

**Preliminary Draft  
Comments Welcome**

**Trade, Growth and Poverty: Re-examining the Linkages**

By

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## Introduction

This paper investigates the relationship between trade, growth and poverty. The topic of trade and growth is as old as economics itself, as is the topic of growth and poverty reduction. There is little doubt in most people's minds about the efficacy of liberal trade policies in promoting growth, as there is little doubt that economic growth is necessary for removal of poverty. What is new is the concern that trade reform, while useful for growth, is not all that necessary, and certainly not that desirable at present i.e. there are several other non-trade growth policies that should have precedence. The second new concern is that growth *per se* is not all that it is made out to be; often, growth bypasses the poor, and hence the search should be on for alternative policies towards poverty reduction: e.g. voice, empowerment, asset and income redistribution, etc. The reason growth is presumed to have missed the poor is because lots of (observed) growth has brought about less poverty reduction than it should have. Left unsaid by the critics is the "should" part i.e. how much extra growth should trade reform yield, and how much poverty decline should growth bring about?

It is intriguing that these new concerns with trade and growth should have come about just after a major expansion in world trade, and related world growth. The new era of globalization, dated perhaps from the early eighties, ushered in unprecedented growth and prosperity. But for two regions of the developing world, sub-Saharan Africa and Latin America, the globalization era has meant painful reforms, the debt crisis, and currency misalignments. And almost zero net growth for two decades. In addition, for the economies of the former Soviet Union, there has been a significant worsening of income distribution, and a decline in average per capita income of close to 20 percent. So in three parts of the world, the globalization and economic reform package has *not* been associated with growth and prosperity. And in exactly these same regions, there was significant growth in the earlier, non-globalization period. This correlation has meant many to suspect the invisible hand of causation i.e. the old tenets of trade and openness being good for growth and poverty reduction need to be re-examined.

Is this suspicion valid? Forgotten by the critics is the simple fact that during the globalization period, the largest continent in the world, Asia, home to over half the world's population, witnessed unprecedented progress – and that the industrialized

world, after a significant slowing down between 1973 and 1985, again saw prosperity. The two populations together account for over 4 billion people. Also not paid enough attention to is the simple fact that the total population in Africa and Latin America is less than the population of China. Also forgotten is the fact that the large Asian continent was given up as lost just four decades ago.<sup>1</sup> In 1960, the average Asian's income was slightly more than *half* that of an African; today, it is more than double. There are precious few Chinese, or even Vietnamese, who are today asking for a relook at the relationship between trade, growth, and poverty.

So what might have been a simple mid-term exam has now turned into a major issue for policy wonks and conference organizers. Apart from a lack of growth in some parts of the world, there is another major "fact" which is fuelling the angst, and the debate. This fact pertains to the official figures on world poverty, figures produced by the World Bank. According to these "official" data, the period of globalization was not all that great for poverty decline; indeed, such decline was miniscule, and only 5 percentage points over twelve years, 1987 to 1999. this period was witness to Chinese per capita incomes more than doubling, and Indian incomes rising by more than 3.5 percent per annum, or more than fifty percent. Since these two countries were home to almost half of the world's poor in the mid-eighties, and poverty declined by only 5 percentage points in the aggregate (from 28 to 23 percent), it must mean that growth had bypassed the poor in China and India. Hence, the justified concern with the old established and strongly positive relationship between trade and growth and strongly negative relationship between growth and poverty.

Bhalla(2002d) suggests that the World Bank poverty figures cannot be supported by the available evidence, and that world poverty today is less than the Millennium Development Goal target for 2015 of less than 15 percent poor. Further, his analysis indicates that the last twenty years were the best for poverty reduction in human history – a growth in developing country incomes of over 3 percent per annum, and a decline in the head count ratio of poverty of over 30 percentage points – from 43.5 percent in 1980 to 13 percent in 2000 (see Bhalla(2002d), pg. 141). These numbers are according to the established \$ a day poverty line and according to survey consumption means adjusted

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<sup>1</sup> See Myrdal (1958) and Asian Development Bank (2002)

to 85 percent of the national accounts means. Thus, he argues, and contrary to the World Bank, there is no need to re-examine old truths; indeed, the policy advice should be to apply the well-established truths to parts of the world that desperately need progress e.g. Africa.

Can an empirical relationship between pro-trade policies and economic growth be established? Before designing such policies for unsuspecting newcomers, can it be said that at least on average, pro-trade policies have led to faster growth? And as Rodrik(2002) has correctly warned, a simple relationship between changes in trade shares and growth acceleration would not suffice. For the simple reason that precisely those factors that lead to higher growth also lead to more trade. The second question that needs an empirical answer is the magnitude of poverty decline that can be expected, given a certain level of growth and given the assumption that distribution does not change. How much poverty decline should a 24 percent rise in per capita consumption, as witnessed in the developing world 1987-99, lead to? Only 5 percent as per the World Bank, or can it be as high as 12 percent as found by Bhalla(2002d). Or perhaps even equal to the percentage increase in consumption itself, i.e. 24 percentage points?

This paper makes an attempt to answer these two questions. Using data assembled from two research projects (Bhalla(2002d)) and Asian Development Bank (2002), various models of growth are estimated, and the implications for trade and poverty reduction derived. The paper is organized as follows: Section 2 discusses why it makes theoretical sense to separate out the joint triangular question as two separate and distinct questions pertaining to trade policies and growth, and growth and poverty reduction. Section 3 outlines the estimating framework and Section 4 discusses the second, separate relationship between growth and poverty. Section 5 contains the conclusions. A brief description of the data and definitions of the variables used are in the Appendix.

