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Globalization, Poverty, and All That
Factor Endowment versus Productivity Views

William Easterly

That globalization causes poverty is a staple of antiglobalization rhetoric. The Nobel Prize winner Dario Fo compared the impoverishment of globalization to the events of September 11, 2001: "The great speculators wallow in an economy that every year kills tens of millions of people with poverty—so what is 20,000 dead in New York?" (quoted in Levy and Peart 2001). The protesters usually believe globalization is a disaster for the workers, throwing them into "downward wage spirals in both the North and the South" (Cavanagh and Mander 2002). Oxfam (2004a) identifies such innocuous products as Olympic sportswear as forcing laborers into "working ever-faster for ever-longer periods of time under arduous conditions for poverty-level wages, to produce more goods and more profit." According to a best-selling book by William Greider (1997),

> in the primitive legal climate of poorer nations, industry has found it can revive the worst forms of nineteenth century exploitation, abuses outlawed long ago in the advanced economies, including extreme physical dangers to workers and the use of children as expendable cheap labor. (p. 34)

Oxfam complains that corporate greed is "exploiting the circumstances of vulnerable people," which it identifies mainly as young women, to set up profitable "global supply chains" for huge retailers like Wal-Mart. In China's fast-growing Guangdong Province, "young women face 150 hours

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of overtime each month in the garment factories—but 60 per cent have no written contract and 90 per cent have no access to social insurance." Women at the bottom of these global supply chains must work "at high speed for low wages in unhealthy conditions" (Oxfam 2004b).

Even Western diplomats are scared by the effects of globalization on poor people: Jean-Paul Fitoussi, advisor to French prime minister Lionel Jospin, referred to "deregulated global markets" as "Frankenstein," who somehow must be brought "under control." Anthony Giddens, director of the London School of Economics and advisor to Tony Blair, said there was a "general realization" that "you cannot leave people unprotected before the global market" (quoted in Micklethwait and Wooldridge 2000). (But can you leave them unprotected before Group of Seven bureaucrats?)

Economists find such rhetoric hard to take, since the neoclassical model of growth identifies at least three ways in which globalization makes the poor of the world better off. Let us define globalization as the movement across international borders of goods and factors of production. Let us adopt the standard assumption of the neoclassical model that poor countries are poor because of lower capital per worker. Let us identify the world's poor as largely belonging to the group of unskilled workers in poor countries. Then globalization has three beneficial channels for poor workers: (a) it gives them access to inflows of capital, which will raise the marginal product of labor and thus wages (part of which can be taken in the form of increased health and safety benefits and shorter hours); (b) it gives them the opportunity to migrate to rich countries, where their wages will be higher; and (c) it gives them market access for their goods, raising the wages of unskilled workers in labor-abundant countries according to textbook trade theory.

Do the poor indeed benefit from globalization through these three channels? I review how these predictions arise from the neoclassical model's predictions when income differences between rich and poor countries are explained by factor endowments. If income differences are instead explained by productivity differences, then these simple predictions do not hold. Hence, it is important to decide to what extent factor endowment models explain the stylized facts as opposed to productivity models. I examine the actual behavior of poverty, inequality, and trade, trends in trade and factor flows, and factor returns to assess whether the factor endowment predictions come true.

I conclude that the clear theoretical channels between globalization and poverty featured by factor endowment models are not very helpful in understanding globalization outcomes. Unfortunately, many episodes seem to require productivity channels to accommodate the facts. Even more unfortunately, we know much less about how productivity channels work than we know about factor endowments.

3.1 The Channels by Which Globalization Affects Poverty in Standard Models

I define globalization as the free movement of capital, labor, and goods across national borders. When I discuss effects of globalization, I have in mind unhindered flows as compared to a situation with restricted flows or, in the extreme case, no flows at all. I look at these flows from the standpoint of the neoclassical growth model. Factor endowment models feature equal productivity levels across nations, while the productivity model is defined as differing productivity levels. These are polar cases, of course, as there are intermediate cases of differences in both factor endowments and productivity. I use the polar cases for pedagogical clarity.

3.1.1 Factor Movements

In the factor endowment model of neoclassical growth, free movement of factors tends to reduce poverty gaps between nations. In Factor World, income differences between countries are due to different capital-labor ratios. Rich nations have more capital per worker than poor nations. Rates of return to capital will be higher in poor nations than in rich nations, while wages will be higher in rich nations than poor nations.

The equations are as follows. Let Y_i, A_i, K_i, and L_i stand for output, labor-augumenting productivity, capital, and labor in country i (where i can either be rich, R, or poor, P).

$$Y_i = K_i^{\alpha}(A_i L_i)^{1-\alpha}$$

Let $k_i = K_i/L_i$ and $y = Y_i/L_i$. The rate of return to capital r and wage w in country i is

$$r_i = \frac{\partial Y_i}{\partial K_i} = \alpha k_i^{\alpha-1} A_i^{1-\alpha},$$

$$w_i = \frac{\partial Y_i}{\partial L_i} = (1-\alpha) k_i^{\alpha} A_i^{1-\alpha}.$$

I am going to use the wage of unskilled workers in poor countries as the indicator of poverty to be affected by globalization. I prefer this to the usual poverty head count numbers, as the latter indicator has a number of undesirable properties: (a) it is very sensitive to the poverty line chosen, and there is no clear guidance how to choose a poverty line; (b) it has an illogical discontinuity at the poverty line, implying a large leap in welfare with an ε movement across the poverty line, but little effect from even a substantial movement as long as one stays either below or above the poverty line.

The per capita income measure is potentially subject to the critique that increases in Gini coefficients could mean that income gains all accrue to the rich. Changes in Gini coefficients influence poverty outcomes just as

average income growth does (see the recent survey by Besley and Burgess 2003), so I will pay a lot of attention to Ginis. I will show in a moment that factor endowment models generally predict that globalization will lower inequality in poor countries, not increase it.

If $A_R = A_P = A$, then the per capita income ratio between the two countries when A is the same is

$$\frac{y_R}{y_P} = \left(\frac{k_R}{k_P}\right)^{\alpha}.$$

If there is free mobility of factors, then capital will want to migrate from rich to poor nations, while workers will want to migrate from poor to rich nations. This will decrease the capital-labor ratio in rich countries while increasing it in poor countries. These flows will continue until capital-labor ratios are equal across nations and factor prices are equal, which will steadily decrease income gaps between nations (reducing poverty in poor countries). Compared to the no-factor-mobility state, returns to capital will rise in rich countries and fall in poor countries. With factor mobility, wages will fall in rich countries and rise in poor countries. Poverty in the South falls for two reasons: (a) the migration of capital to poor countries raises wages in poor countries, and (b) the migration of unskilled labor from poor to rich nations raises the income both of the migrants (who will gain access to higher capital per worker in the North) and of those workers who remain behind (because capital per worker in the South increases with the departure of some Southern workers).

If everyone has raw labor but less than 100 percent of the population owns capital, then the capital rental–wage ratio is positively related to inequality. Hence, factor flows (globalization) will reduce inequality in poor countries and increase it in rich countries.

The predicted capital flows are very large. Denoting k_i^* as the capital-labor ratio in country i ($i = P$ or R) in the final equilibrium, and the unstarred values of k_i and y_i as the initial values, we have the following:

$$\frac{k_P^* - k_P}{k_R^*} = 1 - \left(\frac{y_P}{y_R}\right)^{1/\alpha}$$

$$k_P^* = k_R^*$$

$$\frac{k_P^* - k_P}{y_P^*}\,\frac{y_P^*}{k_P^*} = 1 - \left(\frac{y_P}{y_R}\right)^{1/\alpha}$$

$$\frac{y_P^*}{k_P^*} = \frac{r^*}{\alpha}$$

$$\frac{k_P^* - k_P}{y_P^*} = \frac{\alpha}{r^*}\left[1 - \left(\frac{y_P}{y_R}\right)^{1/\alpha}\right]$$

In the factor endowment model, even small differences in initial income trigger massive factor flows. If we assume a capital share of 1/3, a ratio of poor- to rich-country income of 0.8, and a marginal product of capital (r^*) of .15, then the cumulative capital inflows into the poor country will be 108 percent of the terminal equilibrium GDP in the poor country!

