Trade, Poverty and Inequality*

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1. Introduction

Bhagwati (2004) has elegantly and clearly described “the scientific analysis of the effect of trade on poverty” as being “….centered on a two-step argument: that trade enhances growth, and that growth reduces poverty.” While trade has long been recognized as “an engine of growth,” that there are gains from trade is a much older proposition. The gains from trade proposition simply stated is that trade leads to an increase in the per capita real income of a country. Obviously, during the period of transition to that higher per capita income, growth will increase. Moreover, that trade raises the per capita real income of a country is strongly supported by recent econometric evidence that controls for the possibility of reverse causation (Frankel and Romer, 1999 and Irwin Tervio, 2002). In fact, as far back as the 1960s and 1970s, several individual country studies undertaken by the OECD (directed by Ian Little and Maurice Scott) and by the NBER (directed by Jagdish Bhagwati and Anne Krueger) clearly showed that import substitution policies had not worked. These studies were all showing an unambiguous support for an outward orientation in trade policy.

In addition, as pointed out by Bhagwati (2004) and Bhagwati and Panagariya (2013), the need for growth for the purpose of poverty reduction has also been long recognized. For example, Jawaharlal Nehru, India’s first Prime Minister was aware of this need based on nothing more than basic arithmetic. When per capita incomes are as low as what one saw in low-income countries around the middle of the last century, perfect equality in the economy’s income distribution puts everyone below the poverty line. As a result, growth is necessary for poverty reduction. But is it also sufficient? While poverty-enhancing or poverty-neutral growth is a theoretical possibility if there is a sharp and offsetting worsening of the income distribution accompanying economic growth, most of the recent empirical work shows that the poor gain when the economy grows and,
in fact, the incomes of the poor grow no slower than the overall economy (Ravallion and Datt, 1999, Ravallion, 2001 and Dollar and Kraay, 2002). Thus, given the above, it is not surprising to find that most recent studies on trade and poverty find that trade is good for the poor and that it pulls them out of poverty.

Like any policy change, trade liberalization will create both winners and losers. If the people on the lower end (and in the middle range) of the income distribution are the losers (or they don’t gain proportionally as much as the rich) we get a worsening of the income distribution, i.e., a rise in income inequality. This can happen even when the incidence of poverty declines. Even though poverty has declined during the last two to three decades in major parts of the developing world, income inequality has increased in large parts of it, including China and India. However, whether trade has had a major role to play in this increase in inequality or not is debatable.

Piketty’s recent book entitled *Capital in the Twenty-First Century* has brought the issue of rising inequality into focus. Piketty (2014) invokes the Harvard philosopher, John Rawls’ “difference principle” to argue that we should care about rising inequality. According to this principle, inequality is compatible with justice only if it improves the lives of the least well off. It is important here to note that Piketty’s focus mainly is on the developed world where the kind of extreme poverty we see in low-income countries is non-existent and in many parts of which during recent decades their poorest have not really seen a perceptible improvement in their living standards in the presence of rapid rises in the incomes of the rich. On the other hand, trade reforms in developing countries, even if inequality increasing, within the last couple of decades have halved world poverty. Since these reforms have made those in extreme poverty better off, they are
compatible with the Rawlsian idea of justice. Sunstein (2014) points out that the demanding difference principle is rejected by many people in philosophical circles, in which context he suggests an alternative principle which allows for more inequality: “Ensure that average income in a society is as high as possible while also making adequate provisions for those at the bottom.” Sunstein argues that surveys conducted in various countries show support for such an alternative principle and a rejection of the difference principle, without much enthusiasm for a ceiling on the incomes of the rich. Trade reforms in developing countries seem to pass the alternative principle test with flying colors, since they have resulted in large growth accelerations along with poverty reductions, even though they may have increased inequality.

Bhagwati (2004) argues that whether increased inequality matters or not depends on the context and the society in question. For example, it depends on whether the rich spend their surplus incomes ostentatiously or for social upliftment, i.e., whether on “self indulgence” or “doing social good.” He argues “If a thousand people become millionaires, the inequality is less than if Bill Gates gets to make a billion all by himself. But the thousand millionaires, with only a million each, will likely buy expensive vacations, BMWs, houses in Hamptons and toys at FAO Schwartz. In contrast, Gates will not be able to spend his billion even if he were to buy a European castle a day and the unconscionable wealth would likely propel him, as in fact it has, to spend the bulk of his money on social good.” Based on his difference principle. I think John Rawls would prefer not to replace Bill Gates with a thousand millionaires.

Also, how we view inequality should depend on the degree of social mobility. According to Bhagwati (2004), “another way in which inequality becomes acceptable is if those who are at the
bottom of the scale feel that they can also make it: inequality is accepted because it excites not envy but aspirations and hope.”

Bernstein (2013) has discussed some of the recent theoretical arguments in favor of the proposition that inequality is bad for economic growth. Firstly, higher inequality can lead to higher inequality of education, that in turn leads to a less productive workforce, an argument made by Stiglitz in some of his writings. Secondly, higher inequality increases the incentives for the rich to lobby to protect that inequality at the expense of growth, eg, “high-income tax cuts instead of investments in infrastructure and R&D.” Thirdly, higher inequality can lower consumer spending and therefore aggregate demand, as the rich have a lower marginal propensity to consume than the poor. Finally, “inequality can lead to credit bubbles and financial crises.” This can happen since, with the incomes at the top growing and those at the bottom stagnating, we can get an increase in the demand for cheap credit. The middle class and lower income groups need to borrow, while the rich have surplus money to lend together with their power to influence and push policy in favor of “looser financial rules.” However, Bernstein has also argued that there yet isn’t clear empirical evidence supporting the above stories. While I believe there is enough evidence supporting the view that, other things remaining equal, higher inequality leads to greater political and economic instability, in the case of trade reforms one can argue that the poverty reduction it brings about is an offsetting force (an instability reducing force).

An important point often raised in various discussions of Piketty’s recent work is that inequality leads to the capture of the policy making process by the rich. However, in developing countries, trade liberalization is exactly the thing the rich capitalists of the developing countries would not
like to see happen as it reduces the return to their factor of production, capital (scarce factor in developing countries) and destroys the monopoly power of the firms they own.

2. Trade, Poverty and Inequality: Theoretical Linkages

Having introduced the topic, we discuss the various channels through which trade can affect poverty and inequality and their theoretical underpinnings. International trade leads to increases in average real incomes through two main channels - through efficiency gains from specialization and exchange, and through the availability of larger varieties of final and intermediate goods. While the greater variety of final goods directly improves welfare (or real income), the greater variety of intermediate inputs increases productivity (and, in turn, real income) through greater division of labor and better input-output matching.

