WPS2615

Trade, Growth, and Poverty

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June 2001

Abstract: A key issue today is the effect of globalization on inequality and poverty. We first identify a group of developing countries that are participating more in globalization. Since China, 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 have seen large increases in trade, and significant declines in tariffs over the past 20 years. Their growth rates have accelerated from the 1970s to the 1980s to the 1990s, even as growth in the rich countries and the rest of the developing world has declined. The post-1980 globalizers are catching up to the rich countries while the rest of the developing world is falling farther behind. We next ask how general these patterns are, through regressions that exploit the within-country variation in trade and growth. We find a strong positive effect of trade on growth after controlling for changes in other policies and addressing endogeneity with internal intruments. Finally we examine the effects of trade on the poor. Since there is little systematic evidence of a relationship between changes in trade volumes (or any other globalization measure we consider) and changes in income share of the poorest, the increase in growth rates that accompanies expanded trade leads to proportionate increases in incomes of the poor. The evidence from individual cases and from cross-country analysis supports the view that globalization leads to faster growth and poverty reduction in poor countries.

Views expressed are those of the authors and do not necessarily reflect official views of the World Bank or its members countries. We thank Sergio Kurlat and Dennis Tao for excellent research assistance. An earlier draft of this paper was presented at the conference on "Poverty and the International Economy," sponsored by Globkom (Parliamentary Commission for Swedish Policy on Global Development) and the World Bank, October 20-21, 2000, Stockholm, Sweden. We thank Jeff Williamson, Dani Rodrik, and seminar participants for helpful comments on the initial draft.

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

1. Introduction

Openness to international trade accelerates development: 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." (p. 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.[1] So, by construction this group has had a particularly large increase in trade: from 16% of GDP to 33% of GDP, compared to an increase from 37% to 50% for

[1] Variable definitions and data sources are provided in Table 8.

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, 22 points on average, compared to 11 points for the non-globalizers (Figure 2). The list of post-1980 globalizers includes some well-known reformers (Argentina, China, Hungary, India, Malaysia, Mexico, the Philippines, and Thailand). Padma Desai's book, *Going Global* (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 increase of their growth rates, from 2.9% per year in the 1970s to 3.5% in the 1980s, and 5.0% in the 1990s (Figure 3), while rich country growth rates slowed down over this period. What about developing countries not in the "globalizing" group? They had a decline in the average growth rate from 3.3% per year in the 1970s to 0.8% in the 1980s and recovering to only 1.4% in the 1990s.[2]

There are many interesting pair-wise comparisons between the globalizing group and the non-globalizing group: Vietnam versus Burma, Bangladesh versus Pakistan, Costa Rica versus Honduras. In each of these cases, 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. That China, 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 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 (2000) 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

[2] 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.

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 non-tariff barriers have been particularly pernicious – licensing schemes that amount to firm-specific planned allocations of imports. Yet our experience is that NTB coverage ratios do not effectively capture how severe non-tariff barriers are. Average tariff rates provide 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 which 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 (2000)). 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 4 is the relationship between trade liberalization and inequality. In our paper, "Growth Is Good for the Poor" (Dollar and Kraay (2001)) we examined the impact of growth-enhancing policies on the income of the bottom 20% 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 4). 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 share of income that accrues to the poorest fifth of society 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 this measure of 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 4: growth of income of the poor less than 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 5: there is simply no association between changes in trade to GDP and changes in the Gini measure of inequality, or between changes in trade to GDP and changes in the income share of the poorest quintile. 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 3 and 4 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 0.34 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 6). The figure decomposes this overall effect into a "growth effect" of trade on mean income (estimated in Section 3 of the paper) and a "distribution effect" of trade on the share of income going to the bottom 20% (from our other paper described in Section 4 of this paper). Most of the benefits for poor households come from this growth effect. Our

estimated "distribution effect" is not significantly different from zero although it happens to be in favor of the poor.

We also show in Figure 6 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 24% per annum in the early 1980s to 12% in the late 1990s. Our point estimate is that this would increase the growth rate of income of the poor by about 0.4 percentage points per year. About half of this is due to the beneficial effect on overall growth of stabilizing from high inflation, and half of it reflects a 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, the growth rate of income of the poor generally increased. 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 China. But it is not true in general that the liberalizing economies have had increases in inequality. Costa Rica's and the Philippines' 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 relatively small changes in household income inequality, the growth rate of income of the poor is closely related to the growth rate of per capita GDP.

Although Vietnam is not included among our globalizers (due to limits on the availability of data we use to identify the other globalizers), it nicely illustrates our main finding about trade and poverty. As Vietnam 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% of the population in 1988 to 37% in 1998 -- poverty was cut in half in ten years! In the case of Vietnam 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% of households in 1992, 98% had higher income six years later. Since Vietnam'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.

2. The Experiences of Post-1980 Globalizers

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. We identify these post-1980 globalizers based on their growth in trade relative to GDP in constant prices, and based on their reductions in average tariff rates. Both measures have strengths and weaknesses. Trade volumes are clearly endogenous variables that reflect a wide range of factors other than trade policy. Across countries, a significant share of the variation in trade reflects countries' geographical characteristics. We abstract from these geographical determinants of trade by focusing on proportional *changes* in trade volumes relative to GDP, but we recognize that growth in trade volumes may also reflect many factors other than trade liberalization. We therefore also use reductions in average tariff rates to identify globalizers. The average tariff rate is clearly a policy variable, but the relationship between tariff rates and trade volumes is not that strong (Dollar and Zoido-Lobatón, 2001). This reflects both the fact that trade volumes are determined by many factors other than policy, and also the fact that available data on tariffs are a very imperfect measure of trade policy. For example, we use a dataset of unweighted average tariffs (since this gives us the best country and period coverage) which can give disproportionate weight to tariffs on commodities that represent a small fraction of imports. On the other hand, trade-weighted average tariffs give no weight to tariffs on goods that are so high that imports are choked off entirely. Moreover, in many countries non-tariff barriers ranging from explicit quotas and licensing schemes to local content requirements and health and safety standards constitute significant obstacles to trade that are not captured by average tariffs. The advantage of trade volumes is that they in part reflect these non-tariff barriers to trade.

We begin with a group of 101 countries for which we have data on trade as a share of GDP in constant prices beginning in the 1970s. We begin by separating out the 24 OECD countries (before recent expansions), and add to that group five economies that we think of as early liberalizers (Chile, Hong Kong, Taiwan, 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 in the 1980s and 1990s. 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 trade data for 73 developing economies.[3]

[3] We do not have constant local currency trade to GDP ratios for Turkey, an OECD member, for the 1970s. This is why the 29 rich countries and the 73 developing countries do not add up to the total of 101 countries.

Our first group of globalizers is based on the top one-third of these developing countries in terms of their growth in trade as a share of GDP at constant prices between 1975-79 and 1995-97. These countries are shown in Table 1, and include some well-known economic reformers: Malaysia and Thailand in East Asia, which liberalized trade in the early 1980s; China, 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). We have highlighted the experience of this group of globalizers in the introduction to the paper. However, there are a couple of countries on the list that strike us as anomalies (for example, Haiti and Rwanda). Their inclusion reminds us of the problem that we noted earlier, that a large increase in trade might reflect non-trade-policy factors such as cessation of civil war.[4]

We therefore also present a second group of globalizers based on absolute decline in average tariff rates. Unfortunately, tariff data are scarce before 1985; hence we are forced to use the reduction in the average tariff rate between the 1985-89 period and the 1995-97 period to identify the top one-third of tariff cutters. These countries are shown in Table 2. From our point of view, our second group of globalizers based only on tariff reductions produces some anomalies as well. For example, 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 non-tariff barriers to trade prevent these economies from being genuinely open.

There are nine countries that appear on both lists: these are indicated in bold in Tables 1 and 2 and constitute our third group of globalizers. These are mostly the large countries that are also well-known reformers: China, 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.

Figure 7 provides a graphical summary of our identification of globalizers, plotting the growth in trade relative to GDP on the horizontal axis and the absolute reduction in tariffs on the vertical axis. The dashed lines separate the top third of countries on each axis. The first group of globalizers based on their growth in trade are in regions II and III; the second group of globalizers based on their tariff reductions are in regions I and II, and the group of nine countries appearing on both lists in in region II. Given the problems of measuring trade liberalization that we have discussed, there cannot be a definitive list of recent liberalizers: any one of our three groups of countries constitutes a reasonable candidate set of "globalizers". We therefore consider all three groups in the discussion that follows below. We will also

[4] Vietnam's ratio of trade to GDP has gone from 0.58 in the 1985-89 period to 1.59 in the 1995-97 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.

refer repeatedly to Table 3 in which we present summary statistics for the rich countries, the developing country globalizers, and the non-globalizers, using the three alternative definitions of globalizers discussed above. For each group of countries, we report a simple average and a population-weighted average of trade volumes, tariffs, and growth. Since several populous countries, notably China, India, Bangladesh, and Brazil, are included in all three lists of globalizers, the story that emerges from these population-weighted averages is similar for the three groups. For the most part we focus on the population-weighted averages for the first list of globalizers in the discussion (as we did in the introduction), and note along the way the few differences across lists when we look at unweighted averages.