## **Section 2: Why trade, growth and poverty are sequential**

The question addressed is the relationship between trade and poverty, or more accurately, between the growth in trade and the decline in poverty. The question assumes importance in the context of the recent debate on whether growth has delivered in terms of poverty reduction. World Bank estimates (see Chen and Ravallion(2001)) suggest that poverty declined marginally from 28 percent in 1987 to 23 percent in 1999. Since these twelve years were in the “peak” globalization period, the debate has centered around the proposition that globalization has been, and therefore is, bad for the poor. The argument is straightforward: during these twelve globalization years, per capita consumption in developing countries increased by 24 percent; and since poverty declined by only 5 percentage points, the system is not working properly. Hence, the search for growth policies which deliver a greater punch in terms of poverty reduction.

Co-incident with the globalization period has been a renewed emphasis on trade liberalization as a major policy tool for developing countries seeking an acceleration in economic growth. Trade policy has been advocated by the major international institutions (the IMF and the World Bank) and by several governments of developing countries. Indeed, one is hard pressed to find a single government that has not subscribed to trade reform, and data on tariff reductions testify to this commitment. (See Table ??). Ironically, the critics of globalization and the international institutions (often the same people) point to the above mentioned World Bank poverty statistics to validate their conclusion that liberalized trade, and growth, have not delivered in terms of poverty reduction.

Note that there is not an argument that liberalized trade does not deliver extra growth. However, even on this issue, there is an empirical debate. In particular, that by looking at the data on trade growth and income growth, the direction of causality is not clear. See Rodrik(?). It could very well be that extra growth is inducing the extra trade growth; so by looking at the simultaneous occurrence of both (as observed for many countries during the last decade) one cannot deduce that trade caused growth.

Part of the effect of the pessimistic World Bank estimates of poverty reduction was a disillusionment with growth policies *per se* and a search for policies which delivered “quality” growth or growth which maximized poverty reduction. Since we are talking of monetary poverty, the assumption here has to mean that a given amount of growth can lead to different amounts of poverty reduction. This can only happen if inequality changes with different growth scenarios. Kuznets (1955) had postulated a long time back about the evolution of inequality; in particular, that as developing countries grew, their distributions followed an inverted U-shaped pattern i.e. inequality first got worse before getting better. Several tests of the Kuznets curve have confirmed its validity.

Instead of the indirect method of poverty reduction via trade (and via growth), there is a direct method of estimating the impact of growth on poverty reduction. This method involves the estimation of the labor and capital intensity of the traded (tradeable) sector relative to non-tradeables. This is an involved exercise and one beyond the scope of this paper. Further, it is unclear what the results would indicate if a procedure were found to identify the above factor intensities. The important question of the impact of trade on growth remains.

Let us assume that this impact was known. Could it not be the case that different patterns of trade liberalization while resulting in the *same* level of growth could nevertheless result in different magnitudes of poverty reduction? No, not unless one had a model relating trade liberalization to inequality change – which is an even more intractable exercise than relating growth to inequality. The first empirical concern is with establishing whether trade causes growth; second, whether the growth caused by the trade liberalization policies has actually benefited the poor in at least a neutral fashion, let alone a pro-poor fashion.

### **Section 3: Impact of Trade policies on economic growth**

The relationship between trade and growth is a controversial, and much studied, issue. While theory is unambiguous (trade reform can only increase growth), empirical validity has been harder to achieve. The simplest measure of the importance of trade is the share of traded goods as a percent of GDP. As is well known, individual country factors (size, geography etc.) can make the trade share significantly different for otherwise identical economies. However, change in trade shares can be a useful proxy for the change in trade policy, and indeed has been used as such by Dollar-Kraay(2001).

Even this simple proxy for change in trade policy runs into empirical problems. As pointed out by Rodrik, a change in trade share can easily be a consequence of higher growth, as its cause. There is a simple trade liberalization variable – the magnitude of trade tariffs. This simple variable, however, has several drawbacks; first, what is needed is a weighted tariff rate, and this is rarely available; second, this variable does not provide any information on non-tariff barriers.

Sachs-Warner(1995) develop a trade liberalization or openness variable based on five different criteria: coverage of non-tariff barriers, average tariff rates, black market premium on currency, a socialist economic system and a state monopoly on major exports. There is a zero-one binary variable signifying whether an economy was closed or open, and this index exists for all years till 1994.

In addition to the above three trade liberalization variables (change in trade share, tariff rates, and Sachs-Warner openness variable), one additional variable is constructed and used to estimate the impact of trade policy on growth. It is a variable often speculated upon i.e. the exchange rate under-valuation in an economy.

Under-valuation of the exchange rate: There are several methods which can be used to measure the under-valuation of a currency. (See IMF documents for measurement of the real effective exchange rate, see John Williamson (??) for measurement of the FEER, and see Bhalla(1999) for the PPP+ method of estimating overvaluation). This paper offers yet another definition. Actually, this definition pertains more to the measurement of the *change* in under-valuation of a currency.

As is well known, the purchasing power of developing economies in terms of PPP prices is greater than in terms of US dollars i.e. a PPP dollar goes further, often several times more, to purchase an equivalent amount of goods. For developed economies, the two exchange rates are approximately equal; for developing economies, the two exchange rates converge towards unity (with development).

