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Trade, Growth, and Poverty

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Recognizing the enormous benefits of open international markets, we, the undersigned economists, strongly support China's entry into the World Trade Organization. China's entry will raise living standards in both China and its trading partners. By acceding to the WTO, China will open its borders to international competition, lock in and deepen its commitment to economic reform, and promote economic development and freedom.

*--Open letter in the New York Times, spring 2000,
signed by a long list of prominent economists*

I. Introduction

Openness to international trade accelerates development of poor countries: this is one of the most widely held beliefs in the economics profession, one of the few things on which Nobel prize winners of the both the left and the right agree. The more rapid growth may be a transition effect rather than a shift to a different steady state growth rate, but clearly the transition takes a couple of decades or more, so that it is reasonable to speak of trade openness accelerating growth, rather than merely leading to a sudden, one-time adjustment in real income.

Why is this view so prevalent? Srinivasan and Bhagwati (1999) argue that the best evidence in support of the openness-growth link is that “nuanced, in-depth analyses of country experiences in major OECD, NBER, and IBRD projects during the 1960s and 1970s have shown plausibly, and taking into account numerous country-specific factors, that trade does seem to create, even sustain, higher growth” (p. 6). Their paper goes on to lament the shift of the profession away from detailed case studies in favor of cross-country growth regressions. They criticize cross-country growth regressions on a number of grounds that we will return to, while at the same time acknowledging that such regressions can contain useful information: “In fact, while such regressions can be suggestive of new hypotheses and be valuable aids in thinking about the issue at hand, we would reiterate that great caution is needed in using them at all as plausible ‘scientific’ support” (Srinivasan and Bhagwati 1999, 36).

We agree that individual cases contain important information upon which economists often base their views. The systematic case studies cited by Srinivasan and Bhagwati generally concern trade liberalization in the 1960s and 1970s. It is a shame that there has not been a similar systematic treatment of post-1980 globalizers. In the next section of the paper we identify post-1980 globalizers that are good candidates for case studies. In particular, we single out the top one third of developing countries in terms of increases in trade to GDP over

the past 20 years. So, by construction this group has had a particularly large increase in trade: 111 percent, compared to 66 percent for the rich countries. What is striking is that the remaining two thirds of developing countries have actually had a decline in trade to GDP over this period (Figure 1). The globalizing group has also cut import tariffs significantly, 34 points on average, compared to 11 points for the nonglobalizers (Figure 2). The list of post-1980 globalizers includes some well-known reformers (Argentina, People's Republic of China [PRC], Hungary, India, Malaysia, Mexico, Philippines, and Thailand). Desai (1997) includes case studies of several of these countries, and good studies exist of some others, though in general there has not been a systematic review of these post-1980 globalizers.

The recent globalizers have experienced an acceleration of their growth rates, from 1.8 percent per year in the 1970s to 2.5 percent in the 1980s and 5.1 percent in the 1990s (Figure 3), while rich country growth rates slowed down over this period (Figure 4). What about developing countries not in the "globalizing" group? They had a decline in the average growth rate from 2.6 percent per year in the 1970s to -0.1 percent in the 1980s and -1.1 percent in the 1990s (Figure 5).¹

There are many interesting pair-wise comparisons between the globalizing group and the nonglobalizing group: Viet Nam versus Burma, Bangladesh versus Pakistan, Costa Rica versus Honduras. In every case the economy that has opened up more has had better economic performance. Thus, what we have in the 1990s is an important group of countries growing faster than the rich countries and hence gradually catching up, while the non-globalizing part of the developing world is falling further and further behind (Figure 6). That the PRC and India, and some other large countries are in the fast-growing group means that well over half the population of the developing world is included.

These cases provide suggestive evidence about the effect of openness on growth. Nevertheless, examination of individual cases always raises questions of how general the results are. Is it true systematically that countries that increase their trade grow faster? Many of the reformers noted above moved forward on a whole set of reforms at once: fiscal adjustment, stabilization, strengthening private property rights, exchange rate reform. Does the correlation between greater openness and faster growth persist after controlling for these other factors? Cross-country regressions are a useful way of looking at how general are the

1. We also show that defining a group of post-1980 globalizers based on tariff cutting (the top one third of countries in terms of tariff reductions) produces very similar results.

relationships identified in case studies, and we turn to this approach in the third section of the paper.

There have been a number of attempts to relate trade policy variables to growth rates (Dollar 1992, Sachs and Warner 1995, Edwards 1992), all of which have found that trade openness is associated with more rapid growth. In a recent paper Rodriguez and Rodrik (1999) criticized these studies, primarily on the grounds that the studies have not adequately controlled for other economic policies (either that the “trade policy” measure used captures more than just trade policy or that other plausible control variables have not been included). Their point is similar to the more general critique of Levine and Renelt (1992): the policies correlated with growth (trade openness, macro stability, small government consumption, rule of law) are all highly correlated among themselves. Hence, when all of these policies are included in regression analyses, it can be difficult to identify the separate effects of different policies.

We agree with Rodriguez and Rodrik that the “trade policy” indicators that have been used in the empirical literature are not particularly good. It is hard to come up with clean measures of trade policy. In many developing countries it is nontariff barriers that have been particularly pernicious—licensing schemes that amount to firm-specific planned allocations of imports. Yet our experience is that nontariff barrier (NTB) coverage ratios do not effectively capture how severe nontariff barriers are. The trade-weighted average tariff rate provides some information about trade policy, which we used to help identify our group of globalizers. Still, it is peculiar that changes in reported tariff rates are often not accompanied by any change in trade volume.

In our empirical work we use decade-over-decade *changes* in the volume of trade as an imperfect proxy for *changes* in trade policy. In a data set spanning 100 countries, we find that changes in growth rates are highly correlated with changes in trade volumes, controlling for lagged growth and addressing a variety of econometric difficulties. This approach differs from much of the existing empirical literature that relates growth to cross-country differences in trade volumes. Much of the cross-country variation in trade volumes reflects countries’ geographical characteristics, such as their proximity to major markets, their size, or whether they are landlocked. As a result this type of evidence tells us little about the effects of trade *policy* on growth, and worse, it may simply reflect the effects of geography on growth through other channels. (Both these points are emphasized by Rodriguez and Rodrik 1999). By

focusing on decadal changes in growth and changes in trade volumes we can at least be sure that our results are not driven by geography, nor by any other unobserved country characteristic that drives both growth and trade but varies little over time, such as institutional quality. By including period dummies we are also able to control for shocks that are common to all countries, such as global demand shocks or reductions in transport costs.

The final issue that we turn to in section IV is the relationship between trade liberalization and inequality. In our paper, “Growth *Is* Good for the Poor,” we examined the impact of growth-enhancing policies on the income of the bottom 20 percent of the income distribution, after controlling for their impact on mean income, in a panel covering 80 countries and four decades. There is a one-to-one relationship between the growth rate of income of the poor and the growth rate of per capita income, but also quite a lot of variation around that average relationship (Figure 7). In other words, percentage changes in incomes of the poor on average are equal to percentage changes in average incomes. A useful way of interpreting these results is to realize that they are equivalent to the finding that changes in the distribution of income are not systematically associated with the growth rate.

The main point of our earlier paper was to attempt to explain the deviations around the one-to-one relationship, which reflect changes in inequality. One of the important concerns about globalization is that, while it may be increasing national income, the poor may not benefit proportionately. The hypothesis that greater trade openness leads to growing household inequality is the hypothesis that growing openness leads to points “below the line” in Figure 7: growth of income of the poor less than proportionate to per capita GDP growth.

We considered a variety of possible variables that might explain cross-country differences in the extent to which growth accrues to those in the bottom quintile, with little success. One of the variables we considered was trade volumes, where we found no evidence whatsoever of a systematic relationship between changes in trade and changes in inequality. This relationship is shown in Figure 8: there is simply no association between changes in trade to GDP and changes in the Gini measure of inequality. No doubt trade liberalization has distributional consequences, that is, there are “winners” and “losers” in the short run. However, our finding is that the losers do not come disproportionately from the poor. While it is heartening to know that the losers do not come disproportionately from the poor, nevertheless it has to be a concern that some poor households are hurt in the short run by trade liberalization. It is thus important to complement open trade policies with effective social

protection measures such as unemployment insurance and food-for-work schemes. (Closed economies obviously need safety nets as well since households are subject to shocks from business cycles, technological change, weather, and disease.) To the extent that trade openness raises national income, it strengthens the fiscal ability of a society to provide these safety nets.

The fact that increased trade generally goes hand-in-hand with more rapid growth and no systematic change in household income distribution, means that increased trade generally goes hand-in-hand with improvements in well-being of the poor. We can combine the quantitative estimates of sections III and IV of this paper to get a rough estimate of the general relationship between increased trade and income of the poor. Our globalizing group had an average increase in trade to GDP of 0.35 between the early 1980s and the late 1990s. In general, such an increase is associated with more rapid growth of income of the poor of 2.2 percentage points per year (Figure 9). The figure decomposes this overall effect into a “growth effect” of trade on mean income (estimated in section III of the paper) and a “distribution effect” of trade on the share of income going to the bottom 20 percent (from our other paper described in section IV). Our estimated “distribution effect,” as noted, is not significantly different from zero; it happens to be in favor of the poor.

We also show in Figure 9 the estimated effect of stabilization from high inflation. We emphasized that these reformers are doing lots of things and that it is difficult to estimate the separate effect of individual reforms. The globalizers reduced inflation from an average of 51 percent per annum in the early 1980s to 14 percent in the late 1990s. Our point estimate is that this would increase the growth rate of income of the poor by about 0.7 percentage points per year. Most of this is due to the beneficial effect on overall growth of stabilizing from high inflation. However, in our other paper we also found a small but statistically significant positive distributional effect of stabilizing from very high inflation. This is quite consistent with a growing body of evidence that inflation is disproportionately hard on the poor.

One should be careful not to take this exercise too literally. Still, it is a useful way of summarizing the average relationships in a large panel of countries, emphasizing the magnitude of the growth and distributional effects of policies. Countries that reduced inflation and expanded trade saw their growth rates accelerate over the past 20 years. They did not have significant changes in income distribution. Thus, growth rate of income of the poor generally accelerated. The amount of trade expansion and stabilization observed in our

globalizing group was typically associated with a higher growth rate of income of the poor of about 3 percentage points per year.

To relate the cross-country findings on trade and inequality back to the specific countries in our globalizing group: some have had increases in household income inequality over the past 20 years, most notably the PRC. But it is not true in general that the liberalizing economies have had increases in inequality. Costa Rica's and Viet Nam's income distributions have been quite stable. Inequality has declined in Malaysia and Thailand. Mexico had an increase in inequality in the 1980s followed by a decline in inequality in the 1990s. Since most of the countries have had only small changes in household inequality, the growth rate of income of the poor is closely related to the growth rate of per capita GDP.

Viet Nam nicely illustrates our main finding about trade and poverty. As Viet Nam has opened up, it has had a large increase in per capita GDP and no significant change in inequality. Thus, income of the poor has risen dramatically, and the level of absolute poverty has dropped sharply, from 75 percent of the population in 1988 to 37 percent in 1998 (Figure 10). Poverty was cut in half in 10 years! In the case of Viet Nam we have particularly good data, because a representative household survey was conducted early in the reform process (1992-93), and then the same 5,000 households were visited again six years later. Of the poorest 5 percent of households in 1992, 98 percent had higher income six years later. Since Viet Nam's opening has resulted in exports of rice (produced by most of the poor farmers) and labor-intensive products such as footwear, it should be no surprise that the vast majority of poor households benefited immediately from a more open trading system.

All of this work is aimed at the counterfactual question, what can we expect to happen when developing countries liberalize trade and participate more in the global trading system? Obviously for a particular closed economy (say, Burma) we cannot predict with certainty what will happen. The specific outcome will depend on a whole host of factors (including the country's factor endowments, its location, complementary policies put in place). But we can make some qualitative predictions. Based on the experiences of individual cases of post-1980 liberalizers and the general patterns detected in cross-country regressions, it is highly probable that Burma's growth rate would accelerate. Furthermore, based on other countries' experiences, there is no reason to expect any large change in household income inequality. Therefore, we can expect that greater openness would improve the material lives of the poor. We also know that there will be some individual losers among the poor in the short run and

that effective social protection can ease the transition to a more open economy, so that all of the poor benefit from development.

