JANUARY 2009

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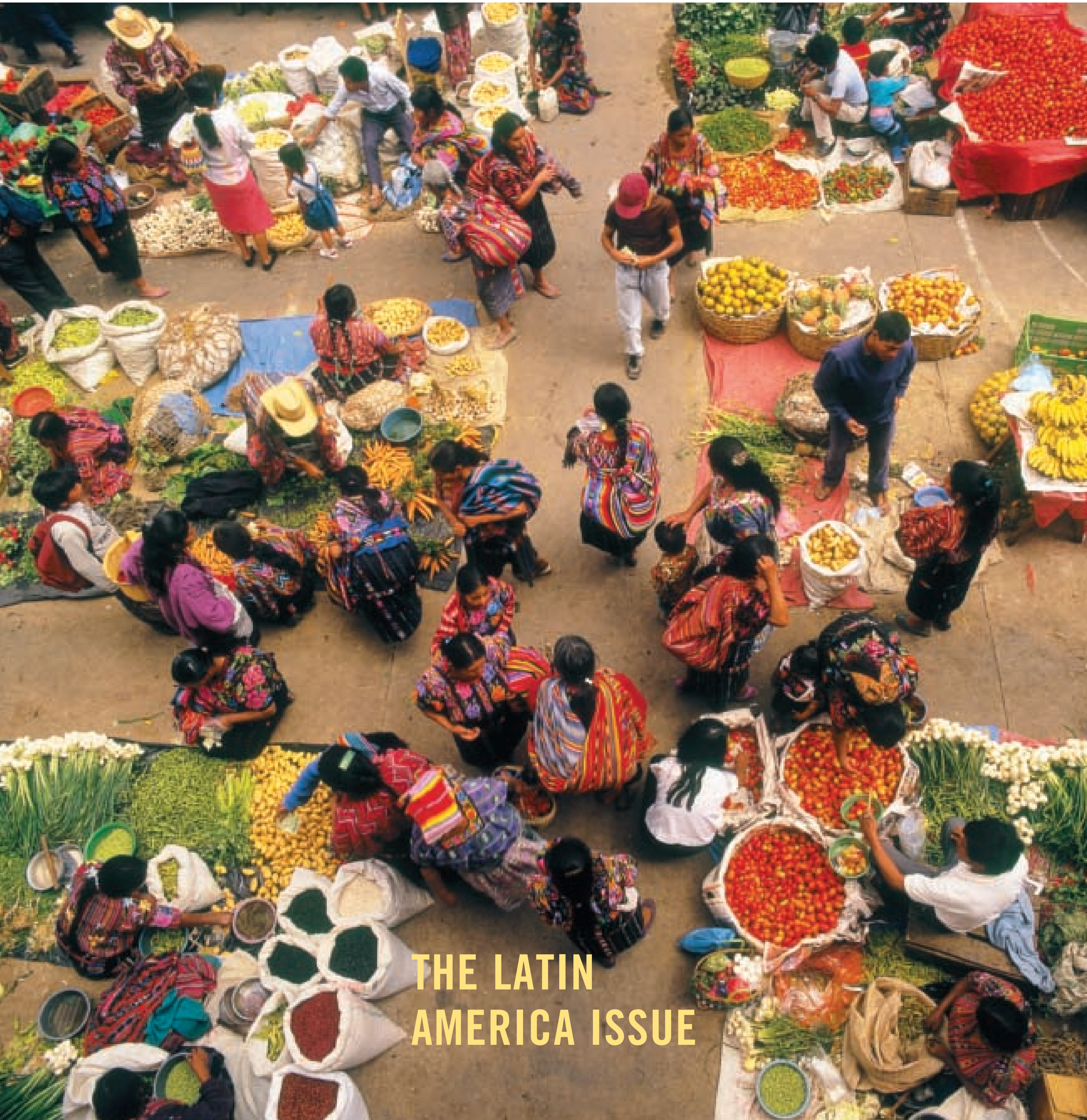


THE LATIN AMERICA ISSUE

FEATURES

INSIDE SIPA

QUALITY UPGRADING

A worker at VW's Puebla plant assembles one of the final editions of the original Beetle on July 11, 2003. The original Beetle went out of production in 2003 after being available for almost 70 years.