The level of under-valuation (UV) in an economy is a function of several factors, most importantly the share of non-tradeables in the economy, the openness of the economy to world trade, the level of development etc. Over short periods, say five years, the percentage change in this ratio can measure the degree to which the dollar exchange rate is *not* allowed to appreciate with the change in PPP incomes.

With globalization, the allocation of capital and manufacturing to different economies is increasingly being determined by the competitiveness of the domestic labor force. Differences in capital costs, and transportation costs, have become negligible. With floating exchange rates, the market will, and does, arbitrate present competitiveness with future growth possibilities e.g. due to convergence, the developing economy exchange rate will have a tendency to appreciate, *ceteris paribus*. However, several East Asian economies have successfully followed the path of currency undervaluation as a basis for achieving higher growth.<sup>2</sup> Can it be empirically shown that this undervaluation has led to higher growth?

The *level* of undervaluation is negatively related to the level of income, and to the rate of economic growth. The former relationship arises because countries that are less developed (poorer) show a greater divergence of UV from unity. But because of convergence, poorer countries are expected to grow faster i.e. a lower UV implies a higher growth rate.

Because of the forces of convergence, economies with greater distance between the value of UV and unity are expected to grow at a faster rate i.e.

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<sup>2</sup> Bhalla(1999a,1999b) argues that the Chinese devaluation of 1990-1993 laid the foundations of the East Asian currency crisis of 1997-1998. The PPP+ model developed in these papers suggests that the Chinese renminbi is today undervalued by as much as 40 percent.

$$y = a + b \cdot (UV)$$

where lower case represents log growth rate and  $b$  is expected to be negative. However, other “fixed” factors e.g. education, geography, access to capital etc. may indeed lead to the coefficient  $b$  in the above equation being positive.

However, the influence of these fixed factors is eliminated by estimating an equation where the dependent variable is the first difference in the growth rate, or an acceleration in growth. An increase in  $UV$  is therefore expected to have a negative impact on the acceleration in per capita growth.

The change in PPP per capita income can be considered as a measure of productivity growth in an economy. Actually, this measure is an under-estimate of productivity growth in traded goods, and a larger such under-estimate for economies whose manufacturing sector is growing faster. The change in the numerator, growth in constant US dollars, reflects the changes in the cost of production. The difference between the two, therefore, reflects the change in costs relative to productivity, or change in competitiveness. The hypothesis to be tested is therefore whether a change in competitiveness i.e. a move towards greater undervaluation, or a decline in the US dollar/PPP ratio, is positively associated with an acceleration in growth.

This undervaluation of currency variable, like all such proxies, has two problems. First, as mentioned above, there is the problem that PPP productivity growth includes productivity changes of non-tradeables. But the bias of this phenomenon is in the right direction i.e. tradeable goods productivity growth is likely to be even higher than measured PPP growth. Second, is the phenomenon of convergence i.e. the natural process of development should lead to an increase in the undervaluation ratio towards unity, and therefore a positive relationship between the change in under-valuation and economic growth. Given that the null hypothesis is that an increase in  $UV$  leads to a decline in economic growth, both the biases are in the right direction i.e. if a negative relationship is observed between a change in undervaluation and a decline in economic growth, then a fairly robust result is obtained.

## Determinants of growth

In its most general form, the model relating per capita income to its determinants is as follows:

$$(1) \quad Y = f(I, K, H)$$

where  $Y$  is per capita (log) income,  $I$  represents initial conditions, and  $K$  and  $H$  represent physical and human capital.

The normal procedure in the growth literature is to estimate equation (1) for a group of countries where each variable refers to the average observed over the time-period. This form of a regression, while useful, suffers from the drawback that it needs identification of all the “fixed-factors” contained in  $I$ .

Equivalently, equation (1) can be written in first differences:

$$(2) \quad y = f(ii, k, h; T)$$

where lower case represent first differences and  $ii$  represents fixed factors which affect the *growth* rate and  $T$  can be used to represent measures of trade policy.

As used by Bhalla(1999), Rodrik(1999) and Dollar-Kraay(2001), first differences in the growth rate equation can be used to factor out the influence of the fixed-factors  $ii$  which affect the growth rate in the economy. Bhalla uses a five-year period to represent the extent of a “normal” business cycle, while Rodrik and dollar-Kraay use a decade as their time-period.

It is important to control for some important growth determining variables before a relationship between policy and output response can be estimated. Two of the most important such “control” variables are the share of investment in GDP and initial income. The first, not surprisingly, is one of the most important determinants of GDP. If a variable is significant in the presence of an investment/GDP variable, then it can be considered to be robust to alternative specifications. It is also common, and correct, to

control for initial levels of income in order to properly account for catch-up. In a capital and technology mobile world, late-comers have an advantage in that they have low labor costs, and can proceed rapidly to international technology levels. During the transition stage, economic and productivity growth in these economies will be higher than that predicted by other factors like investment. The initial level of income variable captures this catch-up.

Thus, the basic model estimated is as follows:

$$(3) \quad dy = a + b \cdot \text{lag}y + c \cdot dx_{\text{inv}} + dW$$

where  $dy$  is the change in the growth rate of per capita incomes,  $\text{lag}y$  represents the influence of initial level of income (which gets converted into lagged growth in a first difference growth model) and  $dx_{\text{inv}}$  represents the change in the share of investment in GDP.

