Comments

Jorge Tovar: Despite the abundant literature on the empirical effects of trade liberalization for both developed and developing countries, the real consequences remain unknown. Giovannetti and Menezes-Filho focus on one of the most complex implications of trade liberalization: the evolution of the labor market. In particular, the paper studies the relation between trade liberalization and the evolution of the demand for skilled labor in Brazil. The authors argue that the reduction in tariffs caused a decline in the prices of imported intermediate goods, which embody advanced technologies that use skilled workers. Trade liberalization thus leads to an increase in the relative demand for skills.

The authors test their hypothesis using Brazilian household and manufacturing data for the period 1990 to 1998, excluding 1991 when no annual industrial survey was conducted. The main conclusion of the paper is that the decline in input tariffs had a significant effect on skill upgrading in Brazil. The strategy followed to identify the effects of trade liberalization is to estimate a series of regressions controlling for input tariffs, which serve as proxies for technology diffusion. The paper finds that the relative demand for skilled workers increased. This result has a potentially interesting policy implication: if the relative demand for skilled workers increases, the market should make an effort to increase the supply of such workers in the long run. This could be seen as an indirect benefit of trade liberalization.

The paper does a great job questioning the differential effects of trade liberalization on workers with different skill levels. However, the authors ignore the political economy of tariff reductions, something that is discussed extensively in the literature. They argue that endogeneity issues do not affect their regressions, that is, the error term and tariff reductions are not correlated because the government's objective was to reduce all tariffs to a common level. The inclusion of industry fixed effects is expected to control for industries that systematically receive more protection. The inclusion of time dummies solves the potential correlation between tariffs and other macroeconomic

events. As Goldberg and Pavcnik argue, however, two potential sources of endogeneity remain.[1] First, unobserved time-varying political economy factors could simultaneously affect tariffs and industry wages (or labor demands). Second, workers could choose certain industries over others based on unobserved time-varying characteristics. If, for example, trade liberalization caused the most productive workers to leave sectors that experienced large tariff cuts, tariff coefficients would be biased upwards. An instrument to correct for this potential endogeneity can be based on the solution proposed by Goldberg and Pavcnik.[2] Essentially, as long as tariffs are reduced over a short period and the industry structure does not vary significantly, one can build an instrument using the information contained in the lags of the tariff levels per industry.

The potential lack of robustness in the estimates can be seen in table 3, where the inclusion of fixed effects (to control for endogeneity) has an important impact on the value of the coefficient. The paper strongly suggests that differentials by type of worker do exist, but the real difference might be hidden behind these unexplored political economy effects.

The paper explores a relevant topic with important policy implications. The authors' use of data at the firm and individual level marks a significant improvement over previous work, and the paper provides new insight into the true empirical effects of trade liberalization on labor markets. The strategy followed by the authors, however, makes one wonder why Brazil is such an unusual case that no political economy issues arose when the trade liberalization process was implemented.

Osmel Manzano: Giovannetti and Menezes-Filho provide an interesting discussion of the effects of trade liberalization on the demand for labor of different skill levels. As mentioned in the paper, this is an important issue in the literature on the effects of trade liberalization. Given that developing countries are relatively abundant in unskilled labor, trade liberalization should increase the relative demand for this type of worker and a corresponding decline in the skill premium. The evidence so far is inconclusive, however. This paper sheds light on the debate by separating the effects of trade liberalization into those relating to final products and those relating to intermediate goods. The main finding is that liberalization reduces the demand for skilled workers in final goods (in accordance with the Hecksher-Ohlin model), while it has the opposite effect in intermediate goods.

1. Goldberg and Pavcnik (2005).
2. Goldberg and Pavcnik (2005).

This may explain why the debate on the effects of trade liberalization on the demand for skills is inconclusive. Perhaps the effects of liberalization on intermediate goods were overlooked because it was believed that tariffs on such goods were generally much lower than on final goods. This is not the case in all countries, however. At least in Brazil, the goals of trade policy included promoting the development of a capital goods industry and the production of more sophisticated goods. Tariffs on these goods were thus maintained at high levels, so the effect of decreasing these tariffs could be as important as for final goods. If, as argued in the paper, imported intermediate goods and skilled labor were complements, then the net effect of trade liberalization would be to increase the skill premium.

In principle, technological upgrading that leads to skill upgrading might not be a problem. It might even be desirable, as it raises productivity and welfare. It might also have negative consequences, however. The authors interpret their results as indicating that trade liberalization has negative effects on inequality, a problem that can only be solved by increasing investments in human capital. Whether skill upgrading translates into an increase in wage inequality depends on the reaction of the supply of skills: if the supply of skilled workers does not match the increased demand, the skill premium will increase. This could happen in an economy with imperfect credit markets, where it is difficult to finance human capital accumulation. In this case, skilled workers will receive a "rent" for their scarcity, and upgrading will be lower than in an economy with no imperfections.

The policy implications of the paper depend on whether the result showing an increase in the demand for skills applies to the Brazilian economy as a whole or just the manufacturing sector in São Paulo. If the problem is limited to the industrial sector in São Paulo, the appropriate policy may involve a targeted intervention toward workers displaced by the upgrading, perhaps through training programs. The Inter-American Development Bank (IDB) presents examples of some successful training programs in Latin America that could serve as guide.[1] If, instead, this is an economywide issue, the government may want to focus on policies that address the relevant market failures and increase the supply of skilled workers. The authors define skilled workers as having more than eleven years of education, which implies at least partial college education in the Brazilian educational system.[2] Therefore, the

1. IDB (2004).

2. Students may also undertake and finish vocational education instead of the regular secondary school. An interesting policy question is what share of the skilled workers in the sample have this type of education.

policy response should be to encourage students to undertake college education, correcting the market failure that drives this low supply.