Suppose instead that income differences between nations are due to productivity differences rather than differences in capital per worker. Now both capital and labor will want to move to the rich country, unlike the opposite flows predicted in the factor endowment model. Unlike the latter case, the final outcome in a frictionless world would be a corner solution in which all capital and labor move to the rich country to take advantage of the superior productivity. Obviously there have to be some frictions such as incomplete capital markets, preference for one's homeland, rich country immigration barriers, costs of relocating to a new culture, and so on to avoid this extreme prediction. Pritchett (2004) argues that there may in fact be countries that could become "ghost countries" if factor mobility was unimpeded, just like the rural counties currently emptying out on the Great Plains in the United States.

In the productivity differences model, equating rates of return to capital across countries implies that the ratio of k_R to k_P is the same as the ratio of A_R to A_P. This will also be the ratio of relative per capita incomes *and* the ratio of relative wages under free capital mobility:

$$\frac{\partial Y_R}{\partial K_R} = \alpha k_R^{\alpha-1} A_R^{1-\alpha} = \frac{\partial Y_P}{\partial K_P} = \alpha k_P^{\alpha-1} A_P^{1-\alpha}$$

$$\frac{k_R}{k_P} = \frac{A_R}{A_P}$$

$$\frac{w_R}{w_P} = \left(\frac{k_R}{k_P}\right)^{\alpha}\left(\frac{A_R}{A_P}\right)^{1-\alpha} = \frac{A_R}{A_P} = \frac{y_R}{y_P}$$

If income differences are due to productivity differences, then opening up to capital inflows will have no effect on unskilled wages in the poor country. The relative income of the world's poor will remain unchanged with this form of globalization (free capital mobility).

Of course, this is a polar case. In the real world, the poor country could have lower wages and per capita incomes because of *both* lower productivity and lower capital-labor ratios. Assessing the degree to which productivity and factor endowments contribute to poverty is the key to assessing the predicted impact of capital mobility.

3.1.2 Trade Flows and Inequality

To discuss trade, we need to shift from the one-sector neoclassical growth model to the standard two-sector trade model in which sectors

differ in their capital intensity. In a two-sector model with a neoclassical production function, goods mobility will have the same effect as factor mobility even if factors cannot move. The capital-abundant rich nation will export capital-intensive goods, while the labor-abundant poor nation will export labor-intensive goods. The expansion of demand for labor and fall in demand for capital in the poor country (compared to autarky) will raise wages of unskilled labor and lower capital rentals. The reverse will happen in the rich country. If the equilibrium is for less than complete specialization, factor prices will move toward equality in the two countries just as in the factor mobility case. Increased trade will reduce poverty in the South because of the expansion in demand for labor that comes with the expansion of labor-intensive exports. Again, if the capital rental–wage ratio is positively related to inequality within the nation, trade will increase inequality in the rich country and decrease it in the poor country.

What if the absolute level of labor-augmenting productivity is different between the two countries? With productivity differences, the factor price equalization theorem still applies, but it now applies to effective labor $A_i L_i$. The wage per unit of effective labor will be equalized between the two countries under free trade, as will the rate of return to capital in the two countries. This means that the wage per unit of physical labor in the two countries will be different. The ratio of the wage per unit of physical labor in the higher-productivity (rich) country to the lower-productivity (poor) country will be A_R/A_P. This will also be the ratio of per capita incomes in the two countries.

The analysis of which country is more labor abundant will also differ from the equal-productivity case. If the relative scarcity of labor in the rich country is sufficiently offset by higher relative productivity, then the rich country will be "labor abundant" and will export "labor-intensive" goods. Compared to autarky, wages will increase in the rich country and decrease in the poor country. Trade increases poverty in this paradoxical example. In this case, trade will reduce inequality in the rich country and increase it in the poor country. Compared to autarky, trade causes divergence of per capita incomes in this unusual case.

If productivity differences are not so stark as to offset relative factor scarcity, the rich country will be capital abundant, and we will go back to the usual prediction that trade reduces poverty in the South. Trade will still increase inequality in the rich country and lower it in the poor country.

As noted by many previous authors, interesting interactions between trade and factor flows arise from the unconventional productivity view of comparative advantage. Whereas in the factor endowments model, trade and factor flows do the same things to factor prices and are effectively substitutes, trade and factor flows can be complements in the productivity model. For example, if the rich country is perversely labor abundant because of productivity advantages in the labor-intensive sector, then trade

will raise the wage in the rich country (relative to the poor country) and lead to more labor migration from poor to rich countries. This makes the rich country even more labor abundant, strengthening its comparative advantage in labor-intensive products.

Analogously, trade could lead to capital inflows into the capital-abundant poor country, if productivity differences lie in that direction. This is the opposite of what happens in the factor endowments model, in which exports from the poor country of labor-intensive goods lower the rate of return to capital, eliminating the capital inflows that would have otherwise responded to the high returns to scarce capital.

The bottom line is that the effect of trade on Southern poverty depends on relative productivity levels as well as factor endowments. Which way the effect goes is an empirical matter.

3.1.3 Introducing Land as a Third Factor

Of course, there is one factor that does not move—land and natural resources. Even if productivity is higher elsewhere, land prices could adjust to retain some capital and labor in the home country. This was an important factor in the nineteenth century. It seems less so now in today's urbanized world. If land and capital are perfect substitutes, then an economy could substitute away from land and not drive up the return to the other factors to make them want to stay. However, there are many countries where agriculture is important enough that land and natural resource availability is a potentially relevant sticky factor that prevents flight of all factors to high-productivity places.

Land acts much like productivity in its effect on the marginal products of capital and labor. Hence a land-rich place could attract both capital and labor, just as a high-productivity place does. This was a very important factor in the nineteenth-century wave of globalization. It still seems relevant today in that natural resources may attract capital and labor into areas that otherwise have low productivity.

The relevant equations including land (T) are the following. Let the production function including land be

$$Y_i = T_i^{\alpha} K_i^{\beta} (A_i L_i)^{1-\alpha-\beta}$$

Now let capital and labor freely move to equate rates of return to capital and wages. Let $t_i = T_i/L_i$ and $k_i = K_i/L_i$. The rate of return to capital and wage will be

$$\frac{\partial Y_i}{\partial K_i} = \beta t_i^{\alpha} k_i^{\beta-1} A_i^{1-\alpha-\beta},$$

$$\frac{\partial Y_i}{\partial L_i} = (1-\alpha-\beta) t_i^{\alpha} k_i^{\beta} A_i^{1-\alpha-\beta}.$$

Obviously, both capital and labor will be attracted to the land-abundant places as well as the places with higher productivity. Since both capital and labor can move, you can show that capital-labor ratios in the two places will be equated. Labor will move to equate wages, which reflect both land abundance and productivity. If there were no productivity differences between places, land-labor ratios would also be equated.

The effect of globalization on poverty with different land endowments now depends on whether the poor nation is land poor or land rich. If the poor nation is land rich, then the only reason it could be poor under the factor endowments model is that it lacks capital. Thus, the poor country attracts capital inflows under globalization both because capital is scarce in the poor country and because land wealth implies a higher marginal product of capital. This will increase wages and reduce poverty in the South. This is the relevant case for poor countries with rich commodity endowments.

If the poor nation is land poor, then we would expect it to lose population under globalization until land-labor ratios are equated. There is still a catching-up effect of Southern to Northern wages. In general, free factor mobility suggests a catching up of poor to rich nations in either case.

With differences in productivity, population density will be higher in the higher-productivity places:

$$\frac{\frac{L_R}{T_R}}{\frac{L_P}{T_P}} = \left(\frac{A_R}{A_P}\right)^{(1-\alpha-\beta)/\alpha}$$

Per capita incomes will move toward equality as well, since labor moves in response to both relative land abundance and productivity. Hence, there will be convergence of per capita incomes if both labor and capital can move freely, in either the factor endowments or productivity models. The only remaining sign of higher productivity in the rich countries in equilibrium is that they will have attracted capital and labor away from the lower-productivity poor countries. Similarly, the only effect remaining in equilibrium of higher land abundance will be that land-abundant countries will wind up with more labor and capital.

Obviously these are extreme predictions that only apply under complete factor mobility. We will examine whether these predictions hold with one natural experiment of full globalization: free factor mobility within the United States.

3.1.4 Mobile Physical Capital and Immobile Human Capital

So far I have not considered human capital. An interesting case with human capital is the open economy version of the factor accumulation model by Barro, Mankiw, and Sala-i-Martin (1995; hereafter BMS). BMS allows

capital flows to equalize the rate of return to physical capital across countries, while human capital is immobile. Immobile human capital explains the difference in per-worker income across nations in BMS.