Note several points about equation (3) – first, the variable being explained is the change or *acceleration* in per-capita income growth, a variable likely to be a lot more “noisy” than per-capita income growth. Second, such an exercise cannot be undertaken for one-period data as in equation (1). Third, the unobserved fixed effects are factored out and are no longer contaminating the estimation.

Additional determinants of growth are represented by the vector  $W$ . The  $W$  variables can be inserted in either level form as  $W'$  (the absolute level of a variable (e.g. education) matters more than the change in such variables) or in change form (acceleration in growth is not a function of the level of education but only of the change in such education). Whether  $W'$  or  $dW$  is used is a matter of empirical choice. The specification of the four trade variables indicated above in equation (3) is as follows: change in trade shares, openness (dummy variable), change in the tariff ratio, and (log) percentage change in under-valuation.

Equation (3) is estimated for all developing countries for which data are available, and the time-period of estimation is 1960-1994. Except for lagged income growth, each of the variables is interacted with a period dummy; this dummy identifies the pre-

globalization (1960-1980) and the globalization era (1980-2000). Each variable is represented by its average over five years e.g. 1960-1964, 1965-1969 etc. The time-period ends in 1994 because that is the end date of the Sachs-Warner openness variable. (The next draft of this paper will attempt to extend the openness index till the year 2000). However, a forecast for the 1995-1999 period is presented in Table 3<sup>3</sup>.

### **Results:**

Table 1 reports the results for different specifications for equation (3). Several results stand out:

*Investment:* Not surprisingly, change in the share of investment is a major explainer of changes in growth rate. The coefficient is stable at around 0.25 i.e. each 10 percentage point increase in the share of investment leads to a 2.5 percentage point increase in the growth rate. If the coefficient of investment share is allowed to vary by the globalization period, then a sharp increase is observed. The coefficient for the earlier 20 year period is about two thirds the value observed for 1980-2000 i.e. capital yielded a significantly higher return with globalization.

*Education:* Education is proxied by the percent of students completing secondary school (variable obtained from Barro-Lee). It is always significant and positive; the coefficient is sometimes higher during the globalization period, sometimes lower; the differences are observed to be a function of the trade variable used. The null hypothesis is that returns to education increase with openness and the most general model ("Final" model) shows that this is indeed the case – the coefficient increases to 0.02 to .07. This is also shown by the data reported in Table 2. Each 10 percent "extra" education yields an extra 0.1 percent in growth during 1960-80; during the globalization era, cheap skilled labor should have enjoyed a premium, and the model does show that: being open increases the return three-fold, from .2 per 10 percent increase in school completion levels to a much higher impact coefficient of 0.67.<sup>4</sup>

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<sup>3</sup> Sachs-Warner have cut-off points for black market premium and tariff rates to help decide whether an economy was open or not; since most of the countries pass their filter, a short-cut assumption was made that most economies were open in the forecast time-period 1995-2000. the revised draft will include a reconstructed openness variable for the period 1995-1999.

<sup>4</sup> See World Bank, World Development Report(1991), and Bhalla(1994) for early estimates of the importance of the interaction effect between openness and education.

### **Impact of trade variables on acceleration of economic growth:**

The effect of the various trade variables are evaluated individually and together and are reported under different specification heads in Tables 1a and 1b. The only trade policy variable that is never significant is the change in the trade share variable; hence, this variable is omitted from the model used for generating the simulation results in Table 3.

*Change in trade shares:* This variable is only significant (and that too at only the 5 percent level) for the globalization period, 1980-2000. If this variable is lagged (as per Dollar-Kraay), then the change in trade shares is not even significant at the 10 percent level. Note that since change in trade shares is a “part” of the dependent variable, some correlation with change in the growth rate of the overall economy was to be expected.

*Change in tariff rates:* Even though the variable is subject to various forms of measurement error (e.g. these are simple unweighted tariff rates, and the variable does not include non-tariff barriers or reforms in the same) it is significant for the only period for which data are available, namely 1980-2000. By itself (without other trade variables), this variable is significant at the 10 percent level. It has the proper sign, negative, and the coefficient of  $-.05$  suggests that for each 20 percentage point decline in tariff rates, the growth rate increases by 1 percentage point. For the “full” model, with all other trade variables in the model, only a 15 percentage point decline in tariffs is needed for the growth to accelerate by 1 percent.

*Sachs-Warner Openness variable:* This variable is only available till 1994. This dummy variable is interacted with the two time-periods to yield four dummy variables. Being closed during the globalization years leads to a lower growth rate, and lower by a large 1 percent a year. Being open during the pre-globalization period (1960-80) would have resulted in an even larger gain of 1.4 percent per annum (difference between the coefficient values of 0.6 and 2.0) . This is probably occurring because since 1980 several countries started the reform process, and therefore the gains from opening up were “shared” i.e. the relative advantage was not as large.

*Under-valuation of currency:* This variable has different results for the two time-periods. When trade was not so important (1960-80), this variable is not significant; for the

globalization period, undervaluation is apparently very important for competitiveness and the capturing of “investment”, both domestic and foreign. The coefficient is highly significant (t statistic equal to  $-4.33$ ) has the right negative sign, and its magnitude suggests that each 10 percent change in undervaluation will lead to an increase in growth rate of 1.6 percent.

