Why Haven't Global Markets Reduced Inequality in Emerging Economies?

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The theory of comparative advantage predicts that globalization should cause inequality in emerging economies to fall. However, this has not been true of the current globalization (even though the prediction held up well for previous such episodes). In this paper, I sketch an alternative theory—developed in collaboration with Michael Kremer—that seems to fit recent history well. JEL codes: D33, E25, F16, F63, O15

The world has witnessed an enormous growth in global markets in the last twenty years or so. Specifically, there has been a sharp upswing in the exchange of goods and services across international borders. There has also been much more *production* of goods and services across international borders, e.g., design of a product in one country and its assembly in another (and international production will be especially important in my discussion below). The reasons for increased globalization include declines in transport costs and removals of trade barriers (as in the enactment of the North American Free Trade Agreement). But below, I will particularly emphasize falling *communication* costs as a major driver of the globalization process.

Proponents of globalization have made many promises on its behalf. In particular, they have predicted that it would bring prosperity to emerging economies. And, on that score, they have often delivered on their promise. In China and India, for example, GDP per capita (a crude but common measure of prosperity) has grown dramatically, thanks to global markets. Many other developing economies have also come a long way, if not quite so spectacularly. However, another promise made about globalization was that it would reduce income inequality (specifically, wage inequality) – the gap between the haves and have nots – in poor countries. Yet, in many such countries, wage inequality has actually increased—and, once again, China and India are leading examples.

There has been a great deal in the press and other media about inequality recently. Most of the attention, however, has focused on inequality in *rich*

countries, for example, stories about the "1% vs the 99%" in the United States. My concern here, however, is with inequality in *poor* countries.

One might ask, of course, why we should care about inequality there (although I suspect that most readers of World Bank publications are already persuaded on that point). But there are, I think, at least three good answers. The first is an egalitarian argument: we believe that all people deserve equal treatment, and so huge disparities in wages offend our egalitarian impulses (at least, the impulses of many of us). Second, even if one doesn't accept this point of view, one might care about eradicating poverty. Yet eliminating poverty is closely connected to inequality, since—in poor countries—antipoverty measures are often anti-inequality measures. Third, even if poverty elimination is not deemed a compelling motive, one might nevertheless care about inequality for a more practical reason: there is a well-established correlation between inequality and social and political instability. So, simply for the state of keeping the social fabric together, reducing inequality may emerge as a serious policy goal.

Next, we should ask whether the rise of inequality in so many poor countries is surprising. But if we accept the theory of comparative advantage, then the answer is clearly *yes*—because the trend clearly contradicts this venerable theory. Comparative advantage goes back more than two hundred years to David Ricardo. It is, by far, the most important tool for understanding international trade patterns, and historically it has been enormously successful. Indeed, in all previous globalizations (and there have been plenty of previous globalizations), its prediction was right on the money, implying that freeing up trade should *reduce* inequality in emerging economies. Because of the theory's importance and success, therefore, let me explain why it draws the implication of declining inequality.

In its formulation by Heckscher and Ohlin, comparative advantage theory asserts that the important difference between countries—from the standpoint of international trade—lies in their relative endowments of the factors of production, that is, the inputs to production. Because my concern is with wage inequality, I shall concentrate on *labor* factors. Specifically, let's suppose that there is *high-skill* labor and *low-skill* labor.

I will compare a rich economy with a poor country. In the rich country, the ratio of high-skill to low-skill workers is higher—that's, after all, what makes the rich country richer. This means that the rich country has a comparative advantage in producing goods requiring a high proportion of high-skill workers, for example, computer software. The emerging economy, by contrast, has a comparative advantage in producing goods for which skill doesn't matter as much. Many agricultural goods fall into this category; let's take the example of rice.

To see the effect of globalization on production, we will look at production patterns (i) *before* globalization, that is, *before* trade between the rich and poor country becomes possible, and (ii) *after* globalization—*after* free trade between the two countries is introduced. The difference between (i) and (ii) can be attributed to globalization.

Notice that, before trade is opened, both software and rice must each be produced in both countries—because consumers in both countries demand both goods. But there's a sense in which producing software in the poor country is inefficient; the country's labor force—with its relative abundance of low-skill workers—is better suited to rice. Indeed, low-skill workers in the emerging economy are "hurt" by that country's software production. They are not much needed for software but greatly needed for rice. Thus, to the extent that production is diverted from rice to software, demand for low-skill labor is suppressed and low-skill wages are likely to be especially low. By contrast, high-skill workers in the poor country benefit from the diversion to software and will enjoy especially high wages.

Now let's see what happens when the door to trade between the rich and poor country is opened. The poor country will shift production from software to rice (which is more efficient for the country to produce) and import its software from the rich country (the rich country will do just the opposite: shift production to software and import rice).

So, the poor country now produces more rice and less software than before. This raises the demand for low-skill workers—since rice uses low-skill workers more intensively than does software—and therefore the low-skill wage. Correspondingly, demand for high-skill labor falls and so do high-skill wages. Thus, inequality in the poor country is reduced as a consequence of globalization.

The foregoing is the standard story for why globalization should abate inequality in emerging economies. Moreover, the story works well empirically when applied to previous globalizations. For example, in the second half of the nineteenth century, Europe had a relative abundance of low-skill labor, whereas the United States was better endowed with high-skill labor. Partly because of a notable decline in trans-Atlantic shipping costs, trade between the United States and Europe rose dramatically in that period. And—just as the theory predicted—inequality fell substantially in Europe.