II. The Experiences of Post-1980 Globalizers

Most of the good case studies of trade liberalization concern economies that were liberalized in the 1960s or 1970s (Chile; Taipei,China; Turkey). We want to focus on the experience of more recent liberalizers. The objective in this section is to identify developing countries that have significantly opened up to foreign trade in the past 20 years and to compare their experience to those of other developing countries that have remained more closed. To identify these post-1980 globalizers we are going to use two variables:

- (i) Actual trade volume (exports plus imports relative to GDP); and
- (ii) Trade-weighted average tariff rate.

Each measure has its strengths and weaknesses. The average tariff rate is clearly a policy variable. Empirical studies of trade flows find that high average tariffs do impede trade. However, the relationship between tariff rates and trade volumes is not that strong (Dollar and Zoido-Lobaton 2001). Trade flows depend a lot on geography. They are also influenced by the quality of trade-related infrastructure (which affects transportation costs) and by nontariff barriers to trade, all of which are hard to measure and rank across countries. Defining a group of globalizers based only on cutting tariff rates ignores the other policies that are important for integration with the global economy.

The actual trade volume reflects these other policies that are hard to measure. Its weakness is that trade volume is an outcome that also depends on nonpolicy factors. We can get around the importance of geography by focusing on *changes in trade volumes*. However, changes in trade volumes are also influenced by exogenous shocks, so that large increases in trade volumes do not always reflect a more open policy. We are going to show in this section that defining a group of globalizers based on trade volumes and defining a group based on tariff cutting results in somewhat different lists. However, there is very substantial overlap between the two lists, so that the basic patterns that emerge are the same regardless of which approach one takes to defining the globalizing developing countries.

We have the necessary trade and tariff data for more than 100 countries. We begin by separating out the wealthy (OECD) countries, and also add to that group five economies that we think of as early liberalizers (Chile; Hong Kong, China; Republic of Korea; Singapore, and South Korea). Their stories are well known, and we want to focus on the developing countries

that have opened up during the recent wave of globalization. This expanded group of rich countries provides a useful benchmark against which to measure the experience of the globalizing and non-globalizing developing countries. With these wealthy countries put aside, we have data on 72 developing economies.

In Table 1 we present the top one third of the developing countries, in terms of increased trade to GDP over the past 20 years (specifically, between the 1975-1979 period and the 1995-1997 period). The list includes some well-known economic reformers: Malaysia and Thailand in East Asia, which liberalized trade in the early 1980s; the PRC, which has been liberalizing trade throughout this period; Bangladesh and India in South Asia, with reforms more in the 1990s; and several Latin American economies (notably, Argentina, Brazil, and Mexico). There are a couple of countries on the list that strike us as anomalies (for example, Haiti and Rwanda). Their inclusion highlights the problem that we noted earlier, that a large increase in trade might reflect nontrade-policy factors such as cessation of civil war.²

So, we also present a list of globalizers based on reductions in average tariff rates. Unfortunately, those data are very spotty before 1985; hence we use the reduction in the average tariff rate between the 1985-1989 period and the 1995-1997 period to identify the top one third of tariff cutters (Table 2). The nine countries in bold appear on both lists. These are mostly the very large countries: PRC, India, Brazil, Thailand, Argentina, Bangladesh. For these large countries, we can have considerable confidence that their greater participation in trade is at least partly policy-induced. From our point of view, defining a group of globalizers based only on tariff reductions produces some anomalies as well. Both Kenya and Pakistan appear here, and yet neither has seen any appreciable increase in actual trade. It would take a detailed case study to delve into exactly why this has occurred. Based on what we know of these countries, it seems likely to us that problems with trade-related infrastructure and with nontariff barriers to trade prevent these economies from being genuinely open.

Given the problems with data on trade policy, there cannot be a definitive list of recent liberalizers. Either grouping, in Table 1 or Table 2, is a reasonable approach to identifying countries that are opening up to the global economy. We will show in the remainder of this section that either definition of globalizers produces the same basic story. We find the list in Table 1 overall more credible, so we will focus on that group in presenting the story, but then

2. Viet Nam's ratio of trade to GDP has gone from 0.58 in the 1985-1989 period to 1.59 in the 1995-1997 period, one of the largest increases in the world. However, we do not have data on Vietnam's trade from the same source for earlier periods, so it is not included in the list in Table 1.

show that all of the main points hold for the other grouping as well.³ There are four points that we want to make about the globalizing developing countries.

The first point concerns trade policy and trade volumes. Note in Table 1 that the openness measure, trade to GDP, *varies enormously across countries*. It depends, among other things, on population, location, and other exogenous factors such as lacklockedness. Because these “gravity” variables are so important, the volume of trade to GDP is not at all a satisfactory measure of trade policy stance. These gravity variables, however, either do not change over time at all or change relatively slowly, so that they cannot explain changes in trade volumes. Thus, changes in trade volumes are more likely to reflect policy than geography. By construction, the globalizing group in Table 1 has had large changes in trade volumes between 1975-1979 and the late 1990s: more than a doubling of trade to GDP on average. As a reference, the rich countries had an increase of trade to GDP of 66 percent over this period; the developing countries not part of this globalizing group actually had a decline in trade to GDP.⁴ At the same time that trade volumes were doubling relative to GDP, the globalizers reduced tariffs by 34 percentage points. The nonglobalizing developing countries also cut tariffs, but much more modestly: an average decline of 11 points.

The second point that we want to make comes out of the existing case studies of these globalizing economies: all of them have been engaged in *wide-ranging economic reforms covering trade and other areas*. The experiences of PRC, Hungary, India, and Viet Nam are covered in Desai (1997); these countries strengthened private property rights and carried out other reforms during this period. Virtually all of the Latin America countries included in the grouping stabilized high inflation and adjusted fiscally over this period. Thus, trade reforms have gone hand-in-hand with other reforms, and it is likely that it is the combined effect of all of these reforms that has contributed to the large increase in trade (and to large increases in direct foreign investment as well).

The third point that we want to emphasize is that per capita growth rates have accelerated for most of the globalizing economies, between the early 1980s and the late 1990s. Of the 24 countries in Table 1, 18 experienced an acceleration of growth between the

3. In an earlier version of this paper we defined a list of globalizers based on both the trade volume and tariff variables. However, a number of commentators suggested that this was confusing and that it was preferable to show how lists based on trade volumes and tariffs would overlap and differ and how results change with the different approaches.

4. Recall that we have included the earlier trade liberalizers (Chile; Hong Kong, China; Korea; Singapore; Taipei, China; Turkey) with the original OECD countries in our “rich country group.” The “nonglobalizing” group is then composed of all other developing and transition economies.

1980-1984 period and the 1995-1997 period. Some of the increases were very large: Argentina (8.4 percentage points of growth); PRC, 3.9; Dominican Republic, 7.7; Mexico, 6.5; and Philippines, 6.2, just to highlight a few of the more successful examples. On average, the growth rate accelerated 3.2 percentage points.

While the simple average growth rate indicates what has been happening to the typical globalizing economy, our fourth point is that the population-weighted average growth rates are much more revealing about the impact of globalization on growth and global inequality. In Table 3 we repeat the population-weighted average growth rates for the post-1980 globalizers over four decades and compare these to population-weighted average growth rates for the rich countries and for the rest of the developing world. It is often argued that developing countries—most of whom had restricted trade regimes—did well during the 1960s and 1970s. For example, Rodrik (1999, 64) argues that “The import substitution policies followed in much of the developing world until the 1980’s were quite successful in some regards and their costs have been vastly exaggerated”.

Rich countries were growing quite rapidly in the 1960s (4.5 percent per annum) and 1970s (3.4 percent). Within this group, the U.S. growth rate has been relatively stable over four decades. In the 1960s and 1970s and into the 1980s Western Europe, Japan, and the Asian tigers—all of whom were well behind the US in 1960—grew rapidly and “converged” on the US. But their growth rates have tended to slow down over time, and the rich group grew at 1.9 percent in the 1990s. The post-1980 globalizers did *not* do well in the 1960s (1.0 percent per capita growth) and the 1970s (1.8 percent). In particular, the two biggest developing countries —PRC and India—did not do well with import-substituting regimes in that period. For the 20 years from 1960 to 1979, the post-1980 globalizers were falling further and further behind the rich countries. The rest of the developing world did somewhat better in the 1960s (2.2 percent) and 1970s (2.6 percent), but still those growth rates meant that they were falling further and further behind the rich countries as well.

What has happened in the past 20 years is that growth rates for the rich countries slowed down; growth rates for the nonglobalizing developing world slowed down disastrously (to -0.1 percent in the 1980s and -1.1 percent in the 1990s); while the growth rate for the post-1980 globalizers accelerated to 2.5 percent per capita in the 1980s and 5.1 percent in the 1990s. It is only in the 1990s that a significant part of the developing world—the economies that opened—are growing faster than the rich countries. So, in the 1990s there has been an

important trend toward *growing equality among open countries* with developing economies such as PRC, India, Mexico, and Viet Nam growing at rates far above those of the OECD countries.⁵

Table 4 shows what these growth rates look like if we define the globalizers based on tariff reductions rather than on increases in trade volumes. The patterns are the same: growth rates for the globalizers have increased over time, while growth rates for the nonglobalizers have decelerated. Either categorization divides the developing world into groups with one group having larger reductions in tariffs, larger increases in trade volumes, and an acceleration of growth rates over the past 20 years, while the OECD growth rate has slowed down.

What about the concern that openness is leading to growing inequality within countries and that hence the poor are benefiting less or even not at all from these developments? To address this important question we use a large data set on income distribution compiled from various sources, which we will describe in more detail in section IV. Most developing countries do not have good household surveys conducted each year, so we have to work with the data that are available. Table 5 reports for seventeen of the globalizers the Gini coefficient closest to 1980 plus the most recent estimate (nationally representative survey data are not available for the other countries). Of these 17 countries, four have had changes in the Gini coefficient of less than one point; seven have had increases of more than 1 point; and six, decreases of more than 1 point. So, there are liberalizing economies that have had increases in household income inequality over the past 20 years, most notably PRC. But it is not true in general that the liberalizing economies have had increases in inequality. Costa Rica's and Viet Nam's income distributions have been quite stable. Inequality has declined in India, Malaysia, Philippines, and Thailand. Table 5 also shows the average per capita GDP growth rate over the whole period from the earliest Gini to the latest, and the growth rate of income of the bottom 20 percent of the income distribution.

We want to make three points from this table. First, because changes in inequality mostly have been small, growth rates of income of the poor are similar to growth rates of per capita GDP. Income of the poor has been rising at more than 3 percent per year in PRC, India, Malaysia, Thailand, and Viet Nam—all countries in which the growth rate of per capita GDP over the whole period has been strong. Income of the poor has declined in Brazil,

5. This observation is consistent with the more systematic evidence in Ades and Glaeser (1999) who find that poor initially open economies tend to grow faster than poor initially closed economies.

Mexico, and the Ivory Coast, countries in which the growth rate of per capita GDP averaged less than 1 percent over the whole period. Now, we emphasized above that growth rates for almost all of the globalizers accelerated between the 1980s and 1990s. So, if we divide this period by decade we would find in countries such as Mexico that income of the poor declined sharply in the recession years of the 1980s and then increased in the good-growth years of the 1990s. The income of the poor tends to be pretty closely tied to the overall state of the economy.

But a second interesting fact in the table is that there are a couple of globalizers that have had large declines in inequality, with the result that income of the poor rose quite a bit more rapidly than mean income. Malaysia and Thailand are the best examples. (Note, ironically, that despite the financial crisis that started in 1997, Thailand had one of the fastest growth rates of income of the poor: 4.7 percent per year from 1980 to 1998.) Obviously, the combination of rapid growth and higher income share for the poor is best for poverty reduction. However, we have to stress that it is difficult to discern any common feature or pattern to the cases where we observe this in the data.

