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Trade Liberalization and the Structure of Poverty in Developing Countries¹

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Abstract

“Globalization increases poverty” is a common assertion made by critics of globalization. The proliferation of low-wage jobs and higher food prices are some of the arguments brought forward in support of this argument. One of the hallmarks of globalization is the systematic dismantling of barriers to trade. Advocates of trade liberalization – particularly industrialized country agriculture reform – argue that the ensuing rise in world prices for agriculture products will boost rural incomes, thereby reducing poverty in the poorest countries, where the bulk of world poverty resides. Who is right? The goal of this paper is take a systematic look at the structure of poverty across a range of developing countries in Africa, Asia and Latin America, and explore how national poverty rates in some of the poorest countries in the world are likely to be affected by global trade liberalization.

Our analysis of the structure of poverty is based on national household surveys from 14 developing countries. While we consider both spending and earnings effects of trade liberalization, it is argued that the earnings effects will generally be the dominant factor. This is particularly true in the short run for households that are highly specialized in their earnings patterns. Consider the case of a self-employed farm household. Assuming that trade liberalization results in higher farm prices, we expect the short run effect on the returns to family labor and land to be positive, and somewhat larger in percentage terms (the so-called “magnification effect”). Furthermore, if this household is not employed off-farm, then the farm profitability effect translates directly into an income effect, and this is likely to be sufficient to lift some of the farm households out of poverty. Of course this same effect can work in reverse, with commodity price declines increasing poverty. This makes specialized households highly vulnerable to trade policy shocks.

In addition to agriculture-specialized households, we focus on self-employed non-agriculture specialized households, households specialized in wage labor and those relying on transfer payments for 95% or more of their income. Together, these four types of specialized households account for an average of 56% of the poor in the 14 countries examined. Thus *a majority of the poor have specialized earnings patterns* and are likely to be disproportionately affected by trade liberalization. The same is not true of the non-poor, where a majority of the households are diversified, and are therefore less vulnerable to sector-specific commodity price changes. We also find that the poor are over-represented among the agriculture-specialized households.

With this background, we turn to an examination of the broad effects of multilateral trade liberalization on relative commodity prices and factor returns across the 14 countries in question. We distinguish between *per capita* effects – or the impact of trade liberalization on the “average” household in each country, and the effects on the poorest households. Our *per capita* results are quite similar to other studies of multilateral trade liberalization, with most countries gaining modestly, while a few gain substantially and a few lose due to the erosion of benefits from existing preferences. Some argue that this “rising tide will lift all boats” and so the positive *per capita* gains from trade liberalization will reduce poverty. However, we show that the short run

impact of trade liberalization on different household groups is quite varied, and not always positive.

First of all, global trade liberalization tends to raise food prices – particularly for staples, relative to non-food prices. This is true in all but 2 of the countries in our sample. This food price hike has an adverse effect on the poor, relative to the *per capita* household, since they spend a disproportionate share of their income on food. Also, the short run earnings impacts are quite varied, with agricultural profits rising relative to *per capita* income in 11 of the 14 countries, while relative non-agricultural profits and wages fall in many of these countries. Thus the overall impact on poverty depends on the structure of poverty in each country – hence our emphasis on this topic.

We proceed to systematically explore the impact of trade liberalization on poverty utilizing a recently developed analytical framework that combines the detailed household survey data with a global economic model in order to measure the poverty impacts of trade liberalization on the five different household *strata* in each country. Each of the first four strata corresponds to one of the groups of earnings-specialized households, while the fifth encompasses the diversified households in each country. We conduct our analysis at the level of one hundred income *percentiles*, ranging from poorest to richest in each stratum. In this way, we uncover the differential impact of trade liberalization, by country, stratum and by income level. We also calculate the change in poverty rates, both at the stratum and national levels. Our findings emphasize the differential short run poverty impacts of multilateral trade liberalization on poverty across countries, across strata, and within strata, thereby highlighting the links between the structure of poverty and the national impacts of trade liberalization.

I. Introduction

“Globalization increases poverty” is a common assertion made by critics of globalization. The proliferation of low-wage jobs and higher food prices are some of the arguments brought forward in support of this argument. One of the hallmarks of globalization is the systematic dismantling of barriers to trade. Advocates of trade liberalization often argue that “a rising tide lifts all boats” and the economy-wide gains from trade liberalization will make everyone better off. More refined arguments in favor of poverty reduction ensuing from trade liberalization often emphasize the ensuing rise in world prices for agriculture products as industrialized countries eliminate protection for farming in OECD countries. This is expected to boost incomes in the rural economies of the developing world, where the bulk of world poverty resides. Who is right? The goal of this paper is take a systematic look at the structure of poverty across a range of developing countries in Africa, Asia and Latin America, and explore how poverty rates in some of the poorest countries in the world are likely to be affected by global trade liberalization.

The linkages between trade liberalization and poverty have been receiving a great deal of attention in recent years. At the 1999 Geneva conference on the WTO and the developing countries, Joseph Stiglitz, then Vice President of the World Bank, proposed that the next round of WTO negotiations be labeled the “Development Round” and that it incorporate an explicit emphasis on poverty reduction. This direction was reinforced by Mike Moore who was Director General of the WTO at the time. The current WTO Round was subsequently dubbed the Doha Development Round.³ In light of this growing interest in the topic, the Swedish Parliament, in cooperation with the Trade Research Division of the World Bank, sponsored a conference in Stockholm in October of 2000 aimed at a quantitative assessment of the links between trade liberalization and poverty. The Globkom conference drew together economists working with household surveys (Levinsohn, Barry and Friedman, 1999; Case, 1998; Friedman, 2001; Ianchovichina, Nicita and Solaga, 2000), as well as researchers using taking a more macro-economic approach (Devarajan and van der Mensbrugghe, 2000; Harrison, Rutherford and Tarr, 2002; Hertel, Preckel and Cranfield, 2000).⁴ The most striking thing about this conference was the extent of disagreement about the right approach to analyzing this linkage. Winters (2000) offers an overview and Reimer (2002) provides a survey of contributions on this topic. It seems fair to say that researchers are still struggling to reach a consensus on the best approach to analyzing the impacts of multilateral trade liberalization on poverty, let alone agreeing on the answer.

Historically most poverty research has focused on consumption side of the question – since that is easier to measure, more reliable, and less volatile than income (Lipton and Ravallion, 2000). However, it is clear that one cannot assess the likely impact of trade liberalization on poverty without considering both the consumption and earnings sides of the problem. Our analysis of the trade-poverty linkage is based on national household surveys from 14 developing countries. While we consider both spending and earnings effects of trade liberalization, it is argued that the earnings effects will generally be the dominant factor. This is particularly true in the short run for households that are highly specialized in their earnings patterns. Consider the case of a self-

³ See also the handbook on trade liberalization and poverty by McCullogh, Winters and Cirera (2001).

⁴ Other good examples are offered by Cogneau and Robilliard (2000), Bourguignon Robilliard and Robinson (2000), Decaluwé, Patry, Savard and Thorbecke (1999), and Löfgren (1999).

employed farm household. Assuming that trade liberalization results in higher farm prices, we expect the short run effect on the returns to family labor and land to be positive, and somewhat larger in percentage terms (the so-called “magnification effect”). Furthermore, if this household is not employed off-farm, then the farm profitability effect translates directly into an income effect, and this is likely to be sufficient to lift some of the farm households out of poverty. Of course this same effect can work in reverse, with commodity price declines increasing poverty. This makes specialized households highly vulnerable to trade policy shocks. The next section of the paper examines the degree of earnings specialization among the poor, and hence their vulnerability to trade liberalization.

II. The Structure of Poverty in Fourteen Developing Countries

Table 1 lists the fourteen countries for which we have obtained and processed household survey data on earnings. These countries were selected based on the intersection of data availability and overlap with countries covered in the Global Trade Analysis Project (GTAP) data base which will be used to simulate the impacts of trade liberalization later in this paper. Our sample of countries is arranged in ascending order, according to GDP/capita (at PPP = purchasing power parity prices). By this measure, the three Sub-Sahara African countries, Malawi, Zambia and Uganda, are the poorest in our sample. They are followed by four of the five Southeast Asian countries: Bangladesh, Vietnam, Indonesia and the Philippines. With the exception of Thailand, the Latin American countries in our sample are the richest, measured on a *PPP-GDP per capita* basis, with Chile and Mexico showing the highest incomes.

Table 1 reports three important types of information on a country/stratum basis. The first of these is the share of the total population allocated to each of the four categories of specialization, as well as to the diversified group. Beginning with the column corresponding to households specialized in agriculture (the agricultural stratum), we see that Malawi shows the highest concentration of population in this category (38%), while Mexico shows the lowest (3%). This suggests that there might be an inverse correlation between *per capita* GDP and the share of the population specialized in agriculture. Figure 1 plots the latter against the former and confirms this point. With few exceptions – most notably Vietnam, which is relatively poor but has amongst the lowest share of its population in the specialized agricultural stratum – there is a strong negative correlation between these two variables.

The non-agriculture and transfer stratum’s concentration in the overall population show no particularly strong correlation with income, or with the continent in question for that matter. However, in the case of the labor stratum there appears to be a strong positive correlation with *per capita* GDP. Uganda and Vietnam show the lowest share of wage and salary-specialized households in the sample (just 4%), whereas Mexico shows the highest share (38%). Figure 2 plots the labor stratum share in the population against *per capita* GDP, confirming the positive relationship between these variables. This makes sense, since richer economies typically exhibit a higher degree of specialization, with lower levels of informal employment, and a larger formal labor market.

