TRADE, GROWTH, AND POVERTY*

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A key issue today is the effect of globalisation on inequality and poverty. Well over half the developing world lives in globalising economies that have seen large increases in trade and significant declines in tariffs. They are catching up the rich countries while the rest of the developing world is falling farther behind. Second, we examine the effects on the poor. The increase in growth rates leads on average to proportionate increases in incomes of the poor. The evidence from individual cases and cross-country analysis supports the view that globalisation leads to faster growth and poverty reduction in poor countries.

> Recognising the enormous benefits of open international markets, we, the undersigned economists, strongly support China's entry into the World Trade Organisation. 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.
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> – Open letter in the *New York Times*, spring 2000,
> signed by a long list of prominent economists

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 transitional 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 favour of cross-country growth regressions. They criticise 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 liberalisation in the 1960s and 1970s. It is a shame that there has not been a similar systematic treatment of post-1980 globalisers. In the next Section of the paper we identify post-1980 globalisers 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 proportionate increase in trade, doubling from 16% of GDP to 33% of GDP, compared to a 70% increase from 29% to 50% for the rich countries. What is striking is that the remaining two-thirds of developing countries have actually had a decline in trade to GDP over this period (Figure 1). The globalising group has also cut import tariffs significantly, 22 points on average, compared to 11 points for the non-globalisers (Figure 2). The list of post-1980 globalisers includes some well-known reformers (Argentina, China, Hungary, India, Malaysia, Mexico, the Philippines and Thailand). Desai (1997) includes case studies of several of these countries. Good studies exist of some others, though in general there has not been a systematic review of these post-1980 globalisers. The recent globalisers have experienced an increase of their
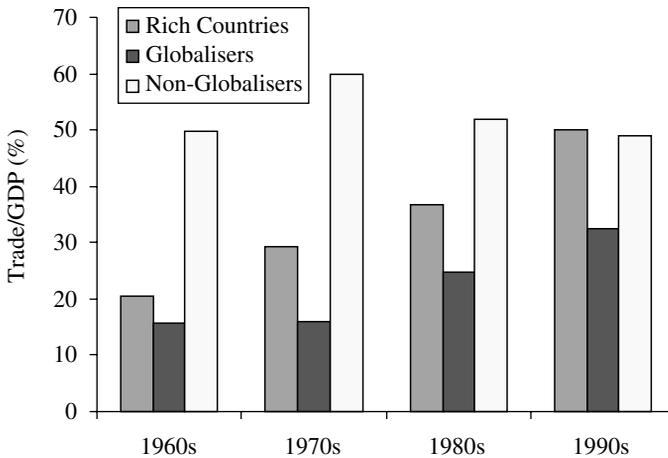

Fig. 1. *Trade/GDP*

Note: Rich countries refers to the 24 OECD economies before recent expansions, plus Chile, Hong Kong, Korea, Taiwan, and Singapore. Globalisers refers to the top one-third in terms of their growth in trade relative to GDP between 1975–9 and 1995–7 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-globalisers refers to the remaining developing countries in this group. Decadal averages are population-weighted. Unweighted averages and alternative definitions of globalisers are reported in Table 3. Variable definitions and data sources are reported in the Appendix.

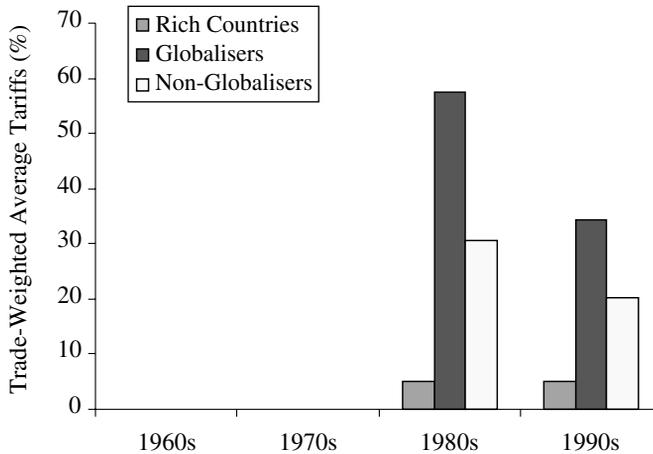[1] Variable definitions and data sources are provided in the Appendix.