AND WAGE INEQUALITY IN MEXICO

By Eric Verhoogen

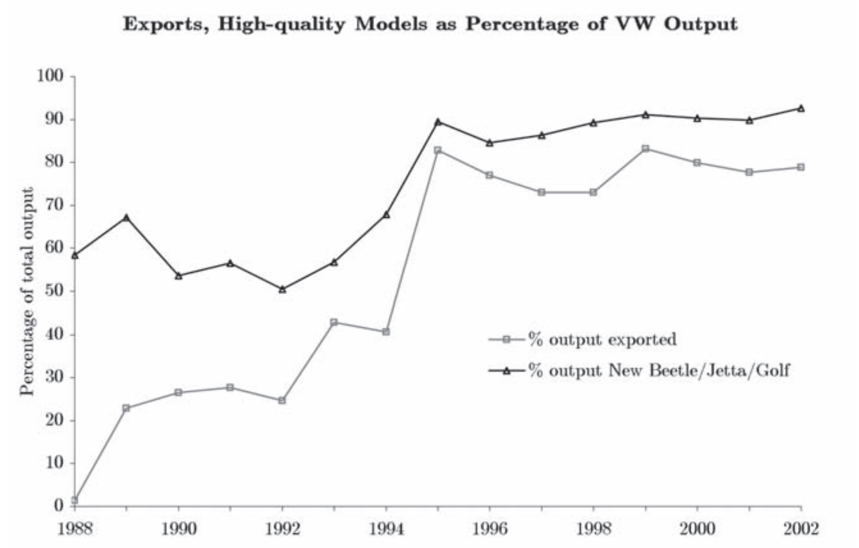
The wave of optimism about international integration that accompanied the signing of the North American Free Trade Agreement (NAFTA) in Mexico and other trade agreements across Latin America has been receding. In part, this disappointment derives from a widespread perception that international integration exacerbates income inequality and social polarization. In a recent review article in the *Journal of Economic Literature,* Penelopi Goldberg of Princeton and Nina Pavcnik of Dartmouth have found that this perception is based in fact: opening to trade has consistently been accompanied by rising income inequality in developing countries.[1]

The coincidence of expanding trade and rising wage inequality in developing countries fits awkwardly into economists' standard trade models. The simplest version of the most common model, called the Heckscher-Ohlin model, predicts that wage inequality will *fall* in poor countries that integrate with rich ones, as they specialize in producing goods that require a high proportion of low-skilled workers, thereby increasing demand for such workers. A common reaction among economists has been to argue that rising inequality is likely due to factors that have little to do with trade, like technological change. In a recent work, I have advanced an alternative hypothesis linking trade and wage inequality in developing countries through the product-quality decisions of manufacturing plants.[2] Let me explain the idea using the example of a particularly well-known plant, the Volkswagen plant in Puebla, Mexico.

The VW-Puebla plant was established in 1964, mainly to sell to the Mexican domestic market, which was largely closed to automobile imports. Over time, the company also started producing for export at the plant, and for many years the Puebla plant was the company's only plant in North America, with primary responsibility for the U.S. as well as the Mexican market. In the early 1990s, it produced the Jetta and the Golf, mainly for export, as well as the original Beetle, known in Mexico as the *Sedan* or, more affectionately, the *Vochito,* mainly for the domestic market. When the company introduced the New Beetle in 1998 aimed at the U.S. market, the Puebla plant became the sole world producer. There are marked differences in quality between the original Beetle and the newer exported models, the New Beetle and Jetta. The New Beetle and Jetta have automatic window-raising mechanisms; the windows of the original Beetle had to be cranked up by hand. The seats of the New Beetle and Jetta consist of polyurethane foam; the seats of the original Beetle were made partly of lower-quality foam and partly of coconut fibers, a cheaper substitute. The quality differences are reflected in the prices of the models: in July 2003, when production of the original Beetle ceased, the New Beetle and the Jetta were selling for approximately US$17,750 and US$15,000 in both countries; the original Beetle was selling for approximately US$7,500 in Mexico.