The share of the population in the diversified stratum in Table 1 is simply one minus the sum of the four specialized shares. This ranges from 0.87 in Vietnam and 0.83 in Uganda to 0.26 in Zambia, and shows little correlation with income or geography.

With this perspective on the stratum profile of the population as a whole, we next turn to the two poverty-related measures in Table 1. The first of these (the middle entry in each cell) reports the share of the national poverty total appearing in each of the strata. Like the population shares, these measures sum to one across each row. Perhaps not surprisingly, the poorest countries (Malawi, Zambia), with a large share of their total population specialized in agriculture, also show a large share of total poverty in this stratum. This positive correlation between the share of agricultural specialized households in the population and their share in total poverty is highlighted in Figure 3. Most interesting are the exceptions to this general trend. For example, in Brazil – one of the richest countries in the sample in which self-employed agricultural households comprise just 4% of the population – this stratum accounts for nearly one-quarter of the poor!

One of the most important comparisons between the first and second rows of Table 1 is for the diversified (i.e. non-specialized) households. With the exception of Thailand and Indonesia, *the poor appear to be more specialized than the population at large*, and therefore, more specialized than the non-poor. This is particularly striking in the Latin American countries where the share of diversified households in the general population is often 20 percentage points above the share of diversified households amongst the poor. The sample average share of diversified households in the general population is 51% vs. just 44% in the case of the sample average for the poor households.⁵ With more specialized income sources, the poor are likely to be more vulnerable to trade policy shocks which result in sharp swings in returns to sector-specific factors of production.

We next turn to the poverty rate, or headcount, which is the third entry in Table 1. This reports the share of the population (stratum or total) that is in poverty. Running an eye down the Total column, it is evident that the poverty rate tends to decrease with increasing income. It is highest in Malawi (65%) and Zambia (73%) and lowest in Thailand (2%) and Chile (4%). This negative relationship is graphed in Figure 4. Clearly if the distribution of income were constant across income levels, then higher *per capita* income would always lift more people out of poverty. However, as the Gini coefficients reported in parentheses in the first column of Table 1 indicate, the degree of inequality varies widely within this sample of countries. Mexico, for example, has a very unequal distribution of income so that the proportion of the population living on less than \$1/day is still 15%, despite the Mexican *per capita* GDP of \$9,000.

In order to understand the structure of poverty in these developing countries, it is also important to consider the intensity of poverty across the different earnings strata. If trade liberalization lifts incomes in a stratum exhibiting a high intensity of poverty, then this will have a beneficial impact on the overall poverty rate, even if incomes fall somewhat in other strata. In order to explore this dimension of poverty in our sample of developing countries, we plot the stratum poverty rate against the national poverty rate in each country, for each of the specialized strata in turn. These scatter plots are shown in Figures 5 – 8. The first of these figures shows that, with the exception of the Philippines and Brazil, the incidence of poverty among transfer-specialized households is always larger than that in the general population. The most extreme divergence is for Peru, where 80% of the transfer-specialized households are in poverty, as opposed to just 16% of the general population. Most countries also lie above the 45 degree line in Figure 6 which plots the poverty rate among agriculture-specialized households against the national poverty rate. For example, in

⁵ We also provide a national population-weighted average of the national survey data at the bottom of Table 1. For

Colombia, the poverty rate amongst self-employed agricultural households is more than twice the national average.

In contrast to the transfer and agricultural strata, the poverty rates amongst the diversified households in most countries lie somewhat below the 45° line, indicating that they are less poor than average (Figure 7). And, with the exceptions of Venezuela, Bangladesh and Vietnam, poverty rates amongst the wage and salary-specialized households are substantially lower than in the population at large (Figure 8).

III. Assessing the Impacts of Trade Liberalization

Over the past decade it has become quite common for researchers to assess the national *per capita* impacts of global trade liberalization. Such studies formed the cornerstone of the World Bank's assessment of the final Uruguay Round Agreement on the developing countries (Martin and Winters, 1996), and they have been widely used in assessing the potential national consequences of further cuts in protection under the Doha Development Round. The most widely used analytical framework for this purpose is the GTAP data base and modeling framework (Hertel, 1997; Dimaranan and McDougall, 2002) and this is what we use here. Since this tool is well-documented elsewhere⁶, we will not go into detail on this aspect in the current paper. We will focus instead on the results and their implications for poverty.

Barriers to Merchandise Trade: Table 2 summarizes the extent of protection currently in place in the 14 developing countries in our sample, and compares it with protection levels in other developing countries in Sub-Saharan Africa, Asia and Latin America, as well as other developing countries and the OECD. From this table we see that tariffs remain quite high throughout the developing world. While the bulk of the world's trade involves non-food manufactured imports into the OECD, where tariffs average just 2%, average tariffs on non-food and non-textile manufacturing imports into developing countries are still quite high, reaching 22% in Malawi. Furthermore, tariffs on textiles and apparel are even higher in the developing countries, and these also remain relatively high in the OECD as a whole. In fact, the global average level of protection on textiles and apparel is five and one-half times higher than for other non-food manufactures taken as a group. Clearly global trade liberalization can be expected to have a significant impact on the apparel trade – much of which is relatively unskilled labor intensive. This, in turn, is likely to affect undeclared wages, upon which many of the poor depend for their income.

Turning to the agriculture and processed food columns of Table 2, we see that OECD protection is very high, relative to non-food imports. Furthermore, the average tariff on processed foodstuffs imported into the OECD is quite a bit higher than that for primary agricultural products, giving an indication of potential tariff-escalation. The highest tariffs on primary agriculture imports are for Uganda and the "Rest of Asia", while Vietnam shows by far the highest average tariff on processed food products. Other primary products show lower tariff rates in most cases.

Trade Liberalization Results: To keep things simple, and to identify the maximum potential impact of trade liberalization on poverty, our simulation experiment involves elimination of all the import barriers listed in Table 2. In addition, we remove agricultural export subsidies, as

most measures this is similar to the simply average.

⁶ The interested reader is referred to the GTAP web site at: www.gtap.org

reported to the WTO (Elbehri, 2002). We do not alter domestic support for agriculture, as the economic impact of these subsidies and the extent to which they will be reduced in any future WTO agreement remains contentious.

Table 3 reports key results from this experiment. We focus first on the *per capita* earnings impacts of trade liberalization. These price changes are relative to the numeraire, which is the average earnings index worldwide. The average percentage increase in private household earnings in each of the 14 focus countries is reported in the first column of Table 3. With the exception of Mexico, Peru and Venezuela, these developing countries all experience a real appreciation of the average earnings for land, labor and capital, relative to the world as a whole. This means that the demand for their services has increased, relative to supply. If consumer prices were unchanged, then the *per capita* household in these eleven countries would be unambiguously better off.

However, the prices that consumers must pay for goods and services also increase in most cases, relative to the numeraire, (column CPI) so one must compare the two to evaluate the *per capita* welfare impacts of trade liberalization on these countries (column Real Income). On this basis, we observe that *per capita* real income rises in every case excepting Mexico, Peru and Venezuela, where the change in CPI dominates the earnings effect of trade liberalization. The largest *per capita* gain in real income arises in Vietnam, followed by Malawi. Most countries show a modest positive (less than one percent) *per capita* gain from trade liberalization. These findings are quite consistent with the *per capita* results from most studies of multilateral trade liberalization which typically show that most, but often not all developing countries gain from trade liberalization, and these gains are typically rather modest in scope (e.g., the studies collected in Martin and Winters, 1996). The goal of such studies is typically to explore the reasons behind these differential gains and we refer the reader to these earlier studies for more analysis of the *per capita* effects of global trade liberalization. Instead, we turn to the differential impacts of trade liberalization on household groups within each of these economies.

Consider the relative earnings impacts of trade liberalization as reported in Table 3. Here, the percentage changes in profits and wages are reported relative to national *per capita* earnings in each country. Note that, with three exceptions⁷, agricultural profits rise relative to average earnings. The reason why returns to agriculture in most developing countries rise, relative to other returns, is due to the high level of protection for agriculture in the OECD countries. With agricultural profits rising, it is perhaps not surprising that relative non-agricultural profits fall in most countries, with the exceptions being Bangladesh, Mexico and Vietnam. The remaining arguments in overall earnings, wages and salaries also fall, relative to the average, in all countries but 4 (unskilled labor) or 3 (skilled labor). However, within the labor earnings category, unskilled wages rise relative to skilled wages in every case but Bangladesh and Uganda.

On the consumer goods side, we also see some common patterns across countries. Food prices rise, relative to the CPI, in all countries but Mexico and Vietnam, whereas manufactures prices

⁷ The exceptions are Mexico, Uganda and Vietnam. Mexico already has free trade in manufactures with its most important trading partner – the United States – but its agriculture sector remains protected. Once these barriers are removed, agricultural profits decline. The decline in Uganda is quite small, but the relative decline in Vietnam is very large and has to do with the strong income in input costs as the rest of the economy expands vigorously in response to tariff cuts in light manufacturers.

falls, relative to the CPI, across the board. This decline in the consumer's cost of non-food items is directly related to the relatively high tariffs on these goods (recall Table 2), coupled with the relative decline in world prices for these products.⁸ Services prices rise in every country but Peru, following multilateral trade liberalization.

IV. Implications for Poverty

Having examined the structure of poverty across our sample of 14 developing countries, and having ascertained the likely changes in relative prices following trade liberalization, we are now in a position to assess the implications for poverty. We will do so in a way that facilitates comparison across countries, attempting to isolate the different structural features driving the differential changes in poverty, by stratum, as well as nationally. Our results will be presented in terms of percentage changes in the poverty headcount rate in each stratum, compared to the national population. These headcount rates have the virtue of being additive across strata, with the row sum equaling the national poverty headcount rate. They may be obtained by multiplying the middle cell in Table 1 (share of stratum in total poverty) by the overall poverty headcount rate reported as the row sum of the third entry in Table 1. These alternative poverty rates are reported for each stratum/country combination in Table 4.

