

Trade and Labor-Market Outcomes: What About Developing Countries?

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1 Introduction

This paper addresses the labor-market impacts of trade and foreign direct investment (FDI) liberalization in developing countries. The central message is that many developing countries have recently seen income inequality *rise*, not fall, subsequent to trade and FDI liberalization. These inequality increases contradict the benchmark Heckscher-Ohlin (HO) intuition commonly applied to developing-country liberalization. The paper discusses several ideas this benchmark intuition misses, ideas which both can explain inequality increases in theory and do seem to have empirical support in the data. The clear policy message is that developing-country policymakers should not regard liberalization as a sure-fire poverty-reduction program—of course, with the caveat that rising inequality can coexist with declines in absolute poverty. And the clear research message is that there remains ample opportunity for interesting empirical work in this area—as the papers for this conference demonstrate.

2. Empirical Evidence on Liberalization and Developing-Country Income Distribution

It is by now quite well known that income inequality—in particular, the skill premium—has risen to varying degrees in the United States and many other OECD countries (for a survey of the OECD data see, e.g., Gottschalk and Smeeding, 1997). Figure 1 shows the rising U.S. skill premium. It shows for U.S. manufacturing the average annual wage of a nonproduction worker to the average annual wage of a production worker. This “skill premium” generally declined for decades before the late 1970s—in this figure, starting with 1958 but since about 1979 it has risen sharply—in this figure, by about 15%. This rise in the U.S. skill premium rise has been going on since the late 1970s across all skill measures such as education, experience, and job classification. For example, in 1979 male college-educated workers earned on average 30% more than male high-school-educated workers. By 1995 this premium for college-educated workers had risen to about 70%. Looking at the overall wage distribution reveals a similar picture of rising inequality. Both the 90/50 and the 50/10 earnings ratios for males were flat or declining from 1967 until about 1979, but then rose steadily from 1979 through 1995.¹

¹ These basic facts on relative earnings come from the 1997 and 2000 *Economic Report of the President*, each of which devotes substantial space to labor markets and inequality. Inequality has risen across education, experience and occupational groups as well as within these groups. The exact timing and magnitude of the changes vary somewhat with the measures used, but all standard measures show dramatic changes. For additional discussion see Blanchflower and Slaughter (1999).

A by-now very large academic literature has examined the causes of rising skill premia in the United States and other OECD countries. A key question in this research is what role has liberalization of trade and/or FDI played in these wage changes. A range of answers to this question has been produced, but the majority of studies have assigned a relatively small role to trade and FDI (for a survey of trade studies see Slaughter, 2000a; for the role in U.S. wages played by outward and inward FDI, respectively, see Slaughter, 2000b, and Blonigen and Slaughter, 2000).

This subsection briefly surveys the wage impacts of *developing-country* trade and/or FDI liberalizations. Some studies explicitly link trade and FDI liberalizations with inequality, others examine broader liberalizations and inequality, and still others examine inequality without explicit links to liberalizations. Obviously, there is a range of outcomes, but the main message is that in many developing countries trade and FDI liberalizations have been followed by *rises*, not declines, in income inequality.

These studies should be interpreted with two important caveats. First, income inequality can be affected by many factors other than trade liberalization, e.g., technological change and labor-market institutions. Many of these studies do not control for these other non-trade forces, so any inferences about liberalization's role should be made with caution. I will address some of these other forces in the analysis below. Second, what patterns of inequality imply about absolute poverty is *a priori* unclear: absolute poverty could be spreading or declining along with rising inequality. It is important to distinguish the relative from real income performance of the poor.

Choksi, Michaely, and Papageorgiu (1991) and Michaely, Papageorgiu, and Choksi (1991) summarize a 19-country World Bank study of developing-country trade liberalizations. They document a range of inequality outcomes: "What does the evidence show? Unfortunately, it is mixed and fragmentary. In some cases the income distribution worsened during the course of liberalization. In roughly as many others ... the reforms improved the income distribution. But in most cases it is hard to be sure" (p. 55).

Robbins (1995) uses household-survey data to examine wage changes across skill groups in nine developing countries, five of which had trade liberalizations: Argentina, Chile, Costa Rica, Mexico, and Uruguay (the other four are Columbia, Malaysia, Philippines, and Taiwan). Robbins claims that in none of the cases was liberalization followed by declining returns to skill. Moreover, Robbins infers

economy-wide shifts in relative labor demand from wage and labor-supply data; he claims that post-liberalization relative labor demand shifted towards, not away from, more-skilled workers in all cases but Argentina.