When the “full” model is estimated, one expects the significance of each individual trade variable to decline, since there is some collinearity between the variables. This is what occurs, though it is interesting to note that the Dollar-Kraay variable, change in trade share, remains insignificant, while tariff rates, Sachs-Warner openness variable and change in undervaluation all retain their broad significance.

Table 3 reports on the average growth, the average change in growth, and the contribution of the trade variables in explaining the change in growth; the estimates are derived from the model labeled “final” in Table 1a with the Sachs-Warner closed economy estimates added to the effects of lagged change in incomes, and secondary schooling completion rates. The effects of trade policy on growth acceleration is large, and largest for the globalization period; the average country growth rate (not weighted by population) during the years 1980-1994 was 0.8 percent per annum; contribution of pro-trade policies was equal to an additional growth of 0.52 percent per year, or almost two thirds of the observed growth.

The estimates reported in Tables 1-3 are emphatic about the role of pro-trade policy in generating extra growth. The estimates have been obtained under “stringent” econometric conditions; what is being explained is the acceleration in growth, not income levels or growth. Further, the models have been estimated with the change in investment share, lagged income growth, and human capital (secondary school completion levels) as control variables. The trade policy variables all work as individual “entrants” and jointly, and are generally statistically significant. None of the variables suffer from a possible endogeneity problem; the one that potentially does, change in trade shares, was not significant and was dropped from the model.

#### **Section 4: The Relationship between Growth and Poverty**

The previous section documented how trade policy can significantly affect growth. This section is concerned with the analysis of how given growth, how much poverty decline one should expect. This section draws from a detailed analysis of this subject which is contained in Bhalla(2002d) and ADB(2002), a research project report which contains a detailed analysis of the Asian experience, 1960 to 2000.

As suggested earlier, the disaffection with growth as a poverty reducer stems from the World Bank finding of too little poverty decline in the presence of high growth during 1987-1999. This finding likely led to (and is still leading many others) to search for better “growth” policies, or better quality of growth. In other words, what is being aimed at growth which delivers more than “normal”; growth which is pro-poor.

There are two aspects to the identification of whether pro-poor growth is being achieved or not. First, and most importantly, is whether there has been any change in inequality – if an improvement, then unambiguously, growth was pro-poor. However, even this conclusion is not so straightforward, especially if it is conjectured that high growth means worsening of inequality. If that is the case, then it can happen that the incomes of the poor rise much more with an “anti-poor” strategy than with a pro-poor one.

How normal is it to expect pro-poor growth? How normal is it to expect countries to become more equal with development, more equal with growth? Not normal – indeed to expect quality growth is (almost) to go against mother nature. Bhalla(2002d) discusses in detail several studies which examine the evolution of intra-country inequality i.e. the testing of the Kuznets inverted U-curve. There are one set of studies emerging from the Harvard Institute of International Development and the World Bank (see Roemer-Gugerty (1997), Gallup et. al. (1998), Timmer(1997), Deininger-Squire(1996), Li. et. al. (1998), and Dollar-Kraay(2000)) which argue that development, especially during the last twenty years has bypassed the Kuznets curve i.e. there has been no change in inequality, or “growth has been good for the poor”. Two studies challenge this conclusion – Cornia and Bhalla(2002d). Both argue that there is little reason to doubt that intra-country inequality has worsened during the eighties and nineties. Bhalla goes on to argue, however, that while intra-country inequality has worsened, world individual inequality has definitely improved.

So the quality of growth argument is really about whether inequality is expected to change, and there is precious little knowledge about what can cause an improvement in the distribution of income. Obviously, forced redistribution of assets and taxation can improve upon what “nature” provides for in terms of inequality, but these possibilities are only available in wars, revolutions, and developed economies (progressive taxation). The Kuznets inverted U curve is one of the most regular of the stylized facts in development economics.

The identification of pro-poor growth is even more problematical when distribution does not change. Growth can, and does, affect poverty differentially i.e. the same amount of growth can often lead to a higher, or lower, reduction in poverty after even holding the level of inequality constant. This occurs because where the poverty line cuts the distribution of income is an important component of how much poverty decline can be expected with growth, *ceteris paribus*. This effect can be quite large and can generally swamp other effects. The following heuristic example is illustrative. Assume the poverty line is 100 and the mean income of the poor is 50 and the standard deviation is 10. An increase in consumption of 10 percent will have a zero impact on the head count ratio. Now assume that the mean income of the poor was 99. Now a 10 percent increase in consumption will lead to a very large decline in the head count ratio – so the elasticity has changed from zero to infinity with virtually no change in the underlying reality – except the phenomenon of where the poverty line cuts the distribution of income.

This changing elasticity can be captured by computing an elasticity at the point where the poverty line exists and shocking the system by a small amount e.g. 2.5 to 5 percent. The resulting change is termed the “shape of the distribution” elasticity and its estimates for three different countries are reported in Table 5.<sup>5</sup> The table also contains the inequality estimates for the closest survey year. This table can help reject various conjectures – for example, that more equal economies will show a larger reduction in poverty, *ceteris paribus*. With a Gini of 27.8, China was a very equal society in the early eighties. At that time, each 10 percent increase in incomes would have led to a 5.9 percent decline in the HCR. A decade later, China had become very unequal; but the same amount of increase in income would now have led to a decline in the HCR of 7.6

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<sup>5</sup> Bhalla(2002) contains the derivation, a detailed discussion and estimates of SDE for different parts of the world for the period 1850-2000.

percent. Analogously, China is more equal than Brazil, yet in the late nineties, and with the national poverty line, China would need higher growth to bring down poverty by an equivalent amount.