Fig. 2. *Average Tariffs*
Note: Rich countries refers to the 24 OECD economies before recent expansions, plus Chile, Hong Kong, Korea, Taiwan, and Singapore. Globalisers refers to the top one-third in terms of their growth in trade relative to GDP between 1975–9 and 1995–7 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-globalisers refers to the remaining developing countries in this group. Decadal averages are population-weighted. Unweighted averages and alternative definitions of globalisers are reported in Table 3. Variable definitions and data sources are reported in the Appendix.

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 over this period. What about developing countries not in the 'globalising' 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 globalising group and the non-globalising 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-globalising 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, stabilisation, strengthening private

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[2] We also show that defining a group of post-1980 globalisers based on tariff cutting (the top one-third of countries in terms of tariff reductions) produces very similar results.
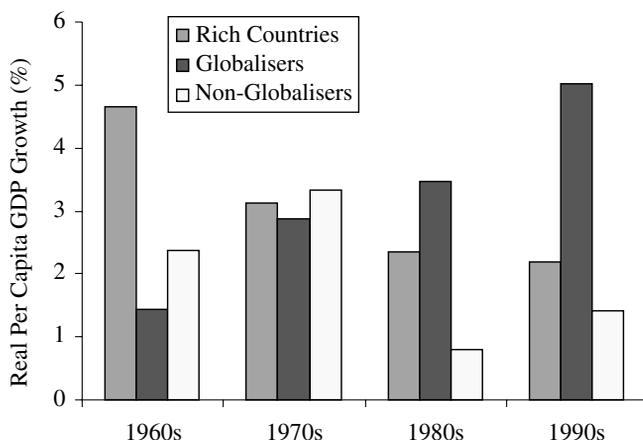
Fig. 3. *Real Per Capita GDP Growth*
Note: Rich countries refers to the 24 OECD economies before recent expansions, plus Chile, Hong Kong, Korea, Taiwan, and Singapore. Globalisers refers to the top one-third in terms of their growth in trade relative to GDP between 1975–9 and 1995–7 of a group of 72 developing countries for which we have data on trade as a share of GDP in constant local currency units since the mid-1970s. Non-globalisers refers to the remaining developing countries in this group. Decadal averages are population-weighted. Unweighted averages and alternative definitions of globalisers are reported in Table 3. Variable definitions and data sources are reported in the Appendix.

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 the next Section summarises a number of these.

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) criticised these studies, both on econometric grounds and also because '…the indicators of ''openness'' used by researchers are problematic as measures of trade barriers or are highly correlated with other sources of poor economic performance'. We agree with Rodriguez and Rodrik that measures of trade barriers are often correlated with other growth-inhibiting factors. In this sense, their argument is related to the more general critique of the empirical growth literature by 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. When all of these policies are included in regression analyses, it can be difficult to identify the separate effects of different policies, and moreover it is easy to misattribute the effects of omitted policy and institutional variables to trade.

We also 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 globalisers. Nevertheless, changes in average tariff rates are not very strongly correlated with changes in trade volumes.[3]

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 emphasised 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.

Section 2 then focuses on the relationship between trade liberalisation and inequality. In Dollar and Kraay (2002*a*) 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 realise 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 overall growth rate of the economy.

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 globalisation 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