The poor countries' marginal product of capital is low because of scarce human capital, which offsets its normal elevation by abundant labor. Whether scarce human capital outweighs abundant labor is ambiguous for poor countries. Hence, globalization does not necessarily lead to physical capital inflows for the South, and thus does not necessarily raise wages of unskilled workers. This could be another reason why globalization does not always lead to capital flows from rich to poor nations, and thus capital mobility does not necessarily lower poverty. Here we have the unwelcome appearance of ambiguity even in the factor endowments model.

However, there are problems with the BMS model in that it explains income differences solely by human capital, problems so severe as to make it not really a viable factor endowments model. As pointed out by Romer (1995), the BMS model implies that both the skilled wage and the skill premium should be much higher in poor countries than in rich countries. To illustrate this, we specify a standard production function for country i as

$$Y_i = AK_i^{\alpha} L_i^{\beta} H_i^{1-\alpha-\beta}.$$

Assuming technology (A) is the same across countries and that rates of return to physical capital are equated across countries, we can solve for the ratio of the skilled wage in country i to that in country j, as a function of their per capita incomes, as follows:

$$\frac{\dfrac{\partial Y_i}{\partial H_i}}{\dfrac{\partial Y_j}{\partial H_j}} = \left[\frac{\dfrac{Y_i}{L_i}}{\dfrac{Y_j}{L_j}}\right]^{-\beta/(1-\alpha-\beta)}$$

Using the physical and human capital shares (.3 and .5 respectively) suggested by Mankiw (1995), the model implies that skilled wages should be five times greater in India than the United States (to correspond to a fourteenfold difference in per capita income). In general, the equation above shows that skilled wage differences across countries should be inversely related to per capita income if human capital abundance explains income differences across countries, à la BMS.

The skill premium should be seventy times higher in India than the United States. If the ratio of skilled to unskilled wage is about 2 in the United States, then the skilled-unskilled wage ratio in India should be 140. This would imply a fantastic rate of return to education in India, seventy times larger than the return to education in the United States.

If we relaxed the restriction of immobility of human capital in this case, we would get a reverse brain drain from rich to poor countries. If we

broaden globalization to include mobility of human capital, this would be yet another reason why poor countries should catch up to rich ones in the factor endowments model—because they attract both physical and human capital. This is obviously counterfactual, as human capital tends to flow to rich countries.

With productivity differences, we do not have these extreme predictions. If the income difference between the South and the North is explained largely by productivity, then lower productivity has an offsetting effect to the scarcity of skills in the South in their effects on the return to skill in the South. This would cancel the counterfactual prediction of reverse brain drain. The predicted effect on physical capital inflows to the South is ambiguous as it was before, and hence the effect on Southern poverty. If we allow human capital to move with lower productivity in poor countries, there could be a tendency for both physical and human capital to flee from poor countries, depressing wages and worsening poverty. If we allow all three factors—physical and human capital and unskilled labor—to move, we return to the extreme prediction of poor countries emptying out.

The central message of this section has been that globalization reduces world poverty if income differences are due to differences in factor endowments, while the effects of globalization are null or ambiguous if income differences are due to productivity differences. I summarize the different predictions in table 3.1. Different globalization episodes or different groups of countries could fall into either case, or somewhere in between. Hence, I now turn to the examination of stylized facts on globalization and poverty.

3.2 Empirical Evidence on Globalization and Poverty

In this section, I review the evidence on globalization and poverty. My method is to look for stylized facts that provide direct or indirect evidence for whether factor endowment differences or productivity differences explain globalization and poverty outcomes. I look first at the overall patterns of trade and factor flows, then at the behavior of relative international incomes and factor prices, and finally at the effect of globalization on domestic inequality. I then adduce evidence from factor movements within countries. The overall pattern tends to support the productivity differences view instead of the factor endowments view, with occasional exceptions. Hence, although there are some globalization episodes that have reduced poverty, the overall effect of globalization on poverty looks like it falls short of the expectations of the standard textbook models.

3.2.1 Empirical Evidence on Trade and Factor Flows across Countries

The migration of labor is overwhelmingly directed toward the richest countries. The three richest countries alone (the United States, Canada,

Table 3.1 Predictions of theoretical models of globalization

Model	Income differences due to factor endowments	Income differences due to productivity differences
Neoclassical model with free mobility of capital and labor	Capital moves from rich to poor nations; labor moves from poor to rich nations; equal capital-labor ratios between rich and poor; factor price equalization; higher unskilled wages and reduced poverty in the South; increased inequality in rich countries, reduced inequality in poor countries.	Both capital and labor move from poor to rich countries. Capital-labor ratio in rich to poor countries is the same as ratio of relative productivity. In frictionless world, corner solution of rich country with all capital and labor, poor country emptying out ("ghost countries")
Neoclassical model with free trade in goods	Rich nations export capital-intensive goods, poor nations will export labor-intensive goods; factor price equalization; higher unskilled wages and reduced poverty in the South; trade increases inequality in rich nation and reduces it in poor nation.	Ratio of wages in rich to poor countries will be given by the productivity ratio. Two cases: (1) Rich nation could export labor-intensive goods if productivity advantage offsets labor scarcity; then trade would reduce inequality in rich country and decrease wages in poor country, and trade would increase Southern poverty. (2) If productivity advantage not so extreme, then trade increases inequality in rich country, increases it in poor country, reduces poverty in South.
Neoclassical model including land with free mobility of factors	Land-rich place attracts both capital and labor; in the limit, land-labor ratios are equated across countries; convergence of per capita incomes.	Population density higher in high-productivity places; still have convergence of per capita incomes.
Neoclassical model with mobile physical capital and immobile human capital (Barro, Mankiw, Sala-i-Martin)	Physical capital may not flow to poor countries if human capital scarcity more than offsets unskilled labor abundance; however, model implies counterfactually high returns to skills in human capital–scarce poor countries than in human capital–abundant rich countries.	Returns to skills determined by relative productivity levels. High-productivity rich countries will have higher returns to skills than low-productivity poor countries.

and Switzerland) receive half of the net immigration of all countries reporting net immigration. Countries in the richest quintile are all net recipients of migrants. Only eight of the ninety countries in the bottom four-fifths of the sample are net recipients of migrants (Easterly and Levine 2001).

Embodied in this flow of labor are flows of human capital towards the rich countries, the famous brain drain. In terms of the simple models above, human capital movements are governed by the same predictions as physical capital movements.

I used Grubel and Scott's (1977) data to calculate that in the poorest fifth of nations, the probability that an educated person will immigrate to the United States is 3.4 times higher than that for an uneducated person. Since we know that education and income are strongly and positively correlated, human capital is flowing to where it is already abundant—the rich countries.

A more recent study by Carrington and Detragiache (1998) found that those with tertiary education were more likely to migrate to the United States than those with a secondary education in fifty-one out of the sixty-one developing countries in their sample. Migration rates for primary or less educated to the United States were less than migration rates for either secondary or tertiary in all sixty-one countries. Lower-bound estimates for the highest rates of migration by those with tertiary education from their data range as high as 77 percent (Guyana). Other exceptionally high rates of migration among the tertiary educated are Gambia (59 percent), Jamaica (67 percent), and Trinidad and Tobago (57 percent).[1] None of the migration rates for the primary or less educated exceed 2 percent. The disproportionate weight of the skilled population in U.S. immigration may reflect U.S. policy. However, Borjas (1999) notes that U.S. immigration policy has tended to favor unskilled labor with family connections in the United States rather than skilled labor. In the richest fifth of nations, moreover, the probability is roughly the same that educated and uneducated will emigrate to the United States. Borjas, Bronars, and Trejo (1992) also find that the more highly educated are more likely to migrate within the United States than the less educated.[2]

Capital also flows mainly to areas that are already rich, as famously pointed out by Lucas (1990). In 1990, the richest 20 percent of world population received 92 percent of portfolio capital gross inflows; the poorest 20 percent received 0.1 percent of portfolio capital inflows. The richest 20 percent of the world population received 79 percent of foreign direct investment; the poorest 20 percent received 0.7 percent of foreign direct investment. Altogether, the richest 20 percent of the world population received 88 percent of private capital gross inflows; the poorest 20 percent received 1 percent of private capital gross inflows.

The developing countries do receive net inflows of private capital, as shown in figure 3.1. However, the importance of capital inflows rises with the per capita income of the developing country, counter to the prediction of factor endowment models.

