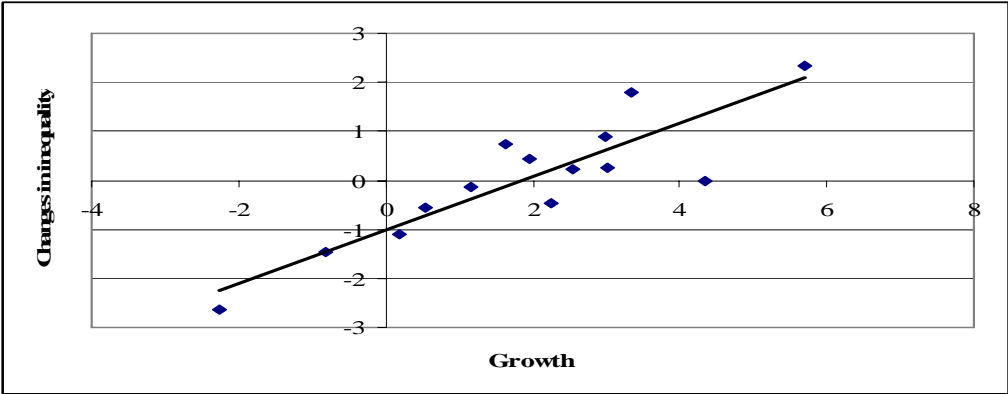


Growth and Inequality. Are they connected?



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I. Introduction

Success stories of poverty reduction are typically associated with the achievement of high sustained growth rates. For example, over 1981-2000 China's poverty rate fell from over 50 percent to 8 percent, owing to an impressive per capita growth rate of about 8.5 percent per year. Similarly, between 1993 and 2002 Vietnam cut in half its poverty rate, from 58 percent to 29 percent by growing at almost 6 percent per year on per capita terms. On the contrary, countries that have experienced economic stagnation or decline have witnessed dramatic increases in poverty: over 1993-2002 when Argentina growth rate averaged .7 percent per year (a decline in per capita terms of .18 percent per year) poverty more than doubled from about 21 percent to slightly above 55 percent. In Zambia over 1991-1998 per capita growth averaged -2.4 percent. As in Argentina, and despite a dramatic improvement in the levels of inequality (the gini coefficient declined from .59 to .49) poverty increased from about 69 to 75 percent. Figure 1 captures the essence of this discussion and plots changes in poverty against growth.¹ Inspection of this figure suggests a strong and negative relationship between growth and changes in poverty, with most of the countries being placed in the NW and SE quadrants and just a few exceptions in the NE and SW quadrants (which would indicate a positive association between growth and changes in poverty).

But once the key role of growth for poverty reduction is acknowledged (see Dollar and Kraay 2003 for a formal analysis), there is an additional issue that has to be taken into account in a debate on pro-poor growth, namely which factors determine why growth reduces poverty in some instances more than in others. For example, Senegal's per capita growth rate over 1995-2002 was about 2.2 percent per year on average and over this period poverty declined at an average annual rate of almost 2.5. In contrast, over the period 1994-2003 despite Burkina Faso averaging the same growth rate as Senegal, poverty declined by at an annual rate of about 1.8 percent per year. Just to give an idea of the significance of these differences, on current trends Senegal would need 28 years to half poverty whereas Burkina would need 40.

The poverty level in any given country depends on the country's average per capita income and on how this income is distributed across the population. Thus it should not be a surprise that works focusing on the efficiency of growth for poverty reduction have tended to concentrate on the role played by income inequality. For example, Ravallion (1997, 2003) notes that high inequality is a barrier for poverty reduction, and presents an empirical model where the changes in poverty would be proportional to the distribution corrected rate of growth (i.e. the impact of a given growth rate on poverty reduction is related to the initial level of inequality). In Ravallion (1997) the distributional term is one minus the initial gini coefficient, whereas in Ravallion (2004) the correction term is allowed to incorporate possible non linear effects between the growth elasticity of poverty and the initial inequality level.² His estimates would suggest that depending on the initial level of inequality a one percent increase in income levels could result in a poverty reduction of as much as 4.3 percent (very low inequality countries) or as little as

¹ The original source of the data is the povmonitor database .

² In practice Ravallion (2004) considers a distributional term of the form $(1-gini)^\theta$ with $\theta > 1$.

.6 percent (high inequality countries). In other words, to achieve a comparable reduction in poverty highly unequal countries will need to sustain higher growth rates. Thus in very many countries (especially in Latin America and in South Saharan Africa³) making growth more pro poor will require, if not reducing it, at the very least preventing inequality from increasing.

