Import Competition, Foreign Inputs, and Labor Adjustment in a Developing Country: Evidence from Colombian Liberalization

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Abstract

We study how import competition and foreign inputs coming from high-income countries affect employment and earnings in low-developed economies. We use administrative data from Colombia, and exploit exogenous tariff reductions that increased Colombian imports from the United States, to draw firm conclusions that contrast with previous findings for high-income economies. First, import competition decreases employment in a similar magnitude that foreign inputs increase it. Second, losses in manufacturing employment are driven by substitution with foreign inputs. Third, labor market adjustment among informal workers occurs by decreased earnings rather than employment. Fourth, high-skilled workers experience significant earnings losses, whereas low-skilled do not, and the effect is focused towards the informal, high-skilled jobs. Our results show that international trade between countries with different levels of economic development does not create only winners in developing countries, but, instead, has highly heterogeneous responses that contrast with those found within developed economies.

Introduction

The effects of imports from low-income countries on the labor markets of high-income economies have been widely studied. However, the effects of imports from high-income countries on the labor markets of low-income countries remain completely understudied. Both types of effects are not the same due to differences in the degree of substitutability of local workers by imported products, which depends on the level of development of the local economy. This substitution can occur directly by a competition effect that drives firms out of the market or by an intermediate input effect that complements/substitutes local workers by foreign intermediate inputs. Both type of effects differ when analyzing labor markets in high- and low-income economies.

In this paper, we use an exogenous decrease in Colombian tariffs that increased imports from the United States, leaving Colombian exports unchanged. We leverage cross-industry variation in the intensity of the tariff decrease to estimate a differences-in-differences model that identifies the causal effect of import competition and foreign inputs on Colombian labor market. We use highly detailed data on Colombian imports and labor market outcomes to estimate the model.

Research Question

How does the penetration of goods from high-income countries affect the labor market in low-income economies?

Conceptual Framework

Let us assume a representative firm in industry \( j \) that combines labor and foreign inputs to produce, and has substitution between both factors of production (i.e. assuming CES technology). If we derive the labor demand, and assume a change in tariffs (charged as an ad-valorem tariff to the foreign input) we find that employment can be affected by competition or by substitution with foreign inputs. Formally, this implies that:

\[
\frac{\partial \ln L}{\partial \tau} = \frac{\epsilon_j P(Y_t)}{P(Y_t)} \left( \frac{(1 - \sigma_j) X_j}{1 + \sigma_j} \right) - \sigma_j Y_t^n
\]

where \( P(Y_t) \) is the output price, \( X_j \) is the amount of foreign input, \( Y_t \) is the total production, \( \epsilon_j \) is the elasticity of demand, \( \sigma_j \) denotes the degree of homogeneity of the production function, and \( \sigma_j \) is the elasticity of substitution between labor and foreign inputs.

Background

The United States is Colombia’s biggest trade partner, representing around 40% of Colombian trade. In 2010, Colombia unilaterally and unexpectedly decreased tariffs for intermediate inputs coming from everywhere in the world. Later, in 2012, Colombia implemented a difficult-to-predict free-trade agreement with the United States that brought the tariffs charged to U.S. products to zero. Both tariff reductions increased exclusively imports from the United States and left Colombian exports unaffected.

Empirical Strategy

We estimate the following model at the industry, \( j \), and year, \( t \), level:

\[
y_{jt} = \beta_0 + \beta_1 \tau_{jt} + \mu_1 + \mu_2 + \epsilon_{jt},
\]

where \( y_{jt} \) is either employment or earnings (industry wage-premia), \( \tau_{jt} \), and \( \mu_1 \) and \( \mu_2 \) correspond to industry and year fixed effects, \( \beta_1 \) corresponds to the import competition shock, and \( \beta_2 \) to the foreign input shock. The shocks are formally defined as:

\[
\tau_{jt} = \tau_{jt}^{2010} + \tau_{jt}^{2012},
\]

The competition shock is the change in tariffs with respect to the year before the liberalization (2010), and input shock is a weighted average of the decrease in tariffs across inputs \( k \) for outcome \( j \). The weights \( w_{jk} \) are computed using imports per firm in 2008 and, as a robustness, a Colombian input-output matrix.

We compute a weighted sum of both effects to evaluate if both shocks are different from each other. The sum is weighted by the average change in each shock to make both of them comparable:

\[
\text{Weighted Sum} = \sum_w \tau_{jk} \times \frac{\mu_2}{\mu_1}.
\]

We also present event-study estimates in the paper that show formally the non-existence of pre-trends.

For the sake of presentation we exclude those figures from this poster.

Result 1. Import competition and foreign inputs have opposite effects off employment of similar magnitude.

Result 2. The input shock decreases earnings of informal workers.

When estimating the result in earnings we observe that the input shock decreases earnings of informal workers, exclusively. We define informal workers as those that do not contribute to health or pensions. This type of workers are not bounded by minimum wages nor constrained by formal contracts. Therefore, they are more likely to adjust via earnings than by employment. This is exactly what our second result suggests.

We then explore the heterogeneity of these effects, which give light about the mechanisms behind this adjustment effect. We first start by analyzing the differential effect by types of industries. Such heterogeneity motivates our third result.

Result 3. Manufacturing employment decreases mainly by substitution with foreign inputs, rather than by competition.
We see again a decrease of employment in manufacturing industries, but a positive effect in some services sector that are quite important for Colombia.

Result 4. College-educated workers seem to be more affected, especially the informal.

We now estimate the model by workers who are and not college-educated. We find striking evidence that the decrease of earnings for the informal workers, Result 2, is driven by the college-educated informal workers. We additionally find that the opposing effects for the competition and input shocks occur for both types of workers: college and non-college educated.

Conclusions

Products from the United States have the following effects:

- Import competition and foreign inputs have opposite effects on employment.
- Input shock decreases earnings of informal workers.
- Input shock decreases employment in manufacturing.
- Informal, college-educated workers decrease earnings.

⇒ Trade between countries with different level of development has heterogeneous responses in developing countries that contrast with developed economies.