1. Note that these are all small countries. Carrington and Detragiache (1998) point out that U.S. immigration quotas are less binding for small countries, because, with some exceptions, the legal immigration quota is 20,000 per country regardless of a country's population size.

2. Casual observation suggests brain drain within countries. The best lawyers and doctors congregate within a few metropolitan areas like New York, where skilled doctors and lawyers are abundant, while poorer areas where skilled doctors and lawyers are scarce have difficulty attracting the top-drawer professionals.

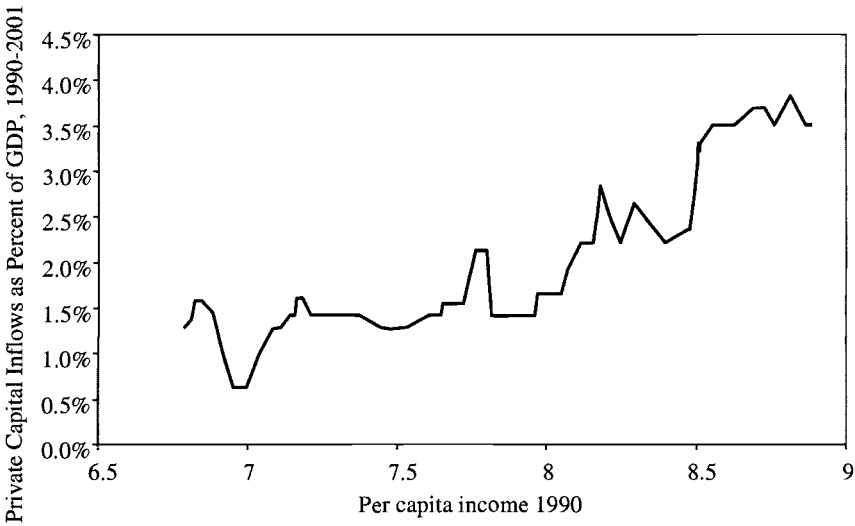

Fig. 3.1 Private capital flows to developing countries and per capita income, 1990–2001 (moving median of twenty observations)

Capital inflows to the poorest countries are primarily made up of foreign direct investment, as shown in figure 3.1. Even so, private foreign direct investment into the poorest region, Africa, is low and is mostly directed to natural resource exploitation (such as oil, gold, diamonds, copper, cobalt, manganese, bauxite, chromium, platinum). The correlation coefficient between foreign direct investment and natural resource endowment across African countries is .94 (Morriset). This tends to confirm the prediction for capital flows of the model including land and natural resources.

Moreover, these numbers do not reflect the movements of private capital out of developing countries outside of official channels—that is, capital flight. Fragmentary evidence suggests that capital flight is very important for poor regions. Collier, Hoeffler, and Patillo (2001) estimate that capital flight accounts for 39 percent of private wealth in both sub-Saharan Africa and the Middle East (see table 3.2). It is also important in Latin America (10 percent of wealth), but less so in South Asia and East Asia.

One measure often used to estimate capital flight is to cumulate the net errors and omissions data in the balance of payments accounts. There one finds evidence of large-scale outmigration of capital in absolute terms in East Asia, Russia, and Latin America (see table 3.3). As percent of GDP, the outflow of capital is very significant in the African countries. This tends to confirm the findings of Collier, Hoeffler, and Patillo (2001) for Latin America and Africa. The availability of more recent data since the East Asian crisis in my findings suggests that recent capital outflows out of East Asia are more dramatic than what those authors found earlier.

Table 3.2 Wealth and capital flight by region

Region	Public capital per worker	Private wealth per worker	Private capital per worker	Capital flight per worker	Capital flight ratio
Sub-Saharan Africa	1,271	1,752	1,069	683	0.39
Latin America	6,653	19,361	17,424	1,936	0.10
South Asia	2,135	2,500	2,425	75	0.03
East Asia	3,878	10,331	9,711	620	0.06
Middle East	8,693	6,030	3,678	2,352	0.39

Source: Collier, Hoeffler, and Patillo (2001).

Table 3.3 Top ten in cumulative negative errors and omissions

Absolute amounts (US$ billions)	Sum 1970–2002	% of GDP	Sum 1970–2002/ GDP 2002 (%)
China	–142	Liberia	–129
Russian Federation	–68	Mozambique	–82
Mexico	–27	Guinea-Bissau	–66
Venezuela	–17	Eritrea	–63
South Korea	–16	The Gambia	–45
The Philippines	–16	Ethiopia	–41
Argentina	–14	Zambia	–41
Brazil	–11	Bolivia	–35
Indonesia	–8	Burundi	–31
Malaysia	–8	Angola	–29

Source: World Development Indicators.

What does this picture of factor flows between rich and poor countries tell us? Although there are some poor country exceptions that attract capital inflows, in most poor countries *all* factors of production tend to move toward the rich countries. This supports the productivity differences view of globalization instead of the factor endowments view. The attractive force of higher productivity in the rich countries overturns the factor endowments predictions of convergence through capital flows and trade. Hence, we should not look for great things from globalization for reducing world poverty.

However, the flows of migrants are still relatively small out of the entire poor country population (3 million out of 5 billion), so we should not jump to the conclusion that the poor countries are just emptying out or that there is free labor mobility. The flows involved are actually too small to make much difference to either rich country or poor country incomes, hence the fact we will examine next: the relative stability of the relative income ratio of poor country to rich country in the era of globalization.

3.2.2 Evidence on Factor Returns within Countries

We have some evidence on the behavior of returns to skill and returns to physical capital within countries. Ross Levine and I (Easterly and Levine 2001) noted that skilled workers earn less, rather than more, in poor countries.

We saw above that the BMS model of income differences due to human capital differences predicts that returns to skill would be much higher in poor countries. The facts do not support these predictions: skilled workers earn more in rich countries. Fragmentary data from wage surveys say that engineers earn an average of $55,000 in New York compared to $2,300 in Bombay (Union Bank of Switzerland 1994). Instead of skilled wages being five times higher in India than in the United States, skilled wages are 24 times higher in the United States than in India. The presence of higher wages across all occupational groups is consistent with a higher A in the United States than in India. The skilled wage (proxied by salaries of engineers, adjusted for purchasing power) is positively associated with per capita income across countries, as a productivity explanation of income differences would imply, and not negatively correlated, as a BMS human capital explanation of income differences would imply. The correlation between skilled wages and per capita income across forty-four countries is .81.

Within India, the wage of engineers is only about three times the wage of building laborers. Rates of return to education are also only about twice as high in poor countries—about 11 percent versus 6 percent from low income to high income (Psacharopolous 1994, p. 1332)—not forty-two times higher. Consistent with this evidence, we have also seen that the incipient flow of human capital, despite barriers to immigration, is toward the rich countries.

Returns to physical capital are much more difficult to observe across countries. Devarajan, Easterly, and Pack (2003) show some indirect evidence that private investment does not have high returns in Africa. They find that there is no robust correlation within Africa between private investment rates and per capita GDP growth. There is no correlation between growth of output per worker and growth of capital per worker. They also find with microevidence for Tanzanian industry that private capital accumulation did not lead to the predicted growth response (as shown by strongly negative total factor productivity residuals).

3.2.3 Empirical Evidence on Trade and Domestic Inequality

Does globalization increase inequality within poor countries, offsetting any positive income effect for the poor (or worsening a zero or negative income effect)? To test the effects of trade on inequality, I perform some stylized regressions. I do not attempt a full cross-country explanation of variations in domestic inequality; I also refrain from trying to establish

Table 3.4 **Regression of log Gini coefficient on trade/GDP shares and interaction terms and time trend (not shown), decade averages, 1960s–1990s**

	Regression 1		Regression 2	
Fixed effects (within) regression	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Constant	4.103	31.85	4.069	31.42
Log of trade share	–0.407	–4.90	–0.407	–4.93
Log of trade share interacted with developing-country dummy	0.400	4.47	0.364	3.99
Log of trade share interacted with commodity-exporting dummy			0.137	1.82
No. of observations	312		312	
No. of groups	112		112	
R^2	0.2142		0.2509	

causality, which is a massive task in itself. I stick to the more modest goal of assessing whether the bivariate associations go in the direction predicted by factor endowments or productivity differences. These results should be seen as additional stylized facts, not definitive findings of causal effects robust to third factors.