Robbins's results should be interpreted cautiously. This study has received a lot of attention as "clear evidence" that developing-country liberalizations raise wage inequality, but the actual analysis is rather unclear. Post-liberalization wages are discussed (p. 29) but never actually presented for the reader's inspection; and the calculated labor-demand shifts are generated from a framework which presumes a single aggregate output sector, in complete contradiction with the multi-sector HO trade framework upon which Robbins explicitly bases his analysis.²

That said, Robbins's conclusion that trade liberalization was not followed by declining skill premia does look correct. I checked this using the income-inequality data set of Deininger and Squire (1996), a panel of country-year observations on Gini coefficients of national-income distribution. Matching Robbins's reported dates of trade liberalization with the Deininger and Squire data (as best I could) generated the following. Argentina liberalized 1976 to 1982 and again 1989 to 1993; its Gini rose from 36.00 in 1975 to 42.00 in 1981 and 47.59 in 1989. Chile liberalized 1975 to 1979; its Gini rose from 46.00 in 1971 to 53.21 in 1980. Costa Rica liberalized from 1987 to 1993; its Gini rose 42.00 in 1986 to 46.07 in 1989. Mexico liberalized from 1985 to 1988; its Gini rose from 50.58 in 1984 to 54.98 in 1989. Of course, these patterns of rising income inequality need not reflect rising skill premia, as returns to skill are only one dimension of overall inequality. But for at least one country, Mexico, it has been documented that the skill premium did begin rising sharply the year of liberalization, after 20 years of steady declines (Feenstra and Hanson, 1997; Hanson and Harrison, 1999). So overall, the Deininger and Squire data suggest that Robbins's main message is correct.

Wood (1997) re-reports many of Robbins's findings for Latin America, which he then contrasts with trade liberalizations in Hong Kong, Singapore South Korea, and Taiwan. Unlike the Latin

² Robbins' calculation replicates similar calculations from Katz and Murphy (1992) and Johnson (1997). The intuition of this calculation is as follows: under the assumption that observed wage trends reflect shifts in downward-sloping national relative labor supply and demand, shifts in relative labor demand can be inferred from data on relative wages, relative labor supply, and an assumed value for the aggregate elasticity of substitution between more-skilled and less-skilled labor (usually assumed to be about 1.4). As Slaughter (1999) discusses, this analysis is inconsistent with the HO trade model, for in this model the existence of multiple output sectors of differing factor intensity allow the national labor-demand schedule to be *infinitely* elastic over broad ranges of labor supply. With infinitely-elastic labor demand, calculations which instead assume downward-sloping labor demand are not appropriate.

American countries, these Southeast Asian countries generally saw falling skill premia following trade liberalizations: South Korea and Taiwan in the 1960s, and Singapore in the 1970s. The exception is Hong Kong in the 1950s, where inequality rose.

Currie and Harrison (1997) document deep trade liberalization in Morocco from 1984-1990. Their analysis of this episode doesn't address wage inequality, but the Deininger and Squire data indicate that Morocco's Gini was flat amidst liberalization: 39.19 in 1984, 39.20 in 1991.

Over the 1990s many formerly communist countries implemented extensive market reforms, of which trade and FDI liberalization have been an important part. Here, too, higher wage inequality tended to follow reforms--although reforms beyond trade and FDI may have been predominant factors (e.g., removing labor-market institutions compressing pay differentials). Using household-survey data, Brainerd (1998) reports that overall wage inequality in Russia doubled from just 1991 to 1994, reaching a higher level than that of the United States. Both returns to skill and residual inequality rose sharply. Jin, Sachs, and Warner (1996) document rising inequality across geographic regions in China. Following the pro-market reforms started in 1978, Chinese coastal regions—which have received much more inward FDI and have much more exporting activities—have grown much faster than inland regions. Since 1990, this faster coastal growth has implied large increases in regional inequality. As for Chinese inequality overall, Benjamin, Brandt, Glewwe, and Li (1999) report steadily rising Ginis from 1978 forward. And Szekely and Hilgert (1999) report sharp rises in Ginis post-reform in Hungary (1991 to 1994) and Poland (1992 to 1995).