Beyond the initial level of inequality, a second factor affecting the impact of growth on poverty reduction is the distributional pattern of growth (i.e. who benefits from growth). Bourguignon (2004) stresses this point and presents a model calibrated on Mexican data that predicts that when no change takes place in the distribution of income, a per capita growth rate of 3 percent per year would lower the country's poverty rate by about 7 percentage points over a 10 year period. When instead he simulates an improvement in the levels of inequality (equivalent to reduction in the gini coefficient by 10 percentage points) he finds that the same growth rate would suffice to cut the poverty rate by more than 15 percentage points. He also shows that it would take approximately 30 years to reach the same result without any change in the distribution.

The role played by changes in inequality in this context is even more relevant because although a number of papers (among others Deininger and Squire (1996), Chen and Ravallion (1997), Easterly (1999) and Dollar and Kraay (2003)) have consistently found that changes in income and changes in inequality are unrelated (i.e. governments pursuing a pro growth strategy will not have to necessarily face an increase in income inequality), when one focuses exclusively on the 1990s there is a more worrisome picture. For example, figures 2 to 4 plot changes in (logged) gini coefficients against growth rates for the 1970s, 1980s, and 1990s. Table 1 presents the estimated slopes and their associated t-statistics. Judging on point estimates, these figures would indicate that whereas in the 1970s and 1980s the relationship between growth and inequality was negative (although for the 1980s not significant) during the 1990s this relationship seems to have turned positive (and significant). The regression line in figure 4 would suggest that every one percent increase in GDP (i.e. growth) is associated with a .55 percent increase in the (logged) gini coefficient. Moreover when we test whether these slopes are statistically different (see also table 1), we cannot reject the null hypothesis that there was no change in slope between the 1970s and 1980s, but we can reject the null that the slope of the growth inequality relationship changed in the 1990s (this is robust to considering as baseline the 1970s, 1980s or both the 1970s and 1980s combined).

Admittedly, in principle these results could be driven by a country effect rather than by a time effect, given that the samples are not balanced. For example, if the 1990s have a large number of Eastern Europe countries (where inequality has risen dramatically during the 1990s) then the results would not be very surprising. But even when one controls for

³ According to Lopez (2004) the average gini coefficients in Latin America and South Saharan Africa during the 1990s, at 49 and 49.8 respectively would be more than 10 percentage points higher than in the third more unequal region (East Asia and Pacific) and almost 20 percentage points higher than in the less unequal region (Eastern Europe).

country effects by balancing the sample⁴ it appears that there are differences between the 1980s and 1990s (figures 5 and 6).

For this balanced sample we now find that there is also positive relationship between changes in inequality and growth during the 1980s although this is not likely to be statistically significantly different from zero (the slope is .18 but its associated t-statistic is .52). During the 1990s we find a much steeper slope that is likely to be significant (slope is 1.2 and the associated t-statistic is 3.0). Thus this experiment would still point towards a change in the growth vs. inequality relationship during the 1990s.

Table 1. Growth and changes in inequality. Estimated slopes

	Unbalanced samples			Balanced samples	
	70s	80s	90s	80s	90s
Slope	-0.1	-0.21	0.55	0.17	1.21
t-stat	-0.58	-1.75	2.03	0.52	3.01
Ho: Equal slopes 70s and 80s			0.25	1/	
Ho: Equal slopes 80s and 90s			2.73	1/	
Ho: Equal slopes 70s and 90s			2.51	1/	
Ho: Equal slopes 70s&80s and 90s			3.3	1/	

1/ Under the null hypothesis of equal slopes the statistic should be distributed as a t.

One could argue that these correlations are the result of measurement error in the data. In order to control for this possibility table 2 report2 the results of the same regressions but now using a 2SLS estimator.⁵ As instruments in the first stage regression we use the average growth rate over the 5-years leading to the first observation in the spell,⁶ and three regional dummies.⁷ Since the system is overidentified, the table also reports a (Jansen) test on the null that the instruments are valid (a hypothesis that at standard levels we cannot reject).

Inspection of table 2 suggests that the main message is maintained. The estimated relationship between growth and inequality during the 1990s continues to be positive (now with an even larger point estimate than in the previous table) and significant (at the 7 percent level). The point estimate for the 1980s sample would still be negative and of comparable magnitude to the OLS estimate although admittedly now it is not significantly different from zero at the 10 percent level. Finally, during the 1970s we estimate a small positive but not significant relationship at standard levels.

