**Session 1:** 2. Measurement issues

a. The welfarist approach: theoretical foundations

***Review:*** ***Pareto efficiency***

1. Define pareto efficiency.

2. Assume an economy contains two people and two goods, *X* & *Y*. Person A likes good *X* but does not care about good *Y*. Person B likes *Y* but does not like *X*. Which allocation is pareto efficient and why?

3. Assume an economy contains of two people and two goods, *X* and *Y*. Both people like both goods but value them differently. For person A, *X* is exactly equivalent to two *Y*. She is indifferent between any bundles *(x, y)* and *(x-n, y+2n)* where *x* is some number of good *X* and *y* is some number of *Y*. For person B, two *X* is exactly equivalent to one *Y*. Under what condition would an allocation be pareto efficient? What are the potential pareto efficient scenarios?

4. Assume two persons, person A and person B, and two goods, *X* & *Y*, the quantities of which are denoted by *x* and *y*. Person A and person B each own 100 units of the *Y*-good. Person A owns 12 units of the *X*-good; person B owns 3 units. Their preferences are described by the utility functions.

   $u_A(x_A, y_A) = y_A + 60x_A - 2x_A^2$ and $u_B(x_B, y_B) = y_B + 30x_B - x_B^2$

   Note that their marginal rates of substitution are $MRS_A=60-4x_A$ and $MRS_B=30-2x_B$.

Determine the entire set of pareto efficient allocations (you may do this via the MRS conditions.) Depict the set in an Edgeworth box diagram (Use different scales on the x- and y-axes).

1. What are the issues and concerns with the pareto criterion as a measure of welfare?

2. What are the main ideas of the Theory of Collective Choice?

3. Explain the concept of transitivity.

4. Explain the axiom of the independence of irrelevant alternatives.

5. What does Arrow's Impossibility Theorem say?

6. What is the basic idea behind the welfarist approach to measure wellbeing?

7. Is income a good measure of well-being? If so, why? If not, why not? Discuss.

**Session 2:** 2. Measurement issues

c. Measures of inequality and poverty

*Review:* *Lorenz curve and Gini coefficient*

1. Draw the Lorenz curve and calculate the Gini coefficient based on the following income distribution

| Income group | % of total income received |
|---|---|
| Top 20% | 42.7 |
| 4th 20% | 24.4 |
| 3rd 20% | 17.1 |
| 2nd 20% | 11.1 |
| Bottom 20% | 4.7 |

   - Which country do you think this distribution represents?

2. The Gini coefficient is the most commonly used measure of inequality. However, what are the main drawbacks of this measure? What are alternative measures of inequality?

**Poverty measures**

**Problem 1:**

a) Define absolute and relative poverty.

b) What is a poverty line?

c) How will you interpret these two expressions:

$$\frac{\sum_{y_i<p}(p-y_i)}{nm} \text{ and } \frac{\sum_{y_i<p}(p-y_i)}{pHC}$$

when $p$ is the poverty line $y_i$ it the income of person $i$, $n$ is the total population, $m$ is the average income and $HC$ is the poverty head count.

d) Which of the above measures would you prefer if you wanted to measure the depths of poverty?

**Problem 2:**

a) Below are the incomes of 30 inhabitants in country A.

| # | Income | # | Income | # | Income | # | Income | # | Income | # | Income |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 1 | **6** | 4 | **11** | 28 | **16** | 84 | **21** | 165 | **26** | 1,637 |
| **2** | 1 | **7** | 6 | **12** | 31 | **17** | 85 | **22** | 216 | **27** | 1,642 |
| **3** | 2 | **8** | 9 | **13** | 32 | **18** | 90 | **23** | 232 | **28** | 2,327 |
| **4** | 2 | **9** | 10 | **14** | 42 | **19** | 122 | **24** | 320 | **29** | 2,482 |
| **5** | 3 | **10** | 10 | **15** | 65 | **20** | 136 | **25** | 1,099 | **30** | 7,117 |

Assume the poverty line is 100.

- Calculate the poverty head count, the poverty head count ratio and the poverty gap.
- Calculate the Foster-Greer-Thorbecke measure with alpha=2

b) Below are the incomes of 10 inhabitants in country B.

| # | Income | # | Income |
|---|---|---|---|
| **1** | 90 | **6** | 96 |
| **2** | 91 | **7** | 98 |
| **3** | 93 | **8** | 102 |
| **4** | 95 | **9** | 140 |
| **5** | 95 | **10** | 300 |

Assume the poverty line is still 100.

- What is the poverty head count ratio and the poverty gap in this society?
- In which of the two countries would you say is poverty the largest problem?
- How high does an income tax on everybody in the society have to be in order to collect enough money to get everybody out of poverty?

**Problem 3:**

Use the 2014 World Development Report and find the 3 countries with the highest poverty measured by the fraction of the population living on less than 2.5 USD /day PPP. Compare the population living on less than 10 USD/day PPP in Nigeria and Sierra Leone. Which country is poorer?

**Problem 4:**

You are given the following information:

| **Poverty Indices by sub-groups, Madagascar, 1994** | | | | | | |
|---|---|---|---|---|---|---|
| | $P_0$ | Rank | $P_1$ | Rank | $P_2$ | Rank |
| **Small farmers** | 81.6 | 1 | 41.0 | 1 | 24.6 | 1 |
| **Large farmers** | 77.0 | 2 | 34.6 | 2 | 19.0 | 2 |
| **Unskilled Workers** | 62.7 | 3 | 25.5 | 4 | 14.0 | 5 |
| **Herders/fishermen** | 51.4 | 4 | 27.9 | 3 | 16.1 | 3 |
| **Retirees/handicapped** | 50.6 | 5 | 23.6 | 5 | 14.1 | 4 |
| Source: Coudouel, Hentschel and Wodon (2001) | | | | | | |

- How would you interpret the following table (comparing e.g. unskilled workers and herders)? Do you see any need for policy to intervene?

**Session 3:** 2. Measurement issues
d. The World Bank's poverty estimates

The IPC One pagers #52-54 (see tutorial folder in StudIP) summarize the debate between Sanjay Reddy, Thomas Pogge and Martin Ravallion on the quality and validity of the World Bank's poverty estimates.

Read the one pagers.

a) What are the main points of critique raised by Reddy and Pogge?

b) How compelling do you find their arguments in light of the response by Ravallion? Explain and justify.

c) Can you think of any other arguments challenging the validity of the World Bank's estimates?

d) You have seen a number different welfare measures in the lecture now, which one do you find the most compelling and why or what would you propose as measure to consider?

***Review Questions:***

| Which of the following is not a criticism that Reddy and Pogge have levied at the World Bank's approach to measuring world poverty? |
|---|
| A. Measured PPP exchange rates vary over time. |
| B. The $2/day standard is too low. |
| C. The data on poverty reduction on India are subject to considerable uncertainty. |
| D. The use of a consumer price index does not necessarily reflect the evolution of prices of the goods and services consumed by the poor. |

| The World Bank's approach to measuring world poverty requires less information from individual household surveys than would be required if one were to apply a cost of basic needs approach. |
|---|
| A. True |
| B. False |
| C. Uncertain |

The **second part** of the tutorial will consist of an **introduction to econometrics** covering the basic principles of regression analysis and interpretation. This session is optional and aimed at students without prior knowledge in econometrics.