Finally, rising inequality appears to be widespread elsewhere in the world as well. Szekely and Hilgert (1999) examine Latin America's income distribution over the 1990s. Using household surveys from nine countries—Brazil, Chile, Costa Rica, Honduras, Mexico, Panama, Peru, Uruguay, and Venezuela—they find no case of significantly declining inequality. Instead, all countries but Costa Rica and Mexico had statistically significant increases in their Ginis, with sharpest rises in Honduras, Peru, and Venezuela. Szekely and Hilgert do not link inequality with liberalizations, but they note that their data follow the 1980s, when most of these “economies started an intense transformation process through trade, financial, and fiscal liberalization” (p. 3).

As for Africa, I know of no study examining trends in inequality (Freeman and Lindauer, 1999, document intra-Africa differences in inequality levels). In the Deininger and Squire (1996) data, I find both increases and decreases in inequality. Increases include Uganda (1989 to 1992) and Zambia (1976 to 1996); decreases include Tanzania (1977 to 1993) and Ghana (1988 to 1992). Asia displays a similar mix, with increases for India (1970 to 1992 and, more recently, in the 1990s amidst widespread liberalizations) and New Zealand (1973 to 1990) and decreases for Indonesia (1980 to 1993) and Malaysia (1970 to 1989).

To summarize this subsection, there is clearly a range of inequality outcomes in countries in recent decades. But in a large number of cases, trade and FDI liberalization were followed by rises in income inequality, in particular inequality across skill groups.

3. Theory: Why Might Developing-Country Liberalization Raise Income Inequality?

Is the fact of rising developing-country inequality surprising? Relative to the baseline two-country, two-factor, two-good HO model most economists first bring to this issue, yes.

In this framework where factors move costlessly across sectors to earn the same return in all sectors, factor incomes tend to vary by factor type. Trade liberalization which changes domestic relative product prices changes domestic relative (and possibly real) factor prices according to the Stolper-Samuelson theorem: returns tend to rise (fall) for the factors employed relatively intensively in the sectors whose relative product price rises (falls). In this model it is usually assumed that protection is received by sectors which use relatively intensively the factors with which the country is poorly endowed relative to the rest of the world; then in opening from autarky to free trade these factors suffer income declines. In contrast, the factors with which the country is relatively well endowed relative to the rest of the world enjoy income gains.

Now, apply this logic to real-world cases of developing countries. Developing countries are assumed to be well endowed with less-skilled labor relative to developed countries, so they are expected to have a comparative disadvantage in and trade protection for the skill-intensive sectors. Trade liberalization should then lower the skill premium in developing countries by lowering the domestic relative price of the skill-intensive good.

But the previous subsection showed this prediction is very often not borne out in the data: skill premia often rise, not fall, in developing countries after liberalization. What can account for this? To work through some possibilities, it helps to summarize the Stolper-Samuelson intuition with a line of algebra. Suppose a developing country produces I different tradable goods, each of which requires some combination of J primary factors and I intermediate inputs. Then for each sector i , one can write the “zero profit” condition as

$$p_i^G = \sum_{j \in J} a_{ji} w_j + \sum_{i \in I} b_{ii} p_i^G \quad i = 1 \dots I \quad (1)$$

where p_i^G is the domestic gross-output price in sector i ; w_j is the unit cost of the j th factor (common across all sectors i); a_{ji} is the employment of factor j per unit of output in sector I , (which depends on production technology and, assuming technology is not Leontief, factor prices); and b_{ii} is the amount of intermediate input hired per unit of good I (which depends on production technology and, assuming technology is not Leontief, input prices). Equation (1) has I equations, one for each sector, each of which says price just covers cost in equilibrium.

The Stolper-Samuelson logic is readily apparent in (1). Domestic product prices p_i^G depend on both domestic trade barriers and world product prices. Given technology, trade liberalization changes domestic product prices, which in turn changes domestic factor prices w_j . Each country has its own set of zero-profit conditions relating that country’s domestic product prices and production technology to its factor prices; across countries, factor prices w_j differ based on differences in production technology and/or trade barriers. In the baseline HO framework just discussed, (1) contains just two equations for the two sectors, and just two factors of production.

In this baseline framework, one obvious explanation for rising inequality post-liberalization is that developing countries protect the *unskill-intensive* of the two goods, not the skill-intensive good. There are at least two stories for why this happens.