⁴ It must be noted that there are only 8 countries for which we have data both for the 1980s and 1990s and hence these results have to be treated very carefully.

⁵ We acknowledge that with the limited sample sizes under consideration (23 observations in the 70s, 42 in the 80s, and 21 in the 90s) the reliability of the results is likely to be somewhat limited.

⁶ As this choice of instruments indicates we are assuming that measurement error in the growth rates of the different periods is uncorrelated. Note that measurement error in the changes in gini variable would not affect the consistency of the correlation coefficients.

⁷ The regional dummies we use are EAP, LCR and ECA. EAP and LCR are the most representative groups during the 1970s and 1980s and EAP and ECA would be the most representative during the 1990s.

Table 2. Growth and changes in inequality. Estimated slopes 2SLS

	Unbalanced samples		
	70s	80s	90s
Slope	0.12	-0.33	0.98
t-stat	0.44	-1.65	1.9
OIR test p-val	.44	.15	.11
First Stage Regression			
R²	0.15	0.41	0.20

One clarification is in order here. Even though growth accompanied by progressive distributional change is better than growth alone, and clearly much better than growth with regressive distributional change, in practice policy makers do not pick combinations of growth and inequality, but rather policy packages that will have a simultaneous impact on growth and inequality.⁸ And in this regard, the preferred poverty reduction package may very well be one that leads to increases in inequality. For example, assume that a policy maker has to pick between two policy packages, one that would increase the income of the poor by 3 percent and that for the average person in society by 2 percent, and a second package that would increase the income of the poor by 4 percent and that of the average person by 6 percent. Standard microeconomics would suggest that the second situation dominates over the first, even if it leads to higher inequality. Put in other words, when poverty reduction is main objective of policy making one may have to be willing to accept increases in inequality if they are the result of an optimal strategy.

The rest of the paper explores the relationship between growth and changes in inequality on the basis of the 14 country case studies of the OPPG work program, paying special attention to the forces that may be at work. Gaining understanding of the mechanisms linking growth and inequality is critical for the design of interventions that may increase the effectiveness of growth for poverty reduction.

To anticipate some of the results below, the basic messages that emerge from the paper are the following.

- The finding noted above regarding the positive relationship between growth and changes inequality during the 1990s is maintained when we consider the sample of 14 country cases in the OPPG work program. Moreover, the correlation coefficient is about the same as the one obtained using the global database.
- We explain it by a combination of three factors: (i) growth is mainly driven by the non agricultural sector; (ii) although there are regional exceptions, the poor tend to be concentrated in the agricultural sector; and (iii) there are limited changes in

⁸ See Lundberg and Squire (2003), or Lopez (2004) for empirical evidence on the simultaneous impact of policies on growth and inequality.

sectoral structure of employment. Thus to a large extent, the observed increases in inequality are driven by the fortunes of those employed in the non-agricultural sector. When this sector does well, inequality tends to increase. When this sector does badly (as it did during the 1980s when non agricultural growth was below agricultural growth) inequality would tend to decline with growth.

- On the policy front, two main messages emerge from the analysis. The first regards specific interventions that may accelerate growth in the agricultural sector. Even with limited change in the sectoral structure of employment, this would contribute to pro-poor growth through faster aggregate growth and lower inequality. The second area in need of attention regards the sectoral structure of employment. Even with a laggard sector, interventions that increase sector mobility will allow the poor to connect to the growth process. On this last point, among the potential factors contributing to this limited mobility there is one that emerges repeatedly from the country case studies. Skills or better, lack of appropriate skills, appear as a critical barrier preventing the poor from connecting to the growth process.

The rest of the paper is organized as follows. Section II introduces the 14 countries used in the analysis and presents some basic statistical information. Section III explores the differences in sectoral growth rates. Section IV explores the implications of the growth inequality relationship for poverty reduction. Section V closes with some concluding remarks.

II. Country cases.

The discussion above has highlighted the positive correlation that appears between growth and changes in inequality (as measured by the gini coefficient) when one focuses on the 1990s. It has also been noted that this seems to be more a time than a country effect. This finding is somewhat surprising because most of the available empirical evidence suggests that there is no general tendency for growth as such to make income distribution more or less equal. For example, Dollar and Kraay (2003) find that, on average, the income of the poorest fifth of society rise proportionately with average incomes. Other studies concluding that changes in income and changes in inequality are unrelated include Deninger and Squire (1996), Chen and Ravallion (1997) and Easterly (1999).