In table 3.4 I do fixed effects regressions of Gini coefficients on trade shares in GDP for a pooled cross-country, cross-time sample of decade averages for the 1960s, '70s, '80s, and '90s, for all countries (developed and developing) with available data. The source of my data for inequality is the Deininger and Squire inequality database, updated with World Development Indicator data from the World Bank. The source of the data on trade shares is the World Development Indicators. Since the theory predicts different signs on the inequality and trade relationship in rich and poor countries, I put in an interaction term that allows the slope to differ for developing countries.

The results suggest that trade reduces inequality in rich countries. The slope dummy on trade for developing countries is highly significant and of the predicted opposite sign. However, the net effect of trade in poor countries (the sum of the two coefficients) is to leave inequality unchanged. I checked whether the developing-country effect reflected commodity exporting, which is often associated with higher inequality, and also reflects the role of "land" in the factor endowments models. However, the developing-country slope dummy is robust to this control, so the contradiction to the predictions of factor price equalization holds. I also check robustness to a time trend for the Gini coefficient; although it is significant and negative, it doesn't change the results.

The pattern of results for rich countries suggests that some of the productivity-driven models of trade may be relevant. If we interpret the falling inequality as a fall in the capital rental–wage ratio (or as a fall in the skilled-

unskilled wage ratio for human capital), then more trade is actually good for the workers in rich countries. We could have the paradox that labor-augmenting productivity is so much higher in rich countries than in poor countries that rich countries are actually (effectively) labor abundant. Trade then decreases the capital rental–wage ratio. If this is true, then we might expect trade to increase inequality in the poor countries. Although there is a significant positive shift in the effect of trade on inequality in poor countries, the net effect turns out to be close to zero. There is a marginally significant slope dummy for commodity-exporting poor countries, in which more trade does increase inequality. These countries may reflect the effect of earnings from natural resources (what I called land in the models above), in which a land-abundant country has an increase in the land rental–wage ratio from opening up to trade. Thus, we could understand the increase in inequality with trade in commodity exporters, if inequality is driven by the land rental–wage ratio.

I next do cross-section regressions for the same relationship (see table 3.5). I regress two measures of inequality (the share of the top quintile and the Gini coefficient, both averaged over 1960–99) on the share of trade in GDP (tradeGDP, averaged over the same period), and the trade share interacted with the log of per capita income (lgdppc, averaged over the same period).[3] Interacting trade with income allows me to test whether the inequality-trade relationship changes between rich and poor countries, as predicted by the theory. I test robustness to including income and income squared to make sure that the trade-inequality relationship is not just proxying for the well-known cross-section Kuznets curve.

The results in the cross section are even stronger than in the fixed effects regression. Increased trade is now associated with higher inequality for poor countries (rather than zero effect as in the fixed effects regressions); the relationship reverses sign in the middle income range, and there is a negative relationship between trade and inequality among the rich countries (the same as in the fixed effects regressions).[4] Again, the empirical

3. The cross-country inequality data have been criticized by Atkinson and Brandolini (2001) as being inconsistent across countries in methodology and sample universe. The data set records whether the income distribution statistics refer to earnings, income, or expenditure. For income, they record whether it is gross income or net income. I use these classifications to adjust measures of inequality with estimated dummy variables for each category of survey methodology. I then subtract the coefficients on the dummies from the Gini coefficient or the top quintile share to adjust all statistics to their gross income equivalent. This procedure is far from perfect, as Atkinson and Brandolini (2001) point out, but it makes the best of a bad data situation. I then average whatever Gini coefficients (or top quintile shares) are available from 1960 to 2000 (most of them in the last two decades) to get one cross-section observation per country. The data on per capita income come from Summers and Heston as updated through 2000 by the Global Development Network Growth Database.

4. Entering dummies for primary exporting countries did not find any clear results—the primary export dummy was not significant, while the inverted U curve in trade share remained significant.

Table 3.5 **Regressions with robust standard errors for inequality and trade**

	Regression 1		Regression 2		Regression 3	
	Coefficient	*t*-statistic	Coefficient	*t*-statistic	Coefficient	*t*-statistic
A. Dependent variable: Share of top quintile in income averaged over 1960–99						
Constant	46.753	30.21	–10.702	–0.24	–1.350	–0.03
tradegdp	0.471	5.72			0.515	2.85
trade*lgdppc	–0.057	–6.26			–0.063	–3.01
lgdppc			18.211	1.62	11.689	1.06
lgdppc^2			–1.354	–1.94	–0.697	–0.99
No. of observations	106		106		106	
Prob > F	0.000		0.000		0.000	
R^2	0.235		0.164		0.244	
Income level at which derivative of inequality with regard to trade becomes negative	3,665				3,603	
B. Dependent variable: Gini coefficient averaged over 1960–99						
Constant	39.844	27.8	–7.995	–0.17	6.172	0.14
tradegdp	0.517	5.19			0.400	2.14
trade*lgdppc	–0.059	–5.51			–0.045	–2.19
lgdppc			16.519	1.38	9.745	0.84
lgdppc^2			–1.256	–1.70	–0.675	–0.92
No. of observations	107		107		107	
Prob > F	0.000		0.000		0.000	
R^2	0.179		0.153		0.1854	
Income level at which derivative of inequality with regard to trade becomes negative	6,805				7,286	

Note: Prob > F is the *p*-value of *F*-statistics.

evidence is just the opposite of what the factor price equalization story predicts—greater openness increases inequality in poor countries and decreases it in rich countries.

The results are robust to including income and income squared, which are not separately significant. Rather than proxying for the Kuznets curve, the trade-inequality relationship offers a possible substitute explanation for the cross-section Kuznets curve (since trade is correlated with income). Overall, the results indicate that understanding the trade and inequality relationship requires understanding the productivity differences associated with trade.

3.2.4 Trade and Growth

What if trade has an effect on productivity growth? The theory here is not very clear, but some argue that trade carries with it access to technol-

ogy. In this case, we would expect the poor countries to gain access to the superior technologies in the rich countries by trading with them, and hence trade could be a vehicle that reduces international inequality through convergence in productivity levels.

There is a huge empirical literature on trade and growth investigating this possibility, which has failed to establish a consensus for growth effects of trade. An old literature covered the correlation between export growth and GDP growth (Feder 1983; Ram 1985). That literature eventually failed to make the case for growth effects of trade because of the difficulty of establishing causality from export growth to GDP—after all, both will grow at the equilibrium productivity growth rate plus population growth in steady state. If productivity growth differs across countries, for whatever reason, there will be a spurious cross-section correlation.

The cross-country literature has revived the trade-growth debate with regressions of per capita growth on trade shares (usually insignificant) or some broad measure of trade policy (highly significant in Sachs and Warner 1995). However, the latter has been criticized as a trade argument for really being a general measure of bad policies and institutions (Rodriguez and Rodrik 2001).

Recently Dollar and Kraay (2004) have proposed the testing of a relationship between per capita growth and the *change* in the trade share. This takes us back almost to where we started—they regress GDP growth implicitly on trade growth (the latter interacted with trade share). They take some steps forward by including fixed effects, but again identification is unconvincing.

Stronger evidence for beneficial effects of trade comes from Frankel and Romer (1999), who did a regression of *levels* of per capita income on trade shares, using geographically determined "natural openness" as an instrument. The level effect could be consistent with a factor endowments view in which labor-intensive poor countries (who dominate the sample) benefit from higher trade through increased unskilled wages (which are proportional to per capita income, remember). It could also reflect a productivity effect, which would be common to both rich and poor countries.

As with all income-level regressions, the solution to the identification problem is not very convincing. One has to believe that the instrument does not affect income directly (doesn't everything affect income?). Also, the bivariate regression with income and trade does not consider competing determinants of income, such as institutions or education, which would then set up an even more complicated identification problem. Frankel and Romer's result is another useful stylized fact, in the same spirit as the stylized fact regressions presented here. It affects our priors about the beneficial effects of trade on long-run development, but it is not as convincing as establishing a causal relationship.

3.2.5 Migration, Income, and Population Density within Countries

The internal markets of countries are examples of "globalized" areas where there is free mobility of goods, capital, and labor. They are another interesting example of what we can expect from complete globalization.