With prices, consumption patterns and incomes changing in the wake of trade liberalization, it is not immediately obvious how one would go about assessing the likely change in poverty. In this paper we follow the approach laid out in Hertel *et al.* (2003) in which a *micro-simulation model* is used. Specifically, we divide each of the five strata into one hundred household groups, organized by income level. Each group represents one percent of the population in the stratum. For each of these groups we perform a welfare calculation, based on an econometrically estimated utility function describing their consumption behavior and our survey-based estimates of their endowments (e.g., skilled labor, agricultural profits, etc.). Prior to our simulation, we establish the poverty level of "utility" for each country. This corresponds to the level of well-being attainable by a household earning \$1/day – our absolute poverty line. The household with this level of utility is termed the "marginal" household or the household on the edge of poverty. Once we obtain the post-liberalization prices, we can re-compute income, as well as consumption and the utility level for each percentile in each stratum. The latter variable permits us to assess whether a given household has risen out of poverty, or whether it has fallen into poverty as a result of the trade liberalization experiment.

We conduct the poverty analysis in stages, in order to emphasize the importance of various structural aspects of poverty in determining the overall outcome for any given country. In the first stage we "pretend" that every household in the economy is the same. This is effectively what is done by most researchers conducting analyses of multilateral trade liberalization. They ignore heterogeneity within the country and focus on changes in *per capita* welfare across countries. The resulting percentage changes in the stratum poverty rates from Table 4 are reported in Table 5.

From the results in Table 5, we see, not surprisingly, that poverty is reduced in all of the countries where *per capita* welfare rises. That is, in every case but Mexico, Peru and Venezuela. The percentage reduction in poverty varies across strata, because the distribution of income varies

⁸ All of these price changes are before wholesale/retail/transport service margins, i.e. at producer prices. Consumer goods price changes are somewhat more ambiguous, as they involve a blend of goods and services price changes.

widely across strata. For example, in Indonesia, the poor households in the labor stratum are clustered relatively close to the poverty line, so the *per capita* gain does more to reduce the poverty rate in this stratum than for the agriculture-specialized stratum where the poorest households are quite a bit poorer. The largest reductions in poverty arise in Vietnam, where we saw the largest percentage increases in real income (Table 3).

The next poverty calculation that we perform involves taking explicit account of the differential spending patterns across households as income levels vary. As has been well known since the time Engel coined his famous “Law”, the poor tend to spend much more of their budget on food than do the rich. With food prices rising, relative to non-food prices, we expect that trade liberalization will hurt the poor – at least from the perspective of spending patterns. This is indeed the case when we compare the results in Table 5 with those in Table 6. The latter set of poverty results take explicit account of the spending patterns of the poor and we see poverty rates rising now in six of the fourteen countries. These are also the countries where relative food prices are rising strongly. The most dramatic case is that of Thailand, where the poverty rate reported in Table 4 increases by between 6% and 18%, depending on the stratum. This is due to the very sharp increase in staple grains prices. As a large exporter of rice, Thailand is quite exposed to world markets and the opening up of the Japanese and Korean rice markets gives a strong boost to prices in Thailand. With staple grains playing an especially large role in the consumption bundle of the poor, their cost of living is hard hit by global trade liberalization. In the remaining countries where poverty continues to fall, based on *per capita* earnings changes and the true spending effects, the poverty rate falls by less than in Table 5. Clearly the fact that the poor are more exposed to food price increases works to their disadvantage in the context of global trade liberalization.

We now turn our attention to the earnings side of the story. Tables 5 and 6 report estimated poverty impacts of trade liberalization based on *per capita* earnings effects. However, we know from Table 3 that the earnings effects of trade liberalization differ greatly depending on the source of household income. With agricultural profits rising and non-agricultural profits falling, relative to *per capita* income, there will clearly be distributional consequences of trade liberalization and impetus for further differential poverty impacts by stratum. Table 7 reports the percentage change in poverty headcount, by country and stratum, when households are assigned the stratum average change in income following trade liberalization. Thus, we ignore differences in earnings patterns within each stratum, but introduce cross-stratum differences when compared to Table 6.

The results in Table 7 are quite interesting. No longer do poverty rates fall uniformly within each country. Poverty amongst agriculture-specialized households falls in every case but Mexico, Peru and Vietnam. In the case of Vietnam, the poor are hard hit by rising consumer goods prices, coupled with falling relative returns to agriculture. In Mexico, poverty also increases amongst agricultural specialized households since *per capita* welfare as well as the relative returns to agriculture fall (Table 3). The largest percentage reductions in poverty amongst agriculture-specialized households are in Brazil and Chile, where agricultural profits rise strongly. Indeed, in Chile, which is heavily tied into world agricultural markets, the poverty rate for the agriculture specialized households reported in Table 4 falls by one-quarter. In light of the tendency for poverty to be stubbornly resistant to public policy, this is a very large change indeed.

With the average stratum earnings effects factored into our analysis, we see that the diversified households experience the next largest reductions in poverty. The low income diversified households are typically heavily reliant on agricultural profits and unskilled wages. Since these returns rise in most countries, poverty falls in the diverse stratum of every country except for Chile, Colombia, Peru and Thailand where rising food prices dominate the outcome.

Poverty changes in the transfer stratum are unchanged from the previous table since transfers are assumed to move in proportion to the change in *per capita* income.⁹ Poverty falls for the transfer stratum in about half of the countries. Only five of the countries show a reduction in poverty for the non-agriculture specialized stratum, and the magnitude of the poverty changes for this group is much larger than for the transfer households. This is due to the volatility of non-agricultural profits in the face of trade liberalization. For example, in Chile, Indonesia and Thailand, this group experiences the largest overall increase poverty as households are hit by the combination of declining income and higher food prices. Finally, we have the labor-specialized households where the poverty rate rises in ten of the fourteen countries.

The last step in this process of decomposing the determinants of stratum-specific poverty changes in the wake of trade liberalization involves introducing within stratum variation in income sources. This is done in Table 8. For example, within the wage labor specialized stratum, low income households tend to be more heavily reliant on unskilled, as opposed to skilled wages. With unskilled wages rising relative to skilled wages in twelve of the fourteen countries, the poorest wage-dependent households experience a somewhat larger gain, which results in a larger reduction (smaller increase) in poverty rates for this stratum (compare tables 7 and 8). The other stratum where the composition of income varies significantly across income levels is the diversified group. Here, poorer households tend to also be more heavily reliant on unskilled wage income, and they also tend to rely heavily on income from agricultural profits. In Chile and Colombia, this intra-stratum earnings effect is strong enough to turn a poverty increase into a reduction in poverty.

Having established the likely change in poverty by stratum in each country of our sample, following trade liberalization, we are now in a position to examine more closely how these changes aggregate up to the national total. Here, the relative importance of each stratum in the overall poverty picture comes into play. A very simple way of approximating the total change in poverty reported in Table 8 is to weigh the poverty changes in that table by the stratum share in total poverty from Table 1 (middle entry in each cell). This gives us the estimate of the national change in poverty as reported in Table 9. (It differs slightly from the total poverty changes Table 8, since the weights that we use change in the wake of trade liberalization.)

Despite the fact that poverty rises in quite a few strata/country pairs, overall poverty falls in every case but Peru, Thailand and Venezuela. This is due to the fact that the reductions in poverty tend to occur in the strata in which the poor are most predominant. Consider, for example, the case of Indonesia. Here, poverty rises in the non-agriculture-specialized and transfer strata, but these account for only about fourteen percent of the poor, so overall poverty falls. In Brazil, poverty rises for the non-agriculture and labor strata, which together account for more than 45% of the

⁹ Since we have also tied government spending and tax revenues to net national income, the same is true for public transfers. Since we do not have explicit information on the origin of private transfers, it seems reasonable to assume that they also depend on net national income in the economy. Since population is assumed to be unchanged, any change

poor, but the percentage reduction in poverty amongst the agriculture-specialized households is much larger, so while these households comprise only about one-quarter of the poor, overall poverty falls there as well. This stands in contrast to Venezuela, where the percentage reduction in agricultural poverty is quite large (about 9%), but this stratum only accounts for 2.5% of the poor. Not surprisingly, overall poverty rises there.

This analysis leads us to an important thought experiment to uncover another aspect of the interaction between the structure of poverty and trade liberalization: What if, instead of their true stratum-weights in overall poverty, we instead applied the sample average weights given at the bottom of Table 1 (middle entry in each cell). On average, 56% of the poor households are specialized, with agriculture-specialized households being the largest component, followed by wage labor-specialized, non-agriculture and transfer specialized households. Applying the average weights yields the second column in Table 9.

By applying the average weights instead of the true population weights to the stratum-specific poverty changes, we are able to isolate the role of inter-stratum poverty composition in determining the overall poverty changes. The most striking difference in the first and second columns of Table 9 is for Venezuela. Recall that in Venezuela, the percentage poverty reduction in the agricultural stratum is quite large, but the importance of this stratum in the overall poverty picture is very small. Therefore, overall poverty rises in Venezuela. If instead, the share of poverty amongst the agricultural stratum was as large as the sample average, then we predict (average weights column of Table 9) that national poverty would fall. Another interesting difference arises for Mexico, where the agricultural stratum contains only one percent of the poor, but poverty rises for this group. Applying the sample average weights in this case results in an overall poverty increase instead of a decrease.