To further explore this issue Table 3 reports the initial value of the gini index, the changes in its logged value (normalized by length of the spell), and the average annual growth rate for the 14 countries in the OPPG work program. Table 2 also reports the initial and final date for each spell (which are determined by data availability). The span of the spells changes with the different countries and ranges from 6 to 13 years, with a median value of 9 years.

This table indicates that our sample of countries includes some that in the early 1990s had very high levels of inequality (such as Brazil with a gini coefficient above .6), and some

others which were very equal (like Bangladesh with a gini coefficient below .3 in the early 1990s). The median gini in this sample would be .36, a value that is in line with the typical values usually quoted in the literature for the world as a whole. As for the changes in (logged) gini indices, inequality would have increased over the decade in 7 countries, remained unchanged in one, and declined in 5. The country experiencing the largest increase in inequality would have been Vietnam (2.35 percent per year) and the one experiencing the largest decline would have been Zambia (-2.65 percent per year on average). The median value for this variable (.11) would indicate that inequality has been on the rise over the decade.

Table 3. Growth and inequality in the 14 country cases.

	Initial Year	Final Year	Inequality^{1/}	Inequality^{2/}	Growth^{3/}
Bangladesh	1989	2000	0.29	0.89	2.98
Bolivia	1989	2002	0.56	-0.14	1.17
Brazil	1989	2001	0.63	-0.55	0.55
Burkina Faso	1994	2003	0.47	-0.48	2.25
El Salvador	1991	2000	0.51	0.22	2.54
Ghana	1992	1999	0.37	0.75	1.63
India	1993	2000	0.32	0.00	4.35
Indonesia	1996	2002	0.36	-1.45	-0.81
Romania	1996	2002	0.31	-1.11	0.20
Senegal	1995	2002	0.33	0.43	1.95
Tunisia	1990	2000	0.4	0.25	3.03
Uganda	1992	2002	0.36	1.78	3.34
Vietnam	1993	2002	0.34	2.35	5.70
Zambia	1991	1998	0.59	-2.65	-2.26

1/ Initial value. 2/ Percent change in gini coefficient. 3/ On an annual basis

On the growth front, we also find Vietnam and Zambia at the two extremes. Vietnam would have been the country with the highest per capita growth rate in our sample (5.7 percent over the 1993-2002 period) and Zambia the one with the lowest (an impressive annual decline of 2.6 percent on average over 1991-1998). For the group as a whole, median per capita growth would have averaged 2.11 per cent per year on average (which would be in line with the median growth rate for the world during the second half of the 1990s).

As for the relationship between growth and changes in inequality, figure 7 presents the scatter-plot of the changes in logged gini indices against growth for the 14 countries in the OPPG study. At the extremes of the NE quadrant of figure 7 one can find Vietnam (the fastest growing country in our sample but also the one that has experienced the more marked increase in inequality) and Uganda (the third fastest growing country in our sample and the second in terms of increases in inequality). At the other extreme of the regression line (SW quadrant), one can find Zambia and Indonesia the two countries with the worse growth record but with the best performance in terms of inequality. Not only this figure suggests a clear and significant positive relationship between changes in

inequality and growth but also coincidentally the slope of the regression line (.55 with a s.e. of .08) is the same as the one that is obtained with data from the global database used in the previous section. Thus our sample seems to capture the global pattern extremely well.

Thus a natural question that arises regards the forces behind the observed correlation between growth and changes in inequality. Early debates on the growth-inequality relationship tended to argue that inequality would increase with growth in the early stages of development (Kuznets, 1955). This rise would be due to rapid growth in the nonagricultural sector, something that would contribute to higher inequality through two different channels. First, given that wages tend to be higher in the non-agricultural sector than in the agricultural sector, growth in the non-agricultural sector would increase inequality so long as most workers were employed in agriculture (i.e. between sectors inequality would increase). Second, because wage inequality tends to be greater in the nonagricultural sector, growth in that sector would also increase inequality (i.e. an increase in within sector inequality). Underlying the whole process was the uneven impact of technological innovation that would initially lead to great productivity gains in manufacturing but that would largely bypass agriculture.

The previous discussion would then suggest attacking this issue with a sectoral perspective. This strategy would be reaffirmed by the findings in Lopez (2004), who finds that sectoral growth rates react very differently to economic policies. In particular, he finds that the observed recovery in growth rates that took place during the 1990s (which he relates to improvements in macroeconomic management) would have been driven by the non agricultural sector, with the agricultural sector showing no recovery. In fact, if:

- (i) sectoral growth rates are higher in the non agricultural sector than in the agricultural sector;
- (ii) the poor tend to be concentrated in the agricultural sector; and
- (iii) the sectoral structure of employment does not change,

one would expect inequality to increase in high growth countries and find a similar pattern to the one hypothesized is by Kuznets. In the following sections we explore these elements in the 14 country cases of the OPPG work program.