We use the information on the globalizers in Tables 1-3 to make three points. First, increases in integration with the world economy have been substantial among the globalizers. By construction, the globalizers in the first panel of Table 3 have had large changes in trade volumes between the 1970s and the 1990s: a doubling of trade to GDP on average (16% to 33% of GDP). As a reference, the trade to GDP ratio also grew dramatically among the rich countries (29% to 50% of GDP), but among the non-globalizers, trade actually fell as a share of GDP (60% to 49% of GDP).[5] The globalizers have also had large reductions in tariffs, a total of 22% (from 57% to 35%), while tariff cuts among the non-globalizing developing countries were a much more modest 11% (from 31% to 20%).[6]

The second point we want to emphasize is that per capita growth rates have increased among the globalizing economies in the 1990s relative to the 1980s. Of the 24 countries in Table 1, eighteen experienced an increase of growth between the 1980-84 period and the 1995-97 period. Some of the increases were very large: Argentina, 8.4 percentage points of growth; China, 3.9; Dominican Republic, 7.7; Mexico, 6.5; and the Philippines, 6.2, just to highlight a few of the more successful examples. For the third list of globalizers, the simple average growth rate during the whole decade of the 1990s increased from 0.5% to 2.0% per year relative to the 1980s. Growth in the rest of the developing world increased from 0.1 percent per year during the "lost decade" of the 1980s to a scant 0.6 percent per year during the 1990s, while growth in the rich countries slowed from 2.6% to 2.4%.[7] It would be naïve to assert that all of this improvement in growth should be attribted to the greater openness of these globalizing economies: all of them have been engaged in wide-ranging economic reforms covering trade

[5]For the group of non-globalizers based on an absence of large tariff cuts in the middle panel of Table 3, we do see some increases in trade relative to GDP, and for the third group of non globalizers we find that trade volumes are essentially constant. This discrepancy is simply a reflection of the fairly weak overall correlation between tariff changes in changes in trade volumes discussed above.

[6] Not surprisingly, the average tariff declines in the globalizers relative to the non-globalizers are even more pronounced if one considers the group of globalizers based on tariffs cuts alone, or on both tariff cuts and increases in trade volumes, in the last two panels of Table 3.

[7] A quick look at Table 3 confirms that this pattern of larger improvements in growth among the globalizers relative to the nonglobalizers holds for all three groups of globalizers, and for both the weighted and unweighted averages.

and other areas. The experiences of China, Hungary, India, and Vietnam are covered in Padma Desai's book, *Going Global;* 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. Disentangling the particular role of trade is something we attempt in the next section of the paper – here we simply note that trade reforms have gone hand-in-hand with other reforms, and the improvements in growth during the 1990s reflect the confluence of all of these reforms.

The third point we want to make concerns the consequences of this rapid growth among the globalizers for worldwide income inequality across individuals. While the simple average growth rate discussed above indicates what has been happening to the typical globalizing economy, population-weighted average growth rates capture the effects on worldwide interpersonal income inequality. These population-weighted averages tell a striking story. First, the rich countries were growing quite rapidly in the 1960s (4.7 %) and 1970s (3.1%), but their growth rates have declined over time, to 2.3% and 2.2% in the 1980s and 1990s. Within this group, the U.S. growth rate has been relatively stable over four decades, but during the 1960s and 1970s Western Europe, Japan, and the Asian tigers – all of whom were well behind the U.S. in 1960 – grew rapidly and "converged" on the U.S. This process of convergence has been a force for declining inequality among the rich countries.

It is often argued that developing countries – most of whom had restricted trade regimes – did well during the 1960s and 1970s.[8] However, the post-1980 globalizers did *not* do paprticularly well as a group in the 1960s (1.4% per capita growth) and the 1970s (2.9%). In particular, the two biggest developing countries – China and India – did not do well with import-substituting regimes in that period. For the twenty 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 (2.4%) and 1970s (3.3%), but did little to catch up with the rich countries. In the past 20 years growth rates for the rich countries slowed down; growth rates for the non-globalizing developing world slowed down disastrously (to 0.8% in the 1980s and only 1.4% in the 1990s); while the growth rate for the post-1980 globalizers accelerated to 3.5% per capita in the 1980s and 5.0% in the 1990s.[9] Thus, in the 1990s, a very significant

[8] For example, Rodrik (1999) 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" (p. 64).

[9] This pattern of higher levels and greater increases in growth among the globalizers relative to the non-globalizers holds for all three groups of globalizers. Moreover, it is worth noting that our sample of non-globalizers does not include the transition economies of Eastern Europe and the Former Soviet Union (since we did not have data on trade going back to the 1970s on which to select the "globalizers"). If these countries and their weak performance in the 1990s were included among the non-globalizers, then the difference in growth performance between the globalizers and the non-globalizers would be even more stark.

part of the developing world – the economies that opened – has begun to grow faster than the rich countries, creating an important trend toward growing equality among open countries.[10]

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 4. Most developing countries do not have good household surveys conducted each year, so we have to work with the limited data that are available. Table 4 reports the Gini coefficient closest to 1980 plus the most recent estimate for those countries appearing in Tables 1 and 2 for which we have nationally representative household surveys. Of the 39 countries covered in our three possible definitions of globalizers, only 23 have income distribution data which allows us to make comparisons of the 1990s relative to the 1980s. In almost exactly half of these countries (11 out of 12), income inequality has fallen. So, there are liberalizing economies that have had increases in household income inequality over the past 20 years, most notably China. But it is not true in general that the liberalizing economies have had increases in inequality. Costa Rica's and Ecuador's income distributions have been quite stable, and inequality has declined in countries such as India, Malaysia, the 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% 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% per year in China, India, Malaysia, and Thailand – 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, Mexico, and the Ivory Coast, countries in which the growth rate of per capita GDP averaged less than 1% 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% per year from 1980 to 1998.) Obviously, the combination of rapid growth and higher income share for the poor is

[10] 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.

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 the growth rate of per capita GDP in China, a transition economy in which there has been a large increase in inequality. But despite the change in inequality, the growth rate of income of the poor in China has still been high (3.8% 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 China, for example, poor transport links between interior regions and the coast and restrictions on inter-provincial 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 twenty 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 China, India, Thailand, and Vietnam.

3. 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 twenty 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 2000; Srinivasan and Bhagwati 1999), which suggests a need to revisit some of these earlier results, as 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.

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 non-tariff 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 non-tariff 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, as we saw in Figure 7 and in the discussion of the previous section of the paper. It is perhaps too strong to conclude from this that available measures of trade policy are entirely uninformative -- however, it does seem likely that they are rather 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 in a cross-country regression. 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.

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 5 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.

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)). Moreover, this problem of reverse causation is clearly not unique to outcome measures such as trade volumes – trade policies may themselves be endogenous to growth, with countries perhaps choosing to liberalize when times are good.

A good 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.

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 particular 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:

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

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, γ_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 only 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:

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

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.[11]

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

- *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 them.
- *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 5, 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.
- *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 $s \geq 0$), they are 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

[11] Elaborations of thes technique involve jointly estimating a system of two equations, in levels (Equation 1) and in differences (Equation 2), and using lagged changes of endogenous variables as instruments for levels in the former (Arellano and Bover (1995)). This approach can yield important efficiency gains (Blundell and Bond (1998)) but is less appropriate in our application where we want to identify the effects of interest using within country *changes* in growth.

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.[12]

Table 6 presents our 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 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 0.48 and remains highly significant. This result is not driven by a few extreme cases in the data, as shown in Figure 8 where we plot the partial correlation between trade and growth based on the specification in the second column of Table 6. 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 address the possibility of 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.[13]

In the remaining columns of Table 6 we perform a variety of robustness checks on this basic result. In column 3 we replace the trade to GDP ratio with the ratio of FDI to GDP, to see whether this

[12] 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.

[13] It is also worth noting that the internal instruments perform quite well in this equation, in the sense of being strongly correlated with the endogneous 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.

alternative measure of openness delivers similar results. After instrumenting for the change in FDI with twice-lagged FDI, we find that this channel of openness also has large and statistically significant growth effects: a one percentage point increase in FDI inflows as a share of GDP would result in a cumulative effect on average incomes over the course of a decade of 13 percent. However, as is well known, trade and direct investment flows tend to be quite correlated across countries. It is therefore interesting to ask whether it is possible to disentangle the separate effects of these two dimensions of openness. We attempt to do so in column (4) where we add both variables together. While the magnitude of the estimated trade and FDI effects on growth does not change much relative to the previous specifications, the significance of the effects slips to just below the 10 percent level. This is not very surprising to us – it simply reflects the fact that different dimensions of openness tend to be correlated across countries and over time, and so it is difficult to disentangle the effects of particular dimensions of openness.