Even though the theoretical literature on trade and endogenous growth does not provide clear predictions on the overall relation between trade and growth (as different models lead to different predictions), it does identify quite a few growth accelerating channels. For example, trade can spur innovation by enhancing industrial learning since it facilitates international exchange of technical information, can improve the efficiency of global research since it eliminates the duplication of research efforts in different countries, and can, through pro-competitive effects, increase the incentives faced by domestic producers to innovate. Holding the distribution of incomes around the average fixed (or moving the same distribution by the amount of the increase in average income), increases in the average income should reduce poverty, as fewer people will remain below the poverty line. Or if everyone experiences the same income growth, it is obvious that poverty should decline. These effects on poverty through aggregate income growth may or may
not reduce poverty depending on to what extent trade creates winners and losers and who these winners and losers are.

We know from standard trade theory that, under plausible conditions, the winners from trade liberalization are the relatively abundant factor(s) of production in a country and the losers are the scarce factor(s). Unskilled labor, being the abundant factor in developing countries, is expected to benefit from trade liberalization in such countries. As a result, we should expect to see trade reforms to lead to poverty reduction in such countries. There are a number of things that can come in the way of this prediction. The first is the lack of mobility of factors, including labor, from one sector to another (or from one region to another). The reasons are two-fold. Firstly, the overall gains from specialization as well as those to the abundant factor take place through the reallocation of factors from one sector to another. Secondly, in the absence of intersectoral labor mobility, workers, who are not able to get out of shrinking sectors, will see a decline in their incomes or will be thrown into a state of unemployment.

There are some other reasons that have been discussed in the literature against the poverty reducing impact of trade. Firstly, capital goods, that require skilled labor as a complementary input, become better available and cheaper through trade. In other words, a reduction in the tariff on the imports of capital goods will lead to an increase in the demand for skilled relative to unskilled labor (Goldberg and Pavcnik, 2007). Along similar lines, as argued by Davis and Mishra (2007), when a tariff on a non-competing import is reduced, we will see a departure from the standard Stolper-Samuelson predictions. If these imported products are inputs into sectors which use skilled relative to unskilled workers more intensively, then reducing tariffs on them will raise skilled wages and
lower unskilled wages, thereby increasing poverty and inequality. On the other hand, if this non-competing import is consumed by all final consumers, then reducing the tariff on it increases everyone’s real income, leading to poverty reduction.

Trade, especially in capital goods, facilitates the offshoring of parts of the production process that are the least skill intensive in developed countries and yet end up being the most skill intensive within developing countries. This raises the relative demand for skilled labor in both the developing and the developed world, thereby leading to an increase in wage inequality everywhere. However, it is possible that though the relative wage of the unskilled goes down, their actual real wages actually do not go down (Feenstra and Hanson, 1999), in which case poverty should not go up.

Next, trade results in firms upgrading their quality in response to greater import competition or to sell in the export market. Production of higher quality products is more skill-intensive (Verhoogen, 2008). In addition, the more productive firms as well as those selling higher quality products will expand their market share in response to trade. All these changes will increase the relative demand for skilled labor and reduce the relative demand for unskilled labor. These are all factors that increase wage inequality. However, there could be a productivity enhancing effect here, which might lead to an increase in the wages of both the skilled and the unskilled.

To summarize, trade can in theory affect poverty and inequality through a large number of channels. There are the standard Stolper-Samuelson effect that benefits the abundant factor and hurts the scarce factor. Through this channel trade is expected to reduce poverty and inequality in
developing countries that are abundant in less-skilled labor. However, several factors can potentially come in the way of the Stolper-Samuelson effect. These primarily include the various types of labor-market frictions, such as lack of mobility across sectors or those resulting in unemployment. In addition, trade in intermediate and capital goods complementary to skilled labor might overturn the standard Stolper-Samuelson results. Besides, there are predictions from quality-based models of firm heterogeneity that show how trade can increase wage inequality.

3. Trade, Poverty and Inequality: A Tale of Two Large Developing Countries

Having discussed a number of theoretical linkages, we need to check their empirical validity. I start that process here by looking at two large developing countries, China and India. With high rates of poverty until the 1980s (together accounting until then for more than half of world’s extreme poverty), China and India are two countries which have experienced huge reductions in poverty over the last three decades. They have also both had dramatic trade reforms. Figures 1-6 show us the changes in poverty, inequality, trade and trade protection over the last 2-3 decades in these two countries.\footnote{Missing WDI data for a few intermediate years have been interpolated based on the observations available for the closest years to make the graphs in these figures appear continuous. These interpolations have no impact on the qualitative inferences from these graphs.} Trade reforms started slowly in China in the late 1970s. According to the World Development Indicators (WDI), trade as a proportion of GDP in China was roughly 18 percent in 1984, while Naughton (2007) reports this ratio to be 10 percent in 1978. By 2005 it was around 70 percent. By 2008 it fell to 62 percent and the world financial crisis led to a big fall in the trade-to-GDP ratio to around 49 percent in 2009. Overall average tariff rates fell from roughly 32 percent in 1992 to about 4 percent in 2009 according the WDI data. During the period 1984-2009, the WDI data show that the percentage of population below $1.25-a-day poverty line (a
measure of extreme poverty) fell from 69 percent to 12 percent. During this period, barring the years 1989 and 1990, the annual growth rate of GDP in China has been in the range of roughly 8-15%. These high growth rates have translated into huge reductions in poverty. Rough calculations show that about 700 million people have been lifted out of poverty in China. Inequality, on the other hand, has been growing in China.

The WDI Gini index for China has grown from roughly 28 in 1984 to roughly 42 in 2009. In this period, according to the WDI, the income share of the bottom 10 percent of the population has dropped from 3.7 percent to 1.7, while that of the top 10 percent has increased from 22 percent to 30 percent. In other words, ratio of the incomes of the top 10 percent to the bottom 10 percent has gone up from 6 to 18. However, despite this increase in inequality China has experienced a huge reduction in poverty due to the high GDP growth it has sustained over the last three decades. In other words, in the case of poverty reduction the direct effect of the high GDP growth has much more than offset its indirect effect on poverty reduction through increasing inequality. It is not clear what would have happened to the growth rate in China if resources were directly used to keep the increase in inequality in check. If this could have been done without reducing growth, then it is obvious that poverty reduction would have been even greater. However, if government revenues had been switched towards redistributive purposes from infrastructure, the effect of the consequent reduction in growth could have possibly (more than) offset the effect of the reduction in inequality on poverty. Thus poverty could have risen in that case.

Naughton (2007) argues that “the most important single factor in Chinese inequality is the urban-rural gap. He argues that “ultimately market reforms contributed to inequality because they
contributed to urban economic growth.” He goes on to invoke the Kuznets’ hypothesis that inequality rises first during the process of economic development and then starts falling. He believes that China is still in the upward rising part of the Kuznets curve, the amplification of which has been caused by three factors: limited spillovers due to China’s size and geographic diversity, the concentration of the effects of foreign trade and investment in coastal cities, and the reinforcement of the rural-urban divide through its socialist institutions. In other words, the increase in inequality might have been magnified by the interaction of foreign trade and investment with its long history of socialist institutions.

While an argument can be made that high inequality can lead to political instability and as a result to lower growth, we are not sure whether inequality had reached such high levels in China. While China’s inequality might be among the highest within Asia it is nowhere close to what we see in Latin America. Compared to China’s Gini coefficient of 42, Brazil’s and Mexico’s are much higher at 59 and 55 respectively. Certainly, inequality in China has not been high enough to make it economically and politically unstable. As mentioned above, despite this inequality China has grown very rapidly and has managed to drastically reduce the incidence of poverty.