INTERNATIONAL
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One pager

May, 2008 Number 52

# Are Estimates of Poverty in Latin America Reliable?

*by Sanjay Reddy,*
*Barnard College, Columbia University*

**What is the level** of income poverty in Latin America and has it been decreasing? Are current estimates reliable?

The most influential approach to gauging income poverty regionally as well as globally uses the World Bank's international poverty lines of 'one-dollar-a-day' and 'two-dollars-a-day' per person. The Bank uses 'purchasing power parity' (PPP) factors to translate these international lines into local currencies.

The Bank's estimates for Latin America suggest that 8.6 per cent of the region's population was in extreme poverty (living on less than one dollar a day) in 2004 while 22.2 per cent was in poverty (living on less than two dollars a day) (see Table). By comparison, extreme poverty affected 10.8 per cent of the region's population in 1981 and poverty affected 28.5 per cent.

The pace of poverty reduction in Latin America was thus slow—slower than in the entire world. The global percentage of the poor fell from 67 per cent in 1981 to 48 per cent in 2004, with extreme poverty falling from 40 per cent to 18 per cent.

Unfortunately, the Bank's method has serious problems. The most basic is the arbitrary nature of its approach to identifying the poor. In the United States, the reference country for setting the Bank's international poverty lines, even two-dollars-a-day does not reflect the real costs of meeting the basic requirements of a human being.

The 'thrifty food plan' of the U.S. Department of Agriculture estimates the costs just for food at a much higher level than $2 a day per person. PPP adjustments also distort the results since the costs of food items (which are internationally traded) are much higher in developing countries than this method (which gives great weight to the low cost of services there) suggests.

Thankfully, there is an alternative to the Bank's approach, i.e., the poverty estimates of the Economic Commission for Latin America and the Caribbean (ECLAC). While it has its own deficiencies, ECLAC's approach tries, at least, to use nutritionally anchored poverty lines that capture better the local cost of purchasing basic foodstuffs. It thus better captures the real requirements of human beings.

ECLAC poverty estimates for Latin America are invariably higher than those of the Bank. In 2005, the former suggest that almost

**Share of the Population in Latin America in Extreme and Overall Poverty**

| World Bank Estimates | 1981 | 2004 |
|---|---|---|
| $1 a day line | 10.8 | 8.6 |
| $2 a day line | 28.5 | 22.2 |
| **ECLAC Estimates** | **1990** | **2005** |
| Lower Poverty Line | 18.0 | 15.4 |
| Upper Poverty Line | 41.0 | 39.8 |

Source: Reddy and Pogge.

40 per cent of the population was poor (compared to about 22 per cent in 2004 for the Bank) and about 15 per cent was extremely poor (compared to 8.6 per cent for the Bank).

Unfortunately, the ECLAC method has its own flaws. It assumes, for instance, that all households have the same demographic composition. And it estimates non-food requirements in an *ad hoc* manner so that allowances for such requirements vary widely among countries. A third approach (Reddy and Pogge, forthcoming) seeks to improve on the ECLAC method.

This alternative approach would carefully construct poverty lines within each country based on a common underlying conception of the real requirements of human beings. This means that each national poverty line would reflect the local cost requirements of achieving a specific set of universal basic human capabilities. However, the resulting estimates would be comparable because the capabilities would be defined globally.

An example is provided by the ability to be adequately nourished. In this case, the poverty line would reflect the local cost of purchasing commodities with a certain nutritional content. While being locally relevant, such a poverty line would also have a common meaning across space and time.

Thus, it would be possible—especially in contrast to the World Bank method—to conduct meaningful and consistent inter-country comparisons. Such an approach eliminates the need for PPPs, which are invariably arbitrary. Rather, it strengthens and coordinates national poverty estimates, by applying a common and well-grounded conception of poverty in all countries.

*Reference:*

Sanjay G. Reddy and Thomas Pogge (forthcoming). 'How Not to Count the Poor', in J. Stiglitz, S. Anand and P. Segal (eds.) *Debates in the Measurement of Poverty*, Oxford: Oxford University Press. Available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=893159>.

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May, 2008 Number 53

# Which Poverty Line? A Response to Reddy

*by Martin Ravallion, Development Research Group of the World Bank*

**Some years ago** a consensus emerged in the development community on the idea of an international poverty line of around $1 a day at purchasing power parity. This became the focus of the first Millennium Development Goal (MDG), which calls for halving the 1990 $1 a day poverty rate by 2015.

In a recent IPC One Pager, "Are Estimates of Poverty in Latin America Reliable?", Sanjay Reddy asserts that this poverty line is "arbitrary" and "unreliable." He feels that the line is too low to reflect well the cost of not being considered poor in Latin America.

Reddy neglects to point out that the $1 a day line is not intended for measuring poverty in Latin America by the standards most Latin Americans would consider appropriate. The $1 a day line was explicitly designed to be representative of the poverty lines found in the poorest stratum of countries, none of which are in Latin America. While the latest available estimates indicate that about one fifth of the population of the developing world lives below $1 a day line, the figure is less than 10 per cent in Latin America (although that is still a lot of very poor people).

In measuring absolute income poverty in the world as a whole, there is a compelling case for treating any two people with the same real income the same way, even when they live in different countries. We need a common yardstick.

It is explicitly acknowledged by the World Bank that $1 a day is a frugal line. One could hardly argue that those people who are poor by the standards of the poorest countries are not in fact poor. This gives the $1 a day line a salience in focusing on the world's poorest that a higher line would not have. At the other extreme, suppose instead that one judged poverty in the poorest countries by (say) US standards. Learning that 95 per cent or more of the population is poor by this standard is unlikely to have much relevance in a poor country, given that US standards of living are not within most people's foreseeable reach.

Reddy claims there is a better approach, though he does not say much about the details. He refers to his paper with Thomas Pogge, which in turn cites Reddy et al. (2006), where one finds details on the preferred "capability approach." This entails calculating the cost of a country-specific food bundle for the poorest stratum of households in that country whose diets are deemed to be nutritionally adequate. To this food poverty line he adds an allowance for non-food spending consistent with the spending patterns of those near the food-poverty line. The key feature for Reddy is that a common nutritional cut-off point—he uses 2100 calories per person per day— should be used for all countries.

But hold on, this is sounding very similar to how most countries currently measure poverty. Indeed, it is the method used by 80 per cent of the country-specific poverty assessments summarized in Ravallion et al. (2008). The resulting national poverty measures are compiled in the World Bank's *World Development Indicators*, side-by-side with the international "$1 a day" numbers. It seems that Sanjay Reddy has reinvented the wheel.