It is also interesting to inquire whether we get the same result with investment relative to GDP, as we get with foreign direct investment. Even though we will control for some other policy changes, it is possible that there are unobserved domestic policy changes or other shocks that lead to both higher investment and more trade as an endogenous result. In column 5 we include the change in the investment rate in the regression, and instrument for it with lagged level of investment. We do not get the same result as with FDI or with trade: there is no significant relationship between the instrumented change in investment rate and change in the growth rate.

One possible explanation for the apparent effect of trade on growth is that it reflects institutional quality which is omitted from the regression (Rodrik (2000)). According to this argument, improvements in institutional quality make countries more attractive as trading partners, and also have direct effects on growth. This argument is neither implausible, nor is it inconsistent with trade also having a direct effect on growth. However, in our context where we are looking at the effect of *changes over time* of trade on growth, this argument may be less relevant empirically, since the limited data available on institutional quality suggests that it changes at best quite slowly over time. However, the best way to address this concern is to include a measure of changes in institutional quality directly in the regression, in order to ensure that the coefficient on the trade variable captures only the partial effect of trade. We do this in column 6 of Table 6, using one of the few time-varying proxies for institutional quality that are available back to the 1970s. In particular, we use one minus the ratio of currency in circulation to M2. This measured, coined as "contract-intensive money" by Clague, Keefer, Knack and Olson (1999) measures the extent to which property rights are sufficienty secure that individuals are willing to hold liquid assets via financial intermediaries. These authors document a strong positive cross-country relationship between this variable and both investment and growth. We find however that changes in this variable have little explanatory power for changes in growth over time, as it enters positively but insignificantly.

This is not very surprising to us given our view that institutional quality tends to change rather slowly over time. More important for our purposes, our basic result on the importance of trade for growth remains positive and highly significant, and even becomes slightly larger in magnitude than in column 2. This suggests to us that omitted *changes* in institutional quality are unlikely to be driving the observed correlation between trade and growth.

We next consider the argument that the effects of trade reflect omitted policies that are good for growth and are correlated with increases in trade as well. In column 7 we expand 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 entered as changes in decade averages in the differenced regression. In this column, we assume that these variables are predetermined with respect 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.

The last thing we attempt in this table is to allow for the possibility that the additional policies in column 7 are endogenous to growth. When we try to simultaneously instrument for all of the right-hand side variables simultaneously in the final column, our results are rather unsatisfying. 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 results. While changes in the additional control variables are not very correlated with changes in trade volumes (as we saw in Table 5), 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.

4. Trade, Growth, and Poverty

Globalization has dramatically increased inequality between and within nations.
--Jay Mazur, "Labor's New Internationalism," Foreign Affairs, January/February 2000

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 – that is, that it 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). In that paper we show that a wide range of measures of international integration are not significantly associated with the share of income that goes to the poorest quintile. In other words, there is no systematic tendency for trade to be associated with rising inequality that might undermine its benefits for growth and poverty reduction. This evidence mirrors the anecdotal evidence in Table 4 which documented the absence of significant patters in changes in inequality among our globalizers.

We gather data on the income distribution from a variety of existing sources, as documented in more detail in the other paper. Our data consist of Gini coefficients from 137 countries from the 1960s to the present, and five points on the Lorenz curve for a most of these country-year observations. 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 surveys, and perform some simple adjustments to crudely control for some of the remaining differences in the types of surveys.

A further 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. For 45 countries, we only have one observation on income distribution. For the remaining 92 countries, we discard all observations not separated in time by at least five years. This leaves us with 418

observations on income distribution separated by at least five years within countries. We are also able to construct 285 observations on non-overlapping changes in income distribution within countries over a period of at least five years.

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.[14] We then examined the relationship between growth in average incomes and growth in incomes of the poorest fifth. Figure 4 summarizes our first finding that there is a strong relationship between growth in average incomes and growth in incomes of the poorest. This is equivalent to the observation that the share of income going to the poorest quintile does not vary systematically with average incomes.

However, there are also significant deviations from this general relationship. In that paper, we considered a large number of possible explanations for these deviations, 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. To answer this question, 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:

$$(3) \qquad y^P_{ct} = \alpha_0 + \alpha_1 \cdot y_{ct} + \alpha_2' X_{ct} + \mu_c + \varepsilon_{ct}$$

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.[15]

We are interested in two key parameters from Equation (3). The first is α_1 which measures the elasticity of income of the poor with respect to mean income. A value of α_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 the income share of the poorest quintile. The second

[14] For the vast majority of our observations, we did this directly by using the first point on the Lorenz curve. For about 15% of our sample, we only have Gini coefficients and so we calculated average income in the bottom quintile under the assumption that the distribution of income is lognormal.

parameter of interest is α_2 which 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 income share of the poorest quintile. 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 the income share of the poorest quintile.

Estimating Equation (3) 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 7 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 government consumption, 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 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 (first column of Table 7). This can be seen quite clearly in Figure 5, which reports the simple correlation between changes in trade volumes and changes in inequality as measured by the Gini coefficient (in the top panel) and the logarithm of the first quintile share (in the bottom panel). In our other paper we also subject this basic result to a wide variety of robustness checks and also consider several other measures of international economic integration. Our

[15] 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.

conclusion is that there simply is no good evidence that countries that trade more (or are more integrated along other dimensions) 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, 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 6 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 (3) with respect to the control variables we can therefore summarize the effect on average incomes in the bottom quintile as:

$$(4) \qquad \frac{\partial y^{P}_{ct}}{\partial X_{ct}} = \frac{\partial y_{ct}}{\partial X_{ct}} + \left((\alpha_1 - 1) \cdot \frac{\partial y_{ct}}{\partial X_{ct}} + \alpha_2 \right)$$

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 6 as the estimated coefficient on the policy variable of interest. We use the results in the second-last 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 the income share of the poor in Equation (3). For these, we use the values reported in Table 7 taken from our other paper.

The results of this exercise are summarized in Figure 6. As noted in the introduction, we consider an increase in trade volumes of 34 percentage points of GDP and a decrease in inflation of 12 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 2.6 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 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 (4), this would be the case if $\alpha_2 = -\alpha_1 \cdot \frac{\partial y_{ct}}{\partial X_{ct}}$. For an estimate of $\alpha_1 = 1.14$ and an estimated growth impact of trade of 0.54, this would imply an estimate of $\alpha_2 = -0.62$. So in order for an increase in trade volumes of 0.35 to have no net benefits for poor people, it would have to be the case that it also lowered the income share of the poorest by 0.62x0.35 = 0.22 or 22 percent. To put this in more familiar terms, this is roughly equivalent to an increase in the Gini coefficient of 6 Gini points, which is a quite large relative to the fairly small changes in income distribution observed in reality.[16]

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.

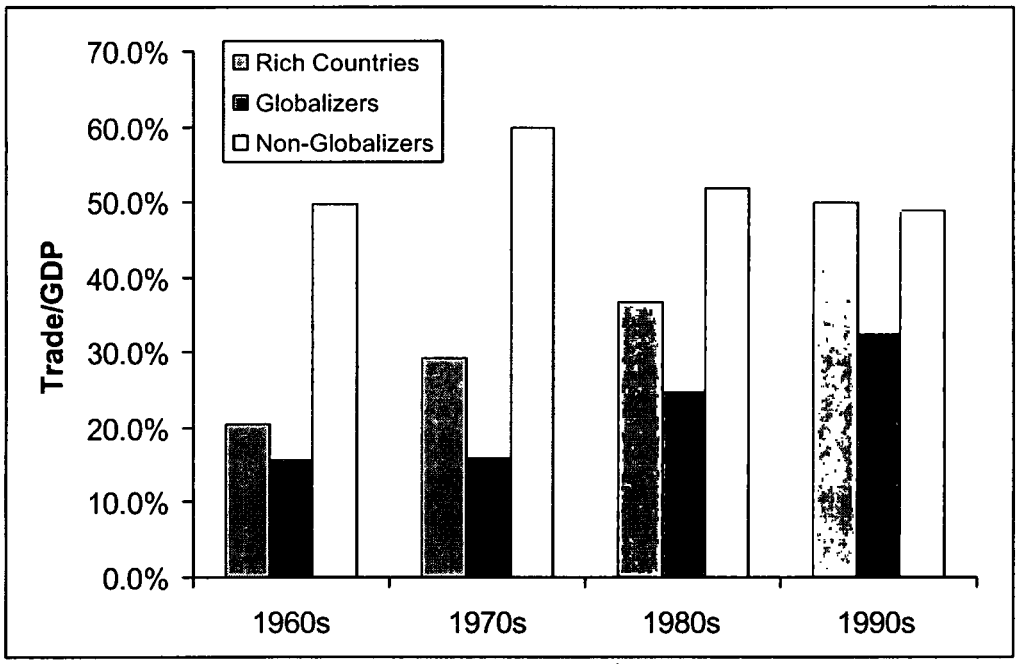
[16] This can be shown under the assumption that the distribution of income is lognormal.