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[3] In our companion paper Dollar and Kraay (2002*b*) we use China in the 1980s to illustrate the case of a country which saw large increases in trade due to reductions in administrative barriers to trade, and without significant declines in tariffs.
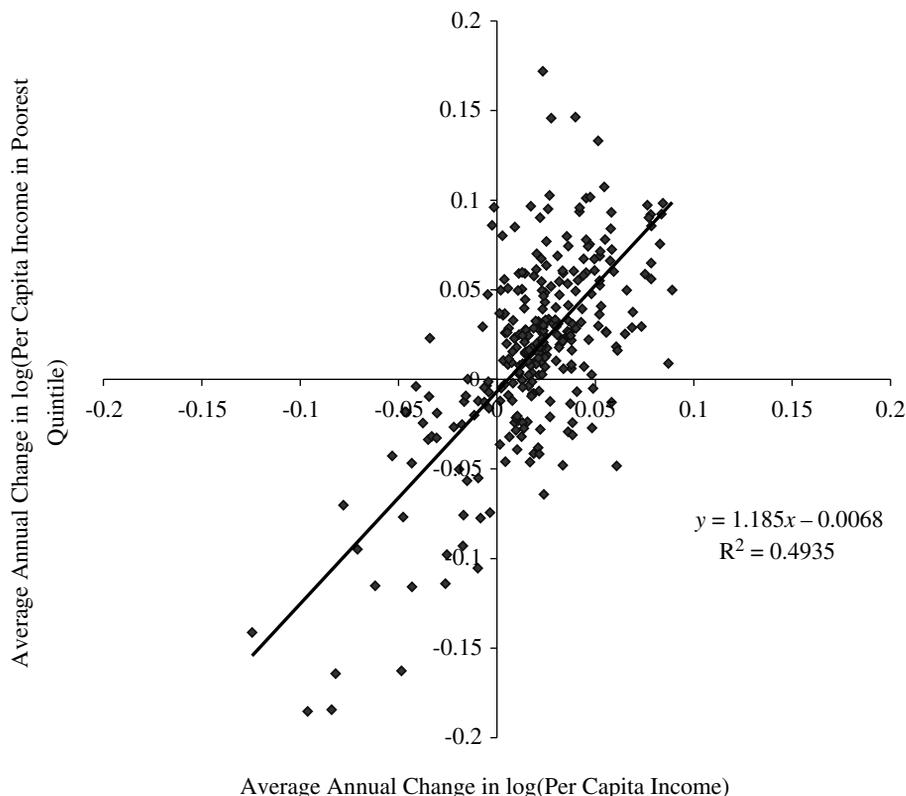
Fig. 4. *Growth is Good for the Poor*
Notes: Figure shows average annual growth rates of indicated variables over non-over-lapping periods of at least five years, in a sample of 285 observations covering 92 developed and developing countries. Per capita income growth refers to real per capita GDP growth. 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. Variable definitions and data sources are reported in the Appendix.
Source: Dollar and Kraay (2002*a*).

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 lib-eralisation has distributional consequences – that is, there are 'winners' and 'losers' in the short run. However, our finding is that the losers on average do not come disproportionately from the poor. While this is heartening,