Reddy also ignores an important problem: the purchasing power over commodities of the poverty lines generated by his preferred method is demonstrably not constant across countries. The reason is clearly not different nutritional cut offs, which do not vary much, but rather that there are multiple ways of reaching 2100 calories, implying very different standards of living. Unsurprisingly, people in richer countries tend to consume more expensive calories, and this is reflected in poverty lines. Across countries, the real income elasticity of the food poverty lines is 0.5; the elasticity of the non-food component of the poverty line is even higher, at 0.9 (Ravallion et al., 2008).

Thus two people with the same real income but living in different countries will not be treated the same way by Reddy's proposed method; typically the person living in the poorer country will be less likely to be deemed poor.

All this just brings us back to the key question: by which definition should we measure poverty in the world as a whole? The first MDG is implicitly saying that we should start with the definition found in the poorest countries, and give priority to bringing everyone in the world up to that standard. Once that is (hopefully) done, we can move to the task of bringing everyone up to the level of living needed to escape poverty in Latin America, by Latin American standards. We have a long way to go.

*References:*

Ravallion, Martin, Shaohua Chen and Prem Sangraula, 2008, "Dollar a Day Revisited," Policy Research Working Paper, World Bank, Washington DC. Available at <http://econ.worldbank.org/docsearch>.

Reddy, Sanjay G., Sujata Visaria and Muhammad Asali, 2006, "Inter-Country Comparisons of Income Poverty Based on a Capability Approach," Department of Economics, Barnard College. Available at <http://ssrn.com/abstract=915406>.

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May, 2008 Number 54

# A Consistent Measure of Real Poverty:

## A Reply to Ravallion

*by Thomas Pogge,*
*Australian National University*

**In 1961,** the United States Department of Agriculture published an Economy Food Plan carefully designed "as a nutritionally adequate diet for short-term or emergency use" for poor people. This diet was updated and later re-branded as the Thrifty Food Plan. The lowest cost stated for this minimal diet was $80.40 per person per month in 1999.

The relevant equivalent of the World Bank's $1 a day poverty line is $37.75 per person per month in 1999, and $49 today. This is clearly not enough to cover the basic nutritional and other needs of human beings in the US.

Is an equivalent to these amounts enough in poor countries? Obviously not, if "equivalent" means equally capable of meeting basic human needs. The $1 a day measure, however, relies on another notion of equivalence, which involves two conversions: converting any amount in local currency units (LCUs), via the national consumer price index (CPI), into its equivalent in some base year (currently 1993), and then converting the result, via 1993 purchasing power parities (PPPs), into 1993 US$s.

Imagine a simple world with three commodities: *necessaries*, *discretionaries*, and *services* (always in this order). If their prices do not move in lockstep, the CPI will reflect a weighted average of their price movements, based on the national spending pattern. By relying on the CPI, the $1 a day measure loses track of the price of necessaries. Falling prices of discretionaries (e.g., consumer electronics) may lead to a falling CPI even while rising biofuel demand is raising food prices. Poor people on constant incomes become poorer relative to what they need to buy, yet richer by the calculations of the $1 a day method.

Suppose the prices of the three commodities are LCU 5, 6 and 1 in some poor country and $3, $4 and $9 in the US. What is the PPP? Here again the answer depends on the spending pattern—in *both* countries. Suppose this pattern, in per cent, is 30, 50 and 20 in the poor country and 10, 50, and 40 in the US. This yields a PPP of 1.55; so the $1 a day measure will take each LCU to be equivalent to $1.55. But in reference only to necessaries, priced at LCU 5 and $3, each LCU is worth only 60 cents! Again, many who are very poor, relative to what they really need to buy, may not show up in the $1 a day statistics.

What is going wrong? Intuitively, income poverty (in the rock-bottom sense here at issue) is a function of what necessaries a person can buy. Through its reliance on CPI and PPP calculations, the $1 a day measure allows far too much influence to the prices of non-necessaries consumed in the same society. Through its reliance on PPPs, it also allows far too much influence to spending patterns in the US (and indeed in all other countries included in the PPP exercise). In our example, one LCU, though it buys only 60 cents worth of necessaries, is assigned much greater value because services are so expensive in the US ($9 versus LCU 1) and because US residents spend a lot on services. But should a poverty criterion be influenced so heavily by facts about prices and consumption of services that the poor do not need and do not consume?

Perhaps the best evidence one can have against any method is that its applications can deliver massively divergent results. The two notions of equivalence invoked in CPI and PPP calculations rely on very different (national and global) spending patterns. As a consequence, the comparison of two amounts in different years and countries varies with the base year chosen for the PPP conversion. One can use the CPIs of the two countries to convert into 1993 amounts and then compare via 1993 PPPs. Or one can use CPIs to convert into any other year and then do the comparison in PPPs of that year. One can get as many different results as there are PPP exercises.

The magnitude of the base-year effect is observable, because the Bank has actually worked with two base years. Before 2000, $1 a day was defined in terms of $31 PPP 1985, after 1999 as $32.74 PPP 1993. This switch of base year has caused large shifts in the relative position of national poverty lines. For example, using 1993 rather than 1985 as the base year raises all Chinese amounts—prices, incomes, consumption expenditures—in all years by 31 per cent relative to all Bangladeshi amounts in all years. And conversely, using 1985 rather than 1993 as the base year raises all Bangladeshi amounts in all years by 31 per cent relative to all Chinese amounts in all years. The $1 a day poverty assessment depends then on yet another irrelevancy: on the arbitrary choice of PPP base year.

Given the first Millennium Development Goal, millions of lives are at stake in counting the poor. Doing this requires a much more direct method than the $1 a day—a method that considers only the income a household has and the prices of the necessaries it might buy. A household is income-poor if it has no way of spending its money so that the basic needs of its members are fulfilled.

Ravallion is right; there are multiple ways of reaching 2100 calories. But this is irrelevant if the direct method focuses solely on the *cheapest* way each household has to get there.

Ravallion is also right to insist on a uniform criterion of income poverty, focused on the real income of the poor. Only the direct method achieves a consistent focus on what really matters: sufficiency for meeting basic human needs.

*References:*

Reddy, Sanjay G. and Pogge, Thomas (forthcoming). "How Not to Count the Poor", in J. Stiglitz, S. Anand and P. Segal (eds.) *Debates in the Measurement of Poverty*, Oxford: Oxford University Press. Available at <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=893159>.

Ravallion, Martin. (2008). "Which Poverty Line? A Response to Reddy". One Pager 53, International Poverty Centre, Brasilia. Availabel at <http://www.undp-povertycentre.org/pub/IPCOnePager53.pdf>.

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**Session 4:**

## Data Exercise

A few things to get you started…

The data in the excel file contains a subset of information from the Household Survey 1998-99 that was conducted jointly by the Bangladesh Institute of Development Studies (BIDS) and the World Bank. The information was collected at individual, household and community level. The survey was a national representative survey.

- Using the data at hand determine the Lorenz curve and Gini.

The variable *pcexp* shows the per capita consumption in the household per month in taka. Assume the poverty line in Bangladesh is set at 5,000 taka.