One story requires more than two countries, more than two products, and “sufficiently dissimilar” endowments across all the countries. Here, a country which is unskill-abundant in a “global” sense can still experience wage-inequality increases from freer trade if that country is skill-abundant in a “local” sense. Davis (1996) shows how this can work. There may be a sufficiently wide range of endowments across countries that different countries make different products—i.e., countries are in different “cones,”

with the set of sectors I in (1) different across countries. This introduces the possibility that developing countries, even if they all produce a common set of I sectors different from the sectors made in developed countries, will have different comparative advantages and thus patterns of protection based on whether they are unskill-abundant not just globally—i.e., relative to developed countries—but locally—i.e., relative to other developing countries—as well. A “middle” developing country which is unskill-abundant relative to developed countries but skill-abundant relative to other developing countries can have a comparative-disadvantage in and thus protection for the *unskill*-intensive sector, not the skill-intensive sector. For this middle country, trade liberalization raises its skill premium by lowering its domestic relative price of the unskill-intensive good. Countries which are unskill-abundant both globally and locally protect the skill-intensive sector, as in the baseline model.

A second story for why unskill-intensive countries protect unskill-intensive sectors is simply political economy. For example, if tariffs are set by majority vote, then in unskill-abundant countries, trade policy may protect unskill-intensive industries. By relaxing the baseline HO assumption linking endowments with protection patterns, this story allows political-economy issues to set protection, such that in (1) trade barriers shift p_i^G in different ways.

Empirically, there are at least two clear cases of developing countries protecting their unskill-intensive sectors. Hanson and Harrison (1999, p. 280) document that in Mexico “skill-intensive sectors were less protected and consequently had smaller reductions in tariff levels.” Currie and Harrison (1997) find a similar pattern in Morocco, where “protection was significantly higher in sectors with a higher share of unskilled workers, such as textiles and clothing.”

What these two studies do not examine is whether these protection patterns come from the multi-cone story or from political-economy considerations. Distinguishing these stories would require data on world endowments, world production patterns, and country-specific trade-policy institutions. Either way, future research would benefit from examining the cross-industry protection pattern in other developing-country liberalizers like Argentina and Chile. This would help gauge whether Mexico and Morocco are more the exception or the rule.³

³ Haskel and Slaughter (2000) document that in the 1970s and 1980s the highest U.S. tariffs and transportation costs were in the unskill-intensive sectors, and that the deepest declines in these barriers over these decades were in these unskill-intensive sectors.

Figure 2, from Leamer (1998) offers suggestive evidence that the multi-cone story matters. This diagram shows the “world wage pool” in 1989, by plotting for many countries average manufacturing wages against population. The vertical axis shows each country’s wage level in real 1989 U.S. dollars; the horizontal axis shows each country’s total population. Figure 2 clearly shows dramatic differences: the world has some relatively small, high-wage countries like the United States and Canada (highlighted in black) along with many relatively large, low-wage countries (such as China). But there are many “middle-wage” countries, too: including Mexico, highlighted in black. These cross-country differences in wages can arise from many forces, but Leamer (1984) and others have documented an important force to be cross-country differences in relative labor supplies. Figure 2 suggests world relative labor endowments are much more finely distributed than the simple skill-abundant/unskill-abundant dichotomy. Countries like Mexico may very well be globally unskill abundant yet locally skill abundant, whereas others like China may be unskill abundant both globally and locally.

A second explanation for rising inequality in developing countries post-liberalization is that liberalization introduces new skill-intensive activities into developing countries. In the context of (1), this explanation emphasizes the introduction of new, skill-intensive sectors into production, a shift which tends to raise the economy-wide skill premium. Feenstra and Hanson (1997) model this process in a framework with a continuum of products. With this continuum of sectors—or, as they model it, of activities within each sector—trade or FDI liberalization induces the “marginal” activities worldwide to shift from developed to developing countries. This raises wage inequality in all countries (the intuition is the same as in the old saw that when the MIT professor moved to Harvard, the average IQ rose at both institutions).

Feenstra and Hanson (1997) offer evidence that this marginal-activity shifting helped raise Mexican wage inequality, as liberalization induced larger FDI inflows from the United States. They find that Mexico’s relative demand for skilled workers *within industries* in manufacturing rose along with FDI inflows into those industries (they look within industries, arguing that the HO intuition of different productive activities shows up empirically within industries rather than across them because industry classifications are too aggregated relative to the theory). Figure 3 visualizes this evidence for the

economy overall. It shows maquiladora activity in Mexico, measured as employment and also number of establishments. Maquiladora activity rose dramatically as Mexico's liberalizations began in 1985.