We next turn to India. During the period 1988-2010, India’s trade-to-GDP ratio increased from roughly 13 percent to 48 percent. The average tariff rate during this period went down from 80 percent to 10 percent. The $1.25-a-day poverty rate went down during from 53 percent to 32 percent. The most rapid decline in poverty was during the five-year period 2005-2010 from 41.6 percent to 32.7 percent. This was also a period of rapid growth in the range of 8-10 percent (barring the year 2008), considered by many experts to be a lagged response to the trade reforms of the
1990s and early 2000s. Inequality in India during this period was fairly stable. It increased only a little from about 32 to 34. The share of the top 10 percent in national income increase from roughly 27 percent to 29 percent, while the share of the bottom 10 percent decreased from 3.91 percent to 3.75 percent. In other words, the ratio of the incomes of the top 10 percent to the bottom 10 percent has gone up by only slightly above 10 percent from 6.9 to 7.7.

Thus, the increase in inequality in India was been relatively modest, especially in comparison with what we see in China. Yet, poverty reduction, while substantial was much smaller than in China, which also had higher growth rate overall sustained over a much longer period of time. Thus, while both countries have performed well after their trade reforms in terms of both growth and poverty reduction, the country with the greater rise in inequality, namely China did better in those two areas.

We next move to some cross-country regression analysis, the results from which we will use to revisit the Chinese and Indian cases.

4. Cross-Country Evidence

Here I provide some cross-country evidence on how poverty and inequality are related to trade and trade protection using a panel of developing countries for the period 1981-2013. Aisbett, Harrison and Zwane (2005) performed a similar cross-country study. I use here an updated poverty series from the World Bank’s World Development Indicators (WDI). Compared to Aisbett, Harrison and Zwane, not only the data that I use are for more recent years, the new poverty headcount ratio based on the $1.25-a-day poverty line is much improved due to a major overhaul of the World
Bank’s poverty numbers based on better funding of and significant improvements in the *International Comparisons Project* as well as the availability of many more country-wide household surveys (See Chen and Ravallion, 2010).

The regression results are provided in Table 1. Following Aisbett, Harrison and Zwane, my right-hand side variables, namely trade as a percentage of GDP and import tariff, are lagged by three years. While Aisbett, Harrison and Zwane had additionally also run instrumental variables (IV) regressions with three-period lagged tariff (or trade-GDP ratio) to instrument current tariff (or trade-GDP ratio) as a right-hand side variable, I only present reduced form regressions with the three-year lagged tariff and alternatively the three-year lagged trade as the right-hand side variables. I present pooled OLS regressions, country fixed-effects regressions and country and year fixed effects regressions. As seen from the first panel of Table 1, there is fairly strong evidence of a negative relationship between poverty and trade and a positive relationship between poverty and tariffs. While the pooled OLS and country fixed effects results are significant at the 1 percent level, the results become insignificant when both country and year fixed effects are thrown in at the same time. This is not surprising given that the timing and the magnitude of trade reforms by various developing countries have been quite close to each other. The Uruguay Round of the GATT led to tariff declines in many countries at the same time. In addition, unilateral trade liberalization took place roughly at the same time in many developing countries in the 1980s and 1990s. As a result, throwing in both country and year effects simultaneously in our regressions will not leave any variation in the tariffs or trade to identify the effects we are interested in.
In order to get a sense of the magnitudes of the effects we focus on the regressions with the country fixed effects. Here we are hoping that the country fixed effects are able to capture the differences in institutions and time invariant characteristics across countries. We see here that a percentage point increase in trade leads to a poverty decline of 0.149 percentage points. During the period 1984-2005, trade as a percentage of GDP went up in China by 52 percentage points (from 17 to 69 percent).2 Based on the regression coefficient in the country fixed effects regression, this would represent a poverty reduction of 7.8 percentage points, which represents more than a seventh of the actual poverty decline of 53 percentage points (from 69 percent to 16 percent) in China that we see in this period. India’s trade as a percentage of its GDP went up by 35 percentage points from 13 percent to 48 percent in the period 1988-2010. Based on the regression coefficient of the third column of the first panel of Table 1, this should lead to a 5.25 percentage point reduction in poverty, which is a fourth of the actual decline in poverty of 21 percentage points (from 53 percent to 31 percent) during this period.

Moving to tariffs, we see from column 5 of the first panel of Table 1 that a percentage point decline in tariff leads to 0.4 percentage point decline in poverty. It is important to note that a percentage point decline in the average tariff can be brought about in many ways. One way could be a uniform decline by a percentage point each in the tariff rate on each importable good at constant import shares. Considering this, our regression coefficient is not large enough in magnitude to cause any concerns about possible overestimation. We see that China’s tariff fell from 32 percent to 5 percent in the period 1992-2005 and to almost 4 percent by 2009. This is a decline in tariff of almost 27-

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2 Actually, it had gone up to 69 percent by 2005 but continuously went down over the next four years to 49 percent in 2009. Given that this might be related to the slowdown in the world economy, we do our calculations for the period up to 2005.
28 percentage points, which represents a poverty reduction of roughly 11 percentage points, which is a fifth of the actual decline poverty of about 53-57 percentage points that took place in China. Moving to India, during the period 1988-2010, the tariff rate went down by 72 percentage points from 80 percent to 8 percent. The regression estimate in column 5 of the first panel of Table 1 predicts a 29 percentage point decline in poverty, which strangely is greater than the 21 percentage point decline in poverty that we see in India. Thus the poverty reduction in China has been much more than what is predicted by our regression based on the trade liberalization that has taken place, while in India it has been less than predicted. There are two interpretations possible. One is that while there have been poverty reducing factors in addition to trade liberalization operating in China, in India there may have been some offsetting factors. An alternative explanation is that China has been much more efficient than the average developing country in getting poverty reductions out of their trade reforms, while India has been less efficient that the average developing country in obtaining such gains from trade reforms for its poor. More specifically, this could mean differences in complementary policies and institutions.

Moving next to the inequality regressions in the second panel of Table 1, we see that while trade as a percentage of GDP has a statistically insignificant effect on inequality across all three specifications, tariff reductions lead to increases in inequality. Using column 5 of this panel, we see that a percentage point reduction in the average tariff leads to a 0.048 point increase in the Gini coefficient (measured on a scale of 0-100). In the case of India where the tariff rate has gone down by 72 percentage points, this predicts an inequality increase of about 3.5 points. India’s Gini coefficient during this period went up by only 2 points from 32 to 34 during this period. Other redistributive policies may have been responsible for this smaller increase. In China’s case, the 28
percentage point decline in tariff during the period 1992-2009, based on the regression coefficient in column 5 of the second panel, translates into a prediction of a very small (1.3 point) increase in the Gini coefficient. The actual increase in inequality was 7 points (from 35 to 42). Thus only a fifth of the blame for the rise in inequality can be put on trade liberalization. In both China and India, trade reforms have been associated with an inequality enhancing effect but the effect has been relatively small in India. As seen later, the work by Krishna and Sethupathy (2012) shows that with better measures of inequality this result does not hold at least for Indian states. They find no effect of trade liberalization on inequality.