The evidence presented in the paper is not clear on whether the liberalization process triggered an increase in the demand for skills that, coupled with a low supply of skilled labor, is raising the skill premium in the Brazilian economy. The relative supply of skilled labor in Brazil has increased.[3] The demand has also increased.[4] The issues, then, are whether the increase in the demand for skilled labor is larger than the increase in the supply and whether trade liberalization in the early 1990s affected that balance. Relative wages should provide an indication in this regard. The authors present figure 2 to illustrate that the relative wage of skilled to semiskilled workers has increased since 1992; they cite this as evidence that the demand for skilled labor has increased more than the supply.

Figure 2, however, can be interpreted in two additional ways. The first is to look at the dates used in the paper. Wage differentials were not higher in 1998 than before the liberalization process, in 1988.[5] It is therefore hard to argue that the upgrading taking place in the industrial sector as a result of the liberalization process was also taking place in the economy as a whole. Moreover, the employment trend in the industrial sector was arguably the opposite of the trend for the rest of the economy.

The second interpretation is that the relative wage has been increasing since 1981; it simply stalled between 1988 and 1992 before resuming its increasing trend, all in the context of an increasing relative supply of semiskilled labor. If that hypothesis of the relative behavior were true, then the Brazilian economy could have increased its demand for skilled labor even before the process of liberalization took place, and the supply of skilled labor may not respond to the higher relative price. Furthermore, the manufacturing sector's role in the increasing demand for skilled labor might be greater than the effect generated by the liberalization process and the reduction in input tariffs. Brazilian exports began growing well before the liberalization process.[6] Between 1980 and 1988, real exports grew at an average annual rate

3. The relative supply of semiskilled to unskilled workers has increased. Given that the relative supply of skilled to semiskilled has been relatively constant, the supply of skilled workers has also increased.

4. Fernandes and Menezes-Filho (2003), as cited in the paper.

5. Casual observation of the figure suggests that even a comparison of the averages from 1992 onward (after the process of liberalization was completed) with the averages prior to 1988 (before the start of the process) would not yield a statistically significant difference.

6. World Bank (2005).

of 5.9 percent.[7] The share of manufactures in total exports increased from 37 percent in 1980 to 52 percent in 1988 and then to 55 percent in 1998.

This scenario poses a big challenge for policymakers. According to Barro and Lee, the average years of education in Brazil was 4.56 in 2000.[8] Moreover, PREAL reports that of the countries that partook in the Program for International Studies Assessment (PISA), only Peruvian students performed worse than Brazilian students in standardized tests for reading, mathematics, and science.[9] Brazil thus seems to have an important deficit in basic and medium-level education.

To address this deficit, the Brazilian government spent the equivalent of 59.3 percent of the Brazilian GDP per capita on tertiary education per student in 2000, versus 11.0 percent per student on secondary education and 11.4 percent per student on primary education.[10] Government spending on tertiary education per student is thus 5.4 times more than on secondary education and 5.2 times more than on primary education. The equivalent ratios in Latin America are 2.5 and 3.0, while they are 1.2 and 1.6 in the member countries of the Organization for Economic Cooperation and Development (OECD). Given that Brazil's public expenditure on education as a percentage of GDP is relatively similar to those groups of countries, it is clearly not the case that the Brazilian government is not spending on higher education.[11]

If Barro and Lee are correct in estimating that Brazilians average just 4.56 years of schooling, then the average Brazilian worker is barely semiskilled, according to Giovannetti and Menezes-Filho's classification.[12] Moreover, the average years of secondary education is barely one (0.9). Given that the wage differential between semiskilled and unskilled workers did not change (see figure 2), it might be the case that firms do not differentiate between these categories. Moreover, the authors' results show no significant effects either in the employment composition of semiskilled and unskilled workers or in the wage bill.

Barro and Lee also show that while the average years of primary education and tertiary education grew around 60 percent each between 1990 and 2000,

7. The average annual growth rate from 1988 to 1998 was 3.2 percent.
8. Barro and Lee (2001).
9. PREAL (2006). The study also covers Argentina, Chile, and Mexico.
10. World Bank (2005).
11. Brazil spends 4.3 percent of GDP on education, compared with 4.3 percent in Latin America and 4.8 percent in the OECD.
12. Barro and Lee (2001).

the average years of secondary education only grew 30 percent.[13] Moreover, the IDB (2004) finds that the returns to secondary education fell between 1990 and 2000, and both the present paper and the IDB show that the unemployment rate for this group of people is high.[14] Consequently, even though the returns to tertiary education in Brazil are higher than anywhere else in Latin America (around 25 percent in 2000), this might not be the relevant return for individuals deciding whether to pursue education after finishing primary school. If they cannot finish secondary, or if they finish but cannot continue on to tertiary education, the risk-adjusted returns might not justify pursuing further education.

The challenge for policymakers may thus lie in secondary education. According to the World Bank figures cited earlier, the ratio of expenditure per student in secondary education to expenditure per student in primary education is 0.96 in Brazil, while the average is 1.18 for Latin America and 1.33 for OECD countries. These numbers suggest that secondary education is a lower priority in Brazil than in other countries.

This discussion illustrates how research—such as the study reported in this paper—opens the door to further research aimed at identifying the appropriate policy response. It is easy to conclude, based on the paper's results, that the government should make education a priority, but policymakers need to know more about the specific distortions in order to design the best policies to tackle them.

13. Barro and Lee (2001).
14. IDB (2004).

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