5. Conclusion

We have identified a group of developing countries that have had large cuts in tariffs and large increases in actual trade volumes since 1980. Since China, 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 (22 point reduction compared to 10 points) and in terms of the increase in trade volume over the past 20 years (an increase from 16% to 32% of GDP, versus a decline from 60% of GDP to 49% of GDP). 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 5.0% per capita; rich countries at 2.2% per capita; and non-globalizing developing countries at only 1.4% per capita. Thus, the globalizers are catching up with rich countries while the non-globalizers fall further and further behind.

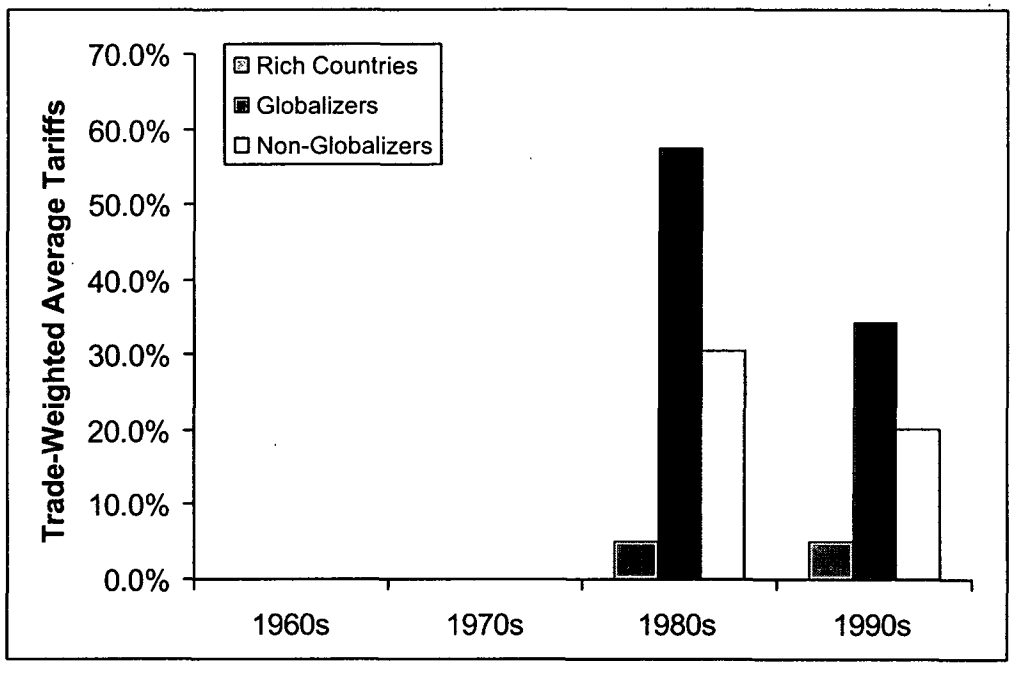
In Section 3 we then looked at how general these patterns are, through cross-country regressions. We focused on *within country* variation and showed that changes in trade volumes have a strong positive relationship to changes in growth rates. In the fourth section we introduced results from our earlier paper, "Growth *Is* Good for the Poor." There is no systematic relationship between changes in trade volumes and changes in household income inequality. The increase in growth rates that accompanies expanded trade therefore on average 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: Trade/GDP



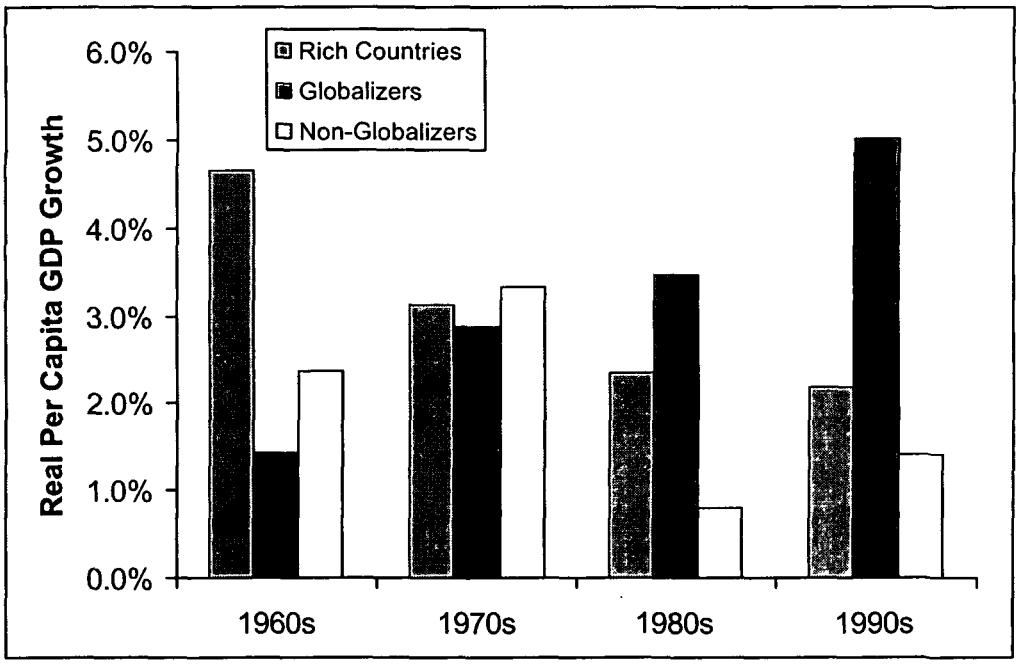
Note: Rich countries refers to the 24 OECD economies before recent expansions, plus Chile, Hong Kong, Korea, Taiwan, and Singapore. Globalizers refers to the top one-third in terms of their growth in trade relative to GDP between 1975-79 and 1995-97 of a group of 72 developing countries for which we have data on trade as a share of GDP in constant local currency units since the mid-1970s. Non-globalizers refers to the remaining developing countries in this group. Averages decadal and are population-weighted. Unweighted averages and alternative definitions of globalizers are reported in Table 3. Variable definitions and data sources are reported in Table 8.

Figure 2: Average Tariffs



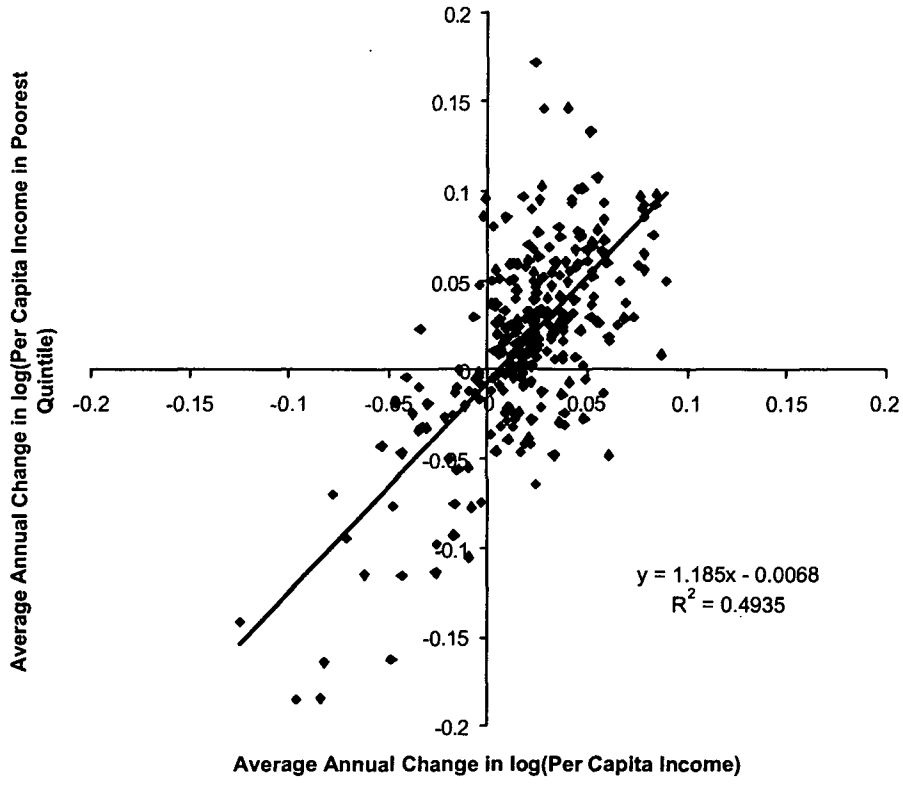
Note: Rich countries refers to the 24 OECD economies before recent expansions, plus Chile, Hong Kong, Korea, Taiwan, and Singapore. Globalizers refers to the top one-third in terms of their growth in trade relative to GDP between 1975-79 and 1995-97 of a group of 72 developing countries for which we have data on trade as a share of GDP in constant local currency units since the mid-1970s. Non-globalizers refers to the remaining developing countries in this group. Averages decadal and are population-weighted. Unweighted averages and alternative definitions of globalizers are reported in Table 3. Variable definitions and data sources are reported in Table 8.