Note that the growth yield (decline in poverty for a given amount of growth) has very little to do with the initial level of distribution of income, as argued by World Bank's World Development Report for 2001. Of course, it is true in a tautological sense that higher inequality will, *ceteris paribus*, lead to a lower decline in poverty. But all other things are never equal, and especially in this case where the other *ceteris paribus* variable, the shape of the distribution elasticity, is affecting the results in such a major way.

On average, with no change in income distribution, a 10 percent increase in average incomes can be expected to lead to a decline of between 5 and 6 percentage points in the head count ratio of poverty. Knowledge of the shape of distribution elasticity can help explain the variation of experience and some of the anomalies in the literature. Recall that it was argued that part of the disillusionment with economic growth had to do with the fact that a 24 percent increase in consumption had led only to a 5 percent decline in the HCR. But this 24 percent is the mean increase in national account consumption. But this is not the mean increase in consumption as reported in the household survey data that have been used by the World Bank to generate their poverty estimates. That mean is reported to be a cumulative increase of 10.4 percent (0.9 percent per capita per year) over the period 1987-1998 (Chen-Ravallion (2001)). The authors do not report what has happened to the distribution of consumption in the developing world during this period, though Bhalla finds a significant improvement. Taking the World Bank mean estimates at face value, one does obtain the result that poverty declined by precisely as much as it "should" have, especially if distribution has stayed constant.<sup>6</sup> An increase of 10.4 percent mediated by the "shape of distribution" elasticity of 0.5 yields a 5.2 percentage decline in the head count ratio of poverty.

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<sup>6</sup> Actually, the distribution of consumption (income) *has* to have improved given the higher than average per capita growth rates by the majority of the poor located in India and China. See Bhalla(2002d, 2002e) for a discussion of the plausibility of the World Bank estimates on poverty.

If there is angst about growth not delivering, it is because growth was not present – at least measured growth as in the household surveys which form the basis of the calculations of world poverty.

## **Section 5: Conclusions**

The aim of this paper was to investigate the relationship between trade, growth and poverty. It was suggested that this question was better dealt in two parts – the relationship between pro-trade policies and growth, and the relationship between growth and poverty reduction. For the first age-old question, the “new” results were in conformity with very old wisdom. Trade policy is empirically shown to be the largest contributor, by far, to growth acceleration in developing countries, and so for the reasonably long period of thirty-five years, 1960-1995. No matter how the period is sliced up (pre-globalization years 1960-1980, or the globalization years thereafter) trade policies are significant, very significant, in enhancing growth. Further, another important non-trade contributor to growth, education, is observed to have a much larger impact on growth in the presence of openness, than in its absence.

The second question is also an old question, and one for which new answers are not required. However, lately, the debate has centered on not whether growth is necessary for the reduction of absolute poverty, but whether, growth is “sufficient”. Prior to the late nineties, one is hard pressed to find any literature that does not take for granted the proposition that if you want to reduce monetary poverty, you have to have growth. The result is tautological. But not lately; now the proposition is a more sophisticated one – growth may lead to inequality increases, and therefore the search should be for the types of growth which are “pro-poor” in their impact. It is another story that the mechanisms that will generate this “super-growth” are nowhere articulated, and perhaps like the invisible hand, nowhere to be found.

There are very, very, few examples of growth with an improvement in intra-country inequality. There are no examples of high growth and such an improvement. There are very many examples of growth with a deterioration in inequality; and there are examples of low and/or negative growth with both an improvement or deterioration in inequality.

The veil of ignorance proposition is unfortunately never applied by the pro-poor policy makers. Would the poor prefer a faster growth for themselves, and a deterioration in inequality, or prefer low growth with an improvement in inequality? Except for those indulging in the “economics of envy” (a set that excludes the poor, by definition), most of us would opt for higher growth in our personal incomes, regardless of whether the Jones’s had more.

In the sequence from trade to poverty, the following result stands out. Openness, or pro-trade, policies are the most effective instruments for enhancing growth; the last twenty pro-poor years, when poverty declined by a record margin of 30 percentage points from 1980 to 2000<sup>7</sup>, was not coincidentally when pro-trade policies were at their peak. These two decades were also witness to a (population-weighted) acceleration in developing country growth rate to 3.1 percent per annum, up a full percentage point from the level observed for the previous two decades. How much of the poverty decline of 30 percentage points can be attributed to trade? All the empirical evidence suggests that this contribution is at least half i.e. 15 percentage points. In 1980, the number of poor are estimated to be 1.5 billion people; in 2000, the number of poor are estimated to be 650 million (13.1 percent of the population of the developing world). Trade contributed to at least 500 million being removed from poverty – there are few other policies, indeed none, that can claim this Nobel prize.

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<sup>7</sup> These figures are not those of the World Bank, but are those which are yielded by World Bank data and the \$ a day poverty line. The figures are contained in Bhalla(2002d) and suggest a decline in the HCR from 45.3 percent in 1980 to 13.1 percent in 2000.