The third point that we want to make from the table is that growth rate of income of the poor has significantly lagged growth rate of per capita GDP in the PRC, a transition economy in which there has been a large increase in inequality. Despite the change in inequality, the growth rate of income of the poor in the PRC has still been high (3.8 percent per year) and there has been a dramatic decline in absolute poverty there. While the large increase in inequality is disconcerting, it would be misleading to attribute it entirely to greater openness as the transition countries have undergone dramatic changes in their entire economic systems over the past two decades. But, whatever its source, there are likely to be measures that can be taken to reverse the trend. Our own reading of history and data is that measures that can successfully raise income share of the poor without harming growth are likely to be country-specific. In the PRC, for example, poor transport links between interior regions and the coast and restrictions on interprovincial migration are factors that probably contribute to growing inequality and are amenable to policy interventions.

To sum up this section: examination of individual cases suggests that trade openness leads to declining inequality between countries, and declining poverty within countries. The poor countries that have reduced trade barriers and participated more in international trade over the past 20 years have seen their growth rates accelerate. In the 1990s they grew far

more rapidly than the rich countries, and hence reduced the gap between themselves and the developed world. At the same time the developing countries that are not participating in globalization are falling further and further behind. Within the globalizing developing countries there has been no general trend in inequality. Thus, rapid growth has translated into dramatic declines in absolute poverty in countries such as PRC, India, Thailand, and Viet Nam.

III. Trade, Trade Policy, and Growth:

A More Systematic Look at the Evidence

The story that emerges from the previous section is that developing countries that have reduced trade barriers and traded more over the past 20 years have also grown faster. In this section we want to examine whether these relationships are true in general or depend on the particular sample of countries that we identified as “post-1980 globalizers.” There was inevitably a certain *ad hoc* character to how we grouped countries. So, here we proceed to more systematic cross-country statistical analysis of trade and growth using regression analysis.

We certainly are not the first to apply this approach to this question. During the 1990s, an immense empirical growth literature has developed, which regresses growth in real per capita GDP on its initial level and a wide variety of control variables of interest. Within this literature many papers have included various measures of trade or trade policy among these control variables. Many of these papers found significant positive correlations across countries between growth and trade volumes or trade policies, controlling for other factors. These studies have been influential in reinforcing the consensus among many economists that “trade is good for growth”.

Recently however there has been criticism of the robustness of these results (for example, Levine and Renelt 1992, Rodriguez and Rodrik 1999, Srinivasan and Bhagwati 1999), which suggests a need to revisit some of these earlier results, which we do in this section. Before presenting our approach it is helpful to summarize these critiques under the headings of three generic problems that arise in regression analysis: measurement error, omitted variables, and endogeneity.

A. Measurement Error

Measurement error is potentially a problem for all variables, but it is especially acute for measures of *trade policy*. The most immediate candidates (average tariff rates or nontariff barrier coverage ratios) have obvious drawbacks. If one uses simple averages (across goods)

of tariff rates, it is possible to give inordinate weight to categories of goods that are relatively unimportant for a country. If, on the other hand, one averages weighting by imports, then the effects of prohibitive tariffs which choke out all imports are lost. In the case of nontariff barriers, the best available data simply report the number of tariff lines on which one of a small number of easily identifiable NTBs is in force. This type of data again provides no information on how binding the NTBs are, and obviously excludes a wide range of less-easily quantifiable barriers to trade, such as local procurement requirements. And for all measures, there are important gaps between statutory rates and actually collected tariffs, due to both legal exemptions as well as poor enforcement of tariffs or outright corruption in the customs administration. These types of concerns have led some to despair of the possibility of measuring trade policy at all (see, for example, Pritchett 1996).

A further concern is that these measures have little correlation with observed trade volumes. We illustrate this in Figure 11 which plots average collected tariffs as a share of imports in the 1990s against average trade volumes over the same period, for the roughly 100 countries for which we have data. The top panel reports the relationship in levels in the 1990s, while the bottom panel reports average annual changes between the 1980s and the 1990s in both variables. The striking feature of this picture is that there is hardly any correlation between this measure of trade policy and the outcome of trade volumes, both in levels and in differences. It is perhaps too strong to conclude from this that available measures of trade policy are entirely uninformative, however, it does seem likely that these are very noisy indicators of policy.

Since it still appears to be difficult to find reliable systematic data on trade policies across countries, many papers have instead simply included trade volumes (exports plus imports as a share of GDP) as one of the explanatory variables. If the objective of the study is to examine the effects of trade on growth, this certainly is adequate. However, this approach is less useful if one is interested in the effects of trade *policy* on growth. This is because much of the cross-country variation in countries' trade as a share of GDP has nothing to do with policy, but rather reflects countries' geographical characteristics. Other things equal, countries that are small (and so produce a narrower range of goods and services within their borders) and are physically close to other countries (so that transport costs are lower) tend to trade more. As a result, it is difficult to interpret cross-country differences in trade volumes as reflecting significant differences in trade policy.

B. Omitted Variables

A second generic problem is that cross-country differences in economic growth reflect a confluence of many factors other than trade. To the extent that these factors are correlated with trade, the significance of trade in a growth regression that omits these factors may simply reflect trade serving as a proxy for other policies and institutions that are conducive to growth. A few examples in the top panel of Table 6 illustrate this point. In this table we show the simple correlation across countries between average levels of trade volumes and several other variables that have been identified as important for growth in the broader empirical growth literature: government consumption as a share of GDP, stability of monetary policy as proxied by the logarithm of one plus the inflation rate, political stability as proxied by the average number of revolutions occurring during the decade, and an index of the rule of law.

A quick glance at this table confirms that across countries there are sizeable correlations between these other growth determinants and trade openness. Since high inflation, political instability, and poor rule of law tend to be negatively correlated with growth, it is possible that trade volumes are simply serving as a proxy for these other correlates of poor economic performance. It should be noted, however, that government consumption is often found to be negatively correlated with growth, but is positively correlated with openness (the latter fact is stressed by Rodrik 1998). In this case a regression of growth on trade which excludes government consumption may understate the effects of trade on growth.

In any case, the main point here is that across countries, trade volumes are correlated with a wide variety of other factors that may matter for economic growth, and it is difficult to adequately control for all of these factors in order to isolate the partial effect of trade on growth. In an influential paper Levine and Renelt (1992) systematically examined this issue for a large number of variables used in the empirical growth literature and concluded that trade volumes were not robustly correlated with growth (although they are robustly correlated with investment rates). And in more recent work Rodriguez and Rodrik (2000) applied this criticism to several of the papers focused specifically on the impact of trade on growth, and reached similar conclusions.

C. Endogeneity

Even after addressing these two difficulties, it is still possible that the observed partial correlation between trade and growth simply reflects reverse causation from growth to trade. There are a variety of plausible reasons for this. If, for example, an economy enjoys a surge in growth, more firms may attain the size necessary to break into export markets, so that exports also increase. At the microeconomic level, there is convincing evidence of reverse causation in the sense that much of the observed correlation between firm performance and exports is driven by larger and more productive firms self-selecting into export markets (see for example Clerides, Lach and Tybout 1997).

The best recent attempt to overcome this problem of reverse causation from growth to trade is Frankel and Romer (1999). They estimate cross-country regressions of the log-level of per capita income on trade volumes, interpreting cross-country differences in income levels as reflecting growth in the very long run. To address the possible feedback from income to trade, they use countries' geographic characteristics as instruments. Given that geography is a robust predictor of trade and given the exogeneity of geography, this is a very promising strategy. Nevertheless, there are two drawbacks to this approach, both of which are stressed by Rodriguez and Rodrik (2000). First, by construction this approach can only be informative about the effect of the geographically determined component of trade on growth, and so it says little about the effects of trade policy on growth. Second, the identification of the effect of trade hinges crucially on the assumption that geographic characteristics matter for growth *only* through their effects on trade, and this strong assumption is difficult to test.

D. Some New Estimates of the Effect of Trade on Growth

We now present some new results on the effect of trade on growth, relying on an existing methodology that has not been widely applied to this question but is quite useful in light of the problems discussed above. Our empirical strategy is simple. Rather than rely on cross-country differences in trade and growth to identify the effects of trade, we rely on the within-country variation in the data. In particular, we examine whether *changes* in decadal average growth rates can be explained by changes in trade volumes.

Consider the following "standard" cross-country growth regression:

$$y_{ct} = \beta_0 + \beta_1 \cdot y_{c,t-k} + \beta_2' X_{ct} + \eta_c + \gamma_t + v_{ct} \quad (1)$$

where y_{ct} is log-level of per capita GDP in country c at time t , $y_{c,t-k}$ is its lag k years ago ($k=10$ years in our application using decadal data) and X_{ct} is a set of control variables which are measured as averages over the decade between $t-k$ and t . We include trade volumes (exports plus imports as a share of GDP) among the variables in X . Subtracting lagged income from both sides of the equation gives the more conventional formulation in which the dependent variable is growth, regressed on initial income and a set of control variables. The disturbance term in the regression consists of an unobserved country effect that is constant over time, η_c , an unobserved period effect that is common across countries, λ_t , and a component that varies across both countries and years which we assume to be uncorrelated over time, v_{ct} .

Most of the empirical growth literature considers growth over a very long period ($k=25$ years or more) so that there is only one observation per country. As a result, all of the effects of interest are estimated using the cross-country variation in the data. Some papers consider shorter periods such as decades or quinquennia, and typically combine the cross-country and within-country variation in the data in a fairly ad-hoc manner. Caselli, Esquivel and Lefort (1996) provide a useful critique of conventional panel growth econometrics and a proposed solution. In this paper we adopt their preferred estimation strategy, which is to estimate equation (1) in differences, using appropriate lags of the right-hand side variables as instruments. In particular, they advocate estimating the following regression:

$$y_{ct} - y_{c,t-k} = \beta_1 \cdot (y_{c,t-k} - y_{c,t-2k}) + \beta_2' (X_{ct} - X_{c,t-k}) + (\gamma_t - \gamma_{t-k}) + (v_{ct} - v_{c,t-k}) \quad (2)$$

This is nothing more than a regression of growth on lagged growth, and on changes in the set of explanatory variables. Or, subtracting lagged growth from both sides of the equation, we have changes in growth from one decade to the next as a function of initial growth and changes in the explanatory variables.

This approach has several desirable features for us, which relate to the empirical problems discussed above:

- (i) *Measurement Error.* While cross-country differences in trade volumes are arguably a poor measure of cross-country differences in trade policy (since they to a large extent reflect geography), changes in trade volumes within countries over time are not subject

to this particular measurement problem since countries' geographical characteristics do not change over time. While change in trade volumes may reflect a variety of factors, we can at least be reasonably confident that geography is not one of these.

- (ii) *Omitted Variables.* Many of the possible omitted variables in a growth regression that may be correlated with trade, such as rule of law, a country's ethnic makeup, or its colonial history, change very little over time. Again, by differencing we can at least be sure that the estimated coefficient on trade is not simply picking up a correlation with these omitted time-invariant country characteristics. Also, since we include time effects in the regression, these will pick up omitted shocks that affect trade and growth in all countries similarly, such as increases in world demand or widespread declines in transport costs. Of course, there are other determinants of growth that do change over time, such as government consumption, inflation, and others. However, looking at the bottom panel of Table 6, it is apparent that *changes* in these variables (in the bottom panel) tend to be less correlated with changes in trade openness than the *levels* of these variables (in the top panel). While we can of course never be entirely sure that we have adequately controlled for all omitted factors, we have arguably removed the effects of an important class of time-invariant omitted factors and time-varying factors that are common across countries.
- (iii) *Endogeneity.* A further advantage of this differenced growth equation is that it presents a natural set of instruments to control for the possible problem of reverse causation from growth to trade. Our identifying assumption is that while trade volumes may be correlated with the contemporaneous and lagged shocks to GDP growth ($E[X_{ct} \cdot v_{c,t-s}] \neq 0$ for $s \geq 0$), it is uncorrelated with future shocks to GDP growth, ($E[X_{ct} \cdot v_{c,t+s}] = 0$ for $s > 0$). In practice, this means that when we regress growth in the 1990s on growth in the 1980s and the change in trade volumes between the 1980s and 1990s, we can use the level of trade volumes in the 1970s as an instrument for trade openness.⁶

Table 7 presents our first set of results using this technique. Our data set consists of 187 observations on growth in the 1990s and growth in the 1980s, for roughly 100 countries. The dependent variable is average annual growth, and the explanatory variables are average annual growth in the previous decade and average annual change in trade volumes (we have

6. We also instrument for lagged growth using the level of income in the 1970s, as is necessitated by the combination of a dynamic panel and unobserved country-specific effects. See Caselli, Esquivel, and Lefort (1996) for details.

in effect divided Equation (2) by $k=10$ years before estimation). As a result, the coefficient on the trade variable can be interpreted as the cumulative percentage change in the level of per capita GDP over a decade of a 100 percent increase in the trade share.