Ross Levine and I (Easterly and Levine 2001) used the database of 3,141 counties in the United States to examine income concentration, population density, and migration within the United States. Migration goes from sparsely populated areas to densely populated areas. We find with county data for the United States that there is a statistically significant correlation of .20 between the in-migration rate of counties from 1980 to 1990 and the population density in 1980. Hence, labor is flowing to land areas where it is already abundant. In the model above, this is consistent with the high-density places being the high-productivity places. It is inconsistent with the simple factor endowment view in which labor would flow to where the labor-land ratio is low.

There is a strong correlation between per capita income of U.S. counties and their population density (correlation coefficient of .48 for the log of both concepts, with a *t*-statistic of 30 on the bivariate association).[5] This again is consistent with productivity differences between areas and inconsistent with income differences across regions being mainly determined by factor endowments. High-productivity places (which are the same as the high-income places) attract more labor relative to land. Of course, this income dispersion reflects either other factors or the incomplete transition of the migration process, since the equilibrium with free factor mobility is for equal regional incomes.

Sorting counties by GDP per square mile, we found a 50-and-2 rule: 50 percent of GDP is produced in counties that account for only 2 percent of the land, while the least dense counties that account for 50 percent of the land produce only 2 percent of GDP. Nor is this result just a consequence of the large unsettled areas of the West and Alaska. If we do the same calculation for land east of the Mississippi, we still have extreme concentration: 50 percent of GDP is produced on 4 percent of the land. The densest county is New York, New York, which has a GDP per square mile of $1.5 billion. This is about 55,000 times more than the least dense county east of the Mississippi ($27 thousand per square mile in Keweenaw, Michigan).

Obviously, another name for these concentrations is "cities." But even if we restrict the sample to metropolitan counties we see concentration: 50 percent of metropolitan GDP is produced in counties that account for only 6 percent of metropolitan land area.[6] There are also regional income differ-

5. Ciccone and Hall (1996) have a related finding for U.S. states.

6. Metropolitan counties are those that belong to a primary metropolitan statistical area (PMSA) or metropolitan statistical area (MSA) in the census classification of counties.

ences between metropolitan areas. Metropolitan areas in the densely populated Boston-to-Washington corridor have a per capita income that is $5,874 higher on average than other metropolitan areas. This is a huge difference: it is equal to 2.4 standard deviations in the metropolitan area sample. Although there may be differences in the cost of living, they are unlikely to be so large as to explain this difference. (The rent component of the cost of living may reflect either the productivity or the amenity advantages of the area—it seems unlikely that amenities are different enough among areas to explain these differences.)

This concentration is explained by the fact that most economic activity takes place in densely populated metropolitan areas. Urban economics is all about the productivity advantages of cities, which can reap the gains of economies of scale and externalities between people and businesses.

We also confirm the Barro and Sala-i-Martin (2003) finding for U.S. states: income per capita and in-migration are correlated. We do so with data on U.S. counties. Migration goes from poor counties to rich counties, with a statistically significant correlation of .21 between initial income and the in-migration rate. This makes sense if income differences reflect productivity differences, but not if they reflect different factor endowments. A regression of the in-migration rate for 1980–90 by county on population density in 1980 and income per capita in 1980 finds both to be highly significant.[7]

The transitional behavior of migration flows suggests a view that productivity differences between U.S. regions are important. However, they fail to illuminate why regional differences in income are still large after a long period of a "globalized" internal economy in the United States. We need different models, such as sorting of individuals and ethnic groups across regions, externalities within ethnic groups, and other types of poverty trap models I will not attempt to cover here.

3.2.6 Poor Areas

Not only riches are concentrated; so is poverty. Poverty is regionally concentrated in the United States, and these concentrations have an ethnic dimension as well. As figure 3.2 shows, there are four ethnic-geographic clusters of counties with poverty rates above 35 percent:

1. Counties in the West that have large proportions (>35 percent) of Native Americans
2. Counties along the Mexican border that have large proportions (>35 percent) of Hispanics
3. Counties adjacent to the lower Mississippi River in Arkansas, Missis-

7. The *t*-statistics are 8.2 for the log of population density in 1980 and 8.9 for the log of per capita income in 1979. The equation has an *R*-squared of .065 and 3,133 observations. The county data are from Alesina, Baqir, and Easterly (1999).

Fig. 3.2 Poverty in the "globalized" internal economy: Counties with a more than 35 percent poverty rate

sippi, and Louisiana and in the "black belt" of Alabama, all of which have large proportions of African Americans (>35 percent)

4. Virtually all-white counties in the mountains of eastern Kentucky

The county data did not pick up the well-known inner-city form of poverty, mainly among blacks, because counties that include inner cities also include rich suburbs. (An isolated example of an all-black city is East St. Louis, Illinois, which is 98 percent black and has a poverty rate of 44 percent). Of course, poverty is concentrated in the inner city as well. An inner-city zip code in Washington, D.C., College Heights in Anacostia, has only one-fifth of the income of a rich zip code (20816) in Bethesda, Maryland. This has an ethnic dimension again, since College Heights is 96 percent black and the rich zip code in Bethesda is 96 percent white. In the Washington metropolitan area as a whole, there is a striking East-West divide between poor and rich zip codes (which again roughly corresponds to the black-white ethnic divide).[8] Borjas (1995, 1999) suggests there are strong neighborhood and ethnic externalities that may help explain poverty and ethnic clusters within cities. When 1990 census tracts are sorted by percent of black residents, the census tracts with the highest shares of blacks account for 50 percent of the black population but contain only 1 percent of the white population.[9] While this segregation by race and class could simply reflect the preferences of rich white people to live next to

8. Brookings Institution (1999) notes that this East-West geographic divide of the Washington, DC, area shows up in many socioeconomic variables like poverty rates, free and reduced-price school lunches, road spending, and so on.

9. From the Urban Institute's Underclass Database, which contains data on white, black, and "other" population numbers for 43,052 census tracts in the United States.

each other, economists usually prefer to offer economic motivations rather than exogenous preferences as explanations of economic phenomena. Benabou (1993, 1996) stresses the endogenous sorting between rich and poor for the rich to take advantage of externalities like locally funded schools.

Poverty areas exist in many countries: northeast Brazil, southern Italy, Chiapas in Mexico, Balochistan in Pakistan, and the Atlantic provinces in Canada. Researchers have found externalities to be part of the explanation of these poverty clusters. Bouillon, Legovini, and Lustig (1999) find that there is a negative Chiapas effect in Mexican household income data, and that this effect has gotten worse over time. Households in the poor region of Tangail/Jamalpur in Bangladesh earned less than identical households in the better-off region of Dhaka (Ravallion and Wodon 1999). Jalan and Ravallion (2002) likewise found that households in poor counties in southwest China earned less than households with identical human capital and other characteristics in the rich Guangdong Province. Rauch (1993) likewise found with U.S. data that individuals with identical characteristics earn less in cities with low human capital than in cities with high human capital. All these examples represent the failure of almost complete globalization within countries to eliminate poverty.

3.3 Conclusions

Factor endowments and productivity differences are not mutually exclusive, because different situations will involve varying mixtures of factor endowment differences and productivity differences. However, productivity differences appear to be an important facet of many globalization and poverty episodes. Productivity differences are important to capture the flow of all factors of production toward the rich countries, the low returns to physical and human capital in many poor countries, and the perverse behavior of within-country inequality in reaction to trade flows. Even within the globalized economy of the United States, productivity differences seem necessary to comprehend the pattern of labor migration and persistent pockets of poverty.

Productivity differences to explain patterns of globalization and poverty are a nuisance! The neoclassical model based on factor endowments specifies very clear channels by which globalization would affect poverty (generally to reduce it). We have no such off-the-shelf models of productivity differences that would allow us to identify the channels by which globalization affects poverty. We need new models to understand the productivity channels that seem to be so important for so many globalization and poverty outcomes (often disappointing outcomes).

What are the lessons of this paper for whether globalization is something to be desired or feared? Should trade and financial reform promote glob-

alization? Ironically, both the critics and the promoters of globalization seem to share the same model—the factor endowments model. The critics fear that globalization will drive down wages and increase inequality in rich countries, while globalization's promoters promise that it will raise wages and decrease poverty and inequality in poor countries. Neither of these predictions comes true; the outcomes seem to favor instead the productivity-differentials model of income differences between countries. In the productivity view of the world, neither the worst fears of globalization detractors nor the glowing promises of globalization's advocates seem justified. Globalization is less important for the well-being of the poor than the (unfortunately more mysterious) process of productivity growth.