A third explanation for rising inequality in developing countries post-liberalization is that liberalization forces greater product-market competition on domestic firms. This explanation modifies the benchmark HO framework in (1) by allowing firms to have some product-market power which yields profits above cost—i.e., prices p_i^G above average production costs. Here, the tight link from product prices to factor prices is loosened, as product-price changes can now be absorbed in profit margins. The wage impacts of liberalization now depend crucially on the nature of product-market competition, and it is possible that liberalization which reduces the relative price of skill-intensive products could have no or even perverse wage-inequality effects.

Currie and Harrison (1997) argue that this pro-competitive effect of liberalization mattered in Morocco. “Our results suggest that many firms ... responded to reforms by cutting profit margins ... This suggests another, less painful mode of adjustment: firms with excess profits could absorb the shock, leaving the labor force unaffected.”

A final explanation for rising inequality in developing countries post-liberalization is that liberalization induces technological change in these countries. This explanation modifies the benchmark HO framework in (1) by allowing the production-technique coefficients a_{ji} to fall (assuming technology improvement) as liberalization also alters prices p_i^G . Here the tight link from changes in product prices to changes in factor prices is loosened because now technology changes must also be accounted for. Even if liberalization lowers the domestic price of skill-intensive sectors, if liberalization induces sufficient innovation in these sectors such that their profitability relative to unskill-intensive sectors rises, then wage inequality rises, not falls, by the Stolper-Samuelson mechanism of cross-industry shifts in factor demands.

Many researchers including Bloom (1996), Wood (1997), Feenstra and Hanson (1997), and others have argued that this liberalization-technology link may matter a lot. For example, Feenstra and Hanson (1997) argue that inward FDI can be an important mode of international technology transfer, and they show how this technology transfer can affect wages as does FDI in their model. Many other researchers have argued that exports and imports transfer technology across countries; others have

argued that greater product-market competition spurs innovation in firms. That said, it has proven difficult to find clear empirical support for this liberalization-technology link in developing countries or developed-countries like the United States, too.

To conclude: there are a number of explanations for why trade and FDI liberalization in developing countries can trigger rises, not falls, in wage inequality. And all but the trade-technology explanation have clear empirical support for at least some countries. These explanations could guide future research to understand, e.g., why many Latin American countries have experienced rising inequality but many Southeast Asian countries the opposite.

4. *Conclusions*

This paper has addressed the labor-market impacts of trade and FDI liberalization in developing countries. The central message here is that many developing countries have recently seen income inequality *rise*, not fall, subsequent to trade and FDI liberalization. These inequality increases contradict the benchmark intuition commonly applied to this issue. But they are consistent with richer intuition involving ideas like non-trivial endowment differences among developing countries; political-economy forces leading to “unexpected” patterns of trade protection; the introduction of new skill-intensive activities; heightened product-market competition; and openness-induced technology innovations.

The clear policy implication of this is that developing countries should *not* regard trade and FDI liberalization as a sure-fire poverty-reduction program. Liberalization may worsen the relative and/or real-wage performance of less-skilled workers, and thus place greater strains on social insurance. Again, it must be stressed that greater inequality need not mean greater absolute poverty for the low-income groups.

The clear research message is that lots of interesting empirical work remains to be done!