In the first column we present the results simply estimating Equation (2) by ordinary least squares. While this estimation method is inconsistent, it is a helpful way of summarizing the partial correlations in the data. We report the estimated coefficients, and in parentheses standard errors that are robust to heteroskedasticity and the first-order serial correlation in the residuals induced by differencing. The striking feature of this first column is that changes in trade volumes are strongly correlated with changes in growth, with a point estimate indicating that a 100 percent increase in the trade share would have the cumulative effect of raising incomes by 25 percent over a decade.

Of more interest are the results in the second column, where we instrument for initial income and trade volumes as described above. The coefficient on trade jumps to 0.47 and remains highly significant. This result is not driven by a few extreme cases in the data (such as the collapse in trade volumes and growth in some countries in Eastern Europe following the fall of the Soviet Union and the COMECON trading system), as shown in Figure 12 where we plot the partial correlation between trade and growth based on the specification in the second column of Table 7. It is worth reiterating that these estimates reflect the effect of *changes* in trade on *changes* in growth. As a result, they do not reflect the effect of geography-induced differences in trade (as in the paper by Frankel and Romer 1999), nor are they tainted by the omission of any variables that matter for growth but change little over time. Our instrumentation strategy also ensures that they also do not reflect reverse causation from growth to trade. Furthermore, as long as any time-varying omitted variables are uncorrelated with the level of trade openness two decades previous, our instrumented coefficients will not reflect the spurious omission of these variables.⁷

We take up this final point last, by expanding the regression to include the three additional time-varying control variables from Table 6: government consumption as a share of GDP, the logarithm of one plus the inflation rate, and a dummy variable indicating whether there was a revolution. These variables are all measured as decade averages and are

7. It is also worth noting that the internal instruments perform quite well in this equation, in the sense of being strongly correlated with the endogenous variables. In particular, the F-statistics for the first stage regressions for lagged growth and changes in trade volume (for which the instruments are twice lagged income and trade volume, as well as period dummies) are 12.5 and 17.5 respectively, and the null that the instruments have no explanatory power is overwhelmingly rejected in each case.

entered as changes in decade averages in the differenced regression. We present two variants on this regression. The first column reports the results of simply adding these variables to the previous column, under the assumption that they are strictly exogenous to growth. When we do so, we find that the magnitude and significance of the coefficient on trade volumes is essentially unchanged. This is what we would expect given our previous observation that changes in these variables are not very correlated with changes in trade volumes. The remaining variables enter with the expected negative signs, but none are significant.

Unfortunately, however, things look considerably worse when we attempt to instrument for all of the right-hand side variables simultaneously in the final column. When we do so, we find that all of the right-hand side variables are insignificant, and the magnitudes of some of the estimated coefficients are wildly different from in the uninstrumented specification. Mechanically, there is a fairly simple explanation for these rather unsatisfying results. While changes in the additional control variables are not very correlated with changes in trade volumes (as we saw in Table 6), the portions of these variables that are correlated with the instruments under our identification scheme are in fact highly correlated with the portion of trade openness that is correlated with the instruments. As a result, the second stage regression in our instrumental variables procedure in the final column is afflicted by severe multicollinearity.

At a more intuitive level, this suggests to us that the available data on trade, growth and other policies may not be sufficiently informative to enable us to isolate the precise partial effect of trade on growth, since our instruments are not sufficiently informative. However, we should also note that this problem is specific to our particular identification scheme. It remains quite possible that alternative instruments for the additional control variables will not induce such strong multicollinearity in the second-stage regressions, and so be more “informative” for our purposes. We agree with critics of cross-country empirics such as Srinivasan and Bhagwati (2000) that we will ultimately not be able to find “scientific proof” of the effects of trade. However, we are encouraged by the fact that our basic results do show a strong correlation between changes in trade and changes in growth, and consider finding better instruments for a more complete regression to be a valuable research area that nicely complements the case-study approach of the previous section.

IV. Trade, Growth, and Poverty

Globalization has dramatically increased inequality between and within nations.
--Jay Mazur, "Labor's New Internationalism," *Foreign Affairs*

One of the most common populist views of growing international economic integration is that it leads to growing inequality between nations, that is, that globalization causes divergence between rich and poor countries and within nations, and globalization benefits richer households proportionally more than it benefits poorer ones. In the second section of this paper we have argued that the experience of globalizers shows how greater openness to international trade has in fact contributed to narrowing the gap between rich and poor countries, as the globalizers have grown faster than the rich countries as a group. In this section of the paper we turn to the effects of globalization on inequality within countries, drawing on results from our recent paper, Dollar and Kraay (2000).

It is useful to begin with what one would expect from theory. The dominant theory of international trade, the factor proportions or Heckschler-Ohlin model, suggests that greater trade openness will affect the distribution of income among factors of production, but the direction of the effect will be different in different countries. To take the simplest example, with only capital and labor as factors, open trade should lead to higher wages in labor-abundant countries and lower wages in labor-scarce ones. The effect of openness on the household distribution of income will thus depend on what factors are abundant in a country and how they are owned across households. It would be quite remarkable if it happened that in general poor households owned scarce factors and were thus hurt by trade. Our reading of theory is that one should expect no systematic relationship across countries between changes in trade policy and changes in household inequality. In other words, looking across countries we should find that on average poorer households should benefit proportionally as much from trade openness as other households.

In order to test this proposition we draw on a large data set on income inequality, compiled from a variety of existing sources (primarily the large dataset constructed by Deininger and Squire 2000) with several updates using more recently available data). Our data consist of Gini coefficients for a large number of countries and years, and five points on the Lorenz curve for a most of these country-year observations. As noted by these and other

authors there are substantial difficulties in comparing income distribution data across countries. Countries differ in the concept measured (income versus consumption), the measure of income (gross versus net), the unit of observation (individuals versus households), and the coverage of the survey (national versus subnational). We restrict attention to distribution data based on nationally representative sources identified as high-quality by Deininger and Squire (1996), and perform some simple adjustments to control for differences in the types of surveys.

A difficulty with the data on income distribution is that it forms a highly unbalanced and irregularly spaced panel of observations. For some rich countries and a few developing countries a continuous time series of annual observations on income distribution is available for long periods. For most countries only one or a handful of observations are available. Since we are interested in growth over the medium to long-run we do not want to rely on potentially adjacent annual observations in our estimation. We therefore work with an irregularly spaced panel of distribution data using the actual years to which the surveys refer. To avoid relying on adjacent annual observations or on growth over overlapping intervals, we filter the data as follows. For each country we begin with the first available distribution observation. Moving forward in time we then choose the next observation subject to the constraint that at least five years separate observations, until we have exhausted the available data for that country. This results in an unbalanced and irregularly spaced panel of 370 observations on income distribution separated by at least five years within countries. These data cover a total of 125 countries. In our econometric estimation we restrict the sample further to the set of 236 observations covering 80 countries for which at least two spaced observations on income distribution are available, so that we can consider within-country growth and changes in inequality over periods of at least five years. When we consider the effects of additional control variables, the sample is slightly smaller and varies across specifications depending on data availability.

In that paper we were interested in how incomes of the poor vary with average incomes, and in what explains deviations from this general relationship. We defined “the poor” as those in the bottom 20 percent of the income distribution, and used the available income distribution data to construct average incomes in the poorest quintile. For the vast majority of observations we do this directly, using reported data on the first quintile share. For a few observations for which we have information on the Gini coefficient but not the Lorenz curve,

we estimate mean income in the poorest quintile under the assumption that the distribution of income is lognormal. Given a lognormal distribution of income, it is possible to show that to a very close approximation:

$$y^P = -\gamma \cdot G + y \quad (3)$$

where y^P denotes the logarithm of per capita income in the poorest quintile of the population; G denotes the Gini coefficient; y denotes the logarithm of average per capita income in the entire population; and $\gamma=0.036$ is a constant.⁸

There is a clear link between the growth rate of income of the poor and growth rate of mean income, but also quite a bit of variation (Figure 7). We are interested in the general relationship between growth and income of the poor. We also interested in explaining deviations around that general relationship, in other words, what makes growth especially “pro-poor” or not. In the context of this paper, one class of possible explanations relates to trade. The question of whether increases in trade systematically lead to higher income inequality within countries is the same as the question of whether trade systematically explains deviations between growth in average incomes and growth in incomes of the poor.

In particular, we estimate variants of the following regression of the logarithm of per capita income of the poor on the logarithm of average per capita income:

$$y_{ct}^P = \alpha_0 + \alpha_1 \cdot y_{ct} + \alpha_2' X_{ct} + \mu_c + \varepsilon_{ct} \quad (4)$$

where c and t index countries and years, respectively; X_{ct} is a vector of other determinants of mean income of the poor; and $\mu_c + \varepsilon_{ct}$ is a composite error term including unobserved country effects.⁹

⁸ If the distribution of income is lognormal, i.e. $y \sim N(\mu, \sigma)$, and the Gini coefficient on a scale from 0 to 100 is G , the standard deviation of this lognormal distribution is given by $\sigma = \sqrt{2} \cdot \Phi^{-1}\left(\frac{1+G/100}{2}\right)$ (Aitchison and Brown (1966)). Using the properties of the mean of the truncated lognormal distribution (e.g. Johnston, Kotz and Balakrishnan (1994)) it can be shown that $y^P = y + \ln\left(\frac{\Phi(\Phi^{-1}(0.2) - \sigma)}{0.2}\right)$. Combining these two results and numerically linearizing the term involving G gives Equation

(1) in the text. In the empirics, we rely on the exact, rather than the linearized, estimate of y^P . However, in most of the discussion we use the linearized version for clarity. Quah (1999) provides a number of similar results for the lognormal and other parametric distributions.

We are interested in two key parameters from Equation (4). The first is α_1 which measures the elasticity of income of the poor with respect to mean income. A value of $\alpha_1=1$ indicates that growth in mean income is translated one-for-one into growth in income of the poor, that is, that changes in income distribution are not systematically associated with changes in average incomes. Estimates greater or less than one indicate that growth more than or less than proportionately benefits the poor, i.e., that growth systematically leads to decreases or increases in income inequality. The second parameter of interest is α_2 that measures the impact of other determinants of income of the poor *over and above their impact on mean income*, i.e., the effects of these variables on the distribution of income. In particular, we can use this regression framework to systematically examine whether increases in trade volumes (or any other variable) are systematically associated with changes in inequality.

Estimating Equation (4) poses a variety of econometric difficulties that we address in detail in our other paper. Here we briefly note that we estimate this equation using a system generalized method of moments estimator which optimally combines information in the levels of the data with the within-country variation in the data. As discussed in the other paper, this strategy allows us to address as best we know how problems of measurement error in the income distribution data (and other variables), possible omitted variables, and the possibility of reverse causation from income distribution to average incomes.