(a) *Trade and the Gini Coefficient*

$y = 2.5227x + 0.0139$
$R^2 = 0.0013$

Average Annual Change in Gini Coefficient

Average Annual Change in Trade/GDP

(b) *Trade and the Income Share of the Poor*

$y = 0.0489x + 0.0012$
$R^2 = 0.0002$

Average Annual Percent Change in Income Share of Bottom Quintile

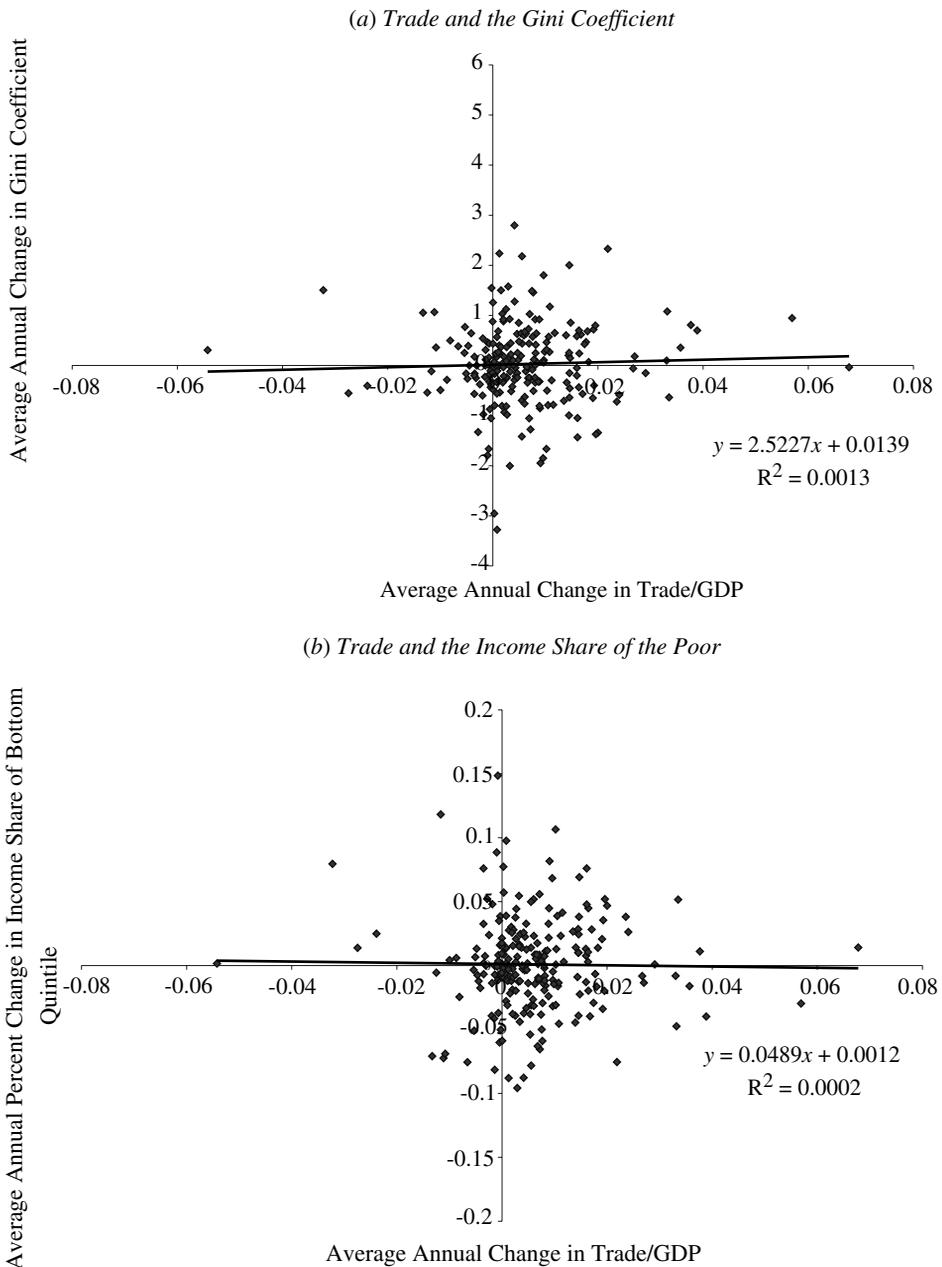Average Annual Change in Trade/GDP

Fig. 5. *Changes in Trade and Changes in Inequality*
Notes: Figure shows average annual growth rates of indicated variables over non-over-lapping 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 the Appendix.
Source: Dollar and Kraay (2002*a*).

nevertheless it has to be a concern that some poor households are hurt in the short run by trade liberalisation. It is thus important to complement open trade policies with effective social protection measures such as unemployment insurance and food-for-work schemes.[4] 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 relate the cross-country findings on trade and inequality back to the specific countries in our globalising 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 liberalising 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 globalisers (due to limits on the availability of data we use to identify the other globalisers), 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 (1992–3), 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 labour-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 liberalise 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 liberalisers 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

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[4] Closed economies obviously need safety nets as well since households are subject to shocks from business cycles, technological change, weather and disease.

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.

1. Growth of the Post-1980 Globalisers

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 growth to that of other developing countries that have remained more closed. We identify these post-1980 globalisers 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 recognise that growth in trade volumes may also reflect many factors other than trade liberalisation. We therefore also use reductions in average tariff rates to identify globalisers. The average tariff rate is clearly a policy variable but the relationship between tariff rates and trade volumes is not that strong. 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 liberalisers (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 globalisation in the 1980s and 1990s. This expanded group of rich countries provides a useful benchmark against which to measure the experience of the globalising and non-globalising developing countries. With these wealthy countries put aside, we have trade data for 73 developing economies.[5]

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[5] 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 globalisers 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 1975–9 and 1995–7. These countries are shown in Table 1, and include some well-known economic reformers: Malaysia and Thailand in East Asia, which liberalised trade in the early 1980s; China, which has been liberalising 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 globalisers 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.[6]