- What is the poverty rate and the poverty gap?

To compare poverty measures over time, it is important that the poverty line itself represents similar levels of well-being over time and across groups. In Bangladesh three methods have been used to derive poverty lines for Bangladesh: direct caloric intake, food-energy intake and cost of basic needs. The following table gives a nutritional based in per capita terms, considered minimal for survival of a typical adult in a family in rural Bangladesh.

**Table A3.1 Bangladesh Nutritional Basket**

| Food items | Per capita normative daily requirements | | Average rural consumer price (taka/kilogram) |
|---|---|---|---|
| | Calories | Quantity (gram) | |
| Rice | 1,386 | 397 | 15.19 |
| Wheat | 139 | 40 | 12.81 |
| Pulses | 153 | 40 | 30.84 |
| Milk (cow) | 39 | 58 | 15.90 |
| Oil (mustard) | 180 | 20 | 58.24 |
| Meat (beef) | 14 | 12 | 66.39 |
| Fish | 51 | 48 | 46.02 |
| Potatoes | 26 | 27 | 8.18 |
| Other vegetables | 36 | 150 | 38.30 |
| Sugar | 82 | 20 | 30.49 |
| Fruit | 6 | 20 | 28.86 |
| Total | 2,112 | 832 | |

*Source:* Wodon 1997, 93.

- Use the quantity information from the data set and the calorie content information from the above table to calculate each household's per capita caloric intake (in Calories per day). (Hint: The unit in the data set is **kilograms per week**).

- Based on the information generated how many households would be considered poor? How does this compare to the poverty rate using the 5,000 taka poverty line?

- According to the basket in table A3.1 and the average rural consumer prices, how much money would a household of four need each day to meet its caloric requirements?

**Table A1.1 Data Description**

| Variable | hh.dta |
|---|---|
| hhcode | household identification number |
| thana | thana code—a *thana* is an administrative center comprising a number of villages—ranging from 1 to 32, as there are 32 thanas in this sample |
| vill | village code—when combined with thana it uniquely identifies a village—ranging from 1 to 4, as a maximum of four villages are selected from a thana |
| region | region code<br>1. Dhaka (the capital)<br>2. Chittagong<br>3. Khulna<br>4. Rajshahi |
| weight | sampling weight for household |
| distance | distance to nearest paved road (km) |
| d_bank | distance to nearest commercial/agricultural bank (km) |
| toilet | type of latrine used in the household<br>1. sanitary<br>2. nonsanitary |
| hhelec | if household has electricity<br>1. yes<br>2. no |
| hassetg | household total assets (in *taka*) |
| famsize | household size |
| sexhead | gender of household head<br>1. male<br>2. female |
| agehead | age of household head (years) |
| educhead | years of schooling of household head |
| hhlandd | land (in *decimals*, that is, one-hundredth of an acre) owned by household |

| Variable | ind.dta |
|---|---|
| pid | household member identification number (unique for a household member, so becomes unique in the sample after being combined with household id) |
| indsave | individual savings (in *taka*) |
| snaghr | nonfarm self-employment working hours per month |
| sagrhr | farm self-employment working hours per month |
| wnaghr | nonfarm wage job working hours per month |
| waghr | farm wage job working hours per month |
| iemphr | total working hours per month |
| rel_hh | code for relation to household head<br>1. Head himself/herself<br>2. Wife/husband<br>3. Son/daughter<br>4. Grandson/granddaughter<br>5. Father/mother<br>6. Sister/brother<br>7. Niece/nephew<br>8. Son-in-law/daughter-in-law<br>9. Spouse of brother or sister<br>10. Brother or sister of spouse<br>11. Father-in-law/mother-in-law<br>12. Other relatives of head or spouse<br>13. Servant/maid servant<br>14. Other _____ (specify) |
| educ | years of schooling completed |
| sex | gender |
| age | age (in years) |

| Variable | consume.dta |
|---|---|
| | 10 items have been selected from the survey: rice, wheat, pulses, milk, oil, meat, fish, vegetables, fruits, sugar. Let *X* denote any items, so: |
| *qX* | quantity (kg) of item *X* consumed last week |
| *eX* | value of item *X* consumed last week (in *taka*) |
| expfd | household total food consumption per month (in *taka*) |
| expnfd | household total expenditure on regular nonfood items per month (in *taka*) |

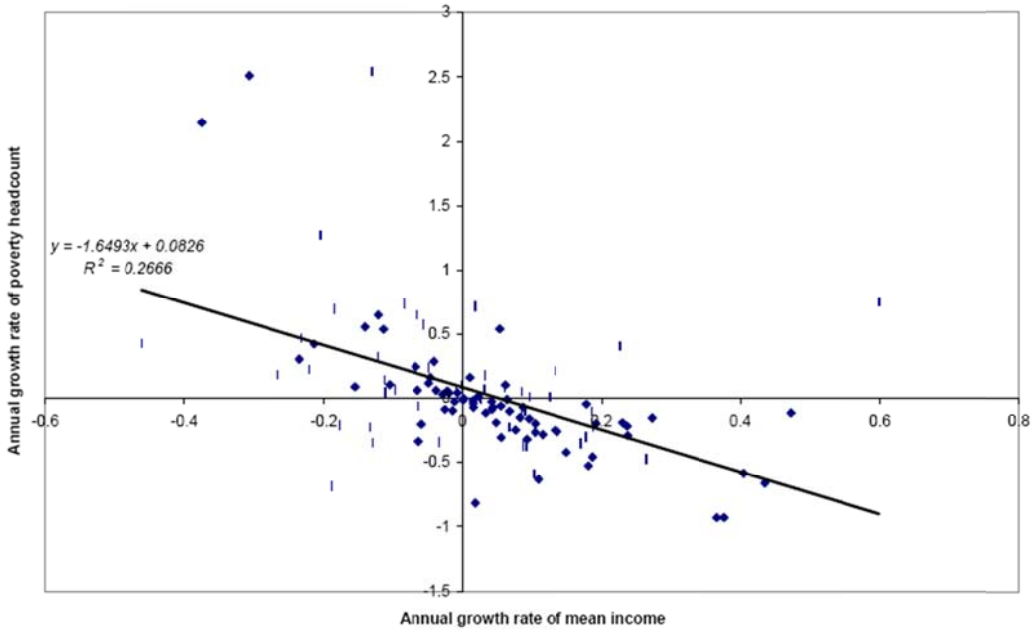
| Variable | vprice.dta |
|---|---|
| | 11 price items (vegetables in consume.dta now has two entries: potatoes and other vegetables) were selected from the survey. Again, denote an item by *X*: |
| *pX* | village price per kg |

**Session 5:** 3. The Growth-Inequality-Poverty nexus
a. A mathematical identity

Read Bourguignon (2003):

1. Consider the following graph from Bourguignon (2003). What can you say about the relationship between poverty and growth? What does the $R^2$ tell you?