But as I noted, comparative advantage has been less successful for the recent globalization. One of its predictions is that the greater is the difference in skill ratios between two countries, the more those countries will trade with each other because the greater will be the gains from exchange. But, in reality, the current globalization has engendered little trade between rich industrialized nations (e.g., the US) and the very poorest countries of the world (e.g., Malawi). More importantly, the predicted decline in poor countries' income inequality has, by and large, not materialized.

Motivated by the predictive failure of comparative advantage, Michael Kremer and I have developed an alternative theory. We posit that what distinguishes the current globalization from its predecessors has been the internationalization of the *production process*—the fact that, for example, computers are now often designed in the United States, programmed in Europe, and assembled in China. We argue that the reality that a Chinese worker can today be employed by a company on the opposite side of the world—a reality made possible by

dramatically lower communication costs—means the labor market is now truly global.

To capture a global labor market, we need more than two skill levels. For my purposes in this expository paper, I will suppose that there are four levels, but the full model can accommodate many more than that. As with the comparative advantage model, there are two countries: one rich, one poor. To simplify, I will suppose that the rich country has workers of skill levels A and B and the poor country has workers of skill level C and D, where $A > B > C > D$ (but the argument still holds if $C > B$).

In the Kremer-Maskin model, wages depend on how workers of different skill levels are "matched" together to produce output. The production process consists of two tasks: a "managerial" task (which is highly sensitive to skill), and a "subordinate" task (which is less skill sensitive). Output is produced by matching a manager with a subordinate, and the quantity yielded depends on the skill levels of those workers. To be concrete, let us suppose that

$$\text{Output} = M^2 S,$$

where M is the skill level of the manager and S the skill level of the subordinate (the fact that M is *squared*—this particular value of the exponent is unimportant—reflects the sensitivity of output to managerial skill). So, for instance, if $M = 4$ and $S = 3$, output will be $4^2 \times 3 = 48$.

We assume that there are many producers competing to hire managers and subordinates, in other words, that the labor market is competitive. This ensures that workers are paid according to their productivity and that matching is efficient (i.e., that it leads to maximum output). In fact, the particular matching pattern that arises will depend on the distribution of skills.

To see this, assume first that there is a population consisting of two 3-workers (workers of skill level 3) and two 4-workers. In principle, there are two ways the workers could be matched: we could either have each 3-worker matched with a 4-worker (the former would be the subordinate, the latter would be the manager) resulting in total output of $2 \times (4^2 \times 3) = 96$ (call this "cross-matching") or (ii) have the two 3-workers matched together and the two 4-workers matched together ("own-matching"), for a total output of $4^2 \times 4 + 3^2 \times 3 = 91$. But since 96 is bigger than 91, competition ensures that cross-matching will occur in equilibrium. Yet, now suppose instead that there are two 2-workers (instead of 3-workers) as well as the two 4-workers. Notice that for these revised numbers, own-matching, leads to higher output—$(4^2 \times 4) + (2^2 \times 2) = 72$ versus $2 \times (4^2 \times 2) = 64$—and now *it* becomes the matching pattern in equilibrium.

The two examples illustrate two (conflicting) forces. First, because the two tasks (managerial and subordinate) are differentially sensitive to skill, there is a tendency to cross-match: to put a higher-skill worker in the managerial position and a lower-skill worker in the subordinate position. But, because the two tasks

are complementary, the market gravitates toward *own-matching* if skill levels are *too* different: it would be a waste to match a very high-skill manager with a very low-skill subordinate. The matching pattern that actually arises in equilibrium will strike a balance between these two forces and so will depend on the available distribution of skills.

Let's apply this logic to our two countries. For concreteness, we'll suppose that $A = 13$, $B = 8$, $C = 6$, and $D = 4$ with equal numbers of all types, but the same qualitative conclusions will hold for a broad range of other numerical values.

Before globalization—that is, before international production becomes possible—the equilibrium matching pattern entails A-workers matching with B-workers in the rich county and C-workers matching with D-workers in the poor country. However, post-globalization—once international production is feasible—C-workers will be matched with B-workers and D-workers (and A-workers) will be own-matched.

The important feature here is that although D-workers may be matched with C-workers pre-globalization, their skill isn't high enough to match with B- or A-workers post-globalization. Thus C-workers will see their wages rise with globalization, thanks to their new matching opportunity with B-workers. But D-workers will experience stagnant or perhaps even falling wages. And the overall effect of the internationalization of production will be to amplify the gap between C- and D-workers, that is, to increase inequality in the poor country. If this theory is right, then there is a clear policy corrective, viz., to raise the skill level of D-workers (through job training or education) so that they have international matching opportunities too. The obstacle to such training, however, is that it is costly. And so the question arises: who is going to pay for it?

Clearly, the workers can't carry the cost themselves—at least not much of it—because these are some of poorest people in the world. Moreover, employers may not have the incentive to fully pay for the training because once a worker's productivity is enhanced, he will command a higher wage—and so some of his employer's investment will be lost. Indeed, if he goes to work for his company's competition (as he is presumably free to do), the investment in him will be lost altogether.

This leaves a significant role for investment by third parties: domestic government, international agencies, NGOs, foreign governments, and even private foundations. Indeed, the message from the theory is not to stop globalization (indeed, even if stopping it were possible, doing so would interfere with the very substantial gains in GDP per capita it has brought). Rather, the most effective remedy for inequality is to give low-skill workers the opportunity to share in globalization's fruits too.