Perhaps the most remarkable feature of the plant, until production of the original Beetle was discontinued in 2003, was the juxtaposition of the production lines for the New Beetle and Jetta, which relied on state-of-the-art technology, and the production line for the original Beetle, which employed essentially the same technology that had been transplanted from Germany in 1964, technology that dated back to the 1950s. When I visited in May 2003, for instance, the conveyor belt in the welding area on the original Beetle line had been in continuous operation since 1967. The welding was done by hand, with sparks flying, and line-workers banged irregularities into shape with mallets. Under the same roof, perhaps twenty yards away, the welding for the Jetta body was performed entirely by robots. The only workers in the area (and then only occasionally) were engineers to program the robots and skilled maintenance workers to repair the machines in case of mechanical failure. The line-workers on the original Beetle were mainly in the category of *técnicos* (technicians), who had a starting wage of about $11 per day. The skilled maintenance workers on the Jetta and New Beetle lines were mainly classified as *especialistas* (specialists), with a starting wage of about $18 per day.

Now consider the effects of increased trade on product quality at the VW-Puebla plant. It is common in the trade economics literature to use changes in tariffs—for instance under NAFTA—to examine the effects of increased trade. But in my work I have mainly used the massive exchange rate devaluation of December 1994 and the ensuing recession—the peso crisis—because the enormity of the shock makes it easier to trace the effects. The accompanying figure illustrates the effect of the peso crisis on the mix of car models produced in the plant. Between 1994 and 1995, exports as a share of total production rose sharply, due both to a decline in domestic sales and to an increase in exported cars, which,



Notes: Output measured in physical units. Omitted model in upper curve is the Original Beetle. Data from Bulletins of the *Asociacion Mexicana de la Industria Automotriz* (Mexican Automobile Industry Association).

The coincidence of expanding trade and rising wage inequality in developing countries fits awkwardly into economists' standard trade models.

because of the decline in the real value of the peso, were relatively cheap to produce in dollar terms. Domestic production was mostly of original Beetles, and export production was mainly of Jettas and Golfs (and, later, New Beetles). So the increase in the export share also entailed a sharp increase in production of the higher-quality models as a share of output, a process I have referred to as *quality upgrading*.

This shift toward sales of higher-quality models also meant a greater reliance on more advanced technologies on the Jetta, Golf and New Beetle lines. Although I was not able to persuade the company to share detailed personnel data, it also appears from conversations with the former human resources director and the head of the union at the plant that demand for *especialistas* rose relative to *técnicos*, and demand for software engineers rose relative to less-specialized supervisors on the original Beetle line.

Generalizing from the VW example, it appears that this mechanism contributed to an overall increase in the demand for skill in Mexico, raising overall wage inequality. There was a second effect, which requires some explanation. Within each industry in Mexico, only the most modern, productive, technologically sophisticated plants, usually fewer than 20 percent of plants in an industry, are able to export profitably. These plants also tend to employ the most skilled people within occupational categories and to pay high wages relative to other plants in the industry. The peso crisis hit the solely domestic-oriented plants harder than the export-oriented plants, and wages fell more in the domestic-oriented plants, which already tended to be lower wage. This tended to increase the dispersion of wages in the manufacturing sector and to raise inequality overall.

So is increased international integration a good thing? The verdict is mixed. On the one hand, quality upgrading may boost the rate of learning and improve productivity while generating good jobs. On the other hand, it may increase inequality, which in turn, strains the social fabric. There are relative winners and losers from trade liberalization—different from the ones suggested by economists' traditional trade models. Many of the poorest and least skilled in developing countries view globalization with pessimism. This research suggests that their concerns may make economic sense after all.

1. See Goldberg and Pavcnik (2007).

2. See Verhoogen (2008).

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Eric Verhoogen is assistant professor of International and Public Affairs and of Economics at Columbia University's School of International and Public Affairs.