V. Conclusions

This study has explored the structure of poverty across fourteen developing countries and, against this back drop, it has examined the likely consequences of trade liberalization for the poor in these countries. Our analysis of household survey data shows that the poor tend to be more specialized in the earnings sources than the non-poor. This makes them more vulnerable to trade policy changes which tend to favor one sector at the expense of another. For the lowest income countries in our sample, agricultural specialized households make up a large share of the population, and an even larger share of the poor. The fact that trade liberalization tends to raise the profitability of agriculture means that poverty in this stratum generally falls, while poverty amongst the self-employed non-farm households often rises. Since the bulk of the poor are dependent on agriculture to some degree, the national poverty rate tends to fall in these cases.

As countries become wealthier and the labor market becomes more highly developed, it is much more common to observe households that are entirely specialized in wage labor. Accordingly, these households also become a larger part of the overall poverty picture. Since the poorest labor-specialized households tend to be heavily reliant on unskilled labor, the key earnings variable for reducing poverty is the wage paid to unskilled labor. In most cases, this wage falls, relative to average earnings, but it rises relative to skilled wages. Therefore the impact of trade liberalization

in net national income translates directly into a change in *per capita* income.

on this group of households is mixed, with the poverty increases more frequent than the decreases.

The findings in this paper have emphasized the differential short run impacts of multilateral trade liberalization on poverty across countries, across strata, and within strata, thereby highlighting the links between the structure of poverty and the national impacts of trade liberalization.¹⁰ In the long run, when self-employed workers, land and capital investments are able to fully adjust to the trade policy shock, the results can be significantly altered (Hertel et al., 2003). But we believe that for households living on less than one dollar per day, the short run impacts are of paramount importance.

Our cross-country analysis also permits us to address a number of myths surrounding trade liberalization and poverty. The first myth is that trade liberalization always benefits developing countries as a whole. While this is generally true in our analysis, the most notable exception is that of Mexico. While global trade liberalization benefits the Mexican economy by increasing economic efficiency, it costs Mexico its preferred access to the US and Canadian markets. That is, many of the benefits of NAFTA are lost when other countries obtain tariff free access to this same market.

A second myth relates to the popular saying that “a rising tide lifts all boats”. While it is generally true that the countries that experience a *per capita* gain also experience a reduction in poverty, Thailand offers an important exception. Here, the very sharp rise in staple grains prices following global trade liberalization pushes more non-agricultural households into poverty and this effect dominates the reduction in poverty among agriculture-specialized households. On the other hand, in the case of Mexico, poverty falls despite the decline in *per capita* welfare following global trade liberalization. This is due to the decline in food prices that results from lower cost imports.

The falling relative price of food and the decline in relative earnings in agriculture in the Mexican case serve to rebut yet another common myth, namely that global trade liberalization will always benefit agricultural producers at the expense of urban consumers. While this rule of thumb is generally true, it does depend on the existing pattern of protection in the economy, as well as the nature of its current trade agreements (e.g., NAFTA). Vietnam also offers an additional, interesting exception to this myth. Global trade liberalization confers a huge boost to that economy and the agricultural sector is simply left behind, with wages and consumer prices outstripping increases in agricultural profits so that the poverty rate amongst agriculture-specialized households actually rises in spite of the strong national gains.

The final myth that this paper addresses is the assertion that reducing poverty in agriculture will unambiguously reduce national poverty and increasing poverty in agriculture will increase national poverty. There are four exceptions to this rule amongst our sample of fourteen countries. In Thailand and Venezuela, the poverty rate falls for agriculture-specialized households, but national poverty rises, due largely to higher food prices. Conversely, in the cases of Mexico and Vietnam, poverty rises amongst agriculture-specialized households, as relative farm earnings decline, but national poverty falls in spite of this outcome

¹⁰ See also Kanbur (2000) for a similar plea for disaggregation in the analysis of poverty.

References

- Annual Poverty Indicators Survey, National Statistics Office, Manila, Philippines, 1999.
- Bourguignon, François, Anne-Sophie Robilliard, and Sherman Robinson. 2002. "Representative vs. Real Households in the Macro-economic Modeling of Inequality" Paper prepared for the Conference on Frontiers in Applied General Equilibrium Modeling, New Haven, Yale University, April 5-6, 2002.
- Case, Anne. 1998. "Income Distribution and Expenditure Patterns in South Africa." Paper prepared for the Conference on Poverty and the International Economy, organized by World Bank and Swedish Parliamentary Commission on Global Development, Stockholm, October 20-21, 2000.
- Cogneau, Denis and Anne Sophie Robillard. 2000. "Growth, Distribution and Poverty in Madagascar: Learning from a Microsimulation Model in a General Equilibrium Framework." IFPRI TDM Discussion Paper 61.
- Thomas W. Hertel, Maros Ivanic, Paul V. Preckel and J.A.L. Cranfield. 2003. "The Earnings Effects of Multilateral Trade Liberalization: Implications for Poverty in Developing Countries." GTAP Working Paper, Center for Global Trade Analysis, Purdue University, http://www.gtap.agecon.purdue.edu/resources/working_papers.asp.
- Decaluwé B., A. Patry, L. Savard and E. Thorbecke. 1999. "Poverty Analysis within a General Equilibrium Framework." CREFA Working Paper 9909. Université Laval. Available at: <http://www.crefa.ecn.ulaval.ca/cahier/liste99.html>.
- Devarajan, Shantayanan, and Dominique van der Mensbrugghe. 2000. "Trade Reform in South Africa: Impacts on Households." Paper prepared for the Conference on Poverty and the International Economy, organized by World Bank and Swedish Parliamentary Commission on Global Development, Stockholm, October 20-21, 2000.
- Dimaranan, Betina V. and Robert A. McDougall. 2002. "Global Trade, Assistance, and Protection: The GTAP 5 Data Base," Center for Global Trade Analysis, Purdue University, West Lafayette, IN, also available on line at http://www.gtap.agecon.purdue.edu/databases/v5/v5_doco.asp.
- Elbehri, Aziz. 2002. "Export Subsidies," Chapter 16.C in Dimaranan and McDougall (2002), *Global Trade, Assistance, and Production: The GTAP 5 Data Base*. Center for Global Trade Analysis, Purdue University, West Lafayette, Indiana.
- Encuesta nacional de Hogares, MECOVI, Peru, 1999.
- Encuesta de Hogares por Muestreo, BID-BIRD-CEPAL, Venezuela, 1998.
- Encuesta Nacional de Hogares – Fuerza de Trabajo, BID-BIRD-CEPAL, Colombia, 1998.
- Encuesta de Caracterización Socioeconómica Nacional, Ministerio de Planificación y Cooperación, Chile, 1998.
- Encuesta Nacional de Ingresos y Gastos de Los Hogares, Instituto Nacional de Estadística Geografía e Informática, Mexico, Mexico, 2000.
- Friedman, Jed. 2001. "Differential Impacts of Trade Liberalization on Indonesia's Poor and Non-Poor." Paper prepared for the Conference on Poverty and the International Economy, organized by World Bank and Swedish Parliamentary Commission on Global
- Harrison, Glenn W., Thomas F. Rutherford, and David G. Tarr. 2002. 'Trade Liberalization, Poverty and Efficient Equity.' Paper prepared for World Bank Conference on Poverty and

- the International Economy, organized by World Bank and Swedish Parliamentary Commission on Global Development, Stockholm, October 20-21, 2000, subsequently published in the *Journal of Development Economics*, 67.
- Hertel, Thomas W. (editor) (1997) *Global Trade Analysis: Modeling and Applications*. New York: Cambridge University Press. Documentation is also available on-line at: http://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=413
- Household Expenditure Survey, Bangladesh Bureau of Statistics, Bangladesh, 1996.
- Household Living Standards Survey, General Statistics Office, Vietnam, 1998.
- Ianchovichina, Elena, Alessandro Nicita, and Isidro Soloaga. 2000. "Trade Reform and Poverty: The Case of Mexico." *The World Economy* 25(7):945-973.
- Integrated Household Survey, National Statistical Office, Zomba, Malawi, 1998.
- Kanbur, R. 2000. "Income Distribution and Development". In *Handbook of Income Distribution*, A.B. Atkinson and F. Bourguignon, eds. Amsterdam: Elsevier.
- Levinsohn, James, Steven Berry, and Jed Friedman. 1999. "Impacts of the Indonesian Economic Crisis: Price Changes and the Poor." Paper prepared for the Conference on Poverty and the International Economy, organized by World Bank and Swedish Parliamentary Commission on Global Development, Stockholm, October 20-21, 2000.
- Lipton, M. and M. Ravallion. 2000. "Poverty and Policy". In J. Behrman and T.N. Srinivasan, eds., *Handbook of Development Economics*, Amsterdam: Elsevier.
- Living Conditions Monitoring Survey II (1998) Central Statistical Office, Zambia.
- Löfgren, Hans. 1999. "Trade Reform and the Poor in Morocco: A Rural-Urban General Equilibrium Analysis of Reduced Protection." IFPRI TMD Discussion Paper 38.
- Martin, Will and L. Alan Winters. Editors. 1986. *The Uruguay Round and the Developing Economies*. Cambridge University Press, New York.
- McCulloch, N., L.A. Winters, and X. Cirera (2001) *Trade Liberalization and Poverty: A Handbook*, Center for Economic Policy Research: London.
- Pesquisa Nacional por Amostra de Domicílios (1998), Brazilian Institute of Geography and Statistics (IBGE).
- Reimer, Jeffrey J. "Estimating the Poverty Impacts of Trade Liberalization." World Bank Policy Research Working Paper 2790. February 2002.
- SUSENAS: Indonesia's Socio-Economic Survey (1993) Biro Pusat Statistik, Jakarta, Indonesia.
- Thailand Socio-Economic Survey, National Statistics Division, Thailand, 1996.
- Uganda Bureau of Statistics, National Household Survey 1999, Entebbe, Uganda.
- Winters, L. Alan. 2001. "Trade, Trade Policy, and Poverty: What are the Links?" Centre for Economic Policy Research Paper No. 2382.