III. Growth, Agricultural and Non agricultural growth.

The first element we address in this section is whether sectoral growth rates are a homogenous or a heterogeneous group. To this end, table 4 reports aggregate, agricultural sector, and nonagricultural sector growth rates for the 14 country sample under analysis.⁹ The growth rates have been computed using as start and end dates those in table 2 so that

⁹ On a per capita basis to facilitate comparison. In principle it would be more appropriate to use growth per worker, but there are significant data limitations with sectoral labor data.

we can later relate the evolution of inequality to the sectoral growth rates. Inspection of table 4 reveals several interesting issues. First, judging from median values it is apparent that during the 1990s and in the sample under analysis, the agricultural sector has performed much worse than the non agricultural sector. While growth in the former sector was about .6 percent per year on average it was above 3 percent in the non agricultural sector (i.e. more than five times as large).

Moreover, inspection of figures 8 and 9, which plot growth against the non agricultural and agricultural sector growth rates respectively, indicates that growth has been high where the non-agricultural sector has enjoyed high growth rates and it has been low where that sector has shown low growth (i.e. growth is mainly driven by the non agricultural sector). More formally when we decompose aggregate growth as:

$$\text{Growth} = \text{Ag. growth} \times \text{share of agriculture} + \text{Nag. growth} \times (1 - \text{share of agriculture}) \quad (1)$$

and compute the share of aggregate growth variance explained by each of sectoral terms in the right hand side of equation (1), it is obtained that about 90 percent of the growth variance is due to non agricultural growth.¹⁰ In other words, the agricultural component explains about half of the variation that one would expect from a sector that in the countries under analysis represents on average 20 percent.

Table 4. Growth in the Agricultural and Non agricultural sector (1990s)

Country	Ag	Nag	Growth
Bangladesh	1.87	3.46	2.98
Bolivia	0.45	1.31	1.17
Brazil	1.28	0.48	0.55
Burkina Faso	0.28	3.14	2.25
El Salvador	-0.59	3.19	2.54
Ghana	1.74	1.53	1.63
India	0.68	6.00	4.35
Indonesia	-0.11	-0.95	-0.81
Romania	-1.52	0.65	0.20
Senegal	-2.46	3.07	1.95
Tunisia	1.35	3.35	3.03
Uganda	1.61	5.15	3.34
Vietnam	2.58	7.03	5.70
Zambia	-0.27	-2.68	-2.26
Median	0.56	3.10	2.10

Clearly, one could argue that these results are affected by the relatively short period of time under consideration and that extending the period of analysis would dramatically

¹⁰ The variance of the agricultural growth component is .16, of the non agricultural growth component is 3.54, and the covariance between these two terms is .25. To compute the shares of each sector we add to the variance of the relevant component one covariance.

change these results. In this regard, table 5 is a replica of table 4 but it now covers the 1980-2003 period. The table displays the countries ranked by growth rates so that the country at the top of the table is the country with the highest growth rate. Inspection of this table would confirm the previous finding of the non-agricultural sector being the main driver of growth. Although the sectoral differences are less dramatic than in table 3, the median values of the sample would still suggest that growth rates in the agricultural sector at .7 percent per year on average¹¹ would be almost one-third of the observed growth rates in industry and services.

Table 5. Per capita aggregate and sectoral growth rates (1980 -2003) 1/

Country	Ag	Nag	Growth
Vietnam	1.79	5.07	3.75
India	0.97	5.31	3.62
Indonesia	1.08	4.08	3.36
Bangladesh	0.63	2.89	2.18
Tunisia	1.47	2.25	2.14
Uganda	0.34	3.69	1.85
Burkina Faso	1.11	1.58	1.45
Senegal	-0.43	1.01	0.74
Ghana	-0.58	2.41	0.67
El Salvador	-1.51	1.73	0.50
Brazil	1.52	0.17	0.32
Romania	0.78	0.12	0.23
Bolivia	-0.17	-0.34	-0.31
Zambia	-0.12	-1.48	-1.28
Median	0.7	1.99	1.09

1/ 1980 or closet available date

In fact, countries that have done well on the aggregate growth front are countries that have done well on the non-agricultural sector front. Instead, countries that have performed poorly on the non-agricultural sector have also performed poorly at the aggregate growth level. Note that the four countries where agricultural growth is higher than non-agricultural growth are at the bottom of table 5 (i.e. they are the countries that have experienced the lower growth rates over the 1980-2003 period). It is also worth noting that in two of these four countries, Brazil and Romania, the agricultural growth rate is above the median for the 14 country sample (i.e. after all these countries have not done so badly in agriculture). Hence, table 5 would reaffirm the message emerging from table 4.