Thus the cross-country regressions using $1.25 a day as the poverty line show the strong possibility of a poverty reducing effect of trade reforms. I call this a “possibility” since having both time and country effects at the same time makes the tariff and the trade variables insignificant. On the other hand, the regressions with the inequality as the right-hand side variable show an inequality increasing effect of trade. However, these effects are small in magnitude.

I next turn to the existing literature on the evidence regarding the effects of trade on poverty. This is a large literature, as a result of which not all important contributions can be covered here.

5. Trade and Poverty: Review of Existing Evidence

5.1 Indirect Evidence

It has been argued by Bhagwati (2004) that trade, by fostering growth, leads to higher incomes and in turn a reduction in poverty. Also, Winters, McCulloch and McKay (2004) in their survey piece on the evidence regarding trade liberalization and poverty write: “In the long run, economic
growth is the key to the alleviation of absolute poverty.” Bhagwati and Panagariya (2013) call this strategy of reducing poverty through promoting growth a “pull-up” strategy as opposed to a “trickle down” effect of growth. Therefore, we first review the literature on the effects of trade barriers on growth and income, which have been empirically studied since the early 1990s. This is followed by a review of the literature on the effect of growth on poverty.

Various cross-country, macro studies, using different measures of openness, have showed positive effects of trade on growth (See for instance Dollar (1992), Sachs and Warner (1995) and Edwards (1998)). However, these papers have been strongly criticized by Rodriguez and Rodrik (2001) for the problems with their openness and protection measures, their econometric techniques and the difficulty in establishing the direction of causality. While the measure of openness used by Sachs and Warner (1995), as argued by Rodriguez and Rodrik (2001), captures many aspects of the macroeconomic environment in addition to trade policy, Baldwin (2003) has recently defended that approach on the grounds that the other policy reforms captured in the measure accompany most trade reforms. Therefore, the use of such a measure tells us the value of the entire package of trade and accompanying reforms. Wacziarg and Welch (2003) have updated the Sachs-Warner dataset and have again shown the positive growth effects of such reforms.

The more recent papers look at the effects of trade on income levels rather than growth rates. Frankel and Romer (1999), using gravity and geography based predicted trade flows as instruments, find positive effects of trade on income levels that are greater than the estimates produced by ordinary least squares. Irwin and Tervio (2002) demonstrate the robustness of these
results, with the same approach applied to cross-country data from various periods in the twentieth century.

Rodrik, Subramanian and Trebbi (2002) have looked at the simultaneous effects of institutions, geography and trade on per capita income levels. Using a measure of property rights and the rule of law to capture institutions and the trade-GDP ratio to capture openness in trade, and appropriately instrumenting them, they find that “the quality of institutions trumps everything else.” However, trade and institutions have positive effects on each other, so trade does have indirect effects on income in Rodrik et al’s empirical analysis.

In this context, it is also important to look at some of the micro-level studies on the impact of trade on productivity growth, since it is productivity growth at the micro level that is one of the two main proximate drivers (the other being structural change in the economy) of overall per capita income growth. Extending Solow’s approach modified by Hall (1988) and Domowitz et al (1988) to include imperfect competition and non-constant returns to scale, Harrison (1994) finds a strong correlation between trade reforms and firm-level productivity growth in Cote d’Ivoire. Using a similar approach and allowing the returns to scale to be flexible and to change over time, Krishna and Mitra (1998) find some evidence of an increase in the growth rate of firm productivity after the dramatic 1991 trade reforms in India. An increase in productivity due to trade liberalization in the Indian case has also been confirmed, using a more updated dataset and more modern techniques in production function estimation to take care of endogeneity and measurement error problems as well as selection issues, by Topalova and Khandelwal (2011). They find that both a pro-competitive effect of the liberalization of tariffs on final good imports as well as cheaper and better
inputs arising from a reduction in the tariffs on input imports have been responsible for this increase in firm-level productivity, with the latter making a bigger contribution than the former. In the trade literature, the use of this class of econometric techniques for productivity estimation was pioneered by Pavcnik (2002) who, using plant-level panel data on Chilean manufacturers, found “evidence of within plant productivity improvements that can be attributed to a liberalized trade for the plants in the import-competing sector.” In addition, she found aggregate productivity improvements due to the reallocation of resources and output from less to more efficient producers. Similar results were found in the case of Colombian plants by Fernandes (2007) after she addressed certain remaining technical shortcomings in the literature. In this context, it is important to mention a paper by Kim (2000) who examined Korean industry-level data for the period 1966-88 and found that trade liberalization led to both greater productivity and scale efficiency, with the reforms in quantitative restrictions contributing more than reductions in tariffs.

Having looked at the impact of trade on incomes, productivity and growth, we next turn to the impact of growth on poverty. The literature on the direct determinants of poverty rates and changes (or rather reductions) in them is much smaller.3 Dollar and Kraay (2002), in a cross-country study of 92 countries over the last four decades, find that the growth rates of average incomes of people in the bottom quintile are no different from the growth rates of overall per capita incomes, with the former growth always associated with the latter. Also policies that promote overall growth promote growth in the incomes of the poor. These policies include trade openness, macroeconomic stability, moderate government size, financial development, and strong property rights and the rule of law. In another paper, Dollar and Kraay (2004), based on data from the post-

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3 For an excellent, comprehensive survey of the evidence on the globalization-poverty linkage, see Harrison (2007).
1980 “globalizing developing economies”, argue that per capita income growth arising from expansion in trade in those countries has led to a sharp fall in absolute poverty in the past 20 years.

Similarly, Ravallion (2001) finds that an increase in the per capita income by 1 percent can reduce the proportion of people below the $1-a-day poverty line by about 2.5 percent on average. This varies across countries, depending how close the poor are to the poverty line. Research by Ravallion and Datt (1999) on the determinants of poverty reduction across India’s major states between 1960 and 1994 also shows empirically the importance of initial conditions. They find that a one percent increase in non-agricultural state domestic product leads to a 1.2 percent decline in poverty rates in the states of Kerala and West Bengal versus only 0.3 percent decline in Bihar. The fact that growth of non-farm output was also relatively meager in Bihar over the period under consideration exacerbated the poverty problem in Bihar. Ravallion and Datt find that more than half of the differential impact of non-farm output on poverty rates is attributable to Kerala’s much higher levels of initial literacy. Their results suggest that while the transition from (low-wage) agriculture to (higher wage) non-farm sectors may be key for the removal of poverty, making the transition is not easy or automatic for the poor. In other words, there are pecuniary costs as well as non-pecuniary ones associated with investments in minimum levels of education, nutrition, and health to be incurred on the part of a poor agricultural worker to making the transition.