Figure 1. Correlation Between Per Capita GDP and the Share of agr Specialized Households in the Total

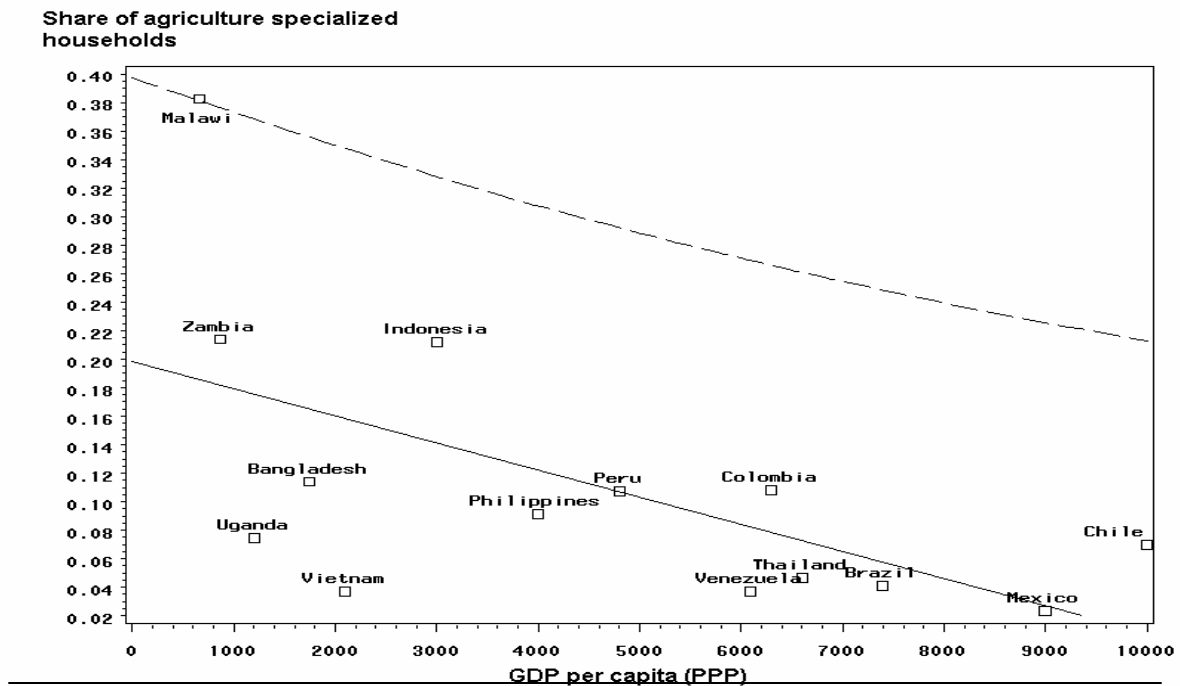


Figure 2. Correlation Between Per Capita GDP and the Share of Labor Specialized hhlds

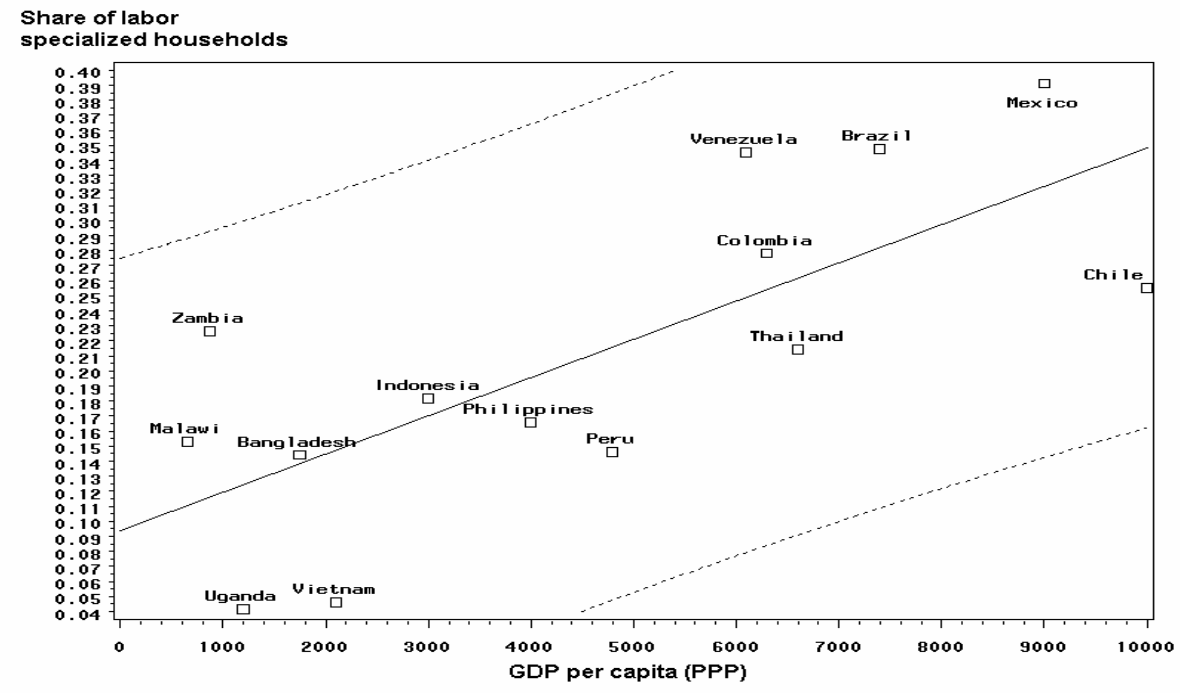


Figure 3. Correlation Between the Share of agr Specialized Households in the Population and Their Share in the Poor