We therefore also present a second group of globalisers based on absolute declines 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 1985–9 period and the 1995–7 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 globalisers 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 globalisers. 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 6 provides a graphical summary of our identification of globalisers, 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 globalisers based on their growth in trade are in regions II and III; the second group of globalisers based on their tariff reductions are in regions I and II, and the group of nine countries appearing on both lists in region II. Given the problems of measuring trade liberalisation that we have discussed, there cannot be a definitive list of recent liberalisers: any one of our three groups of countries constitutes a reasonable candidate set of 'globalisers'. We therefore consider all three groups in the discussion that follows below. We will also refer repeatedly to Table 3 in which we present summary statistics for the rich countries, the developing country globalisers, and the non-globalisers, using the three alternative definitions of globalisers discussed above. For each group of countries, we report a simple average and a population-weighted average

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[6] Vietnam's ratio of trade to GDP has gone from 0.58 in the 1985–9 period to 1.59 in the 1995–7 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.

Table 1

Post-1980 Globalisers (Based on Increases in Trade Volumes)

	Average annual per capita GDP growth (%)						Average trade/GDP (%)						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 the Appendix.

Table 2

Post-1980 Globalisers (Based on Reductions in Tariffs)

Country	Average annual per capita GDP growth (%)						Average trade/GDP (%)						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
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

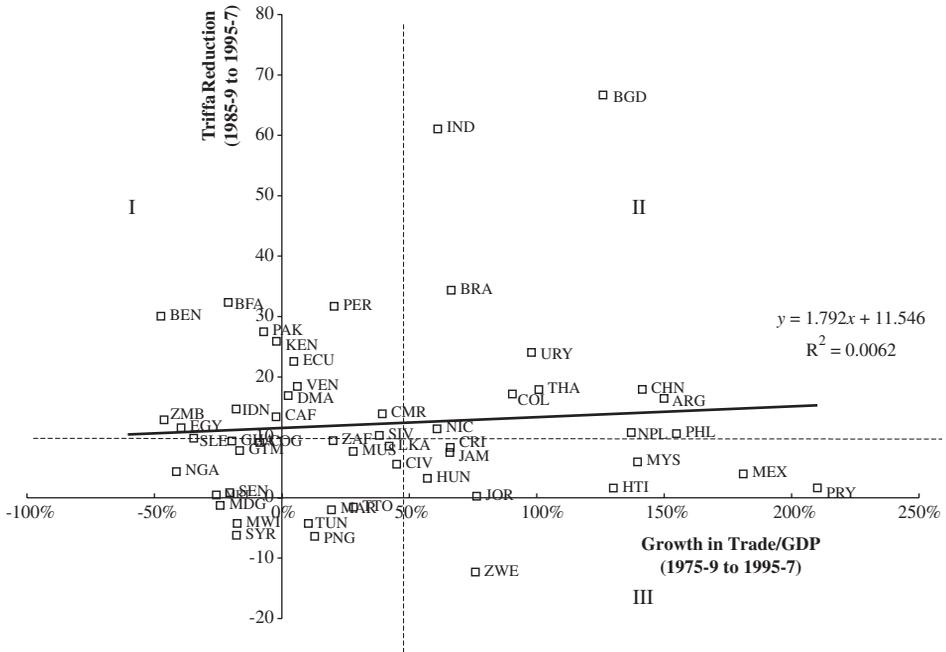*Notes:* Variable definitions and data sources are reported in the Appendix.

Fig. 6. *Identifying Globalisers*

Notes: Figure plots growth in trade relative to GDP over the period 1975–9 to 1995–7 on the horizontal axis and the decrease in weighted average tariffs over the period 1985–9 to 1995–7 on the vertical axis. The first group of globalisers 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 the Appendix.

of trade volumes, tariffs, and growth. Since several populous countries, notably China, India, Bangladesh, and Brazil, are included in all three lists of globalisers, 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 globalisers 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 globalisers in Tables 1–3 to make three points. First, increases in integration with the world economy have been substantial among the globalisers. By construction, the globalisers 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-globalisers, trade actually fell as a share of GDP (60% to 49% of GDP).[7] The globalisers have also had large reductions in tariffs, a total of

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[7] For the group of non-globalisers 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 globalisers, 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.