Table 8 shows a typical set of results from that paper, regressing average incomes of the poorest quintile on average incomes and several additional control variables that have been identified as important for growth in the larger empirical growth literature. We typically find a point estimate of α_1 which is slightly larger than, but not statistically significantly different from, 1, indicating that incomes in the bottom quintile on average rise one-for-one with average incomes (alternatively, that changes in income distribution are not significantly associated with changes in average incomes). In addition, we rarely find that any of the additional control variables enter significantly, indicating that these variables have no systematic effect on income distribution. The only exception is stabilization from high inflation, which at times enters significantly. Neither of these two results should be all that surprising. Various authors, including Chen and Ravallion (1997) and Deininger and Squire (1996) have documented the

9. It is straightforward to generalize the discussion to include year effects. We do not do so here because in our empirical results we do not find time effects to be significant.

striking absence of any correlation between (changes in) income and (changes in) inequality, albeit with smaller samples and different econometric techniques. Our lack of systematic significant effects of policies and institutions on inequality mirrors the dearth of similar robust results in the small empirical literature on determinants of income inequality.

For the purposes of this paper, the most interesting results are those relating to trade volumes. Our results indicate that there is no significant correlation between changes in inequality and changes in trade volumes, controlling for changes in average incomes (Table 8). This can be seen quite clearly in Figure 8, which reports the simple correlation between changes in trade volumes and changes in inequality as measured by the Gini coefficient. It is simply not true that countries that trade more on average have rising income inequality. No doubt there are distributional conflicts over trade policy, and we do not want to minimize the importance of these. But, as would be expected from theory, it is not the case that the poor are systematically the losers from trade openness.

Combining these results with those of the previous section, we can perform the following simple thought-experiment: What would be the effect of a simultaneous increase in trade volumes and stabilization from high inflation of the magnitude observed among our globalizers, on average incomes in the poorest quintile? From the case studies and the econometric evidence above, it seems reasonable to conclude that both of these contribute to higher growth over horizons of a decade or so, and the results in Table 7 give some idea of the magnitude. The results from our other paper provide us with estimates of the effects of these changes on income distribution. By differentiating Equation (4) with respect to the control variables we can therefore summarize the effect on average incomes in the bottom quintile as:

$$\frac{\partial y_{ct}^P}{\partial X_{ct}} = \frac{\partial y_{ct}}{\partial X_{ct}} + \left((\alpha_1 - 1) \cdot \frac{\partial y_{ct}}{\partial X_{ct}} + \alpha_2 \right) \quad (5)$$

The first term captures the effect on incomes of the poor of a change in one of the determinants of growth, holding constant the distribution of income. We refer to this as the “growth effect” of policies, and we can read this off the growth regression in Table 7 as the estimated coefficient on the policy variable of interest. We use the results in the third column of this table given our concerns about the final column discussed above. The second term

captures the effects of a change in one of the determinants of growth on incomes of the poor through changes in the distribution of income. This consists of two pieces: the difference between the estimated income elasticity and one, and the direct effects of policies on incomes of the poor in Equation (4). For these, we use the values reported in Table 8 of our other paper.

The results of this exercise are summarized in Figure 9. As noted in the introduction, we consider an increase in trade volumes of 35 percentage points of GDP and a decrease in inflation of 37 percentage points, which is the unweighted average of the experience of our globalizers between the early 1980s and the late 1990s. The estimated effect of this change is to raise the growth rate of income of the poor by about 3.0 percentage points, of which 2.2 percentage points are due to the increased openness to trade. Most of this reflects the pure growth effects of these policy changes: the distribution effects are small, and in the case of trade, not significantly different from zero.

Given the imprecision with which the distributional effects of policies are estimated, it is also interesting to ask the following closely related question: "Suppose in a particular country case that greater openness does lead to higher income inequality. How large would the increase in inequality associated with trade liberalization have to be in order to erase the income gains for the poorest quintile?". Using Equation (5), this would be the case if

$$a_2 = -a_1 \cdot \frac{\partial y_{ct}}{\partial X_{ct}}$$

For an estimate of $\alpha_1 = 1.17$ and an estimated growth impact of trade of 0.54, this would imply an estimate of $\alpha_2 = -0.63$. What does this mean in practice? Combining Equation (4) with the lognormal approximation in Equation (3) allows us to interpret this inequality impact in terms of Gini coefficients: an estimated coefficient of $\alpha_2 = -0.63$ in a regression with average incomes of the poor as the dependent variable is equivalent to an estimated coefficient of $\alpha_2 = -0.63/0.036 = -17.6$ in a regression of the Gini coefficient on average incomes and trade volumes. So, an increase in trade volumes of 0.35 would need to lead to an increase of about six Gini points in order for the growth benefits of trade liberalization over the course of a decade to be completely offset by the adverse distributional consequences. However, we can see from Figure 8 that such large changes in inequality are in fact extremely rare.

In summary, in other research we have found little evidence of a systematic effect of trade volumes on income inequality. Combining this observation with the results on the growth

benefits of greater trade, we conclude that the balance of the evidence suggests that, on average, greater globalization is a force for poverty reduction.

V. Conclusion

We identified a group of developing countries that have had large cuts in tariffs and large increases in actual trade volumes since 1980. Since PRC, India, and several other large countries are part of this group, well over half of the population of the developing world lives in these globalizing economies. The post-1980 globalizers are different from the rest of the developing world in terms of the extent of tariff cutting (34 point reduction compared to 11 points) and in terms of the increase in trade volume over the past 20 years (111 percent increase in trade to GDP compared to a 12 percent decrease). While rich country growth rates have slowed down over the past several decades, the growth rates of the globalizers have shown exactly the opposite pattern, accelerating from the 1970s to the 1980s to the 1990s. The rest of the developing world, on the other hand, has followed the same pattern as the rich countries: growth decelerating from the 1970s to the 1980s to the 1990s. In the 1990s the globalizing developing countries grew at 5.1 percent per capita; rich countries at 1.9 percent per capita; and nonglobalizing developing countries at -1.1 percent per capita. Thus, the globalizers are catching up with rich countries while the nonglobalizers fall further and further behind.

In section III we then looked at how general these patterns are, through cross-country regressions. We focused on *within country* variation and showed that changes in trade volumes have a strong positive relationship to changes in growth rates. In the fourth section we introduced results from our earlier paper, "Growth *Is* Good for the Poor." There is no systematic relationship between changes in trade volumes and changes in household income inequality. The acceleration in growth rates that accompanies expanded trade in general translates into proportionate increases in income of the poor. Thus, *absolute poverty* in the globalizing developing economies has fallen sharply in the past 20 years. The evidence from individual cases and from cross-country analysis supports the view that open trade regimes lead to faster growth and poverty reduction in poor countries.

