded on the internal EU market and protected by AD to control for price movements.

A logical question following our analysis is where the average productivity improvements come from. It is unlikely that average productivity improvements during AD protection are driven by exit rates. First, trade protection typically prevents a reshuffling of firm-level resources across sectors and results in sub-optimal levels of exit (Hillman, 1982). Second, the Olley–Pakes methodology accounts for biases in measured TFP due to firm exit. Third, a growing number of papers show that free trade promotes efficient exit as shown by Trefler (2004) in the context of the Canada–US free trade agreement and Amiti and Konings (2007) in the context of trade liberalization in Indonesia. Therefore, it is safe to conjecture that trade protection is likely to result in sub-optimal levels of exit. Our exit measure, despite its poor quality[8] seems to confirm this. For the "matched control group", the average exit rate over the sample is 3% while we find it to be much lower and around 1.8% for the protected firms. The channels of productivity improvement within firms that we identify are labor shedding, increased R&D spending, and increased investment in fixed assets at the firm-level during AD protection. However, there can be additional channels through which productivity can be improved that we cannot measure. In particular, "product switching", involving a change in the output mix towards products with higher capital and skilled-labor content (Bernard et al., 2006) is a very likely source of productivity improvement but cannot be tested due to data limitations. In our data, we cannot distinguish between skilled and unskilled labor, which prevents us to analyze skill upgrading. We do find that average wages at the firm-level go up after protection, which could be consistent with an increase in the skill mix. However, increased wages may also be consistent with rent-sharing where some of the profits resulting from protection are shared with workers in the form of a higher wage. Whatever the correct interpretation, productivity is likely to go up in both cases. An increase in the skill mix is likely to boost productivity, just as a wage increase for workers is likely to induce more effort since workers stand to lose more when dismissed.

To understand the link between trade policy and firm-level productivity, we turn to various theoretical models. Lileeva and Trefler (2007) is a particularly useful background model for interpreting the empirical results we obtain. They show that firm-level productivity responses are heterogeneous when trade policy results in an increase in market size. In their model, domestic firms experience an increase in market size due to the trade liberalization in export markets. In addition to a fixed cost of exporting (Melitz, 2003; Helpman, 2006), the model assumes a fixed cost of productivity-improving investment. Under these assumptions, only firms with low initial productivity and high potential productivity gains invest when the size of the market increases. Using tariff cuts by the US against Canadian imports resulting from the US–Canada Free trade Agreement, Lileeva and Trefler (2007) find that the labor productivity of small and lowly productive Canadian plants increases more than does the productivity of large and highly productive firms. While their paper deals with trade liberalization, its results can be transposed easily to the context of AD trade protection described in the present paper. AD trade protection increases the market size of domestic firms to the detriment of foreign importers. This increase in market size allows lowly productive domestic firms that would have exited in the absence of trade protection, to engage in productivity-improving investment. The most productive domestic firms that already operate at competitive cost levels and that are in no danger of exiting are much less affected by the increase in market size and have less incentive to improve their productivity during protection.

[7] The use of a "matched" control group is generally regarded as an acceptable way to deal with selection effects. De Loecker (2007) for instance uses a similar approach.

[8] The firm-level data involves inclusion criteria with minimum levels in terms of employment, turnover and sales. This makes it difficult to distinguish a true exit from a firm that falls forever below the inclusion criteria.