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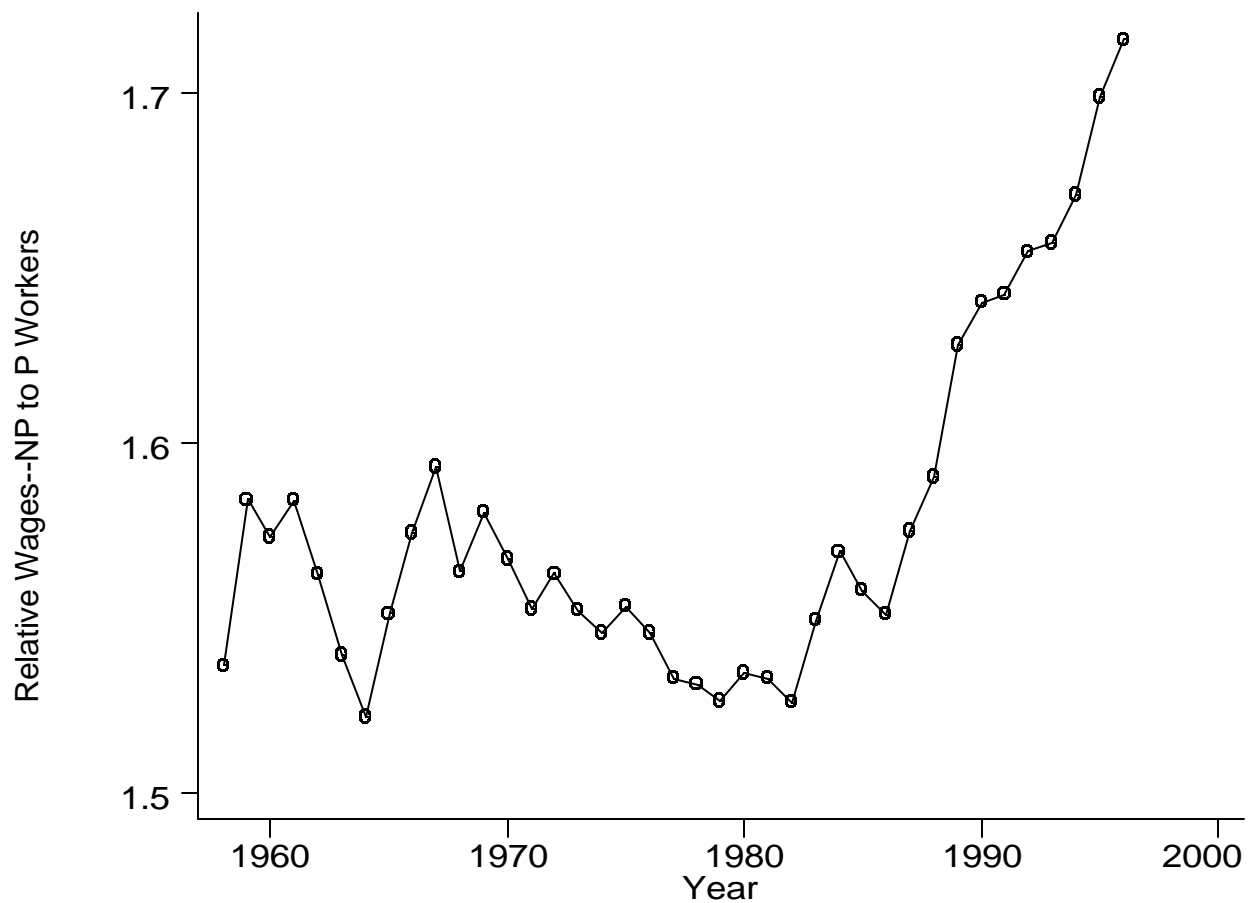
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Figure 1: The Rising U.S. Skill Premium

Wage Inequality in U.S. Manufacturing, 1958-1996

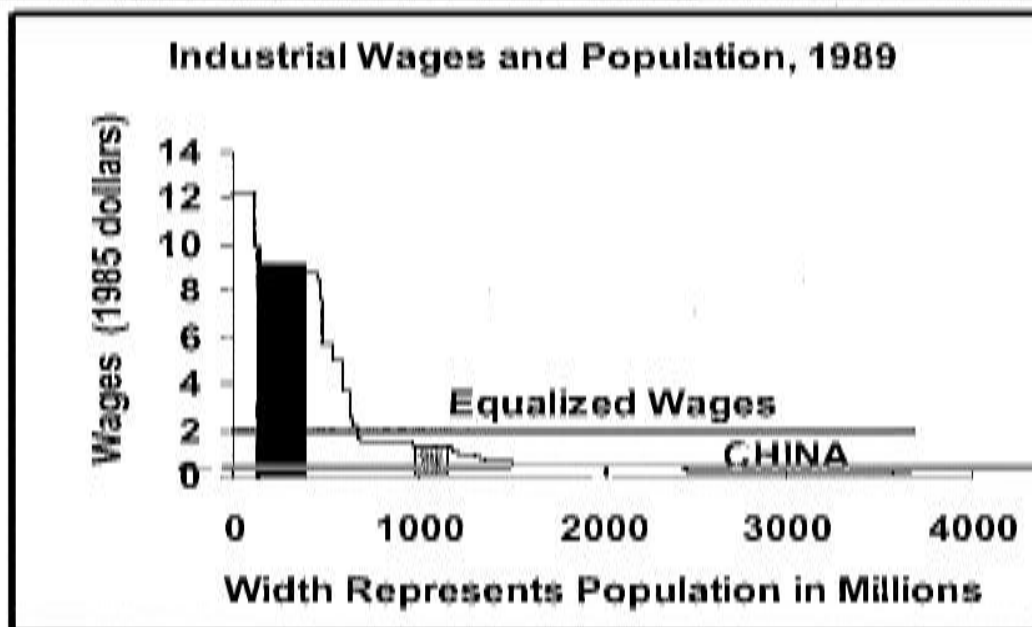


Notes: Skill premium is measured as the ratio of average annual wages of non-production workers to average annual wages of production workers in U.S. manufacturing.