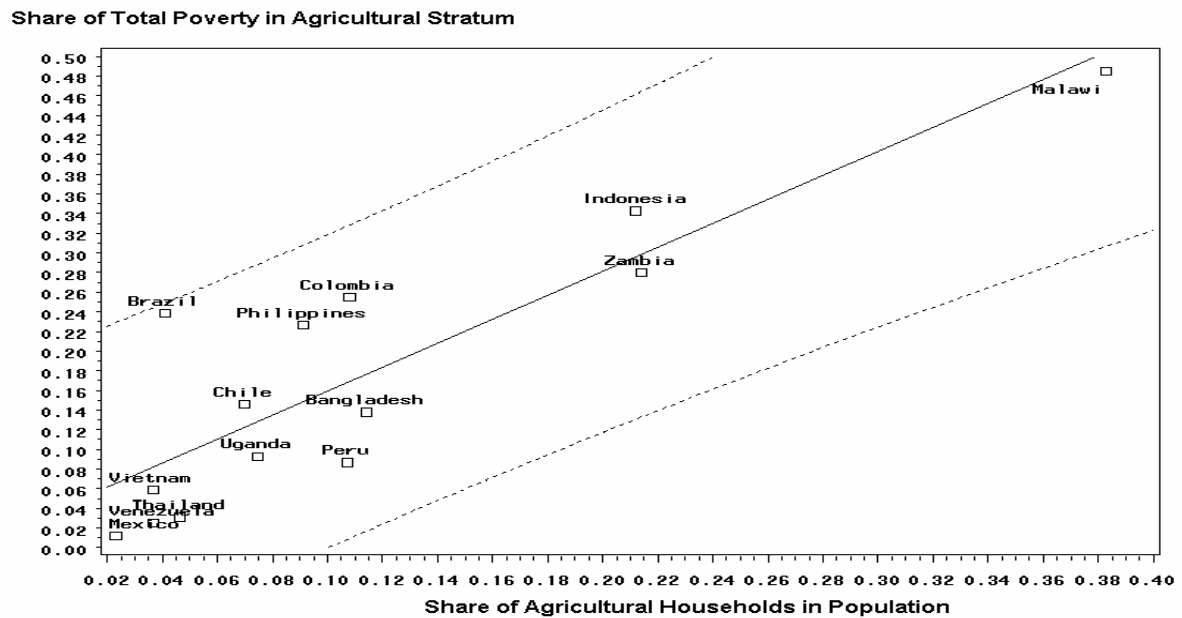


Figure 4. Correlation Between the Overall Poverty Rate and GDP/Capita

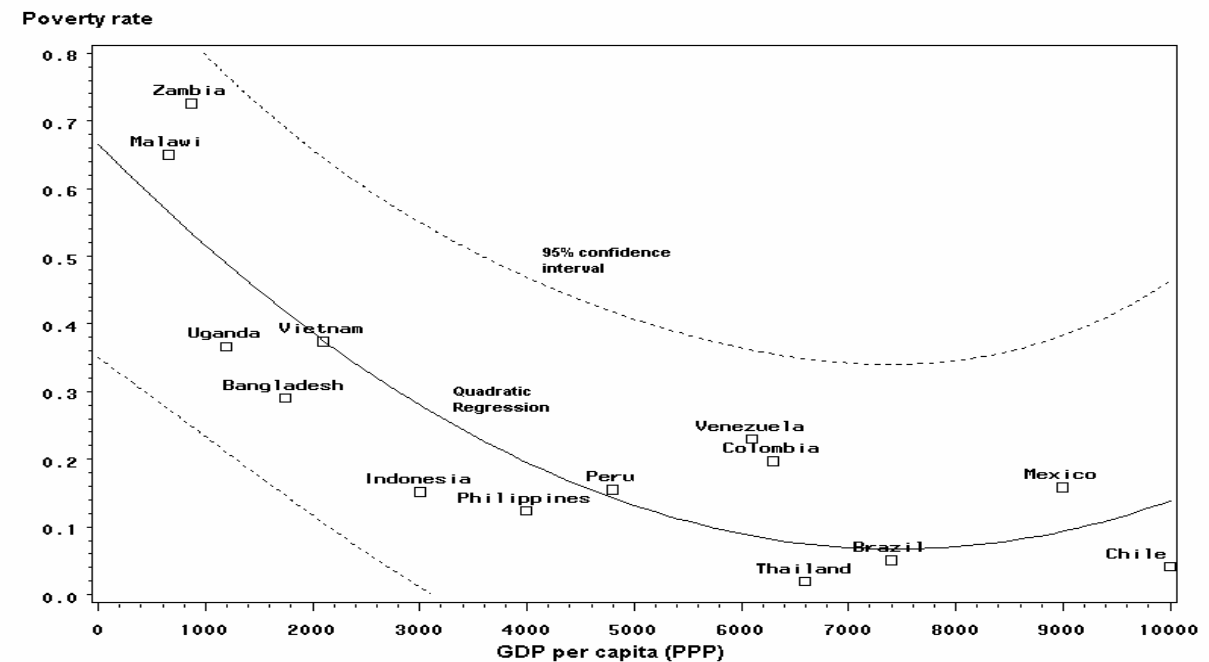


Figure 5. Total poverty rate vs. poverty rate among transfer specialized households (line denotes locus of points with equal poverty rates)

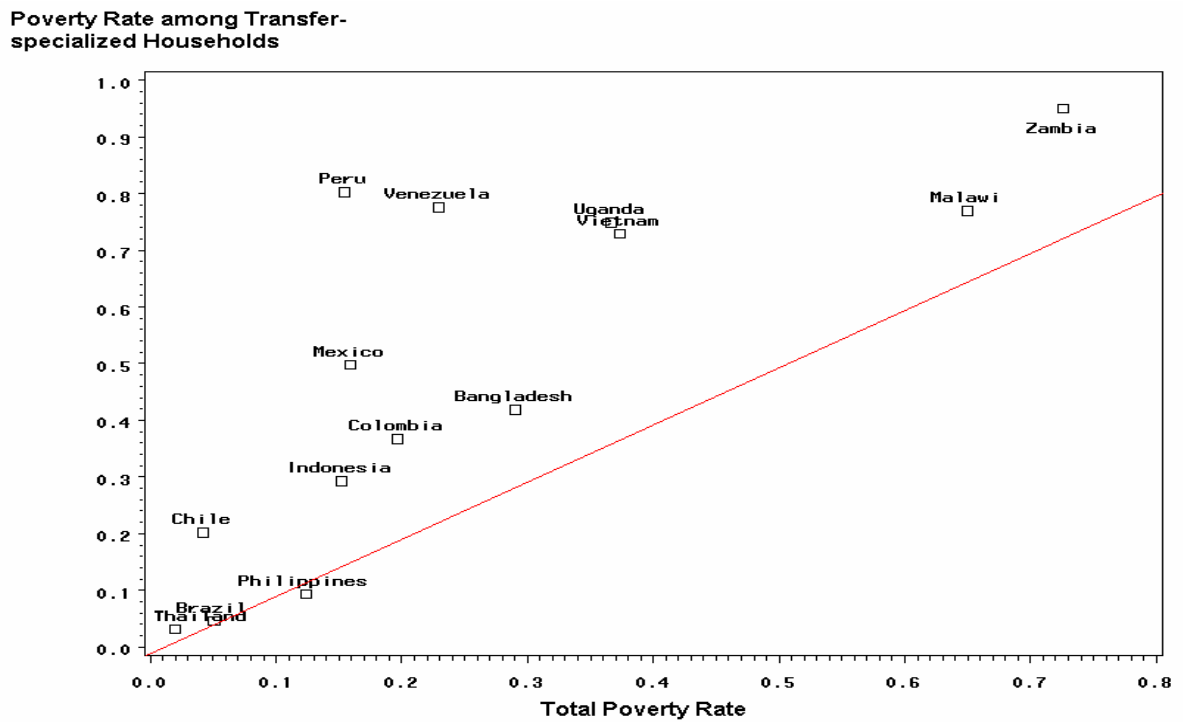


Figure 6. Total poverty rate vs. poverty rate among agr specialized households (line denotes locus of points with equal poverty rates)

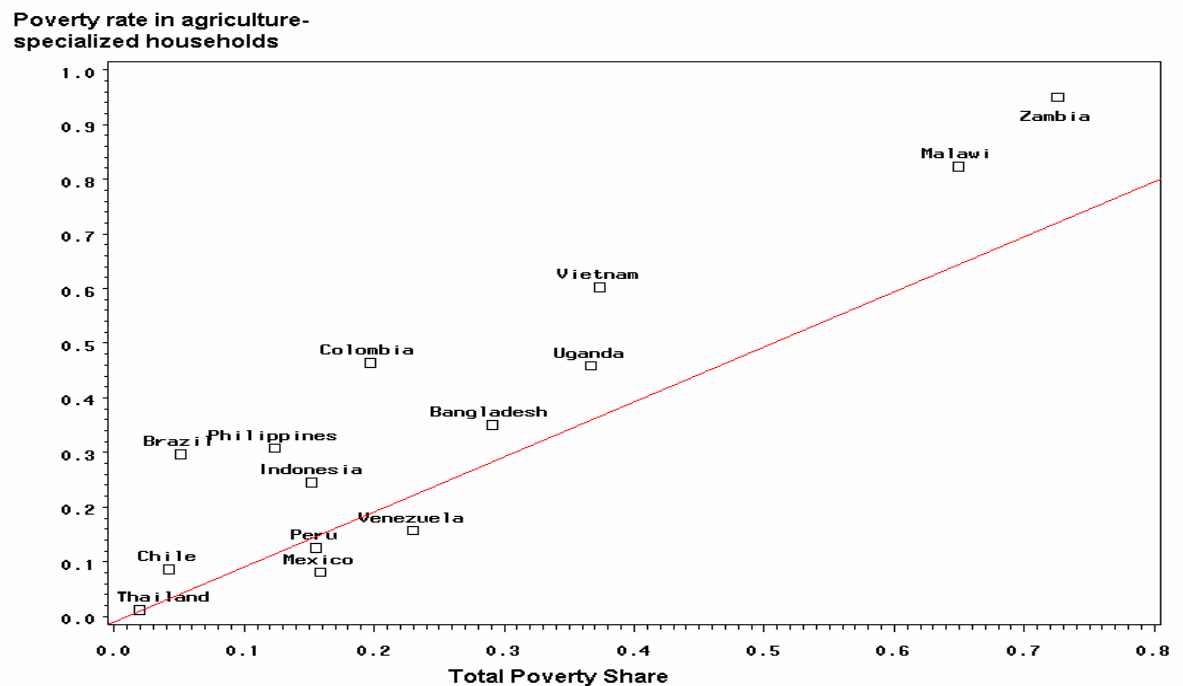


Figure 7. Total poverty rate vs. poverty rate among diversified households (line denotes locus of points with equal poverty rates)

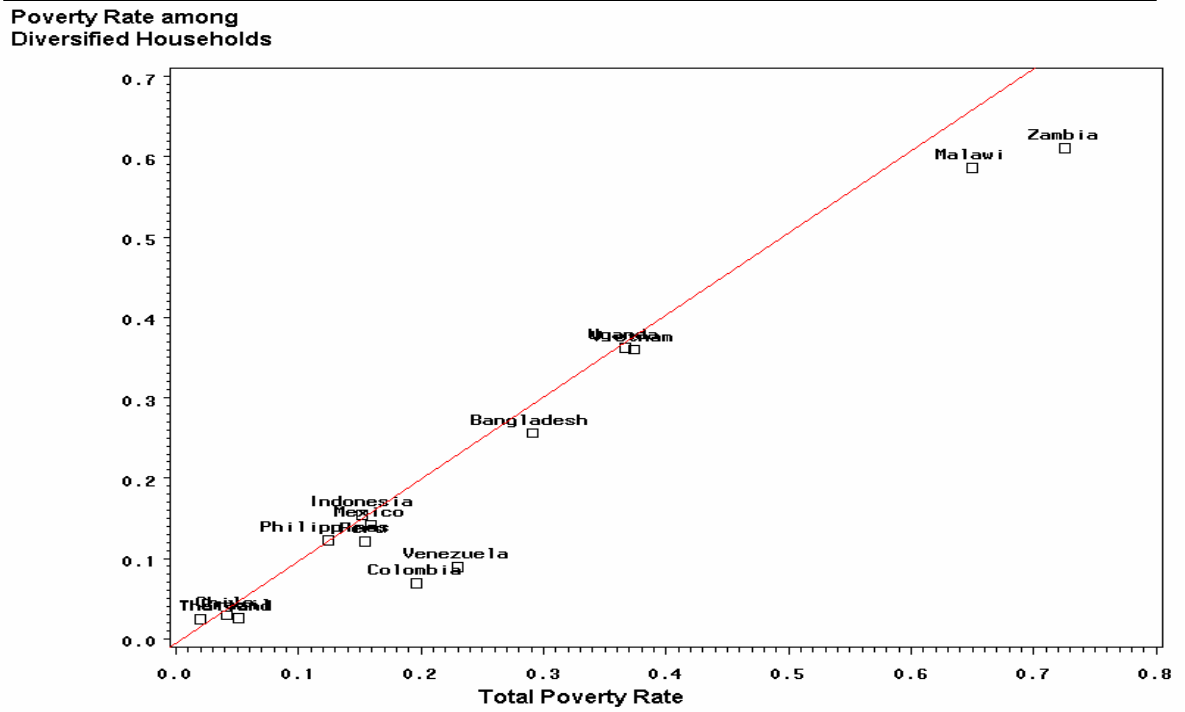


Figure 8. Total poverty rate vs. poverty rate among labor specialized households (line denotes locus of points with equal poverty rates)