**Figure 1. The relationship between poverty reduction and growth in a sample of growth spells**




Source: Bourguignon (2003), p.4.

2. Do you think a linear functional specification of the relationship between growth and poverty is appropriate? If yes, why? If no, why not?

3. Following Bourguignon (2003) into what can any change in headcount poverty be decomposed into? Provide a mathematical specification and explain.

4. How is the growth elasticity of poverty defined?

5. What does the growth elasticity of poverty measure? How do you interpret a growth elasticity of poverty of -3? Is it better for a country to have a growth elasticity of poverty of 2 or of -6?

6. Is the growth elasticity of poverty sensitive to (the initial level of) income inequality? If so how? Explain.

7. What is the policy implication which Bourguigon (2003) derived from his analysis? Do you think that from a policy perspective the effects of growth and distributional change can be addressed separately?

**Session 6:** 3. The Growth-Inequality Poverty-nexus
b. The effect of growth on inequality: Kuznets and beyond

1. Imagine you are discussant at a conference or reviewer at an academic journal. Read Deiniger and Squire (1998) and critically evaluate and discuss their work. You can use the attached data extraction sheet to facilitate your review. Concentrate in particular on the role of inequality in Land in their findings on the Kuznets relationship.

**Guiding questions when reading and reviewing (journal) articles:**

1. What is the research question(s) that they are trying to address in their paper?
2. What is their contribution to the already existing empirical literature?
3. What methodological approach are they using?
4. What kind of data are they using for analysis?
5. Is the methodological approach/data appropriate to address the research question? Which variables/factors are they considering? Are they appropriate? Can you think of alternatives/alternative approaches/specifications?
6. What are their main findings and (policy) conclusions? Do you agree with their points of view?
7. Are there any shortcomings in their analysis?
8. Do you have any questions which remain unaddressed/issues that remain unclear?

**Data extraction sheet**

| Data to be extracted | Notes to reviewer |
|---|---|
| Title of study | |
| Author(s) | |
| Year of publication | |
| Type of publication | *Peer reviewed journal, working paper, program report etc.* |
| Language | |
| Country, national or regional | *Specify if study is conducted at a national level or regional, and if so which region(s)/province(s)/town(s) etc.* |
| Time when study took place | |
| Research question | *List the central research question that study tries to assess* |
| Contribution to the literature | *What is the main contribution of this paper?* |
| Methodology/Method of analysis | *Describe the methodological approach (main empirical specifications…)* |
| Data | *What kind of data are they using?* |
| Sample size (and sample methodology) | |
| Outcome measures and definition | |

| | |
|---|---|
| | |
| Findings | *Give a short summary of the main findings regarding the outcome of interest*<br>*Report statistics* |
| | |
| Highlight | |
| Robustness checks | |
| Policy implications? | |
| Areas for further research, pen questions, outstanding issues? | |
| Opinion/Evaluation | |

# *Quick review:*

***Where was Simon Kuznets born?***

*a) in Pinsk*

*b) in Minsk*

*c) in Camebridge*

*d) In New York*

***According to Kuznets, in the process of development, inequality in an economy will***

*a) first fall, then rise*

*b) first rise, then fall*

*c) remain about the same*

*d) show no definite pattern*

***Which measure of inequality did Kuznets use in his 1955 AER paper?***

*a) Hoover index*

*b) Gini index*

*c) Income of poorest quintiles to the top 5%*

*d) None, just qualitative information given that data is from the early 19$^{th}$ century*

***What does the median voter theorem say?***

*a)* the average voter's preferred candidate (or policy) is bound to win against any one other, by any well-behaved voting system.

*b)* a majority rule voting system will select the outcome most preferred by the middle voter

*c) Political parties will pursue policies that appeal most to the average voter*

*d) None of the above*

## What is credit rationing?

*a) Lenders limit the supply of credit*

*b) Governments limit the access to credit*

*c) The maximum interest rate to be paid is fixed*

*d) None of the above*

**Data from how many countries is assembled in the dataset by Deininger and Squire?**

*a) 103*

*b) 105*

*c) 107*

*d) 108*

**Which one is not a finding by Deininger and Squire?**

*a) Inequality in assets has a negative effect on growth*

*b) Inequality reduces the income growths of the poor but not the rich*

*c) The poor benefit more from education than from investment*

*d) Inequality affects growth in undemocratic societies but not in democratic ones*

**Which of the following equations cannot be used to test the existence of the Kuznets curve?**

a) $I_i = \alpha + \beta Y_i + \delta {Y_i}^2 + u_i$

*a)* $I_{it} = \alpha + \beta Y_{it} + \delta {Y_{it}}^2 + u_{it}$

*b)* $I_{it} = \alpha + \beta Y_{it} + \delta \frac{1}{Y_{it}} + u_{it}$

*c)* $I_{it} = \alpha + \beta Y_{it} + \delta {Y_{it}}^2 + \delta \frac{1}{Y_{it}} + u_{it}$

d) $I_{it} = \alpha + \beta Y_{it} + u_{it}$

*e) All of them*

# *Inequality in land matters more in developing countries?*

Growth regression (1960–1992) with income and land inequality

| | All countries | | | | | | Developing countries[a] | |
|---|---|---|---|---|---|---|---|---|
| Intercept | 2.614 | 1.346 | 2.949 | 2.379 | 4.738 | 3.389 | 4.246 | 3.906 |
| | (2.94) | (1.40) | (4.12) | (2.39) | (4.47) | (2.17) | (2.93) | (1.51) |
| Investment | 0.132 | 0.122 | 0.134 | 0.123 | 0.107 | 0.115 | 0.130 | 0.148 |
| | (6.15) | (5.09) | (6.38) | (4.77) | (4.68) | (4.00) | (3.94) | (3.59) |
| Initial GDP | −0.302 | −0.205 | −0.288 | −0.264 | −0.308 | −0.248 | −0.301 | −0.338 |
| | (3.70) | (2.23) | (4.39) | (3.49) | (4.50) | (3.06) | (1.39) | (1.54) |
| Income Gini | −0.047 | −0.019 | | | −0.025 | −0.019 | −0.018 | −0.045 |
| | (2.80) | (0.95) | | | (1.34) | (0.86) | (0.60) | (1.27) |
| Land Gini | | | −0.034 | −0.022 | −0.037 | −0.027 | −0.039 | −0.053 |
| | | | (4.07) | (1.95) | (3.85) | (2.09) | (2.43) | (2.10) |
| Latin Dummy | | −0.530 | | −0.432 | | 0.018 | | 2.765 |
| | | (0.85) | | (0.87) | | (0.03) | | (1.83) |
| Africa Dummy | | −0.214 | | −0.254 | | 0.324 | | 2.191 |
| | | (0.32) | | (0.46) | | (0.46) | | (1.52) |
| Asia Dummy | | 1.320 | | 0.668 | | 0.798 | | 1.882 |
| | | (2.32) | | (1.36) | | (1.46) | | (1.51) |
| R2 adj | 0.3781 | 0.468 | 0.549 | 0.564 | 0.550 | 0.547 | 0.576 | 0.585 |
| No. Obs. | 87 | 87 | 64 | 64 | 55 | 55 | 27 | 27 |

[a]Only developing countries with a population of more than two million have been included.
Here and in all subsequent tables, figures in brackets denote *t*-values.