Figure 3: Real Per Capita GDP Growth



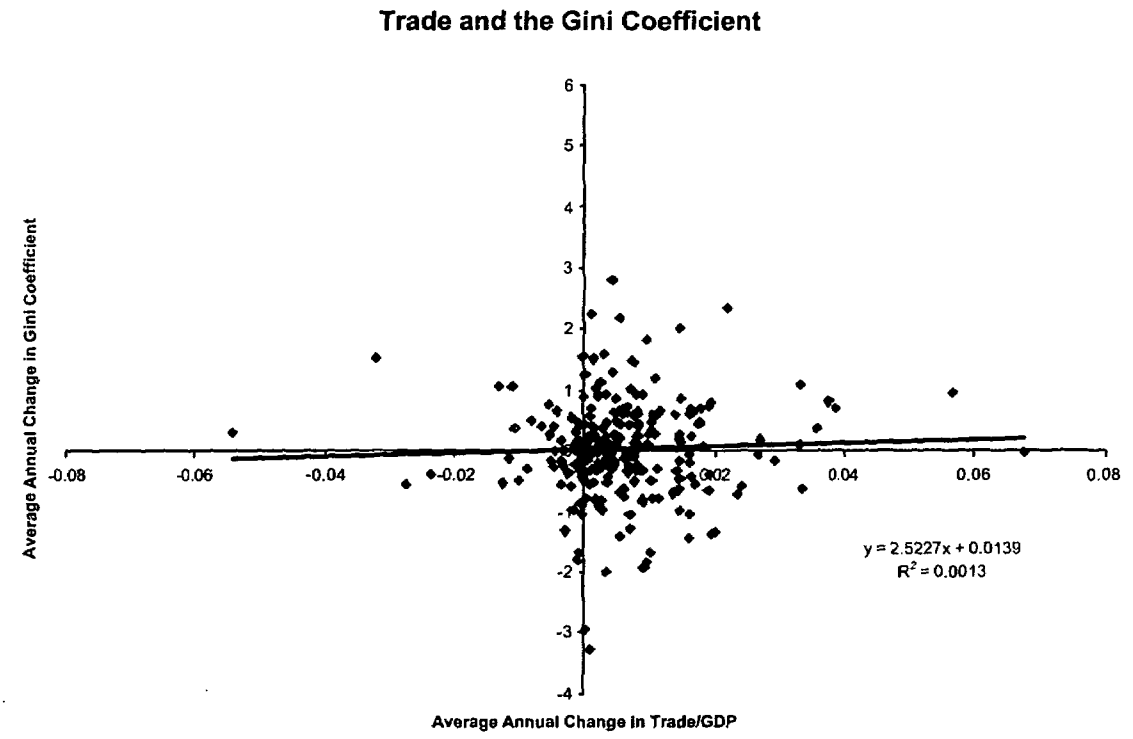
Note: Rich countries refers to the 24 OECD economies before recent expansions, plus Chile, Hong Kong, Korea, Taiwan, and Singapore. Globalizers refers to the top one-third in terms of their growth in trade relative to GDP between 1975-79 and 1995-97 of a group of 72 developing countries for which we have data on trade as a share of GDP in constant local currency units since the mid-1970s. Non-globalizers refers to the remaining developing countries in this group. Averages decadal and are population-weighted. Unweighted averages and alternative definitions of globalizers are reported in Table 3. Variable definitions and data sources are reported in Table 8.

Figure 4: Growth is Good for the Poor



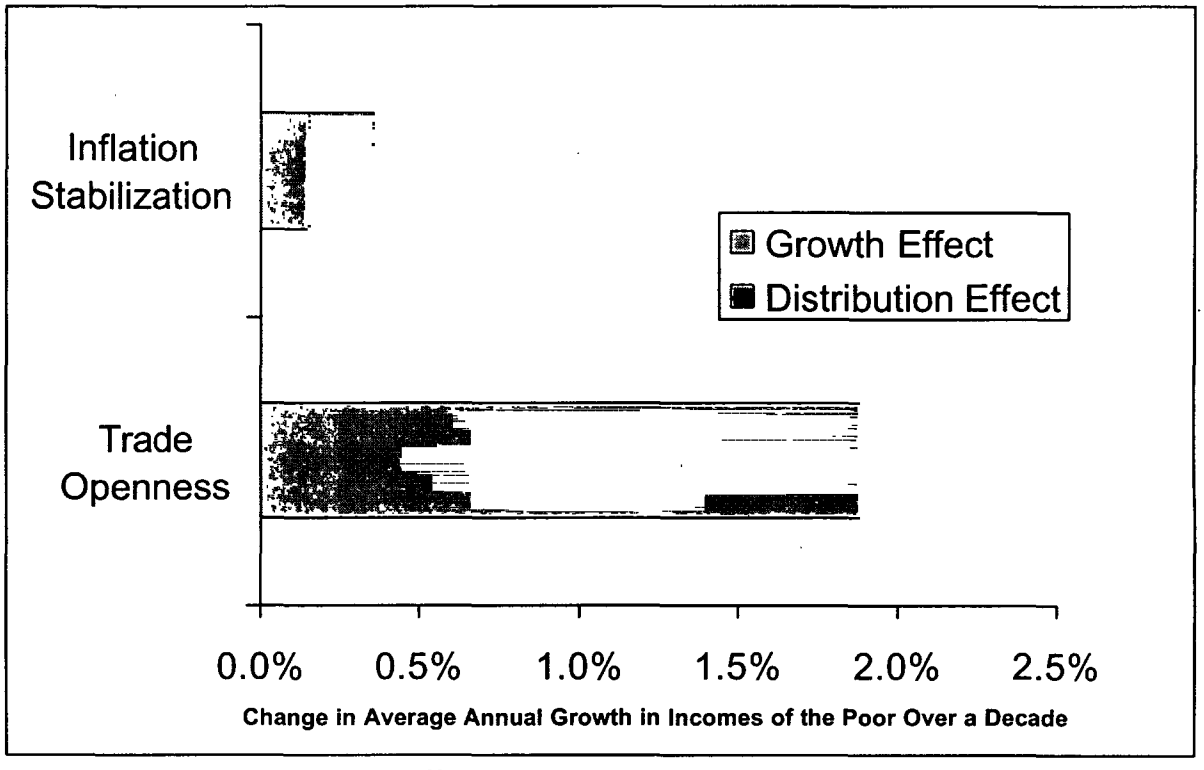
Notes: Figure shows average annual growth rates of indicated variables over non-overlapping periods of at least five years, in a sample of 285 observations covering 92 developed and developing countries. Per capita income growth refers to real per capita GDP growth. Per capita income growth in the poorest quintile is equal to per capita income growth plus growth in the income share of the poorest quintile.
Source: Dollar and Kraay (2001)

Figure 5: Changes in Trade and Changes in Inequality



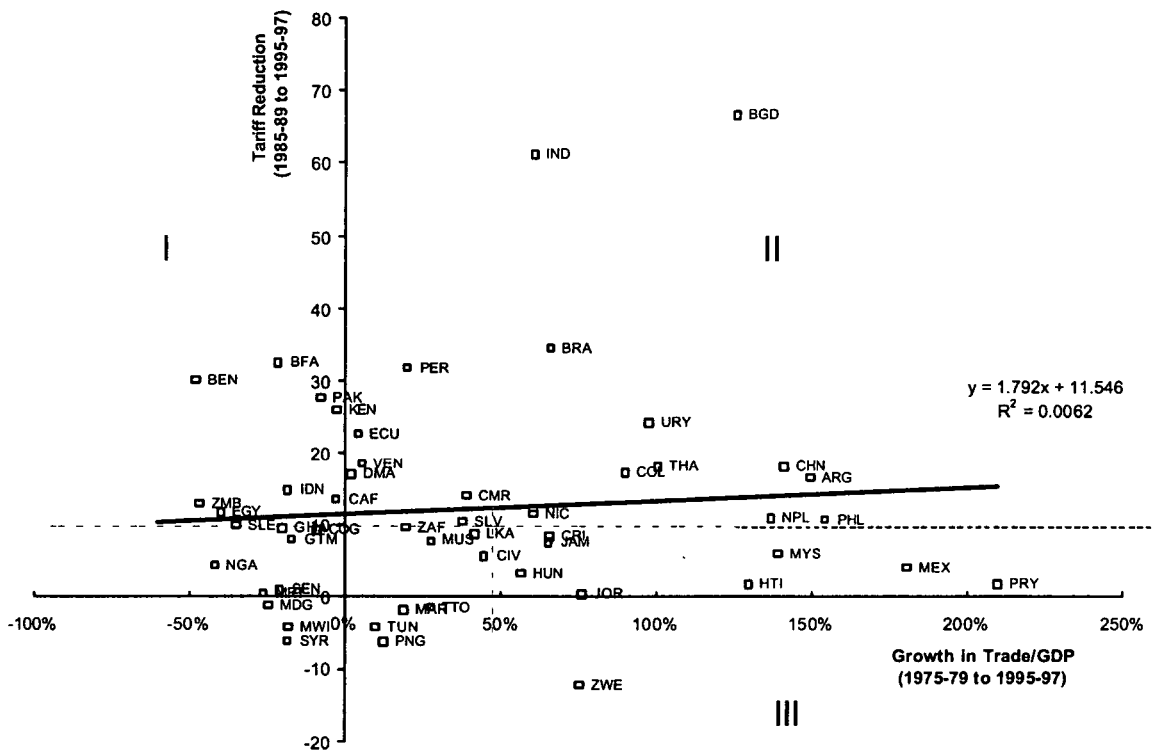
Notes: Figure shows average annual growth rates of indicated variables over non-overlapping periods of at least five years, based on the same sample of countries as Figure 4 for which trade data are available. Variable definitions and data sources are reported in Table 8.
Source: Dollar and Kraay (2001)