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Comment Aart Kraay

As usual, Easterly has written a paper full of interesting facts that challenge us to think differently, in this case about the links between globalization and poverty. Suppose we think of the world's poor as primarily being unskilled workers in poor countries. One can then think of three channels through which globalization, defined as the free movement of goods and factors across borders, can raise the incomes of the poor: (a) capital flows from rich to poor countries will raise the marginal product of unskilled workers in poor countries, (b) out-migration of unskilled workers from poor to rich countries will have similar effects, and (c) goods trade can act as a substitute for factor trade and again raise the return to relatively abundant unskilled labor in poor countries.

As always in economics, it is straightforward to write down models in which these three forces operate, and it is also easy to write down more complicated models in which the theoretical predictions are less clear-cut. Easterly nicely cuts through some of these conceptual ambiguities by observing that cross-country differences in factor endowments are a key feature of models in which the links from globalization to poverty reduction described above are likely to operate. The key empirical question therefore becomes how important cross-country differences in factor endowments are relative to cross-country differences in technology. Easterly marshalls an array of interesting stylized facts that, for the most part, points to technology differences rather than factor endowment differences as the main source of cross-country income differences. This in turn casts doubt on the tidy links between globalization and poverty reduction that one would ex-

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The views expressed here are the author's and do not necessarily reflect those of the World Bank, its executive directors, or the countries they represent.

pect if cross-country differences in factor endowments were important. In fact, under the strictest productivity view of income differences, globalization will reduce poverty only if it has direct effects on productivity. And on this count, Easterly concludes that both theory and empirical evidence give us little guidance.

In my discussion of this paper I would like to do three things. First, I would qualify somewhat Easterly's claim that the pattern of international capital flows is consistent with the existence of large productivity differences between rich and poor countries. Second, I would like to introduce an additional stylized fact that I think reinforces Easterly's case that the productivity view is empirically relevant. Third, I would like to suggest that the empirical evidence on the growth effects of one dimension of globalization, trade, is not as weak as Easterly suggests, and this provides a more hopeful conclusion about the links between globalization and poverty reduction than the one Easterly presents.

Sovereign Risk and North-South Capital Flows

One of Easterly's strongest indictments of the factor endowment view is his empirical observation that we do not see large flows of skilled labor and capital from rich countries (where they are relatively abundant) to poor countries (where they are relatively scarce). In the case of migration, the evidence suggests if anything that skilled workers migrate from poor to rich countries.[1] In the case of capital, the argument follows the classic "Lucas puzzle." Lucas (1990) observed that the return differences predicted by the neoclassical production function with equal technologies across countries and observed capital-labor ratios in rich and poor countries are implausibly large. It is tempting to conclude from these large return differences that North-South capital flows should be large and that the failure to observe such large flows is a failure of the theory. It is also tempting to conclude that the right "fix" for the theory is to assume that rich countries have higher productivity and that this explains the absence of large North-South capital flows. This is roughly the argument that Easterly uses to build his case for the productivity view.

But assuming productivity differences is not the only way to fix the problem. In a recent paper (Kraay et al. 2004) my coauthors and I quantify the importance of sovereign risk for international capital flows. One of the main results of that paper is the finding that just a little bit of sovereign risk can go a long way to bringing the theory closer to the data. In the absence of sovereign risk, both diminishing returns and production risk create in-

1. Easterly also argues that capital flows from poor to rich countries, based on the observation that rich countries account for the lion's share of capital inflows. For this issue it seems more appropriate to look at net than gross capital flows. Here I think the evidence would support the claim that North-South capital flows are at most small, and this is enough to make Easterly's point.

centives for capital to be spread across countries. In the absence of a countervailing force, capital-labor ratios would eventually be equalized across countries, implying very large international capital movements that we do not see in the data. We show that with no differences in technology and no sovereign risk poor countries should in the aggregate have net foreign asset positions equal to –300 percent of their wealth, while in reality the measured net foreign assets of poor countries are in the vicinity of –10 percent of their wealth. We next show that reasonable assumptions on the size of technology differences between rich and poor countries can narrow the gap between the theory and the data, but only up to a point. In particular we find that the theory still predicts that the South should have net foreign assets equal to –150 percent of wealth, or an order of magnitude more than we see in the data. However, if we also add a modest dose of sovereign risk—enough to generate the historical pattern of a major debt crisis roughly every thirty years—we find that the foreign assets of the South drop to only –20 percent of wealth, and this is much closer to what we see in the data.

In short, my point here is that it is possible to generate quite small North-South capital flows in simple world equilibrium models in which cross-country differences in capital-labor ratios combined with diminishing returns generate substantial return differences. I do not want to argue based on this that all is well with the factor endowment view, though. I only want to point out that simple back-of-the-envelope calculations of expected return differences across countries can give an incomplete picture of the incentives for international capital flows.

Growth and Poverty Reduction

I next want to introduce a further stylized fact that I think helps to bolster Easterly's case for the productivity view as opposed to the factor endowment view of the world. An important feature of the factor endowment view is that it predicts that globalization can have large effects on relative incomes within poor countries. The classic case is the textbook Stolper-Samuelson effect: increased trade will raise the relative price of the relatively abundant factor. If the poor are abundant unskilled workers in poor countries, increased trade will raise their wages and lower the return to the relatively scarce factors in poor countries. This is not to say that the factor endowment view implies that only relative incomes will change. For example, one can also think of models based on factor endowment differences where capital flows will also affect income levels. However, I do want to make the observation that changes in relative incomes are an important feature of the factor endowment view.

I now want to contrast this observation with the empirical fact that changes in relative incomes within countries account for only a tiny fraction of the cross-country variation in changes in poverty. This can be seen

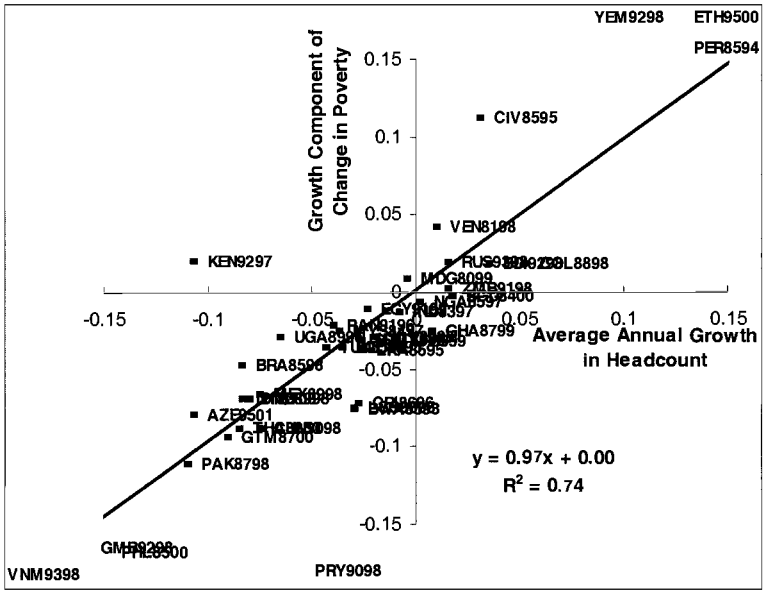

Fig. 3C.1 Growth and poverty reduction
Source: Kraay (2006).

most vividly in figure 3C.1, taken from Kraay (2006). On the horizontal axis I have graphed the average annual percentage change in the head count measure of poverty for a sample of developing countries. The head counts are based on a $1-a-day poverty line, the changes are calculated over the longest possible single period for each country, and the length of the period varies with data availability for each country but averages about ten years. On the vertical axis I plot the average annual percent change in poverty that would hypothetically have occurred had relative incomes within the country remained unchanged over the period. The striking feature of this picture is that this hypothetical change in poverty corresponds very closely to the actual change in poverty. In particular the slope of the regression line has a variance decomposition interpretation. The slope of 0.97 tells us that 97 percent of the variation of changes in the head count is attributable to changes in average incomes, and only 3 percent is attributable to changes in relative incomes.

I think that this observation is relevant for the broader discussion of the links between globalization and poverty in this book, for two reasons. First, many of the theoretical linkages between trade and poverty emphasize the contribution of relative income changes to changes in poverty. But in the data these relative income changes are actually quite small, and on average they account for very little of the variation in changes in poverty.