*a) True*

*b) False*

*c) Don't know*

# *Why do Deininger and Squire report median Gini coefficients instead of mean coefficients?*

Table 1
Decadal medians of Gini coefficients for the income distribution, by Region 1960–1990

| | 1960s | 1970s | 1980s | 1990s |
|---|---|---|---|---|
| Eastern Europe | 22.76 | 21.77 | 24.93 | 28.60 |
| South Asia | 31.67 | 32.32 | 32.22 | 31.59 |
| OECD and high income | 32.86 | 33.04 | 32.20 | 33.20 |
| East Asia and Pacific | 34.57 | 34.40 | 34.42 | 34.80 |
| Middle East and North Africa | 41.88 | 43.63 | 40.80 | 39.72 |
| Sub-Saharan Africa | 49.90 | 48.50 | 39.63 | 42.30 |
| Latin America | 53.00 | 49.86 | 51.00 | 50.00 |

*a) Median is easier to calculates*

*b) Median is less sensitive to drop outs*

*c) Because their data is highly scewed*

*d) Because they feel like…*

**Session 7:** 3. The Growth-Inequality Poverty-nexus

c. The effect of inequality on growth: efficient and inefficient redistribution: Theoretical evidence and empirical evidence

1. Review the paper by Alesina and Rodrik (1994). Following their empirical analysis, what do the results presented in Table 1 of their paper (see below) show?

GROWTH REGRESSIONS FOR 1960–1985

| | High-quality sample ($N = 46$) | | Largest possible sample ($N = 70$) | | Largest possible sample | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ($N = 49$) | | ($N = 41$) | |
| | OLS (1) | TSLS (2) | OLS (3) | TSLS (4) | OLS (5) | OLS (6) | OLS (7) | OLS (8) |
| Const. | 3.60 | 8.66 | 1.76 | 6.48 | 3.71 | 6.22 | 6.24 | 6.21 |
| | (2.66) | (3.33) | (1.50) | (2.93) | (3.86) | (4.69) | (4.63) | (4.61) |
| GDP60 | −0.44 | −0.52 | −0.48 | −0.58 | −0.38 | −0.38 | −0.39 | −0.38 |
| | (−3.28) | (−3.17) | (−3.37) | (−3.47) | (−3.61) | (−3.25) | (−3.06) | (−2.95) |
| PRIM60 | 3.26 | 2.85 | 3.98 | 3.70 | 3.85 | 2.66 | 2.62 | 2.65 |
| | (3.38) | (2.43) | (4.66) | (3.72) | (4.88) | (2.66) | (2.53) | (2.56) |
| GINI60 | −5.70 | −15.98 | 3.58 | −12.93 | | −3.47 | −3.45 | −3.47 |
| | (−2.46) | (−3.21) | (−1.81) | (−3.12) | | (−1.82) | (−1.79) | (−1.80) |
| GINILND | | | | | −5.50 | −5.23 | −5.24 | −5.21 |
| | | | | | (−5.24) | (−4.38) | (−4.32) | (−4.19) |
| DEMOC* GINILND | | | | | | | 0.12 | |
| | | | | | | | (0.12) | |
| DEMOC | | | | | | | | 0.02 |
| | | | | | | | | (0.05) |
| $\bar{R}^2$ | 0.28 | 0.27 | 0.25 | 0.26 | 0.53 | 0.53 | 0.51 | 0.51 |

The dependent variable is average per capita growth rate over 1960–1985. *t*-statistics are in parentheses. Independent variables are defined as follows:

GDP60: Per capita GDP level in 1960
PRIM60: Primary school enrollment ratio in 1960
GINI60: Gini coefficient of income inequality, measured close to 1960 (see Appendix for dates)
GINILND: Gini coefficient of land distribution inequality, measured close to 1960 (see Appendix for dates)
DEMOC: Democracy dummy.

Interpret the results in column (7). What does the coefficient on GDP60, PRIM60, GINILND and DEMOCGINILND tell you? How do you interpret the $R^2$?

2. Inequality can affect growth through a number of channels. The lecture has extensively discussed the political economy channel. Other channels through which inequality can affect growth are capital market imperfections or political instability (social conflict). Explain how inequality works through capital market imperfections using an example.

3. Read the FT-comment by Yukon Huang - China's growing inequality is undermining the regime (05.03.2012, available from: http://blogs.ft.com/the-a-list/2012/03/05/china-must-rethink-its-economic-model-to-calm-growing-social-unrest/#axzz2DbZrHf7E ). What are the underlying problems leading to raising levels of inequality in China mentioned in the comment? What would be the basic prediction of these developments following the social conflict channel (e.g. see argument by Alesina and Perotti, 1996)?

Yukon Huang
March 5, 2012
China's growing inequality is undermining the regime

This year's session of the National People's Congress takes on added significance with the impending anointment of the next generation of senior leaders. China would seem to have many reasons to be self-satisfied given the strong prospects for a "soft landing", a mountain of foreign assets that Europe is eager to tap, and an expanding regional presence that the US has had to take notice of.

Yet the leadership recognises that the country faces daunting economic, social and environmental challenges including vulnerabilities created by past excessive credit expansion. Wen Jiabao, China's premier, warned on Monday that growth is set to slow this year. It is aiming for a 7.5 per cent rise in gross domestic product, the first time since 2004 that the annual target has dropped below 8 per cent.

But these are likely to be seen as technicalities among those gathered in Beijing. Far more worrisome for the political elite is the question of how to deal with rising social unrest. This was underscored by the global attention given to the Wukan village land-related protests that pushed provincial leaders to support more open local elections. Other disturbances such as last year's strikes by truck drivers in Shanghai and recent unrest by migrant workers at Foxconn reflect the tensions stemming from decades of widening social inequality that seems out of place for a regime that originated from egalitarian ideals.

For all of China's economic successes – which lifted some 600m out of poverty – income disparities nevertheless have ratcheted up with the gini coefficient now at 0.47 compared with around 0.25 in the mid-1980s. This has fostered a sense that the system is uncaring, and that opportunities are now being determined by one's status rather than initiatives.

There is a strong link between the growth in social unrest and the reality that the reform process launched by Deng Xiaoping three decades ago has stalled. Rising social tensions come broadly from two forces, namely limitations of China's national budget and banking systems in addressing distributional needs and distortions arising from controls over use of land and labour.

A key weakness of the process of economic liberalisation is its failure to provide the fiscal means for the authorities to limit inequalities that came with rapid growth. China's banking system – which is unique in handling a large share of the financing of public services that would normally go through the budget – accentuates these problems.