Figure 6: Growth and Distribution Effects of Policy



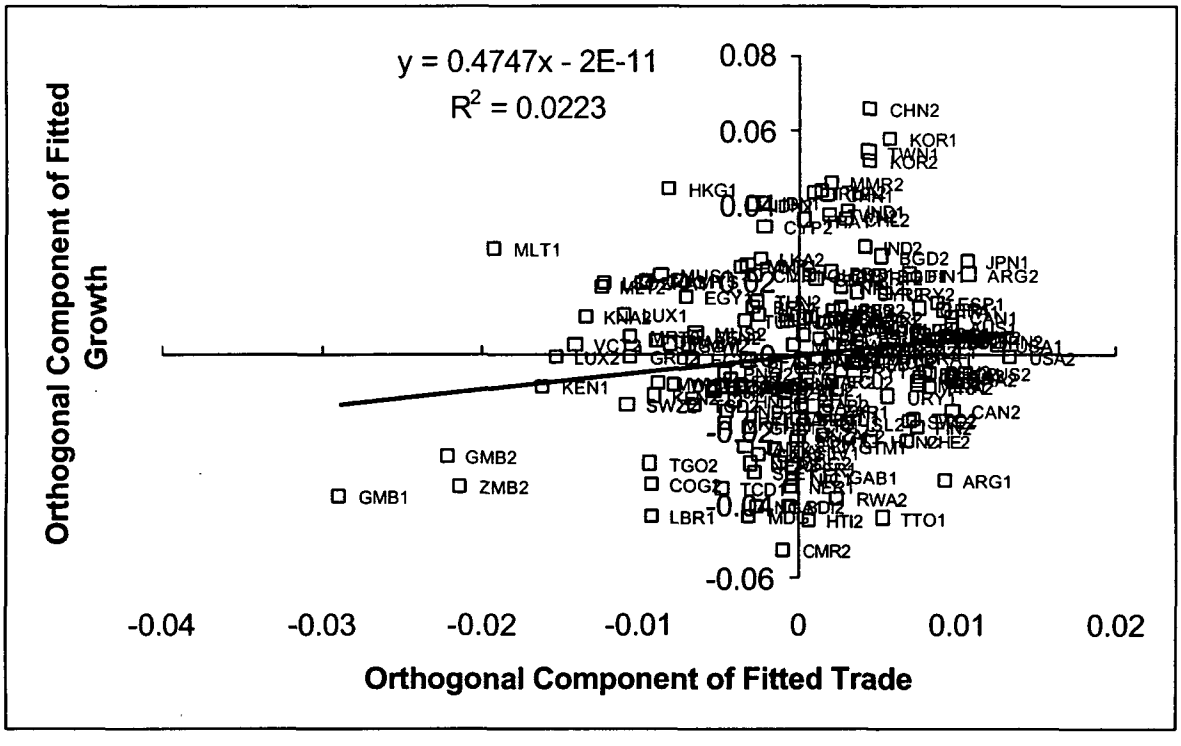
Notes: Figure shows estimated effect on average annual growth in incomes in the bottom quintile of an increase in trade and a reduction in inflation of the magnitude experience by the group of globalizers based on growth in trade relative to GDP, based on the estimates reported in column (7) of Table 6 and column (1) of Table 7, as discussed in the text. Variable definitions and data sources are reported in Table 8.

Figure 7: Identifying Globalizers



Notes: Figure plots growth in trade relative to GDP over the period 1975-79 to 1995-97 on the horizontal axis and the decrease in weighted average tariffs over the period 1985-89 to 1995-97 on the vertical axis. The first group of globalizers consists of regions II and III, the second group consists of regions I and II, and the third group consists of region II. Variable definitions and data sources are reported in Table 8.

Figure 8: Partial Correlation Between Trade and Growth



Notes: This graph reports the partial scatter from the second-stage regression of the two-stage least squares results reported in column (2) of Table 6. Fitted trade and fitted growth refer to the fitted values from the first-stage regression. Orthogonal component refers to the standard technique used to construct partial scatters from an OLS regression. Variable definitions and data sources are reported in Table 8.

Table 1: Post-1980 Globalizers
(Based on Increases in Trade Volumes)

	Average Annual Per Capita GDP Growth (Percent)						Average Trade/GDP (Percent)						Weighted 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%	11.3%	13.2%	16.4%	15.5%	23.7%	32.9%	27.5	13.9	11.0
BANGLADESH	-7.0%	3.2%	1.2%	3.1%	3.4%	3.7%	10.3%	11.8%	13.8%	14.0%	18.6%	26.7%	92.7	54.3	26.0
BRAZIL	8.8%	3.8%	-2.9%	1.5%	0.9%	1.6%	11.1%	10.7%	10.3%	10.5%	13.5%	17.9%	45.8	21.0	11.5
CHINA	1.4%	3.4%	3.9%	1.7%	8.6%	7.8%	12.5%	14.1%	26.7%	28.5%	30.1%	34.2%	38.8	39.9	20.9
COLOMBIA	4.0%	3.5%	0.0%	2.5%	2.4%	0.6%	33.8%	30.9%	33.4%	33.1%	45.0%	58.9%	29.4	16.6	12.2
COSTA RICA	3.4%	3.6%	-3.6%	2.0%	2.0%	-0.1%	74.5%	77.1%	71.3%	82.0%	108.3%	128.1%	19.5	12.6	11.2
DOMINICAN REP.	7.6%	1.7%	-2.1%	3.5%	1.8%	5.6%	38.7%	31.5%	41.3%	40.3%	56.3%	92.3%	..	17.8	16.2
HAITI	1.4%	3.4%	-3.4%	-2.2%	-7.3%	-0.3%	32.2%	43.0%	47.7%	50.8%	67.0%	98.9%	11.6	..	10.0
HUNGARY	5.9%	2.8%	1.2%	1.4%	-2.8%	3.3%	40.9%	47.1%	48.4%	52.7%	57.6%	74.0%	18.0	9.9	14.8
INDIA	-1.2%	0.7%	3.3%	4.1%	2.6%	4.4%	12.7%	13.7%	15.9%	16.3%	17.0%	22.1%	99.4	61.9	38.3
IVORY COAST	1.6%	5.1%	-3.8%	-3.6%	-3.4%	3.3%	54.4%	52.7%	70.4%	67.5%	68.0%	76.4%	26.3	23.8	20.7
JAMAICA	2.5%	-3.8%	-0.1%	3.4%	-0.8%	-2.7%	80.0%	75.9%	76.5%	106.6%	109.2%	125.9%	18.4	19.6	10.9
JORDAN	8.2%	10.8%	1.1%	-4.3%	1.4%	-1.6%	..	94.2%	118.2%	104.0%	162.2%	166.2%	16.3	15.8	16.0
MALAYSIA	6.5%	6.6%	3.8%	3.0%	5.8%	5.4%	89.3%	91.7%	106.8%	120.8%	173.9%	219.8%	14.9	14.3	8.9
MALI	0.8%	4.5%	-1.3%	1.1%	-1.8%	2.3%	28.6%	29.9%	42.8%	51.3%	51.6%	51.3%	..	..	18.8
MEXICO	4.5%	3.3%	-2.3%	-0.2%	2.4%	4.2%	17.0%	17.7%	21.2%	23.2%	33.5%	49.9%	16.7	12.8	12.8
NEPAL	0.7%	11.0%	1.0%	2.0%	3.0%	2.2%	16.5%	25.4%	31.0%	32.2%	42.0%	60.3%	21.8	16.1	11.0
NICARAGUA	2.7%	-9.8%	0.5%	-7.5%	-2.2%	..	49.1%	52.9%	65.6%	51.0%	68.5%	85.1%	22.1	12.7	10.7
PARAGUAY	3.7%	5.2%	-4.2%	-0.7%	1.0%	-0.2%	28.2%	32.1%	32.0%	37.8%	77.3%	99.4%	10.9	13.1	9.3
PHILIPPINES	3.1%	3.3%	-3.1%	2.9%	-0.6%	3.1%	40.5%	41.6%	52.2%	56.2%	75.5%	106.1%	27.8	24.5	17.2
RWANDA	-0.9%	2.8%	0.4%	-1.5%	-14.9%	0.3%	19.1%	22.9%	26.4%	29.5%	46.5%	37.4%	33.0	38.4	..
THAILAND	1.8%	6.2%	3.0%	6.9%	6.0%	1.5%	47.4%	47.1%	49.8%	59.1%	84.6%	94.6%	41.0	36.6	23.1
URUGUAY	0.1%	2.8%	-6.3%	4.1%	4.9%	4.3%	35.5%	42.6%	47.3%	50.0%	66.4%	84.3%	33.7	18.9	9.6
ZIMBABWE	5.8%	-3.1%	0.0%	-0.9%	0.4%	3.1%		43.8%	44.2%	44.8%	59.4%	77.1%	9.2	17.2	21.5

Notes: Variable definitions and data sources are reported in Table 8.