Thus there is strong evidence that trade has increased incomes. The evidence survives controlling or correcting for two-way causation. In addition, most of the evidence suggests that growth in average incomes is accompanied by growth in the incomes of the poor and, therefore, a reduction in the poverty rate. We next look at some of the direct evidence on the impact of trade on poverty
5.2 Direct Reduced-Form Evidence on Trade and Poverty

There are by now a few intra-country studies examining directly the empirical relationship between trade and poverty in a reduced-form way (i.e., regressing poverty measures on trade protection). Four of these studies are for India. This is not surprising since between a quarter and a third of the world’s poor live there. Also, the institutional diversity and the variation in exposure to trade across the various Indian states, regions and districts provides the kind of variations applied econometricians love to exploit. The three papers on trade and poverty in India are Topalova (2007), Hasan, Mitra and Ural (2007) and Cain, Hasan and Mitra (2012).

Topalova examined the impact of trade liberalization on district level poverty in India. Her main findings were that while rural districts with a greater concentration of industries more exposed to trade liberalization experienced a slower progress in poverty reduction, there was no statistically significant relationship between trade exposure and urban poverty (but with point estimates still in the same direction as with rural poverty). In fact, she goes on to claim, based on her regressions, that greater trade exposure could have resulted in a significant setback in poverty reduction.

The results from the Hasan-Mitra-Ural study are quite different from Topalova’s. They, in fact, find that states facing greater exposure to foreign competition by way of employment composition tend to have lower rural, urban and overall poverty rates (and poverty gaps) and have experienced greater poverty reduction due to trade liberalization, with these effects being more pronounced in states with more flexible labor markets. Their results hold at varying strengths and significance for
overall, urban and rural poverty, and are robust to using the National Sample Survey Organization (NSSO) regions in place of states.

It is quite possible for the conclusions from a district-level study to be different from those from a state-level (or a region-level) study, since the results seen at the latter level could be driven by compositional changes of the population living in the various districts. In other words, people within a state could be moving from poorer to richer districts. This is possible since the evidence shows there is lack of mobility between states but there is no evidence on the lack of inter-district mobility within states. However, it is also important to note that there are some additional methodological differences between the two studies with regard to the treatment of the nontradable sectors in the calculation of the state-level protection measure, the inclusion of the 1993-94 round (the round being included in the Hasan-Mitra-Ural study but not in Topolova’s study) and the variety of protection and poverty rate measures in the two studies (with a greater variety included in Hasan, Mitra and Ural).

Cain, Hasan and Mitra (2012) update the Hasan-Mitra-Ural study to include a new round of NSSO survey. In addition, Cain, Hasan and Mitra also allow the gains in poverty reduction from trade liberalization to vary by road connectivity and financial development. The basic flavor of the results from the Cain, Hasan and Mitra study is summarized in Figure 7 where we see there is a tight positive correlation between the change in poverty in a state between 1987 and 2004 and the change in the state’s weighted tariff. Table 2 shows us a positive correlation between the various

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4 The NSSO sampling methodology is not constructed with the aim of making the sample within a district random. In addition, it is extremely difficult, if not impossible, to keep controlling for changes district boundaries that keep happening ever so often. See Hasan, Mitra and Ural (2007) for details.
measures of the reduction in poverty and the reduction in protection (from Cain, Hasan and Mitra). The regressions from Cain et al (not presented in this paper) show that that a 38 percent reduction in poverty during 1987-2004 can be attributed to the change in the exposure to foreign trade. Since their regressions use time and state/region controls, the negative sign of the coefficient of the state-level protection variable indicates that trade liberalization (and the greater exposure of the labor force to foreign competition) actually speeded up poverty reduction. They also find an urban poverty reducing effect of tariff reforms, the extent of which has been larger in states with flexible labor regulations, higher road density and more advanced banking and financial systems. In the case of rural poverty, the basic impact of trade on poverty goes in the same direction but does not vary by labor-market flexibility, road density and financial development.

The study by Mukim and Panagariya (2012) responds to and rebuts the main criticism of the above type of studies that while poverty may have fallen in the aggregate after trade reforms, the socially disadvantaged classes have become poorer. Mukim and Panagariya study the evolution of poverty separately within the scheduled castes (SC), the scheduled tribes (ST) and the Nonscheduled (NS) castes. Looking at the five thick NSSO rounds for the period 1983-2005, they find that the poverty ratio continuously fell for each of these three groups, and this was true in each of the 10 largest states of India. They also find some evidence for the favorable impact of openness and growth on poverty reduction for each of these groups, and no evidence whatsoever for any adverse impact.

We next move to reduced-form studies for other countries. Goldberg and Pavcnik (2007) look at the impact of trade liberalization on poverty in Colombia. They find that there are certain labor market variables such as the unemployment rate, employment in the informal sector etc that are
positively correlated with poverty. They then investigate whether trade affects any of these labor market conditions and they find it doesn’t. Unable to identify the various channels, they go on to look at the direct effect of trade on urban poverty in Colombia. They find that while the poverty of workers in a sector in unrelated to tariffs, it is positively related to the volume of imports of competing products from the rest of the world. Exports on the other hand do not have a significant role to play in this.

Goh and Javorcik (2007) study the impact of Poland’s trade liberalization on wages and indirectly on poverty for the period 1994-2001. They find that trade liberalization increased wages in all industries, controlling for individual worker characteristics, geographical variables, industry and time effects. However, tariff cuts were the deepest in more unskilled labor industries, leading to greater increases in their wages. This increase indicates possible labor productivity increase in response to foreign competition. Given the high rate of poverty among the unskilled workers in Poland, an increase in their wages is expected to result in a decline in the poverty rate.

Hanson (2007) studies Mexico in the 1990s where he compares high-exposure states with states with low-exposure to globalization, as measured by the share of foreign direct investment, imports, or export assembly in state GDP. He finds that poverty incidence declined in the high exposure states relative to the low exposure states (poverty increased in the former from 21 percent to 22 percent, while in the latter it went up from 32 to 40 percent).

Finally, there are a couple of cross-country studies. Hasan, Quibria and Kim (2003) argue, using cross-country evidence, that “policies and institutions that support economic freedom are critical
for poverty reduction.” Economic freedom indicators used by these authors include those pertaining to government size, price stability, freedom to trade with foreigners, absence of over-regulations of markets and civil liberties as reflected in property rights, rule of law etc.

Aisbett, Harrison and Zwane (2005), using cross country data on developing countries with $1 a day poverty as the dependent variable, do not find any effect of trade or tariffs on poverty once country effects are introduced. However, they find evidence separately for the income increasing effect of trade and for the poverty reducing effect of growth. It is then surprising that the direct effect of trade on poverty vanishes, which means only the growth that is independent of trade (not due to trade openness) reduces poverty, for which it is very hard to find any intuition.

The reduced form regressions give us the bottom line on whether trade increases or decreases or does not affect poverty. They cannot identify or account for all the different channels through which trade affects poverty. For this we can get some help from the new literature on empirical general equilibrium welfare analysis.