The unusually limited role that the national budget plays in supporting expenditures makes it difficult to respond to rising expectations, particularly for an economy where the state controls the bulk of resources. The budget as a proportion of the size of the economy is only two-thirds that of other middle income countries, and half that of European Union. As a

consequence, welfare spending has been inadequate, amounting to around half the level (as a share of GDP) of comparable countries.

Rather than strengthening its fiscal system, Beijing relies on its banks to fund much of the growing demand for infrastructure. This has led to episodes of expanded lending to local governments, which (due to concerns regarding repayment) has skewed credit in favour of better off localities and towards the larger state enterprises, rather than private small-scale operators.

Thus the ability to make redistributive transfers (handled elsewhere either by decentralised budgets or through the quasi-fiscal expenditures of banks) has not been available.

No segment of society feels these social pressures more than the 250m migrant workers who do not have access to the same services and employment choices as established residents. As a younger generation without the pre-reform poverty experience matures, their semi-indentured status no longer matches their aspirations in a modernising China. Even with real wage increases of 10-15 per cent annually, increasing numbers of migrants have either returned to their native provinces or increased their demands for more rights.

Migration pressures are also linked to the frequent disputes over land. This reflects the failure to clarify use rights and establish more transparent and equitable transfer systems since all land is formally owned by the state. Local authorities are starved of much needed revenues in the absence of structured property taxes that could serve as the fulcrum for their revenue base. Thus they have been forced to sell off land use rights to balance their budgets. By under paying owners and charging premiums to developers, local bureaucrats are able to capture countless multiples of what they originally paid. The process offers considerable opportunities for corruption and thus weakens trust at community levels. This accounts for some of the more contentious acts of social protest as in Wukan.

If the incoming senior leadership wants to deal with the issues that have spawned rising social unrest, it needs to rethink some of the unintended consequences of its current growth-driven model. Paramount is to reshape China's economic institutions and control over basic resources in ways that moderate, rather than exacerbate, disparities.

*The writer is a senior associate at the Carnegie Endowment and a former World Bank country director in China*

http://blogs.ft.com/the-a-list/2012/03/05/china-must-rethink-its-economic-model-to-calm-growing-social-unrest/#

**Session 8:** 3. The Growth-Inequality Poverty-nexus
d. The concept of pro-poor growth

1. How is pro-poor growth defined?

2. Which measures are commonly used to measure pro-poor growth? How are they defined?

3. Assume the following two scenarios:
   - In Scenario 1 the national income is increasing by 5% but the income of the poor is increasing by 7%.
   - In Scenario 2 the income of the poor is increasing by 7% with national income increasing by 10%.

   You are a politician concerned with pro-poor growth. Which case would you prefer and why? What policy interventions could promote pro-poor growth and how? Discuss.

4. **Case Study: Bolivia**

Consider the following information:

**Table 3: Poverty and Inequality Trends using Moderate Poverty Line***

| | 1989 | | 1994 | | 1999 | | 2002 |
|---|---|---|---|---|---|---|---|
| | Observed | Simulated | Observed | Simulated | Observed | Simulated | Observed |
| Headcount | | | | | | | |
| Capital Cities** | 67.2 | 64.8 | 59.5 | 57.4 | 51.1 | 48.1 | 55.1 |
| Towns | | 81.1 (80.7)+ | | 75.1 (74.3) | 69.1 | 64.2 | 67.7 |
| Rural | | 89.7 (87.8) | | 89.6 (87.8) | 83.4 | 79.1 | 83.8 |
| Total | | 76.9 (76.0) | | 72.4 (71.6) | 65.2 | 60.3 | 67.2 |
| Poverty Gap | | | | | | | |
| Capital Cities** | 32.9 | 32.9 | 25.7 | 25.3 | 21.0 | 21.3 | 24.4 |
| Towns | | 51.3 (50.7) | | 44.7 (44.0) | 34.7 | 33.6 | 32.9 |
| Rural | | 58.3 (55.2) | | 60.9 (58.2) | 47.7 | 43.1 | 44.9 |
| Total | | 45.5 (44.1) | | 41.9 (40.7) | 32.5 | 30.1 | 32.9 |
| Gini Coefficient | | | | | | | |
| Capital Cities** | 0.505 | 0.497 | 0.481 | 0.455 | 0.480 | 0.488 | 0.540 |
| Towns | | 0.547 | | 0.537 | 0.455 | 0.500 | 0.452 |
| Rural | | 0.475 | | 0.497 | 0.423 | 0.443 | 0.421 |
| Total | | 0.555 | | 0.555 | 0.525 | 0.531 | 0.551 |

*The moderate poverty line is, in line with standard practice in Bolivia, applied to income in urban areas, and consumption in rural areas (as income data are considered not to be reliable there and consumption data are not available for the urban household surveys prior to 1997). While the extreme poverty line in Bolivia is only based on ensuring adequate nutrition, the moderate poverty line also makes allowance for some non-food expenditures. The moderate poverty line stood at about US$40 per capita and month, the extreme poverty line at about US$20. For details on the poverty lines and the results for the extreme poverty line, refer to annex 1.

**Capital cities refer to the 9 departmental capitals and El Alto (the city adjacent to La Paz).

**Table 4 – Growth Inequality Decompostion of Poverty Changes (Moderate Poverty)**

| | 1989–1999 | 1999–2002 | 1989–2002 |
|---|---|---|---|
| | | Total Bolivia | |
| Change in poverty | -0.118 | 0.020 | -0.099 |
| Growth component | -0.080 | 0.018 | -0.064 |
| Redistribution component | -0.038 | 0.002 | -0.035 |
| | | Departmental Capitals | |
| Change in poverty | -0.163 | 0.040 | -0.123 |
| Growth component | -0.105 | 0.025 | -0.080 |
| Redistribution component | -0.057 | 0.015 | -0.043 |
| | | Other Urban Areas | |
| Change in poverty | -0.117 | -0.015 | -0.132 |
| Growth component | -0.067 | 0.017 | -0.074 |
| Redistribution component | -0.050 | -0.032 | -0.058 |
| | | Rural Areas | |
| Change in poverty | -0.068 | 0.005 | -0.064 |
| Growth component | -0.041 | -0.005 | -0.039 |
| Redistribution component | -0.028 | 0.010 | -0.025 |

Notes: Calculated using the Datt-Ravaillion (1992) method of growth-inequaltiy decomposition.

Source: Own calculations. For the extreme poverty line, see Table 12 in Annex 1.