Clearly, one could question whether these results also hold in a larger set of countries. In table 6 we report (median) GDP and sectoral growth rates over the 1970s, 1980s, and 1990s based on a balanced sample of 64 countries for which the WDI report data. Figure

¹¹ On a per capita basis.

10 presents this same information graphically. A number of messages emerge from this table. First apart from services during the 1980s, agriculture is always the laggard sector. During the 1970s, industry and services grew by about 2.8 percentage points per year more than agriculture. During the 1990s this difference is lower, but still industry grew .5 percent more per year and services almost 1 percent. Over the three decades 1970-2000 agriculture would have lagged the other two sectors by about 1.5 percent per year on average. The second message that emerges from table 6 is that growth in the agricultural sector seems to be quite stable, at about 2.5 percent per year. This would contrast with the variability of sectoral growth in industry and services and overall GDP growth. The final message emerging from this table is that growth is to a large extent driven by the non agricultural sectors. It goes up when they go up; It goes down when they go down.

Table 6. GDP and Sectoral growth rates worldwide. 1/

	1970s	1980s	1990s	1970-00
GDP	4.6	2.2	3.2	3.4
Agriculture	2.4	2.4	2.5	2.4
Industry	5.3	2.7	3.0	4.0
Services	5.2	2.4	3.4	3.8

1/ Data not normalized by population growth

IV. Where are the poor?

The second ingredient needed for our story line to hold is that the poor are concentrated in the agricultural sector. This point is likely to be the less controversial since the existing evidence clearly indicates that the poor tend to be represented more than proportionally in the agricultural sector (although admittedly there are regional differences¹²). For example, the International Fund for Agricultural Development (IFAD) estimates that seven out of ten of the world's poor still live in rural areas, with many of them working directly in agriculture, as smallholders, farm laborers or herders.¹³

Figure 11 plots the share of the poor in rural areas for our 14 country sample. Inspection of this figure suggests that apart from Brazil where rural poverty is about 30 percent of total poverty, in all the other cases poverty tends to be concentrated in rural areas and in some cases like Burkina Faso, Vietnam, Uganda and Bangladesh be a rural phenomenon.

Table 7. Share of total population, poor and non-poor in agriculture (1998)

	Total	Poor	Non-Poor
Burkina Faso	87	96	76
Ghana	56	77	43
Vietnam	65	82	54

Table 7 (computed using data in Bernabe, 2004) also suggests that the poor tend to be concentrated in rural areas and particularly in agriculture. For example, while only 56

¹² The exception to this discussion is LAC, where poverty tends to be a urban phenomenon .

¹³ Non-farm activities provide 44 percent of rural jobs in Asia and 25 percent in Latin America.

percent of the population was employed in Ghana's agricultural sector in 1998, nearly 77 of the poor were employed in the agricultural sector (and this proportion increases even more if the depth of poverty is taken into account or a lower poverty line is used). This would contrast with only 43 percent of the non poor being employed in agriculture. Similarly, in Vietnam (where the share of agriculture in total employment was about 65 percent in 1998) 82 percent of the poor would be employed in agriculture (against 54 percent of the non poor). The case of Burkina is even more extreme. In fact, the share of this country's population employed in agriculture is about 87 percent, but this is still low when compared with the share of poor in the agricultural sector: a high 96 percent.

V. Sectoral structure of employment

The third element that is needed to explain the increases in inequality in the presence of differences in sectoral growth rates is limited change in the sectoral structure of employment. On this front our evidence is less conclusive because the country case studies do not fully elaborate on mobility issues and because global databases tend to be weak in data that can be used to infer mobility. However, combining the messages that emerge from different sources it is possible to conclude that sectoral changes in the structure of employment has been indeed quite limited.

For example, Okidi et al (2004) find that in the case of Uganda the contribution of intersectoral population shifts to the total change in poverty is relatively small. Over 1992-97 Okidi et al (2004) estimate that the intra-sectoral effect would have accounted for 98 percent of the changes in poverty whereas the population shift effect would be less than 4 percent.¹⁴ Similarly, over 1997-00 the authors estimate a negative population shift effect. When the authors repeat the same exercise but controlling for a urban/rural grouping they obtain similar results with the population shift effect accounting for less than 2 percent of the changes in poverty. Put in other words mobility seems to have been limited from both a geographic and a sectoral viewpoint. Okidi et al. (2004) also note that education, particularly secondary and post secondary education, appears to be an important and increasing factor for explaining inter-household welfare disparities a finding that would also be consistent with an increased skill premium (see Box 1).