5.3 Empirical General Equilibrium Welfare Analysis

There is a growing literature on the evaluation of the impact of trade reforms on income distribution and poverty. It is important to note here the word “empirical” as opposed to “computable” in computable general equilibrium (CGE) analysis. This approach captures empirically the various general-equilibrium channels through which trade affects the real welfare of individuals at all of the different points on the income distribution, as a result of which it is possible to determine fairly comprehensively the impact of trade on poverty and inequality.
The pioneering paper in this literature is by Porto (2006). It is a direct application of the calculation of compensating variation from price changes based on household level data. Porto builds in the relationship between tariff changes and price changes of tradables into this calculation of compensating variation. Further, he estimates the endogenous impact of tariffs on tradables on prices of nontradables. Thus, he is able to estimate the parts of price changes for both tradables and nontradables that can be attributed to the entire tariff change vector. In turn, he plugs them into the formula derived by Deaton for the calculation of compensating variation. These price changes attributable to tariff changes interact with individual budget shares to determine the compensating variation. In addition, Porto adds the welfare change that takes place due to wage changes attributable to tariff changes, for which he estimates the elasticity of wage with respect to tariff for three different classes of skills (skilled, semi-skilled and unskilled). Porto uses this approach to look at the impact of Mercosur on real income changes at each point on the income distribution. While this would normally be quite different from an analysis of unilateral trade reforms, in Porto’s analysis it is not very different as he ignores the trade diversion effects and focuses only on the trade creation effect in the determination of his domestic price changes as well as of the consumption of varieties coming from within the region and from outside. Substitution possibilities between these two classes of product varieties are ignored. Overall, Porto finds that there are statistically significant gains for the poor and middle-income households, the welfare effects are negative but insignificant for the rich (upper tail of the distribution). On the whole, he finds a reduction in wage inequality and the incidence of poverty. While it is well known that in Argentina poverty and inequality increased in the 1990s, these results from Porto’s study tell us that in the absence of the trade creating effects of Mercosur the adverse impact on poverty and
income inequality would have been even greater. Also, important to note is that the focus is only on wage income and other factor incomes are ignored, which is a weakness of this paper by Porto.

Ural Marchand (2012) extends the Porto methodology to allow for incomplete price transmission of tariff changes across the various states of India and across rural and urban areas. In addition, she allows for wage affects to differ both across skill categories and age cohorts to create a “quasi panel” using a dataset of repeated cross sections, which is not a panel (since all the same households are not surveyed as one moves from one NSSO round to another). In addition, she takes the evidence on the lack of labor mobility across sectors seriously and, as a result, allows wages at the same skill level to vary across sectors and therefore, the industry-specific wage for a given skill level responds to changes in tariffs for that industry. Like Porto, she abstracts from changes in capital and land incomes in response to tariff changes (due to the lack of availability of relevant data), but in addition she also assumes that nontradable prices do not respond to trade reforms. In other words, we could think of this (as well as Porto’s) exercise an evaluation of the impact of trade on the distribution of real labor incomes and poverty. Overall, she finds a pro-poor effect of trade reforms both in rural and urban areas with the effect being larger in the states where the transmission of tariff changes is high and in urban areas. Separately both the consumption effect (the change in the cost of consuming a given basket) as well as the wage effect of trade reforms turn out to be pro-poor. An implication of these results is that trade reforms contributed to the reduction in poverty, and, in fact, the gains to the people below the poverty line were greater than to those who were just below it (and were able to cross that line).
Two other applications of this approach need mention here. The first one by Porto (2007) is the application to the impact of agricultural liberalization in the developed world on poverty in Argentina. He finds that as a result of such liberalization Argentinian poverty would decline by about 1.5 percentage points. Seshan (2014) modifies the approach to take into account household production in Vietnamese agriculture and examines the impact of trade liberalization during the period 1993-98 which consisted mainly of relaxing export restrictions on agricultural products and import restrictions, including those on chemicals and fertilizers. He finds a reduction in inequality as well as poverty. While this trade liberalization can explain a third of the decline in overall poverty during this period, it can explain about half of the decline in rural poverty.

6. Trade and Inequality: Existing Evidence

From poverty we move to inequality. As we will see, there are many important aspects of inequality. But it is wage inequality that has been studied in depth in the trade literature. There has also been some recent work on labor shares and some work on overall income inequality. I start with the impact of trade on wage inequality.

6.1 Trade and Wage Inequality

Goldberg and Pavcnik (2007) is a comprehensive survey of research on the impact of globalization on all aspects of inequality, including wage inequality. Therefore, to minimize duplication of effort, I will discuss only the main papers in the pre-2007 literature and some important contributions 2007 onwards.
Using state-level, two-digit data for Mexico for the period 1975-88 Feenstra and Hanson (1996 and 1997) found that wage inequality went up as a result of trade, specifically input trade. They attributed this to the shifting of the least skill-intensive production activities of the US across the border to Mexico where the same activities were more skill intensive than any other existing production activity. This resulted in an increase in the relative demand for skilled labor in both the US and Mexico, resulting in rising inequality in both countries. Feliciano (2001) also found that trade reforms in Mexico between 1986 and 1990 had led to a rise in wage inequality. However, she found that while the import license coverage ratios were positively related to wage inequality, tariffs did not have a statistically significant effect.

Attanasio, Goldberg and Pavcnik (2004) and Goldberg and Pavcnik (2005) find an increase in wage inequality arising from the “drastic trade liberalization” episodes of the 1980s and 1990s in Colombia. They find that the initially most protected sectors were the most unskilled labor-intensive as well as the ones paying the lowest wages. One of the goals of the tariff liberalization was uniformity in tariffs, which meant that these were also the sectors with the biggest tariff cuts. As a result, these sectors had the largest wage declines and because they were unskilled labor intensive, overall unskilled workers’ wages declined proportional more than those of skilled workers. Also, the labor market was rigid which meant that workers in declining sectors could not easily move to expanding sectors. As a result, many of them moved from the formal to the informal sector (that pays lower wages) within the same industry. Also, these sectors were now facing more competition from the rest of the world as a result of the trade liberalization and they responded by upgrading their technology, which was a more skill-intensive one. For all these reasons, trade
liberalization increased wage inequality in Colombia. However, it is important note that the impact of trade reforms on wage inequality was small in magnitude.

Pavcnik, Blom, Goldberg and Schady (2004) study the impact of the 1988-94 trade reforms in Brazil on the structure of wages across manufacturing industries in Brazil. They found that industry affiliation was an important determinant of the wage but that changes in these industry wage premia were not related to changes in trade policy. They also do not find any relationship between industry-specific skill premia and tariffs. Thus trade did not seem to affect wage inequality in Brazil. According to Pavcnik et al, the contrasting results of Colombia and Brazil highlight the role of country characteristics in determining the impact of trade on wage inequality. I can think of the extent of the extent of labor mobility across sectors and regions differing between the two countries. On the other hand, the existence of industry wage premia is not consistent with labor mobility across sectors.