Source: National Bureau of Economic Research Manufacturing Productivity Database.

Figure 2

The Global Labor Pool Has a Shallow End



Source: Leamer (1998).

Figure 3

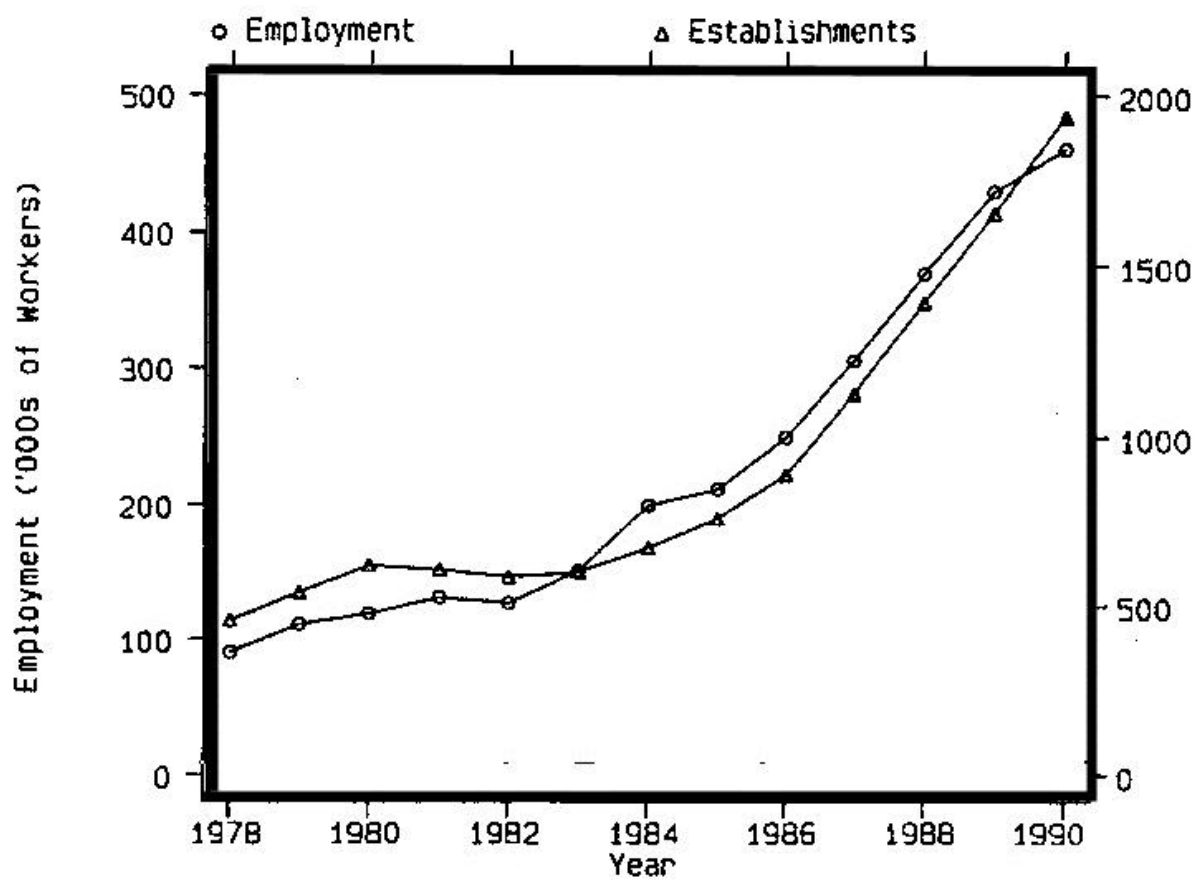


Figure 5: Maquiladora Activity in Mexico

Source: Feenstra and Hanson (1997).