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Table 3

Summary Statistics on Rich Countries, Globalisers, and Non-Globalisers

	List 1: Large increases in trade (%)				List 2: Large tariff cuts (%)				List 3: Large increases in trade and tariff cuts (%)			
	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
Globalisers 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
Globalisers 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-Globalisers 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-Globalisers 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
Globalisers Simple			32.7	19.5			44.3	23.4			51.4	24.4
Globalisers Weighted			57.4	34.5			57.6	34.7			61.3	36.6
Non-Globalisers Simple			30.1	20.6			21.0	16.5			27.3	19.6
Non-Globalisers 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
Globalisers 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
Globalisers 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-Globalisers 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-Globalisers 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 the Appendix.

22% (from 57% to 35%), while tariff cuts among the non-globalising developing countries were a much more modest 11% (from 31% to 20%).[8]

The second point we want to emphasise is that *per capita* growth rates have increased among the globalising economies in the 1990s relative to the 1980s. Of the 24 countries in Table 1, 18 experienced an increase of growth between the 1980–4 period and the 1995–7 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 first list of globalisers, 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% per year during the 'lost decade' of the 1980s to a scant 0.6% per year during the 1990s, while growth in the rich countries slowed from 2.6% to 2.4%.[9] It would be naïve to assert that all of this improvement in growth should be attributed to the greater openness of these globalising economies: all of them have been engaged in wide-ranging economic reforms covering trade and other areas. The experiences of China, Hungary, India, and Vietnam are covered in Desai (1997); these countries strengthened private property rights and carried out other reforms during this period. Virtually all of the Latin American countries included in the grouping stabilised 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 globalisers for worldwide income inequality across individuals. While the simple average growth rate discussed above indicates what has been happening to the typical globalising 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 US 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 US in 1960 – grew rapidly and 'converged' on the US. 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.[10] However, the post-1980

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

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

[10] 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).

globalisers did *not* do particularly 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 globalisers were falling further and further behind the rich countries. The rest of the developing world did some-what 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-globalising 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 globalisers accelerated to 3.5% *per capita* in the 1980s and 5.0% in the 1990s.[11] Thus, in the 1990s, a very significant 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.[12]

The story that emerges so far is that developing countries that have reduced trade barriers and traded more over the past twenty years have also grown faster. However, it is important to examine whether these relationships are true in general or depend on the particular sample of countries that we identified as 'post-1980 globalisers'. There is after all a certain *ad hoc* character to how we group countries. We next turn to a more systematic cross-country statistical analysis of trade and growth using regression analysis. In a companion paper (Dollar and Kraay, 2002*b*), we extend this regression analysis in a number of dimensions.

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 (Levine and Renelt, 1992; Rodriguez and Rodrik, 2000; Srinivasan and Bhagwati, 1999), which suggests a need to revisit some of these earlier results.

We estimate the following 'standard' growth regression:

$$y_{ct} = \beta_0 + \beta_1 y_{c,t-k} + \boldsymbol{\beta}_2' \mathbf{X}_{ct} + \eta_c + \gamma_t + v_{ct} \tag{1}$$

where y_{ct} is log-level of *per capita* GDP in country c at time t, $y_{c,t-k}$ is its lag k years ago ($k = 10$ years in our application using decadal data) and $\mathbf{X}_{ct}$ is a set of control variables which are measured as averages over the decade between $t - $ k and t.

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[11] This pattern of higher levels and greater increases in growth among the globalisers relative to the non-globalisers holds for all three groups of globalisers. Moreover, it is worth noting that our sample of non-globalisers 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 'globalisers'). If these countries and their weak performance in the 1990s were included among the non-globalisers, then the difference in growth performance between the globalisers and the non-globalisers would be even more stark.

[12] 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.