## Appendix – 1

### **Variable Definitions and Construction**

*GDP Per Capita*: measured in constant local currency. Source: World Bank, World Development Indicators, CD ROM, 2002 (hereafter referred to as WBCD)

*Percent completing Secondary School* : Source: Barro–Lee Schooling Dataset

*Trade volume*: Volume of trade in constant US dollars, 1995. Source: World Bank, World Development Indicators, CD ROM, 2002

*Tariff Rate*: Average tariff rate Source: World Bank.

*Sachs Openness Variable*: Sachs openness variable is a dummy variable whose value is 0 for closed economy and 1 for open economy according to Sachs and Warner criterion. Source: Sachs, J. D. and Warner, A. M. (1995), “Economic reform and the process of global integration. Brookings Papers on Economic Activity”

*Undervaluation of currency*: Percentage change in the ratio “dollar GDP per capita to PPP dollars per capita”, both in constant currency terms. Source: WDI 2002.

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Table 1a: Trade Policy and Growth Acceleration

<b><u>Independent Variables</u></b>	<b>Model Basic</b>	<b>Model Full</b>	<b>Model Final</b>
<b>Control Variables</b>			
One period lagged income growth	-0.689 (-16.31)	-0.735 (-14.98)	-0.704 (-15.27)
Change in share of investment in GDP			
<i>1960-80</i>	0.247 (6.6)	0.174 (3.92)	0.213 (5.72)
<i>1980-00</i>	0.257 (7.63)	0.269 (7.06)	0.268 (7.60)
<b><u>Education &amp; institution variables</u></b>			
Percent completing secondary school			
<i>1960-80</i>	0.08 (4.45)	.038 (0.19)	.016 (0.69)
<i>1980-00</i>	0.05 (4.95)	.065 (.001)	.065 (3.46)
<b><u>Trade related variables</u></b>			
Change in trade volume			
<i>1960-80</i>		0.0267 (0.74)	
<i>1980-00</i>		0.0228 (0.88)	
Change in tariff rates			
<i>1980-00</i>		-0.057 (-1.99)	-0.055 (-1.93)
Sachs openness variable			
1. <i>Closed, 1960-80</i>		0.593 (1.67)	0.676 (2.25)
2. <i>Closed, 1980-00</i>		-0.908 (-2.71)	-0.952 (-3.01)
3. <i>Open, 1960-80</i>		1.95 (3.02)	2.29 (3.70)
4. <i>Open, 1980-00</i>		-0.088 (-0.17)	0.171 (0.34)

Contd.

Table 1a: Trade Policy and Growth Acceleration (contd.)

<b>Independent Variables</b>	<b>Model Basic</b>	<b>Model Full</b>	<b>Model Final</b>
Log change in undervaluation of currency			
<i>1960-80</i>		0.034 (1.18)	0.059 (2.17)
<i>1980-00</i>		-0.078 (-2.05)	-0.089 (-2.40)
Adj. R-squared	0.45	0.52	0.52
RMSE	2.89	2.52	2.56
No. of obs	432	340	380

*Notes: 1. Dependent Variable: First differences in per capita income growth, local currency. Data: Developing Country 5-year averages from 1952 to 1992, centered on 1962 ..... 1992*

*2. For variable definitions, see text and Appendix I.*

**Table 1b: Trade Policy and Growth Acceleration**

<b>Independent Variables</b>	<b>Model Trade Shares</b>	<b>Model Tariff Rates</b>	<b>Model Openness</b>	<b>Model Undervaluation of Currency</b>
<b>Control Variables</b>				
One period lagged income growth	-0.756 (-16.25)	-0.682 (-16.13)	-0.737 (-16.1)	-0.645 (15.25)
Change in share of investment in GDP				
<i>1960-80</i>	0.201 (4.65)	0.247 (6.62)	0.226 (6.09)	0.239 (6.55)
<i>1980-00</i>	0.25 (7.19)	0.268 (7.86)	0.248 (7.13)	0.279 (8.29)
<u>Education &amp; institution variables</u>				
Percent completing secondary school				
<i>1960-80</i>	.1042 (4.85)	.079 (4.39)	.018 (0.81)	.07 (4.1)
<i>1980-00</i>	.047 (4.43)	.0437 (4.06)	.062 (3.3)	.05 (5.09)
<u>Trade related variables</u>				
Change in trade volume				
<i>1960-80</i>	.039 (1.17)			
<i>1980-00</i>	.044 (1.73)			
Change in tariff rates				
<i>1980-00</i>		-0.054 (-1.72)		
Sachs openness variable				
1. <i>Closed, 1960-80</i>			0.7025 (2.37)	
2. <i>Closed, 1980-00</i>			-0.769 (-2.45)	
3. <i>Open, 1960-80</i>			2.28 (3.64)	
4. <i>Open, 1980-00</i>			0.393 (0.8)	

*Contd.*

**Table 1b: Trade Policy and Growth Acceleration (contd.)**

<b><u>Independent Variables</u></b>	<b>Model Trade Shares</b>	<b>Model Tariff Rates</b>	<b>Model Openness</b>	<b>Model Undervaluation of Currency</b>
Log change in undervaluation of currency				
1960-80				0.040 (1.63)
1980-00				-0.159 (-4.33)
Adj. R-squared	0.49	0.45	0.49	0.47
RMSE	2.65	2.88	2.62	2.78
No. of obs	361	426	395	419

Notes: 1. Dependent Variable: First differences in per capita income growth, local currency. Data: Developing Country 5-year averages from 1952 to 1992, centered on 1962 ..... 1992  
2. For variable definitions, see text and Appendix I.