Table 2: Post-1980 Globalizers
(Based on Reductions in Tariffs)

	Average Annual Per Capita GDP Growth (Percent)						Average Trade/GDP (Percent)						Weighted Average Tariff Rate		
COUNTRY	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%	11.3%	13.2%	16.4%	15.5%	23.7%	32.9%	27.5	13.9	11.0
BANGLADESH	-7.0%	3.2%	1.2%	3.1%	3.4%	3.7%	10.3%	11.8%	13.8%	14.0%	18.6%	26.7%	92.7	54.3	26.0
BENIN	-0.2%	0.1%	-1.9%	-4.6%	1.4%	2.6%	78.7%	87.2%	88.7%	63.9%	51.8%	45.8%	42.8	41.0	12.7
BRAZIL	8.8%	3.8%	-2.9%	1.5%	0.9%	1.6%	11.1%	10.7%	10.3%	10.5%	13.5%	17.9%	45.8	21.0	11.5
BURKINA FASO	1.2%	2.6%	0.9%	1.2%	-0.9%	3.2%	42.4%	48.1%	48.5%	46.1%	43.1%	37.9%	60.8		28.5
CAMEROON	2.9%	5.5%	4.0%	-2.2%	-7.2%	2.1%	53.6%	46.7%	59.3%	61.3%	68.5%	65.0%	32.0	18.6	18.1
CENTRAL AFR.R.	-0.9%	0.9%	-3.2%	-1.9%	-2.8%	-0.2%	40.7%	43.1%	48.1%	44.3%	46.9%	42.1%	32.0		18.6
CHINA	1.4%	3.4%	3.9%	1.7%	8.6%	7.8%	12.5%	14.1%	26.7%	28.5%	30.1%	34.2%	38.8	39.9	20.9
COLOMBIA	4.0%	3.5%	0.0%	2.5%	2.4%	0.6%	33.8%	30.9%	33.4%	33.1%	45.0%	58.9%	29.4	16.6	12.2
DOMINICA			5.7%	5.9%	1.4%	1.8%		109.6%	108.9%	114.5%	118.5%	112.3%	31.9	28.0	15.0
ECUADOR	8.3%	4.0%	-2.8%	-1.1%	1.1%	0.6%	49.8%	54.9%	46.9%	47.0%	52.5%	57.5%	34.3	10.6	11.7
EGYPT	0.3%	4.1%	3.7%	-0.6%	0.1%	3.3%	84.0%	98.7%	83.6%	64.6%	61.6%	59.7%	39.7	35.3	28.1
ETHIOPIA	0.3%	0.8%	-0.3%	1.9%	-1.2%	5.0%			27.7%	28.6%	22.9%	25.4%	29.6	28.8	16.3
INDIA	-1.2%	0.7%	3.3%	4.1%	2.6%	4.4%	12.7%	13.7%	15.9%	16.3%	17.0%	22.1%	99.4	61.9	38.3
INDONESIA	5.5%	5.6%	5.7%	2.5%	4.3%	4.5%	58.0%	69.4%	60.1%	48.6%	50.2%	57.0%	27.9	20.1	13.2
KENYA	9.2%	2.7%	-2.2%	3.5%	-0.6%	0.6%	109.5%	79.9%	56.6%	51.4%	60.7%	78.2%	39.4	33.3	13.5
NICARAGUA	2.7%	-9.8%	0.5%	-7.5%	-2.2%	..	49.1%	52.9%	65.6%	51.0%	68.5%	85.1%	22.1	12.7	10.7
PAKISTAN	-2.4%	3.3%	2.1%	2.5%	0.8%	-0.3%	47.6%	37.1%	35.7%	33.4%	34.9%	34.5%	69.2	59.8	41.7
PERU	3.4%	-3.1%	-2.8%	-3.3%	2.7%	3.0%	47.0%	43.7%	45.3%	37.8%	44.3%	52.7%	45.0	19.0	13.3
THAILAND	1.8%	6.2%	3.0%	6.9%	6.0%	1.5%	47.4%	47.1%	49.8%	59.1%	84.6%	94.6%	41.0	36.6	23.1
UGANDA	-0.8%	-1.9%	1.9%	0.4%	1.6%	4.2%			35.3%	37.8%	31.4%	43.1%	25.0	17.1	13.0
URUGUAY	0.1%	2.8%	-6.3%	4.1%	4.9%	4.3%	35.5%	42.6%	47.3%	50.0%	66.4%	84.3%	33.7	18.9	9.6
VENEZUELA	-1.1%	2.2%	-3.7%	-1.3%	2.3%	0.2%	61.4%	51.5%	42.6%	42.8%	47.2%	54.7%	31.1	15.8	12.7
ZAMBIA	2.0%	-6.9%	-4.0%	-1.7%	-1.4%	2.4%	194.2%	145.8%	98.3%	87.6%	78.9%	78.3%	29.9	26.4	17.0

Notes: Variable definitions and data sources are reported in Table 8.

Table 3: Summary Statistics on Rich Countries, Globalizers, and Non-Globalizers

		1960s	1970s	1980s	1990s	1960s	1970s	1980s	1990s	1960s	1970s	1980s	1990s
Average Trade Volumes													
Rich Countries	Simple	41.7%	57.7%	73.0%	96.6%	41.7%	57.7%	73.0%	96.6%	41.7%	57.7%	73.0%	96.6%
Rich Countries	Weighted	**20.5%**	**29.3%**	**36.8%**	**50.0%**	20.5%	29.3%	36.8%	50.0%	20.5%	29.3%	36.8%	50.0%
Globalizers	Simple	36.1%	37.9%	47.7%	72.4%	50.9%	52.2%	46.9%	51.7%	26.4%	25.6%	31.0%	45.8%
Globalizers	Weighted	**15.7%**	**16.0%**	**24.7%**	**32.6%**	19.8%	20.9%	27.1%	31.4%	14.5%	14.2%	22.5%	27.8%
Non-Globalizers	Simple	64.3%	71.7%	68.2%	63.9%	69.3%	70.5%	74.5%	76.7%	63.4%	63.8%	60.8%	71.0%
Non-Globalizers	Weighted	**49.7%**	**59.9%**	**51.8%**	**49.1%**	31.4%	40.4%	50.9%	63.6%	47.6%	56.6%	52.8%	58.5%
Average Tariffs													
Rich Countries	Simple			14.6%	7.4%			14.6%	7.4%			14.6%	7.4%
Rich Countries	Weighted			**5.0%**	**5.0%**			5.0%	5.0%			5.0%	5.0%
Globalizers	Simple			32.7%	19.5%			44.3%	23.4%			51.4%	24.4%
Globalizers	Weighted			**57.4%**	**34.5%**			57.6%	34.7%			61.3%	36.6%
Non-Globalizers	Simple			30.1%	20.6%			21.0%	16.5%			27.3%	19.6%
Non-Globalizers	Weighted			**30.6%**	**20.3%**			21.0%	17.3%			32.6%	22.6%
Average Growth													
Rich Countries	Simple	4.4%	3.6%	2.6%	2.4%	4.4%	3.6%	2.6%	2.4%	4.4%	3.6%	2.6%	2.4%
Rich Countries	Weighted	**4.7%**	**3.1%**	**2.3%**	**2.2%**	4.7%	3.1%	2.3%	2.2%	4.7%	3.1%	2.3%	2.2%
Globalizers	Simple	2.3%	3.1%	0.5%	2.0%	2.0%	1.8%	1.0%	2.1%	2.5%	2.3%	1.4%	3.8%
Globalizers	Weighted	**1.4%**	**2.9%**	**3.5%**	**5.0%**	1.4%	2.8%	3.6%	4.9%	1.3%	2.8%	3.8%	5.4%
Non-Globalizers	Simple	2.5%	2.4%	0.1%	0.6%	3.1%	3.1%	-0.4%	0.9%	2.2%	2.8%	-0.1%	0.8%
Non-Globalizers	Weighted	**2.4%**	**3.3%**	**0.8%**	**1.4%**	2.5%	4.2%	-0.6%	1.1%	2.3%	3.9%	0.8%	1.8%

Notes: Weighted averages use population weights. Variable definitions and data sources are reported in Table 8.

