

Comments

Gerardo Esquivel Hernández: This paper addresses a fundamental question: what effect has the North American Free Trade Agreement had on total factor productivity in the manufacturing industry in Mexico? Responding to this question is important for Mexico, since it may provide one of the most important pieces of evidence in terms of the long-term impact of the opening of the Mexican economy. However, the relevance of answering this question goes well beyond the Mexican case and may be an important part of the more general debate about the effects of globalization.

As is well known, there is an important, and in some cases growing, degree of skepticism about the benefits of globalization. This perception is related to the apparently limited benefits that increased trade and investment links have brought to the people of the countries that have undergone a process of trade and investment liberalization. The critics' main argument is often that liberalization has translated into more poverty and unemployment, as well as greater wage inequality. In this sense, the contribution of the paper by Ernesto López-Córdova is a very important one, since it presents very compelling evidence on the positive effects of trade and investment liberalization on total factor productivity (TFP) in the manufacturing industry in Mexico. TFP has been identified as one of the main explanatory factors of per capita income differences across countries.¹ The fact that trade and investment reforms are positively associated with TFP in the manufacturing industry in Mexico thus suggests that economic openness will have positive and long-lasting effects on the Mexican economy. Given the nature of the effects, the positive effects of liberalization should be observed mostly in the medium and long term, and not just in the short term. Providing robust and convincing evidence that trade and investment liberalization has an effect on a fundamental variable such as TFP is the most important contribution of this paper.

1. Caselli, Esquivel, and Lefort (1996); Klenow and Rodríguez-Clare (1997); Prescott (1998).

The paper proceeds in a very well organized fashion. First, the paper reviews the process of trade and investment liberalization in Mexico. It succinctly but thoroughly describes the main reforms that led to the opening of the Mexican economy in the 1980s. The author then briefly surveys the theoretical and empirical literature on the relationship between trade, FDI, and productivity. Next, the author presents the estimates of total factor productivity in the manufacturing industry in Mexico and analyzes its determinants. In doing so, he attempts to establish a link between productivity performance, in either levels or growth rates, and some variables that presumably capture the channels through which increased trade and investment may have had an effect on productivity performance in Mexico.

In general, I like the approach used by the author (productivity analysis at the firm level), and he used an appropriate econometric methodology (the Olley-Pakes algorithm), which takes into account the problems of firms' exit and selectivity in the manufacturing industry. I would further like to mention one caveat, one comment, and one criticism of this paper. The caveat has to do with the lack of representativeness of the data used in this paper. Unfortunately, the survey that the author uses in this paper, the Annual Industrial Survey, is not representative of the whole manufacturing industry in Mexico, but rather is biased toward medium-sized and large firms. The Mexican authorities basically chose to oversample medium-sized and large firms in this survey to deal with the problem of a relatively large death rate among small firms. This characteristic of the dataset implies that we cannot easily draw inferences for the whole population based on these data. Moreover, part of the gains in productivity that are documented in the paper were achieved through economies of scale; this result might have been different if the dataset had included a greater number of small firms. Even so, this is probably the best available dataset for analyzing the topic discussed in this paper, and the results are quite valuable since they contribute to an understanding of the effect of liberalization on TFP in an important segment of the manufacturing industry in Mexico.

My comment has to do with the results presented in tables 4 and 5. In these tables, the author shows some regressions in which the dependent variable is the level of TFP and others in which the dependent variable is the growth of TFP (the change in logs). The author treats the two sets of results as separate, and he discusses them as if they addressed different aspects of the issue being studied. However, the specifications clearly must

be related in some way. For example, equations 3 and 4 in both tables can be rewritten as autoregressive versions of equations 1 and 2, respectively. The coefficients in equations 1 and 2 can thus be seen as the long-term impact of changes in the explanatory variables, whereas the coefficients in equations 3 and 4 could be interpreted as estimating the short-term effects. As is standard in the literature, estimates of the long-term impacts could be obtained by dividing the estimated coefficients in equations 3 and 4 by one minus the coefficient associated with the lagged dependent variable in those equations.² This suggests that the results in the two cases should be similar. If they are not, it could be due to a specification problem (the presence or absence of fixed effects, for example). A fuller discussion of this matter is relevant and could improve understanding of the issue.³

The only criticism I have of the paper is related to the result mentioned in the last section of the paper. There, the author does a sort of counterfactual analysis to show the relevance of the opening process in terms of the productivity level in Mexico. By inputting the initial levels of the right-hand-side variables, the author provides an estimate of the TFP level that could have prevailed in the absence of trade and investment reforms. He concludes that in the absence of these reforms, TFP in the manufacturing industry in Mexico in 2000 would have been less than half its actual value. This result is undoubtedly striking, but it is not necessarily correct. The assumption underlying this analysis is that in the absence of the reforms, the right-hand-side variables would have stayed at their initial levels, although this would not necessarily have been the case. For example, given that capital flows have increased worldwide in the past few years, it is reasonable to assume that FDI to Mexico would have increased up to a certain point even in the absence of trade and investment reforms. Something similar can be said about the level of imports. Of course, taking these trends into account would have led to a lower estimate of the impact of the reforms on TFP level in Mexico.

2. Since the original specification uses log differences as the left-hand-side variable, the equation should be rewritten in autoregressive form before the transformation discussed above is performed. This means that the actual transformation to obtain the long-term effects consists of dividing the estimated coefficients by the negative of the coefficient associated with the lagged dependent variable.