**Table 2: Education & Openness: Convincing Evidence**

<b>Independent Variables</b>	<b>Model Education + Openness</b>	<b>Model Education + Openness + Exchange rate undervaluation</b>
<b>Control Variables</b>		
One period lagged income growth	-0.686 (-15.35)	-0.656 (-14.65)
Change in share of investment in GDP		
<i>1960-80</i>	0.26 (7.15)	0.248 (6.87)
<i>1980-00</i>	0.263 (7.36)	0.275 (7.73)
<b>Education &amp; institution variables</b>		
Percent completing secondary school		
1. <i>Closed, 1960-80</i>	.068 (2.79)	.06 (2.51)
2. <i>Closed, 1980-00</i>	.026 (1.49)	.021 (1.20)
3. <i>Open, 1960-80</i>	.079 (3.47)	.079 (3.50)
4. <i>Open, 1980-00</i>	.066 (5.07)	.067 (5.27)
Log change in undervaluation of currency		
<i>1960-80</i>		0.055 (1.98)
<i>1980-00</i>		-0.1 (-2.62)
Adj. R-squared	0.47	0.48
RMSE	2.69	2.63
No. of obs	395	385

*Notes: 1. Dependent Variable: First differences in per capita income growth, local currency. Data: Developing Country 5-year averages from 1952 to 1992, centered on 1962 ..... 1992*

*2. For variable definitions, see text and Appendix I.*

**Table 3: Contribution of Trade Policy to Growth Acceleration**

	<b>Average Growth</b>	<b>Average Acceleration in Growth</b>	<b>Contribution of trade policy</b>	<b>Ratio</b>
1960-1994	1.52	-0.21	0.43	28.3%
1960-1980	2.38	-0.10	0.33	13.9%
1980-1994	0.80	-0.30	0.52	65.0%
1994-2000 <sup>1</sup>	1.43	0.35	1.18	82.5%

*Notes: 1. Predicted model (final model, Table 1a) estimated for the five-period 1960-1994, on the basis of five year averages, centered on 1962, 1967....1992, etc.*

**Table 4: Average Tariff Rates (in %)**

	<b>1982</b>	<b>1987</b>	<b>1992</b>	<b>1997</b>	<b>Fall in tariff rates (1982-97) (% points)</b>
Industrialized World	9.0	8.5	7.2	4.8	4.2
East Asia	19.9	18.6	16.3	12.8	7.0
Eastern Europe	10.9	10.6	10.0	10.1	0.8
Latin America	24.8	23.1	18.0	13.0	11.8
Middle East & North Africa	16.1	13.8	14.0	13.8	2.2
South Asia	63.0	61.2	47.4	28.4	34.6
Sub-Saharan Africa	28.1	25.8	24.4	17.7	10.3
<b>Developing World</b>	<b>25.3</b>	<b>23.4</b>	<b>20.5</b>	<b>15.4</b>	<b>9.9</b>

*Source: World Bank*

*Notes: 1. The above are unweighted five year averages for each region. Tariff data is available for each year and if not available the tariff rate of the previous closest year for which data is available has been assumed.*

*2. Developing countries exclude two regions - Industrialized World & Eastern Europe.*

**Table 5 : Growth, Poverty Reduction and Inequality**

	Log Change	HCR	SDE	HCR	SDE	Gini
	In consumption (%)	(National Poverty Line)		(\$1.3 poverty line)		
<b>India</b>						
1962	1.84	31.7	0.71	35.4	0.69	32.0
1967	0.42	38.7	0.76	42.6	0.77	31.3
1972	-1.68	33.3	0.73	37.1	0.76	30.2
1977	0.30	37.5	0.75	41.3	0.74	30.9
1982	3.58	35.3	0.75	39.1	0.76	32.4
1987	2.88	25.0	0.67	28.5	0.70	32.8
1992	3.38	14.5	0.54	17.5	0.60	31.6
1997	3.78	7.9	0.36	9.9	0.41	34.4
<b>China</b>						
1962	-2.25	72.5	0.65	92.9	0.25	29.5
1967	3.80	60.9	0.75	87.6	0.41	29.5
1972	1.89	52.0	0.68	82.2	0.49	29.5
1977	-1.04	56.8	0.71	85.2	0.45	29.5
1982	8.27	44.6	0.81	77.0	0.59	27.8
1987	7.12	22.1	0.50	48.2	0.71	33.3
1992	6.40	12.4	0.34	35.2	0.76	38.2
1997	8.90	1.3	0.26	12.3	0.38	40.5
<b>Brazil</b>						
1962	3.03	86.5	0.20	27.6	0.32	49.7
1967	3.08	84.5	0.22	24.6	0.31	49.7
1972	9.20	73.8	0.33	14.8	0.23	60.1
1977	3.02	66.4	0.37	9.7	0.22	62.4
1982	-0.65	64.7	0.35	8.7	0.22	56.9
1987	-1.40	64.5	0.37	8.6	0.20	60.4
1992	0.45	68.6	0.35	11.0	0.23	62.8
1997	1.58	65.1	0.38	8.8	0.22	55.4

Notes: 1. Income Ginis have been reported for China & Brazil and consumption gini for India.

2. SDE refers to the shape of distribution elasticity e.g. an SDE of 0.22 means that if distribution of consumption stays constant, a 10 percent change in consumption will result in a 2.2 percentage point decline in the head-count ratio.