Figure 1. Increase in trade/GDP:
late-1970s to late-1990s

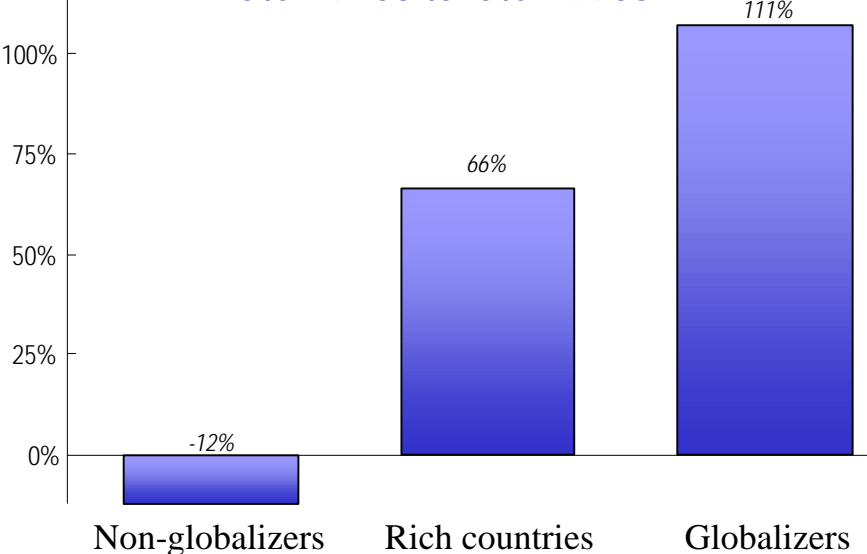


Figure 2. Decline in average import tariffs:
mid-1980s to late-1990s

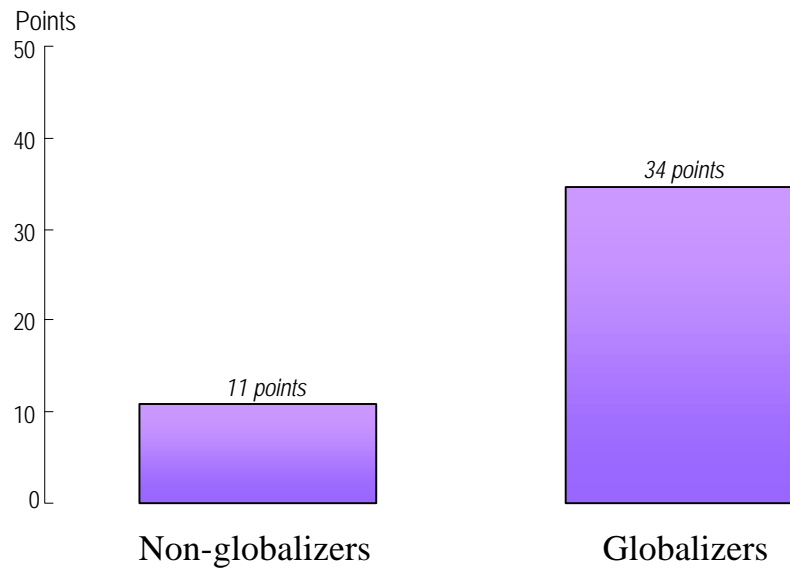


Figure 3. Per capita GDP growth rates:
post-1980s globalizers

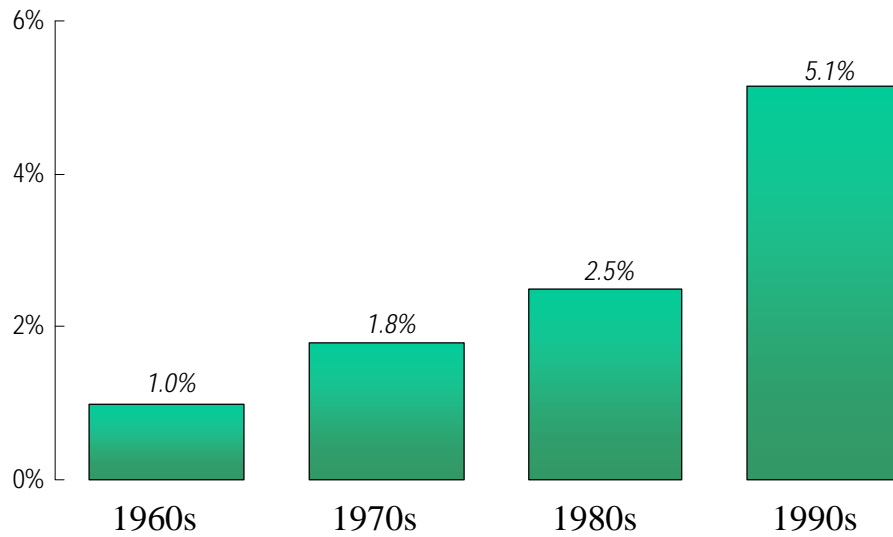


Figure 4. Per capita GDP growth rates:
rich countries

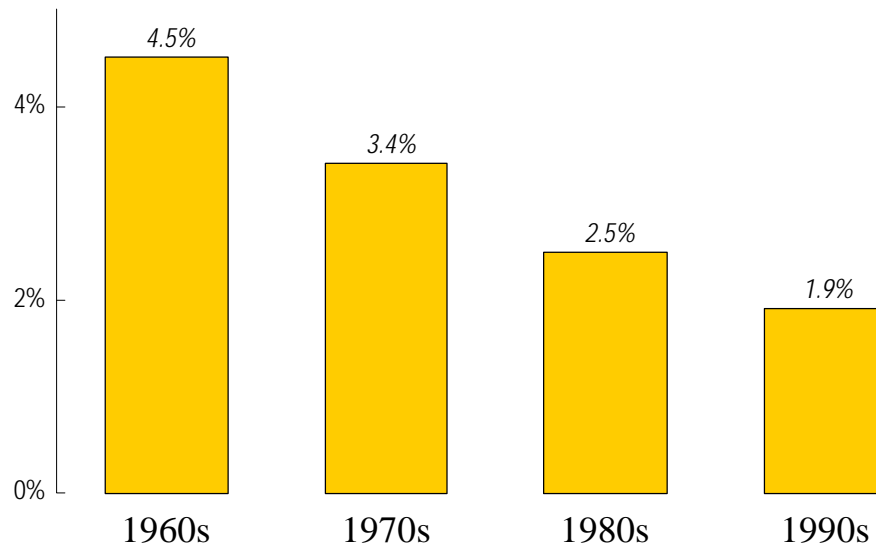


Figure 5. Per capita GDP growth rates:
non-globalizers

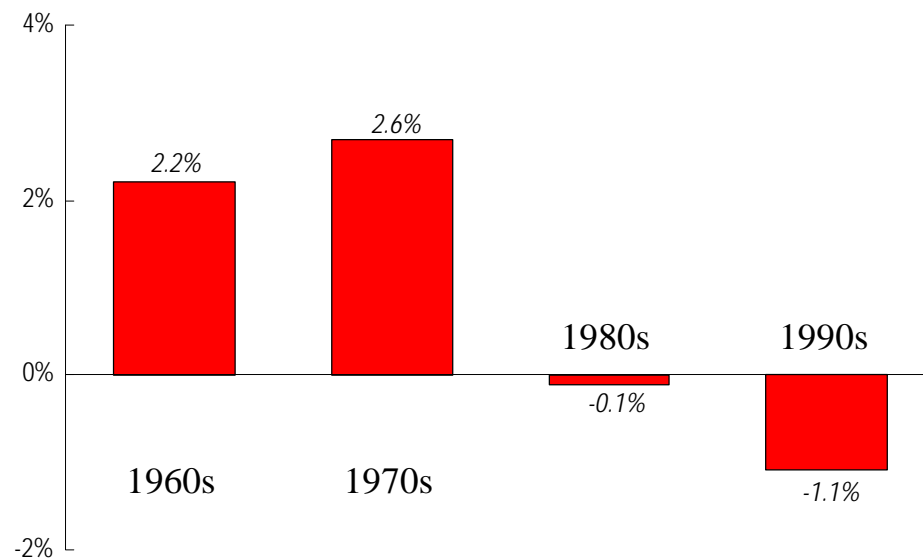


Figure 6. Convergence and divergence in the 1990s (GDP per capita growth rates)

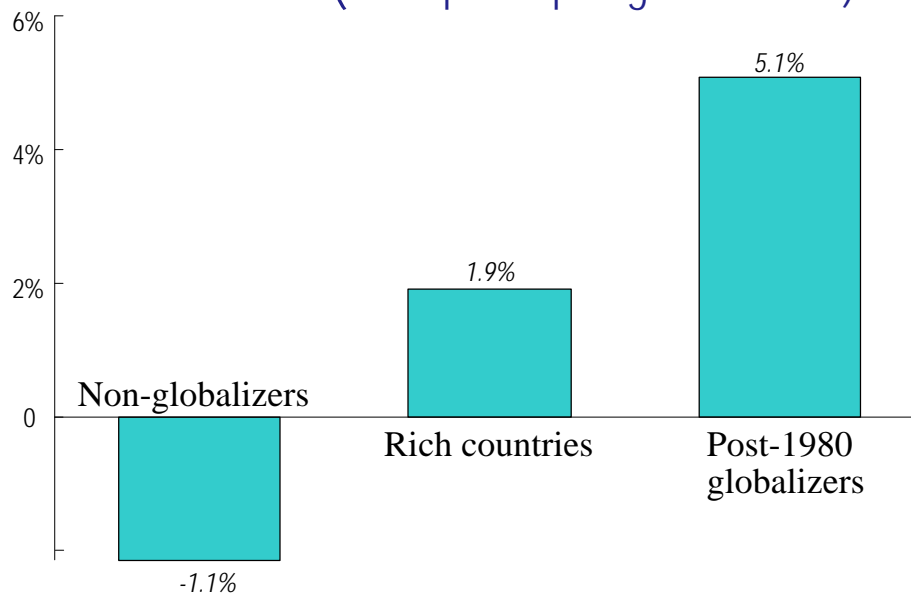


Figure 7. Growth is good for the poor

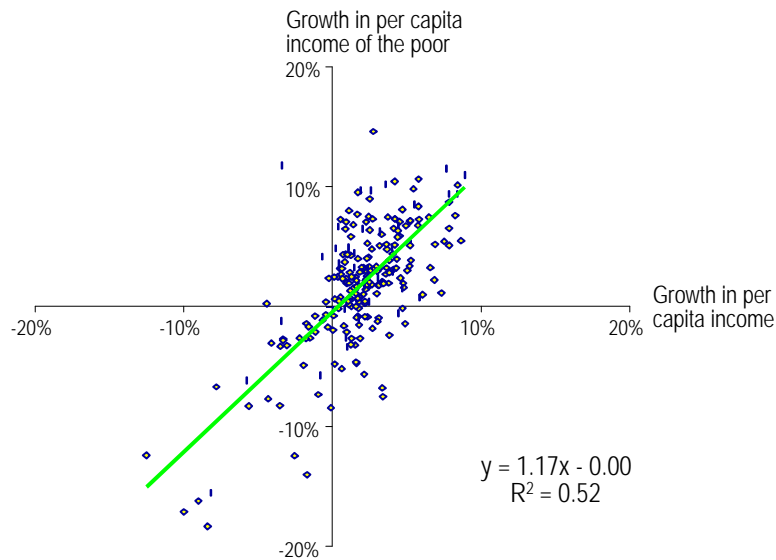


Figure 8. Increased trade has no correlation with changes in inequality

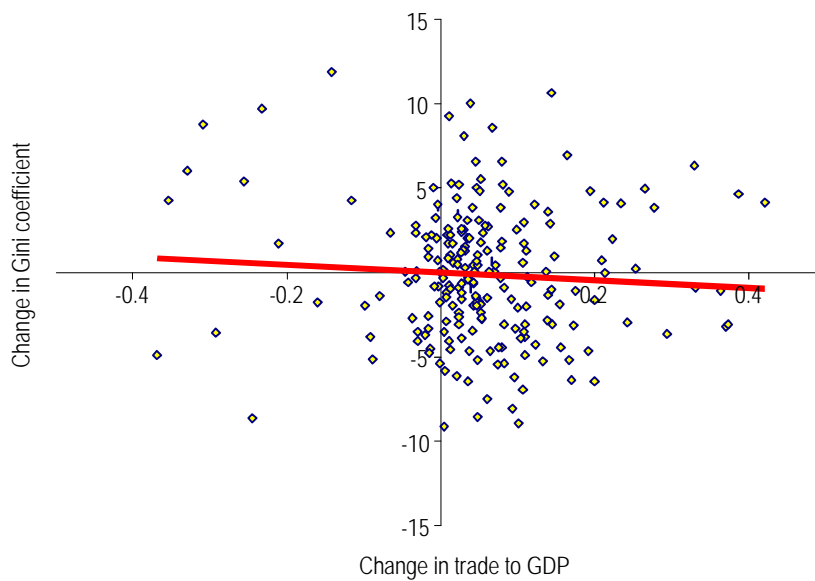


Figure 9. Trade, stabilization and income of the poor

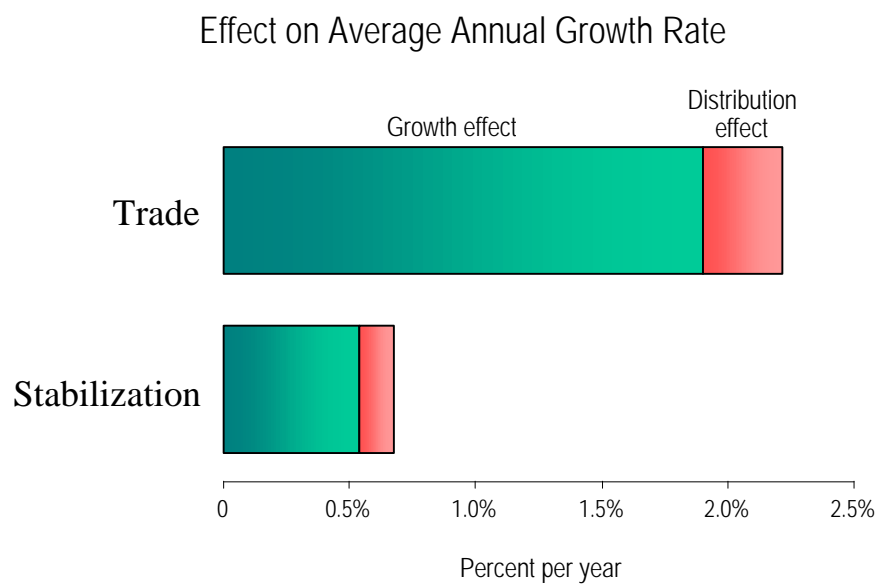


Figure 10. Poverty declined rapidly in Vietnam...as the economy opened

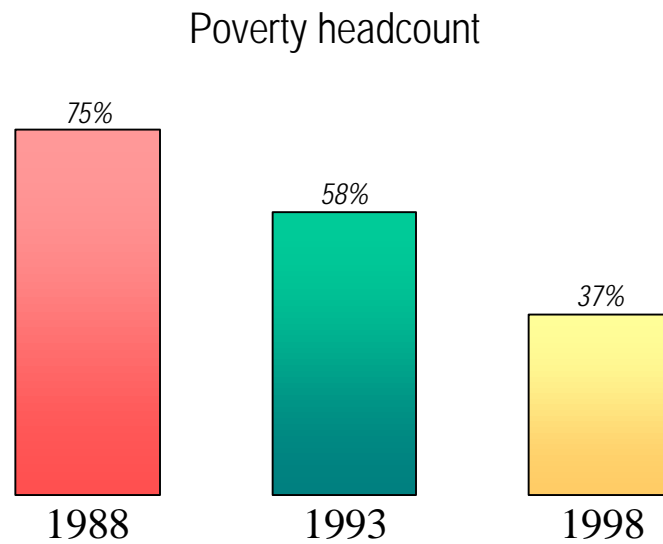
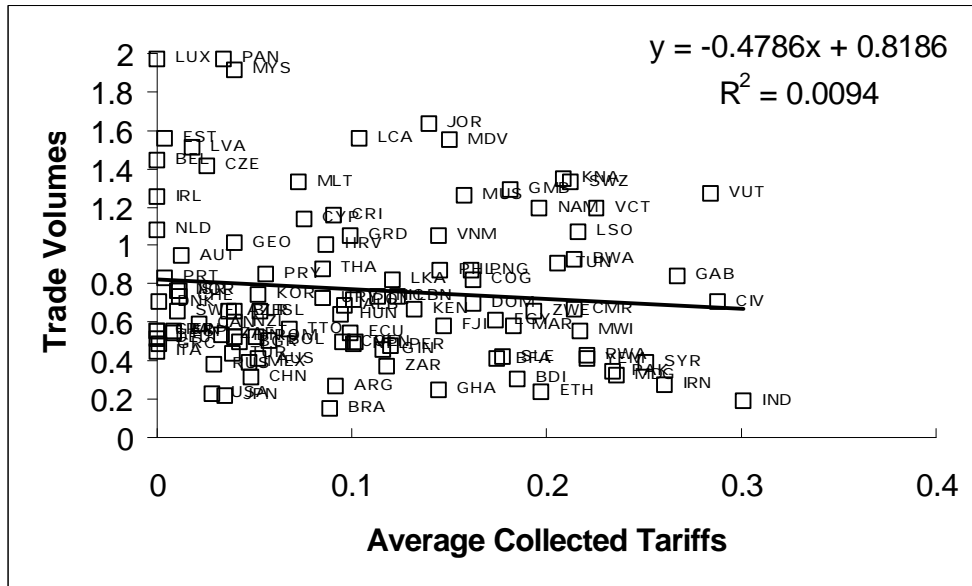