This should warn us against placing too much emphasis on theoretical links between globalization and poverty that emphasize such relative income changes within countries. Second, I think that the observation that most poverty reduction comes through growth should focus our attention on the channels through which globalization may affect country growth rates directly. Here I agree with Easterly that we have relatively less guidance from theory. However, I think that the empirical evidence on the growth effects of one particular dimension of globalization—greater international trade—is stronger than Easterly suggests. I turn to this final point next.

Recent Empirical Evidence on the Growth Effects of Trade

Following the very influential Rodriguez and Rodrik (2000) critique of the cross-country empirical evidence on trade and growth, it has become commonplace to hear any observed correlation between trade and growth dismissed as either (a) a spurious artifact of omitted variable bias or simultaneity bias, or (b) irrelevant for policy. I think that such a dismissive view does not accurately capture the state of the empirical literature on trade and growth. I cannot attempt a comprehensive review of the evidence in this discussion. Rather, I would like to focus very selectively on a few recent papers that I think have made progress in addressing the limitations of the earlier literature and consistently turn up positive links between trade and growth that are harder to dismiss.

Much of the empirical literature on trade and growth has focused on partial cross-country correlations between trade and growth. As with all such cross-country regressions, it is difficult to adequately address concerns with omitted variables and reverse causation that potentially taint such partial correlations. A natural alternative is to rely on the within-country variation in trade and growth rates. Four recent papers—Dollar and Kraay (2002, 2004); Lee, Ricci, and Rigobon (2004); and Wacziarg and Welch (2003)—all adopt this approach.

The first three papers use regression analysis to look at the links between trade and the within-country variation in decadal or quinquennial growth rates, but they use very different identification strategies. The Dollar and Kraay papers use instrumental variables techniques, relying on standard internal instruments from the dynamic panel literature. In these two papers the identifying assumption is that shocks to growth in future decades are uncorrelated with the trade-GDP ratio in the current decade. Note that this identifying assumption allows for contemporaneous reverse causation—within a decade, higher growth might lead to higher trade for a variety of reasons. It also allows for contemporaneous omitted variables that matter for growth and are correlated with trade. Nevertheless, one can think of examples that undermine even this relatively stringent identifying assumption (as is so often the case in all empirical work!). An alternative is

provided by the Lee, Ricci, and Rigobon paper, which also allows for this contemporaneous reverse causation but achieves identification through heteroskedasticity. In particular, their approach relies on being able to find different splits of the data where the variance of shocks to growth is different, but one can safely assume that the slope coefficients in the regression are the same across these splits. Despite their use of very different identification strategies, is it striking that the three papers find growth effects of trade that are significant and quite similar in magnitude: a 10 percentage point increase in the trade-GDP ratio raises growth by somewhere between 0.25 and 0.45 percentage points.

Of course, one can always object that this finding is irrelevant for policy, because it links trade volumes and not trade policy to growth outcomes. The Lee, Ricci, and Rigobon paper also finds some evidence that a tariff index and a measure of import duties also raise growth, although the effects are less strongly significant. They also find quite strong evidence that the black market premium is strongly linked to growth, although they are careful not to oversell this result because reductions in the black market premium reflect more than just trade reforms.

More compelling evidence on the growth effects of trade policy reforms comes from Wacziarg and Welch (2003). These authors build on the earlier work of Sachs and Warner (1995) to develop a set of dates of trade liberalization. With these dates in hand, they compare average growth before and after trade liberalization, and they find that growth on average increases by between 0.5 and 1.5 percentage points per year. These are quite large growth effects, and Wacziarg and Welch are appropriately cautious not to attribute the entire increase in growth to trade reforms alone. As they clearly acknowledge, trade reforms are frequently accompanied by other, nontrade reforms, and isolating the partial effects of both trade and nontrade reforms is therefore difficult. One way they address this problem is to look at a smaller set of countries where they can identify a major class of domestic structural reforms, privatizations. Controlling for these concurrent reforms, they continue to find that growth increases substantially following liberalization dates.

A different strand of the trade and growth literature exploits the cross-country variation in trade and income levels, interpreting the results as evidence of very long-run effects. Frankel and Romer (1999) is the best-known of these papers, and it uncovered a causal long-run effect of trade on income using geographic remoteness as an instrument for trade. A drawback of such highly parsimonious regressions of per capita income on trade is that they ask a lot of the instrument: it has to be uncorrelated with many other possible determinants of income that are omitted from the regression. Controlling for other factors can therefore make the results more convincing, and this is exactly what Alcala and Ciccone (2004) do. They adopt the same levels specification as the Frankel and Romer paper, but

importantly they also introduce institutional quality into the regression, and instrument for it with a variety of variables capturing countries' colonial past.[2] In this augmented specification they continue to find strong long-run growth effects of trade.

Another recent paper, Rigobon and Rodrik (2004), seeks more ambitiously to isolate the long-run partial effects of rule of law, democracy, geography, and openness on per capita income, again exploiting cross-country variation in levels of these variables. They use the identification-through-heteroskedasticity approach, and they find an interesting mix of results. In their main specification they allow income to be a function of democratic institutions, rule of law, trade, and several exogenous geographic variables. In this core specification trade has a hard-to-explain *negative* and significant estimated causal impact on per capita income. However, in their first robustness check, they drop democracy from the regression and estimate a specification that is closer to that of Alcala and Ciccone (2004). When they do so, they now find a large *positive* and significant effect of trade on per capita incomes, consistent with the other paper's findings.

What do we learn from this? I have tried to argue here that in order to understand the first-order effects of globalization on poverty we need to focus on the growth effects of globalization. I have also argued that we have at least some empirical evidence to support the case that one particular dimension of globalization, increased international trade, does in fact have measurable growth benefits. I do not want to argue that the literature has succeeded in identifying the precise growth effects of narrowly defined trade policy reforms. The uncomfortable fact is that trade reforms are often accompanied by other reforms, and so we are unlikely to ever be able to precisely isolate their partial effects on growth. But the empirical evidence does suggest that countries that have chosen to participate in the process of globalization through trade reforms—often accompanied by other domestic reforms—have grown faster.

From the standpoint of poverty reduction, this additional growth is very welcome. In figure 3C.2 I want to emphasize that even the fairly modest estimated growth effects of trade discussed above are nontrivial relative to the growth rates required to achieve the Millennium Development Goal of halving poverty between 1990 and 2015. The vertical bars for each country represent an estimate of the average annual growth rate required to halve poverty over a twenty-five-year period, assuming no changes in relative incomes. Most of these required growth rates are clustered between 1 and 3 percent per year, and vary with the initial location and shape of the distri-

2. The paper contains two other important methodological innovations. The authors recalculate the original Frankel-Romer instrument based on more, and more recent, data, and they also measure trade as a fraction of purchasing power parity–adjusted GDP in order to have a cleaner measure of cross-country differences in real trade volumes relative to production.

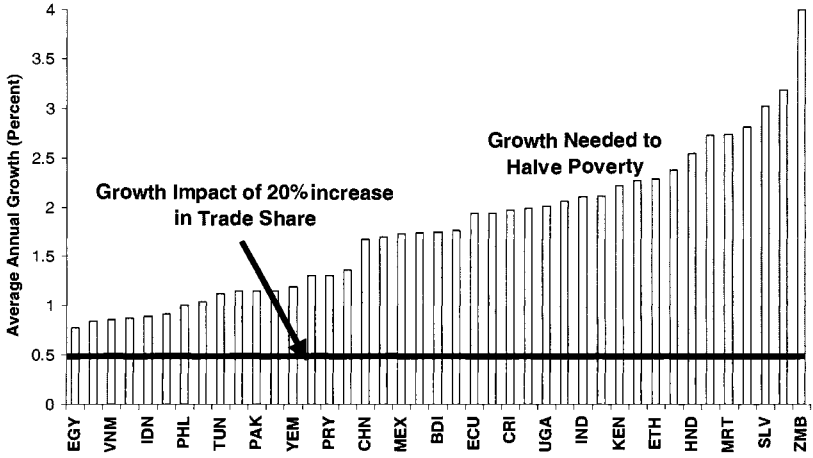

Fig. 3C.2 Growth required to halve poverty over twenty-five years

bution of income in the country. The horizontal line at 0.5 percent shows the estimated growth effect of trade (with all the caveats noted above) of a 20 percentage point increase in the trade-GDP ratio. Of course, one cannot conclude from this graph that narrow trade reforms in isolation will reduce poverty at the rate envisioned in the Millennium Development Goals. But we can say that the growth benefits of globalization have a nontrivial role in economic development and poverty reduction.

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