**Figure 1 — Growth Incidence Curve for Bolivia, 1989 to 2002**

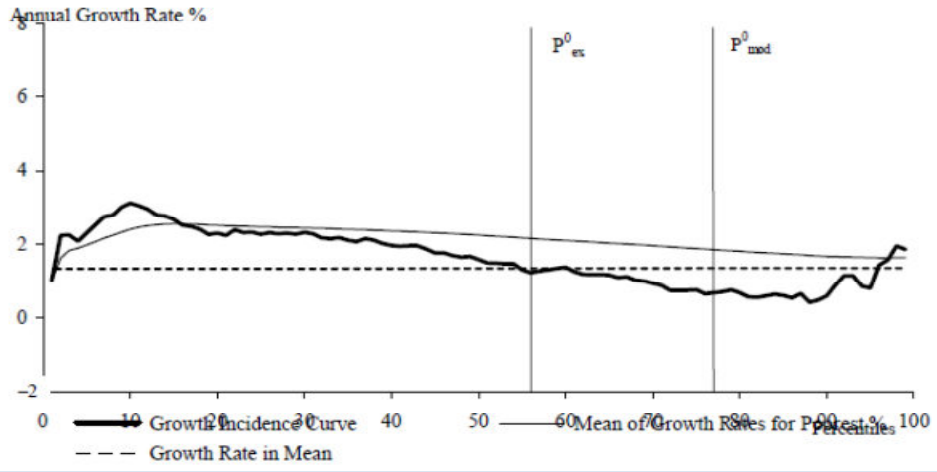



**Figure 2 — Growth Incidence Curve for the Departmental Capitals of Bolivia, 1989 to 2002**

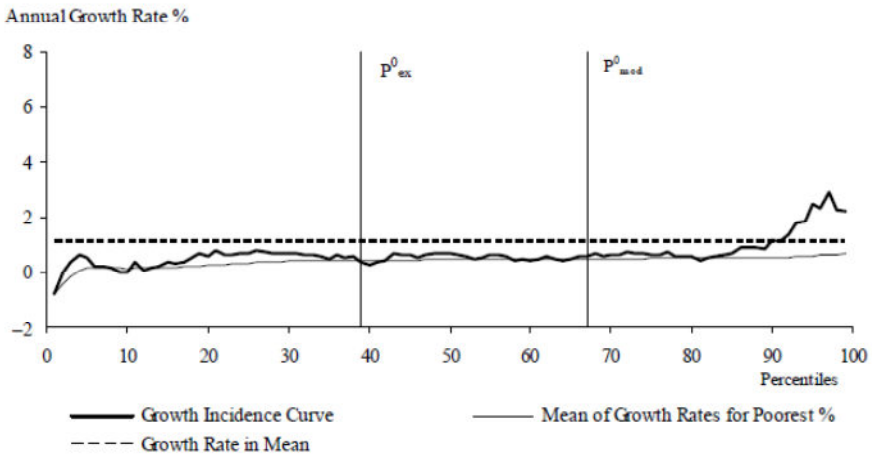


**Figure 4 — Growth Incidence Curve for Rural Areas of Bolivia, 1989 to 2002**

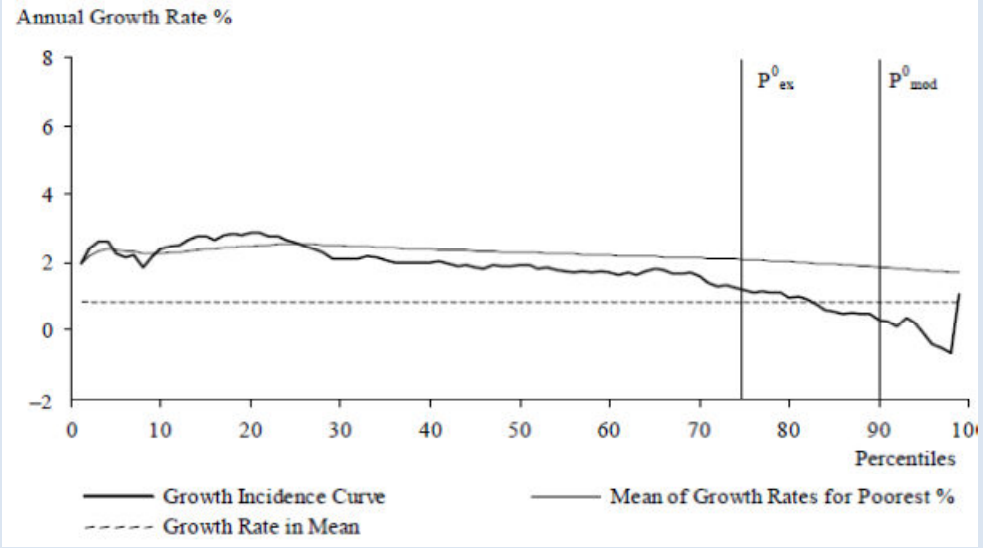
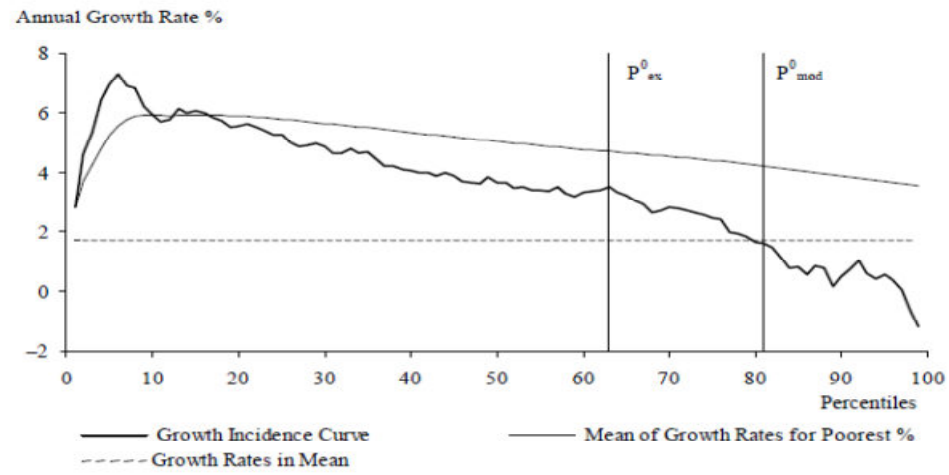



**Figure 3 — Growth Incidence Curve for Other Urban Areas of Bolivia, 1989 to 2002**




(Source: Klasen, S., M. Groose, R. Thiele, J. Lay, J. Spatz, and M. Wiebelt (2004): Operationalizing pro-poor growth, country case study: Bolivia. Discussion Paper No. 101. Iibero-Amerika-Insititut für Wirtschaftsforschung. Universität Göttingen.)

Has growth in Bolivia between 1989-2002 been pro-poor? Are there differences between rural and urban areas?

Do you have enough information to make an assessment or would you want to have additional information? If so, what?

**Session 9:** 4. Shocks, Policies and Poverty

a. Trade liberalization and poverty

1. In the course of your studies you probably across a number of models on international trade (e.g. Ricardo etc.). Briefly explain the Heckscher-Ohlin-model of international trade (using a two-factor case).

    a. What are the main assumptions of the model?

    b. What are the main mechanisms and predictions of the model?

    c. Is there any empirical support for the Heckscher-Ohlin- model?

    (For sources see e.g. Ray (1998) – Development Economics, Chapter 16; Rübel (2008) – Grundlagen der Realen Aussenwirtschaft)

2. Raúl Prebisch and Hans Singer were among the first to challenge the Heckscher-Ohlin-model. What were their main critiques? Explain.