Box 1 Education and Labor Force Participation in Uganda

Education is among the initial conditions required to increase one's opportunities in the workforce. In fact, in Uganda there is demand for more educated workers across sectors including crop agriculture. Noticeably, the move from crop agriculture to non-agriculture requires a more educated workforce. Education comes out strongly as a key variable influencing earnings, the returns increasing with increasing education level. It is further a key factor in influencing the observed increasing income inequality in Uganda. Thus the potential for rural workers to get into better paying employment is extremely limited given their low education levels which in turn, limits their participation in high employment growth sectors.

Source: Okidi et al (2004)

¹⁴ The figures do not necessary add to 100 hundred because of remaining residual interaction effect.

Aryeetey and McKay (2004) on the other hand find that in Ghana migration seems to have been significant both between rural and urban areas and between laggards and faster growing areas. Thus one could expect these flows to have been equalizing. However, when one estimates how the population-shift-effect has contributed to poverty changes during the 1992-99 one finds a very small contribution: just about 3 percent. Aryeetey and McKay (2004) explore the nature of the migration flows and find that migration seems to have been undertaken disproportionately by better qualified individuals in the sending direction. This would in principle explain the small contribution to poverty of migration and even suggest that the migration flows might have been dis-equalizing (by having the better qualified individuals of laggard areas move to faster growing areas.) Again mobility seems to be affected by skills.

In the case of Bangladesh, Winters (2000) notes that two of the most successful sectors over the past few years have been ready made garments and shrimp farming. However, none of these sectors increased the demand for rural unskilled male labor or workers displaced by the decline of the jute industry, and instead have mainly employed women (80 percent in the ready made garments and a great majority in the shrimp farming sector). In fact because apparently they lack the required skills rural workers are argued to be unable to access urban jobs.

On Bolivia, The World Bank (2004) finds that the rise of income inequality in recent years mainly reflects rising returns to skills and preferential access to jobs, and notes that only workers favored with these unobserved wage determinants benefited from the rising skills wage premium while the less advantaged borne the earnings erosion of a sluggish economy and rising unemployment. Moreover, this situation would discourage the skill investments of the poor.

Bernabe (2004) analyses the labor markets in Vietnam and Burkina Faso and reports the composition of the overall labor force by sector of activity (table 8). While her work indicates that there is substantial sectoral churning with some people moving out of one sector and some others moving in, judging on the basis of net effects one has to conclude that in these two countries there was very limited sectoral mobility. Similarly, labor force data in the World Bank's WDI for Brazil would indicate that sectoral mobility has also been low in Brazil.

Table 8. Sectoral composition of labor

Burkina Faso	1994	2003
Agriculture	87.2	84.6
Industry	3.3	2.5
Service	9.5	12.9
Vietnam	1993	1998
Agriculture	67.4	64.1
Industry	13.8	14.2
Service	18.8	21.8
Brazil	1990	2001
Agriculture	22.8	20.6

Industry	22.7	20.0
Service	54.5	59.2

On other hand, in Zambia, Thurlow and Wobst (2004) note that manufacturing production declined sharply after the government removed in the early 1990s the trade protection that had shielded the manufacturing sector from foreign competition. As a result, urban poverty increased dramatically. At a period when rural poverty remained basically stable, the overall result was a dramatic fall in inequality. It must be noted, however, that the decline in inequality in this case takes place not because the poor are better off but rather because those that were initially better off (to a large extent those employed in the state owned enterprises) eventually become worse.

Table 9. Urban and Rural Poverty in Zambia during the 1990s.

	Headcount poverty		
	1991	1996	1998
National	68.9	79.4	75.4
Rural	88.0	90.1	85.6
Small-scale	89.8	91.2	86.4
Medium-scale	81.6	77.6	80.3
Non-farm	70.9	83.4	80.9
Urban	46.0	61.2	58.3
Low-cost	53.1	66.3	64.3
Medium-cost	39.5	47.4	50.1
High-cost	34.6	39.9	33.0

Thus all in all the evidence discussed above indicates that sectoral changes in the structure of employment have been very limited. Moreover, in the cases for which there is evidence of significant mobility (like in Ghana) it appears to have been inequality increasing.