Table 4: Changes in Inequality in Globalizers

	Gini Coefficient		Real Income Growth	
	Initial	Final	Average	Poorest Quintile
Argentina	**#N/A**	**#N/A**	**#N/A**	**#N/A**
Bangladesh	**28.9 (1989)**	**33.6 (1996)**	**3.1%**	**1.8%**
Benin	#N/A	#N/A	#N/A	#N/A
Brazil	**57.8 (1980)**	**60 (1996)**	**0.1%**	**-0.8%**
Burkina Faso	#N/A	#N/A	#N/A	#N/A
Cameroon	#N/A	#N/A	#N/A	#N/A
Central African Republic	#N/A	#N/A	#N/A	#N/A
China	**32 (1980)**	**40.3 (1998)**	**5.4%**	**3.8%**
Colombia	**54.5 (1978)**	**57.1 (1996)**	**1.6%**	**1.4%**
Costa Rica	47.5 (1981)	47 (1996)	0.6%	1.8%
Dominica	#N/A	#N/A	#N/A	#N/A
Dominican Republic	43.3 (1984)	48.7 (1996)	1.3%	-0.8%
Ecuador	43.9 (1988)	43.7 (1995)	0.3%	3.2%
Eqypt	#N/A	#N/A	#N/A	#N/A
Ethiopia	32.4 (1981)	40 (1995)	0.2%	-1.1%
Haiti	#N/A	#N/A	#N/A	#N/A
Hungary	24.2 (1987)	24.6 (1997)	-0.8%	-1.4%
India	**31.5 (1983)**	**29.7 (1994)**	**3.2%**	**3.8%**
Indonesia	33.1 (1987)	31.5 (1999)	2.5%	3.0%
Ivory Coast	41.2 (1985)	36.7 (1995)	-3.4%	-1.2%
Jamaica	43.2 (1988)	36.4 (1996)	-0.2%	3.2%
Jordan	36.1 (1986)	36.4 (1997)	-2.0%	-1.6%
Kenya	#N/A	#N/A	#N/A	#N/A
Malaysia	51 (1979)	48.5 (1995)	4.3%	5.4%
Mali	36.5 (1989)	50.5 (1994)	-2.6%	-11.0%
Mexico	50.6 (1984)	53.7 (1995)	0.6%	-0.5%
Nepal	#N/A	#N/A	#N/A	#N/A
Nicaragua	#N/A	#N/A	#N/A	#N/A
Pakistan	33.5 (1987)	31.2 (1996)	1.6%	3.0%
Paraguay	#N/A	#N/A	#N/A	#N/A
Peru	45.7 (1985)	46.2 (1997)	0.5%	-0.4%
Philippines	46.1 (1985)	45.1 (1994)	1.2%	2.6%
Rwanda	#N/A	#N/A	#N/A	#N/A
Thailand	**45.2 (1980)**	**41.4 (1998)**	**4.0%**	**4.7%**
Uganda	33 (1989)	35.8 (1997)	2.9%	1.6%
Uruguay	**#N/A**	**#N/A**	**#N/A**	**#N/A**
Venezuela	55.6 (1981)	48.8 (1996)	-0.6%	0.5%
Zambia	#N/A	#N/A	#N/A	#N/A
Zimbabwe	#N/A	#N/A	#N/A	#N/A

Notes: Real income growth refers to constant price growth rates of real GDP per capita. Growth rates of incomes of the poor are equal to growth rates of real per capita GDP plus the growth rate of the share of income accruing to the poorest quintile. Variable definitions and data sources are reported in Table 8.
Source: Based on data reported in Dollar and Kraay (2001).

Table 5: Correlations of Trade Volumes with Other Growth Determinants

		Levels	
	1970s	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		..	..

Notes: Variable definitions and data sources are reported in Table 8.

Table 6: Trade and Growth Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**	**IV**
Initial Income	0.419	0.783	0.58	0.369	1.587	0.765	0.960	0.455
	(0.071)***	(0.297)***	0.257**	0.435	0.984	(0.367)**	(0.397)**	(0.751)
Trade Volume	0.252	0.475		0.345		0.514	0.543	-0.207
	(0.095)***	(0.175)***		0.22		(0.187)***	(0.210)***	(0.397)
FDI/GDP			13.53	13.089				
			5.283***	9.302				
Investment/GDP					2.834			
					5.193			
Contract-Intensive Money						0.232		
						(0.410)		
Government Cons/GDP							-1.164	3.472
							(1.009)	(2.614)
log(1+Inflation Rate)							-0.142	-0.967
							(0.152)	(0.712)
Revolutions							-0.025	-0.305
							(0.084)	(0.417)
# Obs	187	187	199	164	241	153	173	173

* (**) (***) indicate significance at the 10 (5) (1) percent level
All regressions include period dummies (not reported).

Notes: Variable definitions and data sources are reported in Table 8.

Table 7: Growth and Incomes of the Poor

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

	Trade Volumes			Government Consumption/GDP			log(1+Inflation Rate)			Financial Development			Rule of Law Index			All Growth Variables		
	Coef	Std.Err.		Coef	Std.Err.		Coef	Std.Err.		Coef	Std.Err.		Coef	Std.Err.		Coef	Std.Err.	
ln(Per Capita GDP)	**1.094**	**0.108**	***	**1.050**	**0.085**	***	**1.020**	**0.089**	***	**0.995**	**0.119**	***	**0.914**	**0.105**	***	**1.140**	**0.100**	***
(Exports+Imports)/GDP	-0.039	0.088														0.023	0.056	
Government Consumption /GDP				-0.571	0.419											-0.746	0.386	
ln(1+Inflation)							-0.136	0.103								-0.163	0.107	
Commercial Bank Assets /Total Bank Assets										0.032	0.257					-0.209	0.172	
Rule of Law													0.084	0.069		-0.032	0.060	
P-Ho: $\alpha 1=1$	**0.386**			**0.555**			**0.825**			**0.968**			**0.412**			**0.164**		
P-OID	0.257			0.168			0.159			0.350			0.279			0.393		
T-NOSC	-0.751			-0.506			-0.261			-0.698			-0.945			-0.762		
# Observations	223			237			253			232			268			189		

Source: Dollar and Kraay (2001), Table 5.

Notes: All regressions include regional dummies. The row labelled P-Ho: $\alpha_1=1$ reports the p-value associated with the test of the null hypothesis that $\alpha_1=1$. The row labelled P-OID reports the P-value associated with the test of overidentifying restrictions. The row labelled T-NOSC reports the t-statistic for the test of no second-order serial correlation in the differened residuals. Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey-West procedure.

Table 8: Variable Definitions and Data Sources

Variable	Source	Comments
(Exports + Imports)/GDP	World Bank Data	Numerator and denominator are in constant local currency units.
Real GDP Per Capita	Summers and Heston Penn World Tables, World Bank Data	Constant 1985 US dollars. Extended to 1998 using constant price local currency growth rates. Extended cross-sectionally as described in Kraay, Loayza, Serven and Ventura (2000).
Population	World Bank Data	Mid-Year population
Tariffs	Sources: WTO, IDB database and Trade Policy Review -- Country Report, Various issues, 1990-2000; UNCTAD, Handbook of Trade Control Measures of Developing Countries -- Supplement, 1987 and Directory of Import Regimes, 1994; World Bank, Trade Policy Reform in Developing Countries since 1985, WB Discussion Paper #267, 1994, The Uruguay Round: Statistics on Tariffs Concessions Given and Received, 1996 and World Development Indicators, 1998-99; OECD, Indicators of Tariff and Non-Tariff Trade Barriers, 1996; IDB, Statistics and Quantitative Analysis data, 1998. Data are available at http://www1.worldbank.org/wbiep/trade/TR_Data.html	All tariff rates are based on unweighted averages for all goods in ad valorem rates, or applied rates, or MFN rates whichever data are available in a longer period.
First Quintile Share	UN-WIDER (2000), Deininger and Squire (1996), Ravallion and Chen (2000), Lundberg and Squire (2000)	Directory of Import Regimes, 1994; World Bank, Trade Policy Reform in Developing Countries since 1985, WB Discussion Paper #267, 1994, The Uruguay Round: Statistics on Tariffs Concessions Given and Received, 1996 and World Development Indicators, 1998-99; OECD, Indicators of Tariff and Non-Tariff Trade Barriers, 1996; IDB, Statistics and Quantitative Analysis data, 1998.
Gini Coefficient	UN-WIDER (2000), Deininger and Squire (1996), Ravallion and Chen (2000), Lundberg and Squire (2000)	Combination of data from different sources described in more detail in Dollar and Kraay (2001)
Investment/GDP	Summers and Heston Penn World Tables, World Bank Data	Constant 1985 US dollars. Extended to 1998 using constant price local currency growth rates. Extended cross-sectionally as described in Kraay, Loayza, Serven and Ventura (2000).
Contract-Intensive Money	IMF International Financial Statistics	1-currency in circulation/M2, as described in Clague et. al. (1999).
Government Consumption / GDP	World Bank Data	Numerator and denominator are in current local currency units.
ln(1+inflation)	World Bank Data	Inflation is CPI-based where available, otherwise use growth of GDP deflator.

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