Figure 11: Measured Tariffs and Trade Volumes

Levels for 1990s



Changes 1990s vs 1980s

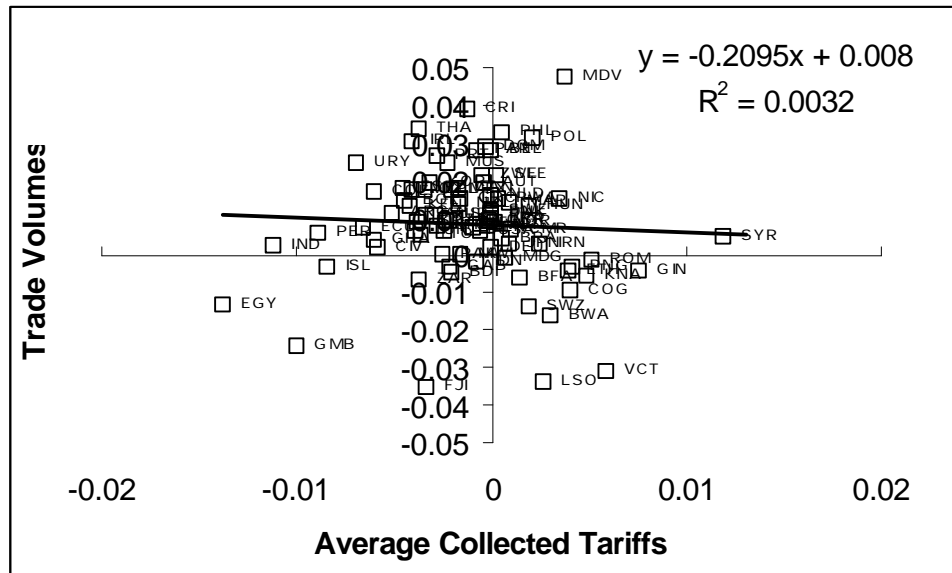


Figure 12: Partial Correlation Between Trade and Growth

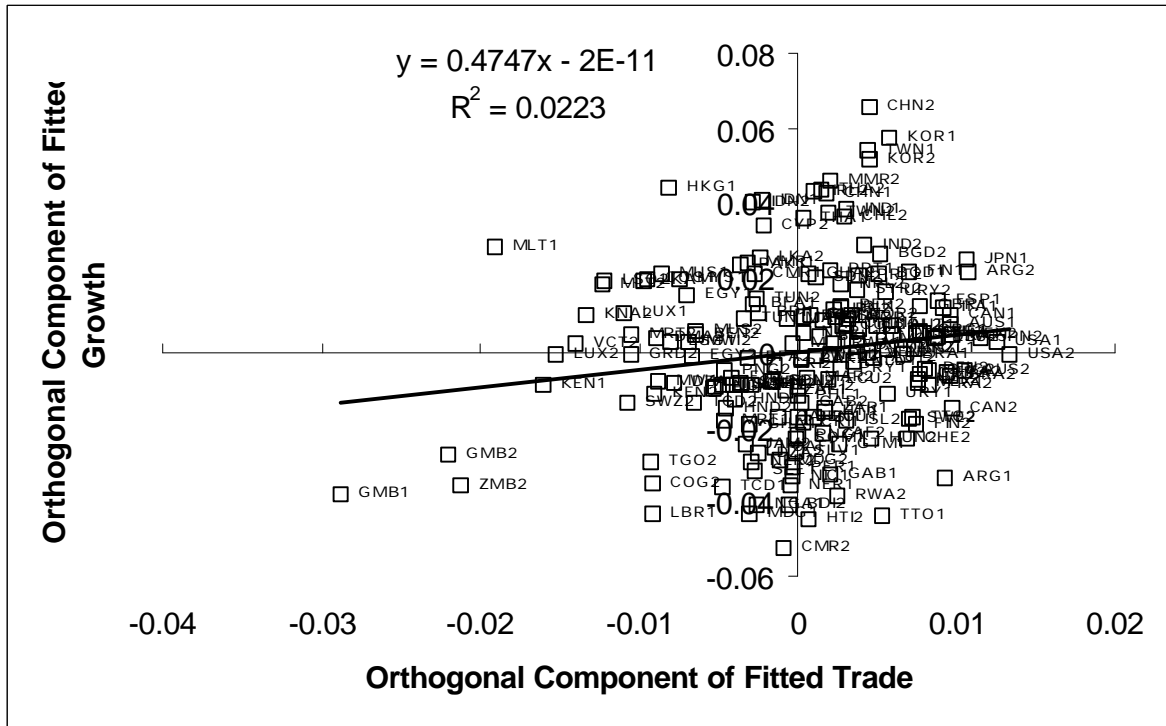


Table 1. Post-1980 Globalizers: Per capita GDP growth, openness, and tariffs
(Defined by increases in trade volumes)

COUNTRY	AVERAGE GROWTH RATE						AVERAGE OPENNESS						AVERAGE TARIFF RATE		
	1970s	1975s	1980s	1985s	1990s	1995s	1970s	1975s	1980s	1985s	1990s	1995s	1985s	1990s	1995s
ARGENTINA	2.3%	1.0%	-3.2%	-2.0%	6.8%	5.2%	0.11	0.13	0.16	0.16	0.24	0.33	27.5	13.9	11.0
BANGLADESH	-7.0%	3.2%	1.2%	3.1%	3.4%	3.7%	0.10	0.12	0.14	0.14	0.19	0.27	92.7	54.3	26.0
BRAZIL	8.8%	3.8%	-2.9%	1.5%	0.9%	1.6%	0.11	0.11	0.10	0.10	0.14	0.18	45.8	21.0	11.5
CHINA	1.4%	3.4%	3.9%	1.7%	8.6%	7.8%	0.13	0.14	0.27	0.29	0.30	0.34	38.8	39.9	20.9
COLOMBIA	4.0%	3.5%	0.0%	2.5%	2.4%	0.6%	0.34	0.31	0.33	0.33	0.45	0.59	29.4	16.6	12.2
COSTA RICA	3.4%	3.6%	-3.6%	2.0%	2.0%	-0.1%	0.74	0.77	0.71	0.82	1.08	1.28	19.5	12.6	11.2
DOMINICAN REP.	7.6%	1.7%	-2.1%	3.5%	1.8%	5.6%	0.39	0.32	0.41	0.40	0.56	0.92	..	17.8	16.2
HAITI	1.4%	3.4%	-3.4%	-2.2%	-7.3%	-0.3%	0.32	0.43	0.48	0.51	0.67	0.99	11.6	..	10.0
HUNGARY	5.9%	2.8%	1.2%	1.4%	-2.8%	3.3%	0.41	0.47	0.48	0.53	0.58	0.74	18.0	9.9	14.8
INDIA	-1.2%	0.7%	3.3%	4.1%	2.6%	4.4%	0.13	0.14	0.16	0.16	0.17	0.22	99.4	61.9	38.3
IVORY COAST	1.6%	5.1%	-3.8%	-3.6%	-3.4%	3.3%	0.54	0.53	0.70	0.67	0.68	0.76	26.3	23.8	20.7
JAMAICA	2.5%	-3.8%	-0.1%	3.4%	-0.8%	-2.7%	0.80	0.76	0.77	1.07	1.09	1.26	18.4	19.6	10.9
JORDAN	8.2%	10.8%	1.1%	-4.3%	1.4%	-1.6%	..	0.94	1.18	1.04	1.62	1.66	16.3	15.8	16.0
MALAYSIA	6.5%	6.6%	3.8%	3.0%	5.8%	5.4%	0.89	0.92	1.07	1.21	1.74	2.20	14.9	14.3	8.9
MALI	0.8%	4.5%	-1.3%	1.1%	-1.8%	2.3%	0.29	0.30	0.43	0.51	0.52	0.51	18.8
MEXICO	4.5%	3.3%	-2.3%	-0.2%	2.4%	4.2%	0.17	0.18	0.21	0.23	0.33	0.50	16.7	12.8	12.8
NEPAL	0.7%	11.0%	1.0%	2.0%	3.0%	2.2%	0.16	0.25	0.31	0.32	0.42	0.60	21.8	16.1	11.0
NICARAGUA	2.7%	-9.8%	0.5%	-7.5%	-2.2%	..	0.49	0.53	0.66	0.51	0.68	0.85	22.1	12.7	10.7
PARAGUAY	3.7%	5.2%	-4.2%	-0.7%	1.0%	-0.2%	0.28	0.32	0.32	0.38	0.77	0.99	10.9	13.1	9.3
PHILIPPINES	3.1%	3.3%	-3.1%	2.9%	-0.6%	3.1%	0.40	0.42	0.52	0.56	0.75	1.06	27.8	24.5	17.2
RWANDA	-0.9%	2.8%	0.4%	-1.5%	-14.9%	0.3%	0.19	0.23	0.26	0.30	0.47	0.37	33.0	38.4	..
THAILAND	1.8%	6.2%	3.0%	6.9%	6.0%	1.5%	0.47	0.47	0.50	0.59	0.85	0.95	41.0	36.6	23.1
URUGUAY	0.1%	2.8%	-6.3%	4.1%	4.9%	4.3%	0.35	0.43	0.47	0.50	0.66	0.84	33.7	18.9	9.6
ZIMBABWE	5.8%	-3.1%	0.0%	-0.9%	0.4%	3.1%	..	0.44	0.44	0.45	0.59	0.77	9.2	17.2	21.5
AVERAGE	2.8%	3.0%	-0.7%	0.8%	0.8%	2.5%	0.4	0.4	0.5	0.5	0.6	0.8	30.7	23.3	15.8
POP WGT AVG	0.9%	2.6%	2.5%	2.5%	5.0%	5.4%	0.2	0.2	0.2	0.3	0.3	0.4	59.4	43.7	25.5

Table 2. Post-1980 Globalizers: Per capita GDP growth, openness, and tariffs
(Defined by reductions in tariffs)