Kumar and Mishra (2008) have looked at the impact of tariff reductions on wage premia in India and have found that tariff reductions result in increases in industry wage premia. Note that since skill variables such as education, experience etc are controlled for these are not the premia for additional skills. As a result, Kumar and Mishra argue that “since different industries employ different proportions of skilled workers, changes in wage premiums translate into changes in the relative incomes of skilled and unskilled workers.” They in fact find that tariff reductions have been larger in the more unskilled labor intensive industries, where the increases in the “industry

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5 It is important to note that these results are obtained upon controlling for time-invariant unobservable industry characteristics along with observable worker and industry characteristics. These results survive instrumenting tariffs with initial tariffs interacted with macro variables.
wage premiums” have also been bigger. As a result, they infer a reduction in wage inequality in India. This is consistent with the Stolper-Samuelson effect, or is simply that the increase in productivity gets passed on as an increase in the industry wage premium, both being greater in the labor-intensive industries.

In the context of wage inequality as well, it is important to discuss again the literature that uses the general equilibrium welfare approach that we already discussed in detail in the context of poverty. One of the weaknesses of that literature is that it ignores the impact of trade on non-labor factor incomes, but does a fairly comprehensive job on labor incomes based on skill level and in one of the papers also age cohorts. It also takes into account differences in consumption bundles depending on the households income level, which lead to different effects of a given change in the price vector on different households. Thus, Porto (2007) and Ural (2012) effectively are able to do a very good job in looking at the impact of trade on the inequality of real labor incomes. In fact, while the authors explicitly have not calculated Gini coefficients, the pro-poor impact where the proportional increase in real labor income is higher in the left tail than in the right tail of the income distribution is suggestive of an improvement in the distribution of real labor incomes, factoring in the differences in the structure of consumption across income levels.

Recent work by Helpman, Itskhoiki, Muendler and Redding (2012) looks at Brazilian employer-employee data for the 1990s. They document that most of the wage inequality occurs within industries and occupations, driven mainly by between- rather than within-firm inequality, with these patterns being robust to controlling for worker characteristics. The authors estimate a model of firm heterogeneity in productivity, export-market entry costs and worker screening costs to
match the above observations about the data. The prediction of the model estimated using Brazilian data is an inverted-U-shaped relationship between the variance of log worker wages (which is a measure of wage inequality) and log market access. As trade costs go down from a prohibitive level, initially only a few firms are able to jump their fixed costs of exporting and are able to earn higher profits. These are the firms that were making relatively higher profits to begin with. Now their larger market beyond their home country increases their profits further, which they share with their own workers. As a result, inequality goes up. With further declines in trade costs, many more firms start exporting, as a result of which wage inequality declines. For the period analyzed, the trade costs for Brazil had not gone down far enough to result in inequality reduction. However, it is a predicted result of further expansion of trade coming from this model estimated using available Brazilian data.

Krishna, Poole and Senses (2014) use the same dataset to analyze the impact of trade on wage inequality from a different angle. In investigating the impact of trade on wages, they introduce firm-worker match fixed effects, which they can do with employer-employee matched data. In other words, they believe that, based on unobservable characteristics, a worker “fits” a particular firm better, as a result of which one could think of there being additional productivity from that match. Once this is controlled for, Krishna et al find that exporters do not actually pay a higher wage than others. They also find that trade results in better matches and higher productivity in exporting firms for which workers are paid a higher wage. Thus if there is higher wage inequality it corresponds closely to the greater productivity or ability heterogeneity among workers.

### 6.2 Trade and Overall Income Inequality
Goldberg and Pavcnik (2007) have looked at trends in income inequality and in trade flows and protection for a number of countries that liberalized their trade regimes in the 1970s/80s/90s. In Mexico, they observe that during the liberalization phase inequality first increased and then declined. In Brazil and Colombia there have been non-monotonic changes in inequality (first declined, then increased and after that fairly stable), while Argentina and Chile has shown a steady increase during the liberalization phase. These trends do not show us a clear pattern. However, as mentioned earlier, even a clear pattern would not definitively tell us anything about causation. Therefore, we move onto an intra-country study.

Krishna and Sethupathy (2012) compute the Theil’s inequality index from Indian household survey data for each of the four NSSO “thick” survey rounds during the period 1988-2005. The attractive property of this inequality index is that if the entire population can be divided into groups then the overall inequality is the sum of within-group and between-group inequality. Krishna and Sethupathy find that the inequality between states or between rural and urban areas is much smaller than that within these aggregates, the latter accounting for more than 70 percent of the overall inequality in India. Overall inequality fell from the year 1988 to 1994, rose in the period 1994-2000 and subsequently fell again. These trends are robust to using alternative measures of inequality such as the Gini coefficient or the variance of log expenditures. In addition to finding a non-monotonic movement in inequality in the post reform period, the authors fail to find any correlation between inequality and tariff and non-tariff barriers. Thus there seems to be no association between trade and overall inequality.
Thus there seems to be no systematic relationship between trade and overall income inequality. Firstly, there is no systematic pattern in changes in inequality after trade liberalization. Also, the impact of protection on inequality from cross-state regressions for India are statistically insignificant.

6.3 Trade and Labor Shares

In most of the work on trade and inequality the focus has been on labor income. However, overall inequality can grow due to a reduction of the share of labor in come since the rich derive a lot of their income from assets like capital or land. ILO (2011) shows a declining labor share of national income since the early 1990’s in many countries, with this decline more rapid in developing countries. The trend in the labor share of corporate value added is no different (Karabarbounis and Neiman, 2013). Atkinson (2009) argues that this declining labor share can possibly explain the rising inequality in recent years. Since this decline in the labor’s share as well as the rise in income inequality in many parts of the world has coincided with an increase in world trade, it is important for the trade and inequality literature to go beyond looking at the rising skilled-unskilled wage gap.

Ahsan and Mitra (2014) fill this gap in the literature by empirically examining the impact of India’s 1991 trade reforms on labor’s share of firm revenue among a sample of Indian firms. They find that the share of wages in total revenue increased rapidly between the initial point and the end point of their sample period among smaller firms in the sample, while the share of wages in total revenue declined among the larger firms. It is important to note this finding also holds with respect to changes in the share of wages in value added instead. It is important to note that the smaller firms are more labor-intensive than the larger firms. Ahsan and Mitra run a regression which has
the share of labor compensation in total firm revenue on the left-hand side and on the right-hand side they have a one-year lagged tariff, the interaction of this tariff with their labor intensity measure (or alternatively with our firm size indicators), firm and year fixed effects and a bunch of controls. Their results indicate that trade liberalization raised labor’s share of revenue for firms that are, based on translog production function estimates, sufficiently labor intensive (about 34.6% of the firms in their sample). When they use firm size indicators as their proxy for labor intensity, they find that trade liberalization led to an increase in the share of wages in total revenue for small firms (whose sales in any given year are below the 33rd percentile of the sample’s sales distribution. For such firms, the elasticity of wage share with respect to tariff, evaluated at the mean, is -0.05. The results also suggest that trade liberalization led to a decrease in the share of wages for large firms. These are firms whose sales in any given year are above the 67th percentile. In this case, the elasticity, evaluated at the mean, is 0.09. These results are consistent with the predictions of a model they develop that incorporates firm-labor union bargaining in the presence of imperfect competition in the product market.