3. This comment is similar in spirit to one made by Hall and Jones (1999) in the context of the economic growth literature.

Alexander Monge-Naranjo: This highly valuable paper is of obvious interest for those studying the Mexican economy or those interested in the probable effects of new free trade agreements between the United States and other Latin American countries (negotiations are ongoing between the United States and Chile, the Central American cohort, and the Dominican Republic). Based on the most current plant-level data, the paper also documents facts that are relevant for academic and professional economists interested in economic growth, international income differences, and the effect of regional integration agreements. Despite the common wisdom that total factor productivity (TFP) is the major force behind sustained growth and cross-country income differences, a good theory of it has yet to be developed.¹ Moreover, the omission in standard trade and growth models of the implications for TFP make them of limited use in analyzing regional integration agreements, including NAFTA.²

The value added of López-Córdova's paper is twofold. First, after estimating (sectoral) production functions, the paper decomposes the manufacturing TFP growth into different sources: within-firm gains, within-industry reallocations, and cross-industry reallocations. This type of decomposition is also computed for groups of firms with different characteristics with respect to international trade and competition from (or participation in) the U.S. market. The results of this part of the study are quite interesting and suggestive. Correcting for attrition and selection, the author finds that reallocations are the main drivers of TFP growth; that almost all the productivity gains are concentrated in industries with strong trade links; and that exporting and foreign-owned plants improve productivity faster than nonexporting and domestically owned plants.

The second contribution of the paper is an analysis of the relationship of trade and foreign direct investment (FDI) with the productivity growth of different manufacturing sectors. Correcting for endogeneity, the author finds that import competition increases plant efficiency; that preferential access to U.S. markets improves plant productivity; that exporting or using imported inputs does not increase productivity growth; and that FDI has a positive effect on downstream and upstream local producers, but a negative effect on local producers in the same industry. Almost all these findings are becoming stylized facts.

1. Klenow and Rodríguez-Clare (1997); Prescott (1998).

2. Kehoe (2002).

I wish to make three general comments. The first has to do with the empirical strategy of estimating TFPs, the second with the estimation of NAFTA effects, and the third with the role of trade and FDI in the cross-border transmission of productivity growth. Before proceeding, however, I must highlight my conviction that this is a careful paper with high value added.

First, the author employs what can be considered the best econometric methodology for dealing with attrition and simultaneity biases: a decline in a plant's TFP may reduce the plant's investment (a right-hand-side variable), induce its exit, or both. The method by Olley and Pakes, as employed by López-Córdova, is the natural method to use in a panel with a decreasing sample of firms. There is, however, an important limitation: the omission of changes in aggregate TFP generated by new firms. This omission is important because the purpose of the paper is to study the effects of increased trade and foreign investment. Both are likely to have affected Mexican manufacturing sectors by changing the amount and nature of new plants and firms in the different sectors. New firms are more likely than established firms to adopt state-of-the-art or world-frontier technologies. Indeed, in my own theoretical model, I find that FDI reduces the productivity of preestablished local producers, but it increases the TFP of future vintages of firms.³ In that model, the dynamic aggregate effect of FDI is positive, while the static effect on local firms is negative; this is consistent with estimates by López-Córdova and by Aitken and Harrison.⁴ The message is that including new firms can change the picture dramatically. Studying the behavior of the productivity of new firms is an interesting subject for further research.

Second, the title and objective of the paper is to study the effect of NAFTA on Mexican manufacturing productivity. The paper is a bit obscure, however, about the without-NAFTA scenario it is using for estimating the effects of NAFTA. I have no doubt that NAFTA was one of the key forces behind the brisk increments in trade and FDI in Mexico during the sample period, but how much of the magnitude and composition of the increments can be attributed to NAFTA? Practically all the countries in the region also experienced a steep increment in trade and FDI flows during the same period (for example, Chile and Costa Rica). To evaluate these trends, one needs to specify the assumptions on tariffs, trade, and FDI under NAFTA.

3. Monge-Naranjo (2003).

4. Aitken and Harrison (1999).

For Mexico, one important advantage originating from NAFTA is that the country did not have to use other, perhaps more distortionary, means for attracting FDI and encouraging exports. Furthermore, NAFTA provides Mexican producers a clearer and more permanent set of rules than the ones provided by unilateral, temporary preferences such as the Caribbean Basin Initiative. It would be very interesting to investigate whether differences in the TFP of Mexico with respect to other countries in the region can be attributed to differences originating in NAFTA.

My third point is that the role of trade and FDI in the transmission of productivity innovations across countries needs further investigation. In the current version of the paper, López-Córdova uses the sectoral productivity of the United States as one of the controls in the regressions of Mexican TFP over trade and FDI variables. One can easily construct models in which the productivity innovations in one country affect not only the decisions of its firms in terms of exports and foreign investment, but also the presence of firms in other countries. Indeed, in those models the magnitude and direction in the comovement of TFP across countries, as well as the response of trade and FDI flows, all depend on the degree to which innovations are embedded in entrepreneurs (and are thus internationally mobile) or in countries (that is, not mobile).⁵ The richness of the events of the 1990s and of the database available to López-Córdova provides a good opportunity for learning about how productivity diffuses across countries in a globalized world.

5. See Burstein and Monge-Naranjo (2003).

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