COUNTRY	AVERAGE GROWTH RATE						AVERAGE OPENNESS						AVERAGE TARIFF RATE		
	1970s	1975s	1980s	1985s	1990s	1995s	1970s	1975s	1980s	1985s	1990s	1995s	1985s	1990s	1995s
ARGENTINA	2.3%	1.0%	-3.2%	-2.0%	6.8%	5.2%	0.11	0.13	0.16	0.16	0.24	0.33	27.5	13.9	11.0
BANGLADESH	-7.0%	3.2%	1.2%	3.1%	3.4%	3.7%	0.10	0.12	0.14	0.14	0.19	0.27	92.7	54.3	26.0
BENIN	-0.2%	0.1%	-1.9%	-4.6%	1.4%	2.6%	0.79	0.87	0.89	0.64	0.52	0.46	42.8	41.0	12.7
BRAZIL	8.8%	3.8%	-2.9%	1.5%	0.9%	1.6%	0.11	0.11	0.10	0.10	0.14	0.18	45.8	21.0	11.5
BURKINA FASO	1.2%	2.6%	0.9%	1.2%	-0.9%	3.2%	0.42	0.48	0.48	0.46	0.43	0.38	60.8		28.5
CAMEROON	2.9%	5.5%	4.0%	-2.2%	-7.2%	2.1%	0.54	0.47	0.59	0.61	0.69	0.65	32.0	18.6	18.1
CENTRAL AFR.R.	-0.9%	0.9%	-3.2%	-1.9%	-2.8%	-0.2%	0.41	0.43	0.48	0.44	0.47	0.42	32.0		18.6
CHINA	1.4%	3.4%	3.9%	1.7%	8.6%	7.8%	0.13	0.14	0.27	0.29	0.30	0.34	38.8	39.9	20.9
COLOMBIA	4.0%	3.5%	0.0%	2.5%	2.4%	0.6%	0.34	0.31	0.33	0.33	0.45	0.59	29.4	16.6	12.2
DOMINICA			5.7%	5.9%	1.4%	1.8%		1.10	1.09	1.15	1.19	1.12	31.9	28.0	15.0
ECUADOR	8.3%	4.0%	-2.8%	-1.1%	1.1%	0.6%	0.50	0.55	0.47	0.47	0.52	0.58	34.3	10.6	11.7
EGYPT	0.3%	4.1%	3.7%	-0.6%	0.1%	3.3%	0.84	0.99	0.84	0.65	0.62	0.60	39.7	35.3	28.1
ETHIOPIA	0.3%	0.8%	-0.3%	1.9%	-1.2%	5.0%			0.28	0.29	0.23	0.25	29.6	28.8	16.3
INDIA	-1.2%	0.7%	3.3%	4.1%	2.6%	4.4%	0.13	0.14	0.16	0.16	0.17	0.22	99.4	61.9	38.3
INDONESIA	5.5%	5.6%	5.7%	2.5%	4.3%	4.5%	0.58	0.69	0.60	0.49	0.50	0.57	27.9	20.1	13.2
KENYA	9.2%	2.7%	-2.2%	3.5%	-0.6%	0.6%	1.09	0.80	0.57	0.51	0.61	0.78	39.4	33.3	13.5
NICARAGUA	2.7%	-9.8%	0.5%	-7.5%	-2.2%	..	0.49	0.53	0.66	0.51	0.68	0.85	22.1	12.7	10.7
PAKISTAN	-2.4%	3.3%	2.1%	2.5%	0.8%	-0.3%	0.48	0.37	0.36	0.33	0.35	0.34	69.2	59.8	41.7
PERU	3.4%	-3.1%	-2.8%	-3.3%	2.7%	3.0%	0.47	0.44	0.45	0.38	0.44	0.53	45.0	19.0	13.3
THAILAND	1.8%	6.2%	3.0%	6.9%	6.0%	1.5%	0.47	0.47	0.50	0.59	0.85	0.95	41.0	36.6	23.1
UGANDA	-0.8%	-1.9%	1.9%	0.4%	1.6%	4.2%			0.35	0.38	0.31	0.43	25.0	17.1	13.0
URUGUAY	0.1%	2.8%	-6.3%	4.1%	4.9%	4.3%	0.35	0.43	0.47	0.50	0.66	0.84	33.7	18.9	9.6
VENEZUELA	-1.1%	2.2%	-3.7%	-1.3%	2.3%	0.2%	0.61	0.52	0.43	0.43	0.47	0.55	31.1	15.8	12.7
ZAMBIA	2.0%	-6.9%	-4.0%	-1.7%	-1.4%	2.4%	1.94	1.46	0.98	0.88	0.79	0.78	29.9	26.4	17.0
AVERAGE	1.8%	1.5%	0.1%	0.6%	1.5%	2.7%	0.5	0.5	0.5	0.5	0.5	0.5	41.7	28.6	18.2
POP WGT AVG	0.9%	2.6%	2.8%	2.5%	4.7%	5.1%	0.2	0.2	0.3	0.3	0.3	0.3	59.5	43.8	25.7

Table 3

Per Capita GDP Growth Rates by Decade and by Country Group
(percent per annum)

	1960s	1970s	1980s	1990s
Developed Countries	4.5	3.4	2.5	1.9
Of which: U.S.	2.8	2.7	1.9	2.1
Post-1980 Globalizers ^a	1.0	1.8	2.5	5.1
Other Developing and Transition Economies	2.2	2.6	-0.1	-1.1

^aDefined on the basis of increased trade volume (see Table 1).

Table 4

Per Capita GDP Growth Rates by Decade and by Country Group
(percent per annum)

	1960s	1970s	1980s	1990s
Developed Countries	4.5	3.4	2.5	1.9
Of which: U.S.	2.8	2.7	1.9	2.1
Post-1980 Globalizers ^a	1.0	1.7	2.6	4.9
Other Developing and Transition Economies	2.4	2.8	-0.9	-1.8

^aDefined on the basis of tariff reductions (see Table 2).

Table 5: Changes in Inequality in the Globalizers

	Gini Coefficient		Real Income Growth	
	<u>Initial</u>	<u>Final</u>	<u>Average</u>	<u>Poorest Quintile</u>
Argentina	#N/A	#N/A	#N/A	#N/A
Bangladesh	28.9 (1989)	33.6 (1996)	3.1 percent	1.8 percent
Brazil	57.8 (1980)	60 (1996)	0.1 percent	-0.8 percent
China	32 (1980)	40.3 (1998)	5.4 percent	3.8 percent
Colombia	54.5 (1978)	57.1 (1996)	1.6 percent	1.4 percent
Costa Rica	47.5 (1981)	47 (1996)	0.6 percent	1.8 percent
Dom. Republic	43.3 (1984)	48.7 (1996)	1.3 percent	-0.8 percent
Haiti	#N/A	#N/A	#N/A	#N/A
Hungary	24.2 (1987)	24.6 (1997)	-0.8 percent	-1.4 percent
India	31.5 (1983)	29.7 (1994)	3.2 percent	3.8 percent
Ivory Coast	41.2 (1985)	36.7 (1995)	-3.4 percent	-1.2 percent
Jamaica	43.2 (1988)	36.4 (1996)	-0.2 percent	3.2 percent
Jordan	36.1 (1986)	36.4 (1997)	-2.0 percent	-1.6 percent
Malaysia	51 (1979)	48.5 (1995)	4.3 percent	5.4 percent
Mali	36.5 (1989)	50.5 (1994)	-2.6 percent	-11.0 percent
Mexico	50.6 (1984)	53.7 (1995)	0.6 percent	-0.5 percent
Nepal	#N/A	#N/A	#N/A	#N/A
Nicaragua	#N/A	#N/A	#N/A	#N/A
Paraguay	#N/A	#N/A	#N/A	#N/A

Table 6: Correlations of Trade Volumes and Other Growth Determinants

	1970s	Levels 1980s	1990s
Government Consumption/GDP	0.39	0.31	0.21
log(1+Inflation Rate)	-0.18	-0.27	-0.07
Average Number of Revolutions	-0.23	-0.16	-0.09
Rule of Law	0.14	0.22	0.30
		Changes	
		1970s-1980s	1980s-1990s
Government Consumption/GDP		0.03	0.18
log(1+Inflation Rate)		-0.11	-0.18
Average Number of Revolutions		-0.06	0.03
Rule of Law	

Table 7: Trade and Growth Regressions

	OLS	IV	IV (Controls Exogenous)	IV (Controls Endogenous)
Initial Income	0.419 (0.071)***	0.783 (0.297)***	0.960 (0.397)**	0.455 (0.751)
Trade Volume	0.252 (0.095)***	0.475 (0.175)***	0.543 (0.210)***	-0.207 (0.397)
Government Cons/GDP			-1.164 (1.009)	3.472 (2.614)
log(1+Inflation Rate)			-0.142 (0.152)	-0.967 (0.712)
Revolutions			-0.025 (0.084)	-0.305 (0.417)
# Obs	187	187	173	173

*** Significant at the 1 percent level.

Table 8: Growth and Incomes of the Poor

(Dependent Variable is ln(Per Capita Income in the Bottom Quintile))

	(1)	(2)	(3)	(4)	(5)
ln(Per Capita Income)	1.055 (0.102)	1.063 (0.088)	1.021 (.080)	1.042 (.092)	1.104 (.094)
(Exports+Imports)/GDP	0.004 (0.055)				-0.004 (.013)
ln(1+Inflation)		-0.134 (0.089)			-0.021 (.012)
Government Consumption/GDP			0.0001 (.0001)		0.0005 (.001)
Rule of Law				0.005 (.067)	-0.041 (.065)
# of Observations	213	232	214	235	210
P-OID	0.166	0.384	0.208	0.271	0.499

Source: Dollar and Kraay (2000). This table reports the results of estimating Equation (4) using the indicated control variables. The row labelled P-OID reports the P-value associated with the test of overidentifying restrictions. Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey-West procedure

References

- Ades, Alberto and Edward Glaeser (1999). "Evidence on Growth, Increasing Returns, and the Extent of the Market". *Quarterly Journal of Economics*. 114(3):1025-1046.
- Aitchison, J. and J.A.C. Brown (1966). *The Lognormal Distribution*. Cambridge: Cambridge University Press.
- Arellano, M. and O. Bover (1995). "Another Look at the Instrumental-Variable Estimation of Error-Components Models". *Journal of Econometrics*. 68:29-52.
- Atkinson, A.B. and A. Brandolini (1999). "Promise and Pitfalls in the Use of "Secondary" Data-Sets: Income Inequality in OECD Countries". Manuscript. Nuffield College, Oxford and Banca d'Italia, Research Department.
- Blundell, Richard and Stephen Bond (1998). "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics*, 87:115-143.
- Chen, Shaohua and Martin Ravallion (1997). "What Can New Survey Data Tell Us about Recent Changes in Distribution and Poverty?" *The World Bank Economic Review*, 11(2):357-382.
- Deininger, Klaus and Lyn Squire (1996). "A New Data Set Measuring Income Inequality." *The World Bank Economic Review*, 10(3):565-591.
- Desai, Padma, ed. (1997). *Going global: Transition from Plan to Market in the World Economy*. MIT Press.
- Dollar, David (1992). "Outward-Oriented Developing Countries Really Do Grow More Rapidly: Evidence from 95 LDCs, 1976-85," *Economic Development and Cultural Change*, April, 523-544.
- Dollar, David, and Aart Kraay, (2000), "Growth *Is* Good for the Poor," World Bank mimeo.
- Easterly, William, and Sergio T. Rebelo (1993). "Fiscal Policy and Economic Growth: An Empirical Investigation." *Journal of Monetary Economics*, (December) 32(3), 417-58.
- Edwards, Sebastian (1992). "Trade Orientation, Distortions, and Growth in Developing Countries," *Journal of Development Economics* 39(1): 31-57.
- Fischer, Stanley (1993). "The Role of Macroeconomic Factors in Growth." *Journal of Monetary Economics*, (December) 32(3), 485-512.
- Frankel, Jeffrey A. and David Romer (1999). "Does Trade Cause Growth?" *The American Economic Review*, (June) 379-399.
- Johnston, N, S. Kotz, and N. Balakrishnan (1994). *Continuous Univariate Distributions (Second Edition, Volume 2)*. New York: Wiley.
- Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobaton (1999). "Governance Matters". World Bank Policy Research Department Working Paper No. 2196.
- Knack, Stephen, and Phillip Keefer (1995). "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures." *Economics and Politics*, (November), 7(3), 207-227.
- Levine, Ross, and David Renelt (1992). "A Sensitivity Analysis of Cross-Country Growth Regressions," *American Economic Review*, September, 82(4): pp. 942-963.

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- Lundberg, Mattias and Lyn Squire (1999). "The Simultaneous Evolution of Growth and Inequality." Manuscript, The World Bank.
- Quah, Danny (1999). "6x10⁹: Some Dynamics of Global Inequality and Growth." Manuscript, LSE Economics Department.
- Pritchett, Lant (1996). "Measuring Outward Orientation in LDCs: Can It Be Done?". *Journal of Development Economics*. 49(2):307-35.
- Rodriguez, Francisco and Dani Rodrik (1999). "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence." Mimeo, Department of Economics, University of Maryland.
- Rodrik, Dani (1998). *Why Do More Open Economies Have Bigger Governments?*. *Journal of Political Economy*. 106(5):997-1032.
- Rodrik, Dani, (1999). *Making Openness Work: The New global Economy and the Developing Countries*. Overseas Development Council.
- Sachs, Jeffrey D. and Andrew Warner (1995). "Economic Reform and the Process of Global Integration." *Brookings Papers on Economic Activity*, (1), 1-118.
- Srinivasan, T.N., and Jagdish Bhagwati, (1999). "Outward-Oriented and Development: Are Revisionists Right?" Yale U. mimeo.
- Summers, Robert and Alan Heston (1991). "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-88." *Quarterly Journal of Economics*, (May) 106(2), 327-68.