Many studies include trade volumes (exports plus imports as a share of GDP) among the variables in $\mathbf{X}$. 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 *et al.* (1996) provide a useful critique of conventional panel growth econometrics and a proposed solution. We adopt their preferred estimation strategy, which is to estimate (1) in differences, using appropriate lags of the right-hand side variables as instruments. In particular, they advocate estimating the following regression:

$$y_{ct} - y_{c,t-k} = \beta_1(y_{c,t-k} - y_{c,t-2k}) + \boldsymbol{\beta}'_2(\mathbf{X}_{ct} - \mathbf{X}_{c,t-k}) + (\gamma_t - \gamma_{t-k}) + (v_{ct} - v_{c,t-k}). \quad (2)$$

This is nothing more than a regression of growth on lagged growth and on changes in the set of explanatory variables. Or, subtracting lagged growth from both sides of the equation, we have changes in growth from one decade to the next as a function of initial growth and changes in the explanatory variables.[13]

This approach has several desirable features for us. 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. Also, 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. 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 ($\mathrm{E}[\mathbf{X}_{ct}v_{c,t-s}] \neq 0$ for $s \geq 0$), they are uncorrelated with future

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[13] Elaborations of these techniques involve jointly estimating a system of two equations, in levels (1) and in differences (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.

shocks to GDP growth, $(E[\mathbf{X}_{ct}\mathbf{v}_{c,t+s}] = \mathbf{0}$ for $s > 0)$. In practice, this means that when we regress growth in the 1990s on growth in the 1980s and the change in trade volumes between the 1980s and 1990s, we can use the level of trade volumes in the 1970s as an instrument for trade openness.[14]

Table 4 presents our results. Our data set consists of 187 observations on growth in the 1990s and growth in the 1980s, for roughly 100 countries. In our companion paper (Dollar and Kraay, 2002b) we consider an expanded set of countries over a longer period of time and obtain qualitatively similar results. 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 (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% increase in the trade share.

In the first column we present the results simply estimating (2) by ordinary least squares. While this estimation method is inconsistent, it is a helpful way of summarising the partial correlations in the data. We report the estimated coefficients, the standard errors that are robust to heteroscedasticity in parentheses 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% increase in the trade share would have the cumulative effect of raising incomes by 25% over a decade.

Table 4

Trade and Growth Regressions

	(1) OLS	(2) IV	(3) IV	(4) IV
Initial income	0.419	0.783	0.765	0.960
	(0.071)***	(0.297)***	(0.367)**	(0.397)**
Trade volume	0.252	0.475	0.514	0.543
	(0.095)***	(0.175)***	(0.187)***	(0.210)***
Contract-intensive money			0.232	
			(0.410)	
Government consumption/GDP				−1.164
				(1.009)
log(1 + inflation rate)				−0.142
				(0.152)
Revolutions				−0.025
				(0.084)
F-Stat. for First-stage regressions				
Lagged growth		12.46	8.09	8.56
Open		17.49	16.17	10.62
No. of Obs.	187	187	153	173

* (**) (***) indicate significance at the 10 (5) (1) level.
All regressions include period dummies (not reported).
Variable definitions and data sources are reported in the Appendix.

[14] 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 *et al.* (1996) for details.

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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. 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 before, our instrumented coefficients will not reflect the spurious omission of these variables.

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. In (Dollar and Kraay, 2002*b*) we examine this hypothesis empirically in detail and find little support for the idea that the partial correlation between trade and growth is driven by the omitted effect of institutional quality. In column 3 of Table 4, we show one such result in this sample of countries. We measure institutional quality 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 variable, coined as 'contract-intensive money' by Clague *et al.* (1999) measures the extent to which property rights are sufficiently 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. 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. In our companion paper we find that this general conclusion holds when we consider several other measures of institutional quality, including the widely-used subjective measures produced by the *International Country Risk Guide* and Freedom House, as well as measures of violent strife. Taken together, these results suggest to us that omitted *changes* in institutional quality are unlikely to be driving the observed partial correlation between trade and growth.

In column 4 of Table 4 we show that the results are also robust to the inclusion of other policy and non-policy determinants of growth, suggesting that the effects of trade are also not simply capturing the overall quality of the growth environment. We also note that our strategy of using internal instruments to address potential problems of endogeneity appears to work reasonably well. In Table 4, we report the F-statistics for the first-stage regressions for lagged growth and openness. In all cases the null hypothesis of zero slopes is overwhelmingly

rejected.[15] In summary, we argue that the experience of the post-1980 globalisers illustrates a more general finding, that greater involvement in trade is related to faster growth in developing countries.