Using China’s Annual Survey of Industrial Production, Kamal, Lovely and Mitra (2014) estimate the effect of Chinese tariff cuts during the period 1998-2007 on manufacturing firms’ labor shares relative to economy-wide trends. Regressions estimated with this large panel of firms provide evidence of a positive and statistically significant effect of tariff cuts on labor shares of output and, alternatively, labor shares of value added. This is true despite the fact that both tariffs and labor

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6 They address concerns about the endogeneity of tariffs, if any, by adopting a variant of the instrumental variable (IV) strategy used by Goldberg and Pavcnik (2005). Also, to rule out alternative channels working through other firm characteristics correlated with firm size or labor intensity, they tried controlling for tariff interactions with R&D expenditure, export status, import status etc.
shares were falling during this period. The average labor share of value added is an estimated 12 percent higher in 2007 than it would be if tariffs had remained at their 1998 levels. In other words, the fall in labor shares would have been more rapid in the absence of these tariff cuts.

Thus this literature on trade reforms and labor shares does not show a negative impact of the former on the latter. While in India, in the case of smaller, labor-intensive firms trade reforms have raised labor shares, in China the positive impact of trade reforms on labor shares in firms seems to hold on average across all firms. Thus, it is quite possible that income inequality may have gone up even more had there not been trade reforms of the magnitude these countries had experienced in the last two decades.

7. Discussion and Concluding Remarks

In this paper, I have reviewed the literature on the impact of trade on poverty and inequality. Before going to the evidence, I have surveyed the various theories from which we can derive predictions regarding the impact of trade on poverty and inequality. The evidence on the whole that trade reduces poverty is quite strong. There is some evidence of a possible poverty reducing effect of trade reforms in the cross-country regressions I have run and presented in this paper. In addition, a vast majority of the intra-country studies, including both of the direct reduced form type as well as those relying on empirical general equilibrium welfare analysis, strongly support the poverty reducing impact of trade reforms. Also, there is strong empirical evidence that trade increases incomes and that growth reduces poverty, which together support the view that trade reduces poverty.
The evidence on the impact of trade on inequality is quite mixed in several respects. Firstly the impact on inequality is different for wage inequality and overall income inequality. Even in the case of wage inequality, once we bring in the heterogeneity in consumption bundles across income classes and how their costs change as a result of reforms, the results change from an inequality increasing effect of trade reforms to an inequality reducing effect of trade. Furthermore, when we focus on within-country variation it can be non-monotonic with respect to both time and trade openness. This is true of overall income inequality trends reviewed by Goldberg and Pavcnik (2007) and the trends for Indian states studied by Krishna and Sethupathy (2012). It is also true of the predictions generated by the model estimated using Brazilian data in Helpman et al. However, cross-country regressions do show some evidence of an inequality increasing effect of trade liberalization. Also, overall for India as a whole and for China inequality post reforms has exhibited an increasing trend. However, it seems that trade has had a relatively small role to play in their rise in inequality. In fact, labor shares in output at the firm level in India and China do not seem to be declining with respect to trade liberalization across all types of firms. On average, this share is increasing for relatively small, labor-intensive firms in India. It is also increasing on average for Chinese firms with respect to tariff cuts. Since a falling wage share is associated with rising inequality, as shown by Atkinson, the positive empirical relationship between labor shares and tariff cuts shows us one way in which trade might have been relatively inequality reducing rather than enhancing (compared to the counterfactual).

We need to be aware here that the impact of trade on poverty and inequality depends on domestic institutions and complementary domestic policies. Bhagwati (2004) emphasizes the importance of “appropriate policies” for trade reforms to yield maximum benefits. In particular, he discusses
diversifying way from specializing in products that might experience steeply falling world prices over time (while still specializing according to one’s factor abundance based comparative advantage), suitable agricultural policies, suitable policies promoting financial development, providing property rights (so that people have titles to assets against which they can borrow for production purposes), infrastructure development such as building roads (to facilitate the transmission of price changes from tariff reforms to remote parts of the country) etc. Cain, Hasan and Mitra actually find evidence that better road density, labor regulations making for more flexible labor markets and greater financial development enhance the impact of trade reforms on urban poverty. While this means that increase in road density translates more completely the changes in prices at the border into local price changes, financial development leads the banking system to respond to changes in the needs of the producers for credit as they face greater competition through trade liberalization and need to increase their scale of production or invest in more modern techniques. Krishna, Mitra and Sundaram (2010) show how trade liberalization is relatively less effective in reducing poverty in the lagging states (states further away than average from the closest port) in India. They find that it is the price transmission from tariff changes that is relatively more imperfect in such states, which in turn weakens the poverty reducing effect of trade reforms. Thus building more ports and roads reduces uneven regional development and promotes more effective poverty reduction in response to trade reforms.

References


China's Import Protection and Poverty

**FIGURE 1**

China's Trade and Poverty

**FIGURE 2**
China's Trade and Inequality

India's Import Protection and Poverty
India's Trade and Poverty

![Graph showing India's Trade and Poverty over time. The graph compares India's trade (% of GDP) and poverty headcount ratio at $1.25 a day (PPP) (% of population).]

**FIGURE 5**

India's Trade and Inequality

![Graph showing India's Trade and Inequality over time. The graph compares India's GINI index and trade (% of GDP).]

**FIGURE 6**
Change in poverty vs. change in protection in Indian states

Source: Cain, Hasan and Mitra (2012)
TABLE 1: Cross-Country Evidence on Poverty and Inequality vs Trade and Protection (1981-2013)

| Dependent Variable: POVERTY | | | | | |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|
| Trade           | Tariffs         | Pooled OLS     | Country FE | Country and Year FE | Pooled OLS | Country FE | Country and Year FE |
| -0.263***        | -0.149***       | 0.005           | 0.879***   | 0.401***          | 0.005     | 0.005     | 0.178    |
| (0.037)          | (0.053)         | (0.035)         | (0.241)    | (0.095)           | (0.178)   |           |          |
| 350              | 350(67)         | 350(67)         | 129        | 129(45)           | 129(45)   |           |          |

| Dependent Variable: GINI Coefficient | | | | | |
|---------------------------------------|-----------------|-----------------|-----------------|-----------------|
| Trade           | Tariffs         | Pooled OLS     | Country FE | Country and Year FE | Pooled OLS | Country FE | Country and Year FE |
| 0.024           | -0.215***       | 0.020           | -0.048***   | -0.105***        |          |          |          |
| (0.016)         | (0.048)         | (0.017)         | (0.024)    | (0.026)          |          |          |          |
| 352              | 352(71)         | 352(71)         | 127        | 127(46)           | 127(46)   |           |          |

***, **, * indicate statistical significance at 1%, 5%, and 10%. Numbers in the parenthesis are robust standard errors. Last row for each column shows the number of observations(countries).
TABLE 2: Pairwise Correlations: Reductions in Poverty and Lagged Protection in Indian states, 1987 and 2004

Source: Cain, Hasan and Mitra (2012)

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