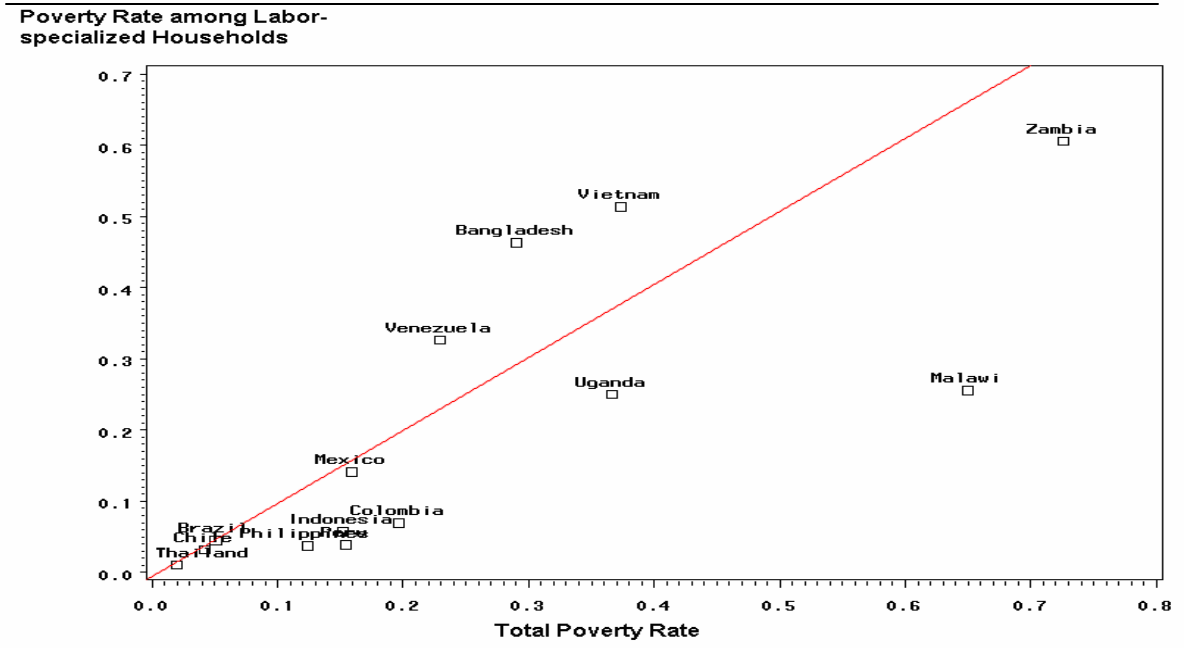


Figure 9. Total poverty rate vs. poverty rate among nonagr specialized households (line denotes locus of points with equal poverty rates)

Poverty Rate among Non-agriculture Business-specialized Households

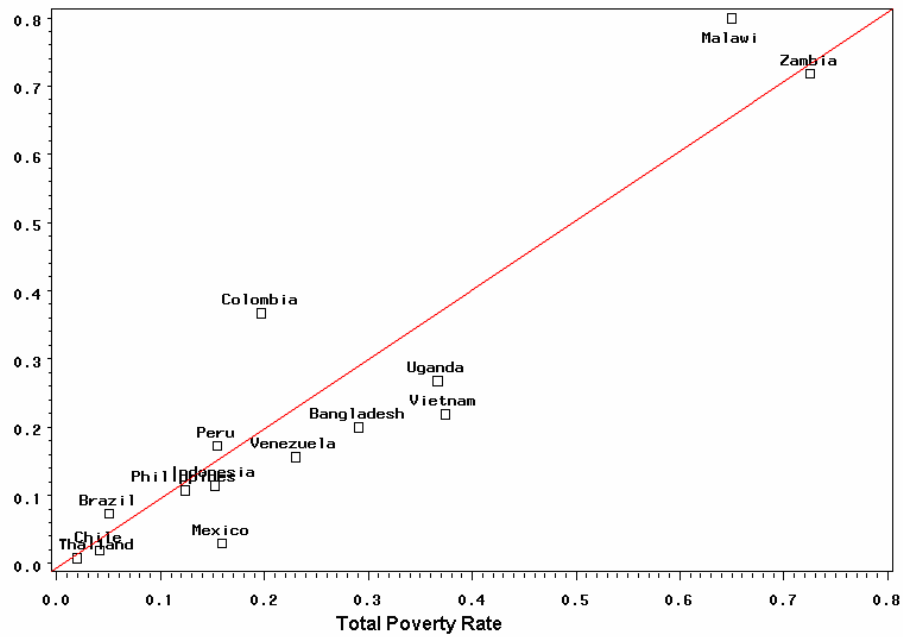


Table 1. Structure of Poverty in Fourteen Developing Countries

Share of total population Share of total poverty Poverty rate	Stratum						
	GDP PPP per capita	Agricul- tural	Nonagr.	Labor	Transfer	Diversified	Total
	Gini Coef.						
Malawi	660 0.8271	0.38 0.49 0.82	0.07 0.08 0.80	0.15 0.06 0.26	0.05 0.06 0.77	0.35 0.31 0.59	=1 =1 0.65
Zambia	870 0.6867	0.21 0.28 0.95	0.25 0.25 0.72	0.23 0.19 0.61	0.05 0.06 0.95	0.26 0.22 0.61	=1 =1 0.73
Uganda	1200 0.6446	0.07 0.09 0.46	0.04 0.03 0.27	0.04 0.03 0.25	0.02 0.03 0.75	0.83 0.82 0.36	=1 =1 0.37
Bangladesh	1750 0.4695	0.11 0.14 0.35	0.16 0.11 0.20	0.14 0.23 0.46	0.02 0.03 0.42	0.56 0.50 0.26	=1 =1 0.29
Vietnam	2100 0.5096	0.04 0.06 0.60	0.04 0.02 0.22	0.05 0.06 0.51	0.01 0.02 0.73	0.87 0.84 0.36	=1 =1 0.37
Indonesia	3000 0.4266	0.21 0.34 0.25	0.15 0.11 0.11	0.18 0.07 0.06	0.01 0.03 0.30	0.44 0.45 0.15	=1 =1 0.15
Philippines	4000 0.5141	0.09 0.23 0.31	0.06 0.05 0.11	0.17 0.05 0.04	0.02 0.02 0.09	0.66 0.65 0.12	=1 =1 0.12
Peru	4800 0.5489	0.11 0.09 0.13	0.21 0.23 0.17	0.15 0.04 0.04	0.05 0.26 0.80	0.49 0.38 0.12	=1 =1 0.16
Venezuela	6100 0.4913	0.04 0.03 0.16	0.19 0.13 0.16	0.35 0.49 0.33	0.06 0.21 0.78	0.36 0.14 0.09	=1 =1 0.23
Colombia	6300 0.4695	0.11 0.26 0.46	0.23 0.43 0.37	0.28 0.10 0.07	0.05 0.10 0.37	0.33 0.12 0.07	=1 =1 0.20
Thailand	6600 0.5391	0.05 0.03 0.01	0.08 0.03 0.01	0.21 0.12 0.01	0.05 0.08 0.03	0.61 0.74 0.02	=1 =1 0.02
Brazil	7400 0.5369	0.04 0.24 0.30	0.10 0.15 0.07	0.35 0.31 0.05	0.11 0.10 0.05	0.40 0.20 0.03	=1 =1 0.05
Mexico	9000 0.7346	0.03 0.01 0.06	0.11 0.02 0.02	0.38 0.35 0.15	0.08 0.25 0.52	0.41 0.37 0.15	=1 =1 0.16
Chile	10000 0.5457	0.07 0.15 0.09	0.08 0.04 0.02	0.26 0.19 0.03	0.05 0.24 0.20	0.55 0.39 0.03	=1 =1 0.04
Simple Average	4556 0.5674	0.11 0.17 0.35	0.13 0.12 0.23	0.21 0.16 0.20	0.04 0.11 0.48	0.51 0.44 0.21	=1 =1 0.25
Population Weighted Average	4692 0.5231	0.10 0.19 0.29	0.12 0.11 0.14	0.22 0.17 0.17	0.04 0.08 0.34	0.51 0.45 0.16	=1 =1 0.18

Table 2. Average Rates of Import Protection, by Sector and Country

Country	Share in World Exports	Primary AG	Primary Nonag	Proc food	Textiles, apparel	Other Manuf.
Malawi	0.000	23	12	24	35	22
Uganda	0.000	40	13	15	19	16
Zambia	0.000	6	13	11	20	13
Rest of Subsah. Africa	0.014	19	11	24	21	13
Bangladesh	0.001	14	20	24	29	15
Indonesia	0.009	7	7	15	16	10
Philippines	0.008	14	7	18	14	6
Thailand	0.012	22	11	37	27	13
Vietnam	0.002	14	15	43	34	14
Rest of Asia*	0.123	22	9	16	16	7
Brazil	0.013	8	8	16	15	19
Chile	0.004	11	11	12	11	11
Colombia	0.003	13	10	19	17	12
Mexico	0.017	18	3	31	4	3
Peru	0.002	14	12	14	16	13
Venezuela	0.003	13	11	16	18	16
Rest of America**	0.020	10	10	18	19	14
Other LDC's	0.046	39	10	54	19	10
OECD***	0.702	16	2	21	10	2
Former Soviet Union	0.021	7	7	10	17	10
World	1.000	18	4	22	12	4
Share of Total Exports		0.05	0.35	0.06	0.07	0.47