2. Inequality and Poverty in the Post-1980 Globalisers

> Globalisation 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 globalisation 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 previous Section of this paper we have argued that the experience of globalisers shows how greater openness to international trade has in fact contributed to narrowing the gap between rich and poor countries, as the globalisers have grown faster than the rich countries as a group. In this Section of the paper we turn to the effects of globalisation on inequality within countries, drawing on results from Dollar and Kraay (2002a). 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.

To examine the effect of globalisation on inequality, 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 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 sub national). 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

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[15] In the case of multiple endogenous variables, these large first-stage F-statistics need not be sufficient statistics for the strength of the instruments. In a closely-related paper (Dollar and Kraay, 2003) we carefully investigate the strength of internal instruments in identifying the effects of trade on growth, using recently-developed techniques in the literature on weak instruments. Our conclusion in that paper is that these internal instruments are in fact sufficiently strong to identify the effects of trade as long as we treat other control variables as exogenous (as we do here).

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% of the income distribution and used the available income distribution data to construct average incomes in the poorest quintile.[16] We then examined the relationship between growth in average incomes and growth in incomes of the poorest fifth. Figure 4 summarises 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:

$$y_{ct}^P = \alpha_0 + \alpha_1 y_{ct} + \boldsymbol{\alpha}_2' \mathbf{X}_{ct} + \mu_c + \varepsilon_{ct} \tag{3}$$

where c and t index countries and years, respectively; $\mathbf{X}_{ct}$ 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.[17]

We are interested in two key parameters from (3). The first is α_1 which measures the elasticity of income of the poor with respect to mean income. A value of $\alpha_1 = 1$ indicates that growth in mean income is translated one-for-one into growth in income of the poor – that is, that changes in income distribution are not systematically associated with changes in average incomes. Estimates greater or less than one indicate that growth more than or less than proportionately benefits the

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[16] 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.

[17] It is straightforward to generalise 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.

poor, i.e. that growth systematically leads to decreases or increases in the income share of the poorest quintile. The second 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 examine systematically whether increases in trade volumes (or any other variable) are systematically associated with changes in the income share of the poorest quintile.

Estimating (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 generalised 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 5 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 5). 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 Dollar and Kraay (2002*a*) we also subject this basic result to a wide variety of robustness checks and also consider several other measures of international economic integration. Our conclusion is that there simply is no 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

Table 5

Growth and Incomes of the Poor (Dependent Variables 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	
No. of Obs.	223		237		253		232		268		189	

Source: Dollar and Kraay (2002*a*), 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 over identifying restrictions. The row labelled T-NOSC reports the t-statistic for the test of no second-order serial correlation in the different residuals. Standard errors are corrected for heteroscedasticity and for the first-order autocorrelation induced by first differencing using a standard Newey-West procedure.

not want to minimise the importance of these. But, it is not the case that the poor are systematically the losers from trade openness.

Does the experience of the post-1980 globalisers accord with this general result? Table 6 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 globalisers, only 23 have income distribution data that allows us to

Table 6

Changes in Inequality in Globalisers

	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
Egypt	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 the appendix.

Source: Based on data reported in Dollar and Kraay (2002*a*).

make comparisons of the 1990s relative to the 1980s. In almost exactly half of these countries (11 out of 23), income inequality has fallen. So, there are liberalising 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 liberalising 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 6 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 emphasised above that growth rates for almost all of the globalisers 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 globalisers 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 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.

In summary, we have found no 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 globalisation is a force for poverty reduction.

3. 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 globalising economies. The post-1980 globalisers 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 globalisers 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 globalising developing countries grew at 5.0% *per capita*; rich countries at 2.2% and non-globalising developing countries at only 1.4%. Thus, the globalisers are catching up with rich countries while the non-globalisers fall further and further behind.

We also 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. Furthermore, 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 globalising 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.

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Appendix
Variable Definitions and Data Sources

Variable	Source	Comments
(Exports + lmports)/ 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 *et al.* (2000).

Appendix (Continued)

Variable	Source	Comments
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*	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)	Combination of data from different sources described in more detail in Dollar and Kraay (2002*a*)
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 (2002*a*)
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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