*Excludes Japan, Korea in OECD

**Excludes USA, Canada in OECD

***Excludes Mexico

Table 3. Impacts of Global Trade Liberalization on Key Variables (% Change)

Country	Per capita Earnings	Effects CPI	Real In	Relative Earnings Impacts				Relative Spending Impacts		
				agrprofit	nagrprofit	unsklabor	sklabor	food	Mnfcs	svces
Bangladesh	-1.7	-2.0	0.3	0.1	0.0	-0.3	-0.2	0.3	-7.8	2.1
Brazil	1.2	0.3	0.9	12.5	-1.4	-1.1	-1.1	4.0	-3.4	0.4
Chile	3.5	3.4	0.1	16.8	-1.8	-0.7	-1.8	5.4	-4.9	0.4
Colombia	-0.2	-0.6	0.3	9.8	-1.0	-0.6	-1.1	2.3	-3.5	0.8
Indonesia	4.2	3.5	0.7	1.5	-0.7	0.8	0.1	2.8	-7.5	0.5
Malawi	3.1	0.9	2.2	7.8	-5.1	-0.2	-1.7	5.7	-10.3	3.5
Mexico	-2.5	-2.3	-0.2	-2.6	0.4	0.0	0.0	-0.9	-1.3	1.0
Peru	5.4	6.3	-1.0	0.6	0.0	-1.3	-2.0	11.3	-5.3	-2.1
Philippines	3.0	2.9	0.1	2.7	-0.8	0.9	-1.2	2.1	-6.0	0.9
Thailand	1.7	0.5	1.2	6.7	-0.7	-0.1	-2.4	2.3	-5.2	3.9
Uganda	2.9	2.5	0.5	-0.4	0.0	-0.1	0.6	1.0	-7.6	0.3
Venezuela	0.4	0.4	0.0	5.8	-0.5	-0.6	-1.3	0.8	-2.6	1.0
Vietnam	49.9	37.8	12.0	-22.6	0.6	3.5	0.1	-10.3	-39.8	24.2
Zambia	3.0	2.2	0.9	1.7	-1.1	-1.3	-1.3	1.5	-4.7	0.5

Table 4. Poverty Headcount As A Proportion Of Total Population, By Country And Stratum

	Total	Agr	Nagr	Labor	Transf	Diverse
Bangladesh	0.29	0.04	0.03	0.07	0.01	0.14
Brazil	0.05	0.01	0.01	0.02	0.01	0.01
Chile	0.04	0.01	0.00	0.01	0.01	0.02
Colombia	0.20	0.05	0.09	0.02	0.02	0.02
Indonesia	0.15	0.05	0.02	0.01	0.00	0.07
Malawi	0.65	0.32	0.06	0.04	0.04	0.20
Mexico	0.16	0.00	0.00	0.06	0.04	0.06
Peru	0.16	0.01	0.04	0.01	0.04	0.06
Philippines	0.12	0.03	0.01	0.01	0.00	0.08
Thailand	0.02	0.00	0.00	0.00	0.00	0.02
Uganda	0.37	0.03	0.01	0.01	0.01	0.30
Venezuela	0.23	0.01	0.03	0.11	0.05	0.03
Vietnam	0.37	0.02	0.01	0.02	0.01	0.31
Zambia	0.73	0.20	0.18	0.14	0.05	0.16

Table 5. Impact of Per Capita Earnings and Spending Effects on Poverty (Change in Number of Poor, Relative to Total Population, in Percent)

Country	Total	Agr	Nagr	Labor	Transf	Diverse
Bangladesh	-0.5	-0.5	-0.7	-0.3	-0.2	-0.6
Brazil	-1.1	-0.9	-1.8	-0.9	-1.0	-1.2
Chile	-0.1	-0.2	-0.1	-0.1	0.0	-0.1
Columbia	-0.3	-0.3	-0.2	-0.7	-0.2	-0.6
Indonesia	-1.5	-1.4	-1.6	-1.9	-1.3	-1.5
Malawi	-1.0	-0.7	-0.4	-2.9	-0.5	-1.5
Mexico	0.3	0.2	0.2	0.4	0.2	0.3
Peru	0.3	0.6	0.2	0.4	0.1	0.3
Philippines	-0.5	-0.4	-0.4	-0.2	-0.4	-0.5
Thailand	-1.6	-3.7	-2.5	-1.8	-1.4	-1.4
Uganda	-0.6	-0.4	-0.7	-0.6	-0.2	-0.6
Venezuela	0.0	0.0	0.0	0.0	0.0	0.0
Vietnam	-15.1	-7.2	-16.8	-9.7	-4.2	-16.3
Zambia	-0.3	0.0	-0.3	-0.5	0.0	-0.5

Table 6. Impact of Per Capita Earnings and True Spending Effects on Poverty (Change in Number of Poor, Relative to Total Population, in Percent)

Country	Total	Agr	Nagr	Labor	Transf	Diverse
Bangladesh	-0.2	-0.2	-0.3	-0.1	-0.1	-0.2
Brazil	0.1	0.1	0.2	0.1	0.1	0.1
Chile	1.5	2.7	1.6	1.5	0.7	1.6
Columbia	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1
Indonesia	0.2	0.2	0.2	0.2	0.2	0.2
Malawi	-0.5	-0.3	-0.2	-1.4	-0.2	-0.7
Mexico	-0.4	-0.3	-0.3	-0.6	-0.2	-0.5
Peru	1.4	3.0	1.1	2.4	0.6	1.8
Philippines	0.0	0.0	0.0	0.0	0.0	0.0
Thailand	7.6	18.2	12.3	8.6	6.9	6.9
Uganda	-0.7	-0.5	-0.8	-0.7	-0.2	-0.7
Venezuela	0.1	0.2	0.1	0.1	0.1	0.2
Vietnam	-13.8	-6.6	-14.8	-8.9	-3.8	-14.8
Zambia	-0.3	0.0	-0.3	-0.5	0.0	-0.5

Table 7. Impact of Stratum Average Earnings and True Spending Effects on Poverty (Change in Number of Poor, Relative to Total Population, in Percent)

Country	Total	Agr	Nagr	Labor	Transf	Diverse
Bangladesh	-0.2	-0.4	-0.5	0.1	-0.1	-0.2
Brazil	-2.8	-14.0	1.8	1.2	0.1	-0.2
Chile	-2.6	-26.2	3.2	2.6	0.6	1.2
Columbia	-2.1	-9.2	0.4	1.4	-0.1	0.1
Indonesia	-1.2	-2.8	1.2	-1.3	0.2	-0.6
Malawi	-1.8	-2.8	0.3	0.3	-0.2	-1.4
Mexico	-0.3	2.7	-0.8	-0.6	-0.2	-0.2
Peru	1.5	2.1	0.9	4.3	0.6	2.0
Philippines	-1.4	-5.9	0.9	0.3	0.0	-0.1
Thailand	7.0	-4.6	13.0	10.5	6.9	6.7
Uganda	-0.7	-0.3	-1.2	-0.9	-0.2	-0.8
Venezuela	0.3	-9.6	0.4	1.0	0.1	-0.1
Vietnam	-7.7	10.8	-21.1	-10.6	-3.8	-8.5
Zambia	-0.1	0.0	-0.3	0.2	0.0	-0.3

Table 8. Impact of True Earnings and Spending Effects on Poverty (Change in Number of Poor, Relative to Total Population, in Percent)

Country	Total	Agr	Nagr	Labor	Transf	Diverse
Bangladesh	-0.1	-0.4	-0.4	0.1	-0.1	-0.1
Brazil	-2.4	-11.4	2.9	1.2	0.1	-2.2
Chile	-3.9	-25.0	3.4	2.3	0.7	-2.4
Columbia	-2.2	-8.9	0.5	1.0	-0.1	-2.1
Indonesia	-1.5	-2.8	1.8	-1.6	0.2	-1.4
Malawi	-2.0	-2.6	0.4	-0.7	-0.2	-2.5
Mexico	-0.2	2.5	-0.8	-0.7	-0.2	0.2
Peru	1.4	2.2	1.1	3.9	0.6	1.8
Philippines	-3.1	-5.2	1.1	-0.9	0.0	-3.0
Thailand	5.7	-0.2	13.6	8.8	6.9	4.9
Uganda	-0.5	-0.2	-0.8	-0.7	-0.2	-0.5
Venezuela	0.3	-9.1	0.6	0.8	0.1	0.5
Vietnam	-5.6	10.9	-16.0	-11.1	-3.8	-6.1
Zambia	0.0	0.0	-0.1	0.2	0.0	-0.1

Table 9. Approximating National Poverty Changes using True vs. Sample Average Population Weights for Each Stratum

Country	True weights	Average weights	True/Average
Bangladesh	-0.10	-0.13	1.25
Brazil	-2.39	-2.41	1.01
Chile	-3.87	-4.54	1.17
Colombia	-2.23	-2.27	1.02
Indonesia	-1.47	-1.11	0.76
Malawi	-2.03	-1.61	0.79
Mexico	-0.21	0.27	-1.27
Peru	1.43	2.00	1.39
Philippines	-3.14	-2.23	0.71
Thailand	5.68	5.93	1.04
Uganda	-0.49	-0.50	1.02
Venezuela	0.34	-1.16	-3.38
Vietnam	-5.60	-4.92	0.88
Zambia	-0.01	-0.03	4.20