VI. Inequality and Sectoral growth rates.

So far we have been discussing the evidence emerging from the country case studies on three elements that may explain why growth is associated with increases in inequality, but have not compared changes in inequality and sectoral growth rates directly. When one performs this comparison it is clear that that the two countries that have experienced the largest increases in inequality (Uganda and Vietnam) are the countries where the differences between growth in the agricultural sector and in the rest of the economy are the most marked. For example, while agricultural growth was 1.6 and 2.6 percent per year in Uganda and Vietnam, non agricultural growth (on a per capita basis) was an impressive 5 and 7 percent respectively.

Conversely, the countries that have experienced the largest decline in inequality (Zambia and Indonesia) are countries that experienced large declines in the non agricultural sector. For example, in Zambia the agricultural sector declined by .3 percent per year but the non

agricultural sector declined by 2.7 percent (during this period industrial value added fell by more than 6 percent). In Indonesia, agriculture fell by .1 percent but industry and especially services fell much more (-.6 and -1.3 respectively).

Among the rest of the countries there is substantial variation but still there is some connection between changes in inequality and growth pattern. For example, in Bangladesh (the third country ranked by the observed increase in inequality), the non agricultural sector grew about twice as much as the agricultural sector. Admittedly, for some countries things are a bit more difficult to explain. For example, in India despite significant differences in the agricultural and non agricultural sector, inequality remain constant.

More formally, table 10 presents the results of regressing the changes in (logged) inequality against growth in the non-agricultural and agricultural sectors. Even if due to the low sample, the results of this table have to be interpreted very carefully, they would suggest that growth in the non-agricultural sector would explain about 74 percent of the variability in the observed changes in inequality, whereas growth in the agricultural sector would explain less than half that amount: 29 percent. Moreover, when we take into account the potential spillovers between the non-agricultural sector and the agricultural sector we cannot reject the null hypothesis that the share of variance explained by the agricultural sector is due to a spillover from the non-agricultural sector.

Table 10. Inequality and growth in the agricultural and non agricultural sector 1/

Changes in inequality on:			
Growth in NonAg	0.41		0.37
	(0.07)		(0.07)
Growth in Ag		0.49	0.21
		(0.22)	(0.15)
R2	0.74	0.29	0.78

1/ standard errors in parentheses.

What can be concluded from this discussion? Well, it all depends on how one values the deterioration in income inequality, but if the main policy objective is poverty reduction then one should not get too concerned (especially in low inequality countries). Two main reasons. First as shown in figure 12 (which plots poverty reduction against growth for our 14 country sample), growth has been typically accompanied by poverty reduction despite the observed increases in inequality. Second, although admittedly it is not a desirable situation, the increases in inequality are mainly driven by the positive outcomes for those at the top of the distribution and not by the bottom of the distribution being squeezed (agricultural growth after all has been positive). On the other hand declines in inequality seem to be also more related to the misfortunes of those at the top of the income distribution than to the fortunes of those at the bottom.

VIII. Conclusions

This paper has reviewed the forces behind the strong positive association between growth and changes in inequality (i.e. inequality increases more in faster growing countries) observed during the 1990s. This positive correlation appears both when one considers the sample of 14 country cases and when one computes it using the data in global databases. We explain the previous finding in the following way. Growth seems to have been driven by growth in the non agricultural sector, and this pattern of growth when taken in a context of (as suggested by the country case studies) limited changes in the sectoral structure of employment would explain the observed sharp increases in inequality in fast growing countries. Beyond the 1990s we also find that growth has been high (low) where non-agricultural growth has been high (low). This finding would also suggest that in absence of sectoral changes in the structure of employment policy makers will likely have to face an apparent trade off between growth and inequality. To a large extent, the observed increases in inequality are driven by the fortunes of those employed in the non-agricultural sector. When this sector does well, inequality tends to increase. When this sector does badly inequality tends to decline.

In addition to the need to ensure a stable macroeconomic framework, there are two main policy recommendations emerging from this study. The first regards specific interventions that may accelerate growth in the agricultural sector. Even with limited mobility this would contribute to faster aggregate growth and lower inequality. The second area in need of attention regards the structure of employment. Even with a laggard sector interventions that increase sector mobility towards high growth sectors will allow the poor to connect to the growth process. On this last point, among the potential factors contributing to this limited mobility there is one that emerges repeatedly from the country case studies. Skills or better, lack of appropriate skills, appear as a critical barrier preventing the poor from connecting to the growth process.

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Figure 1. Growth and Poverty Reduction

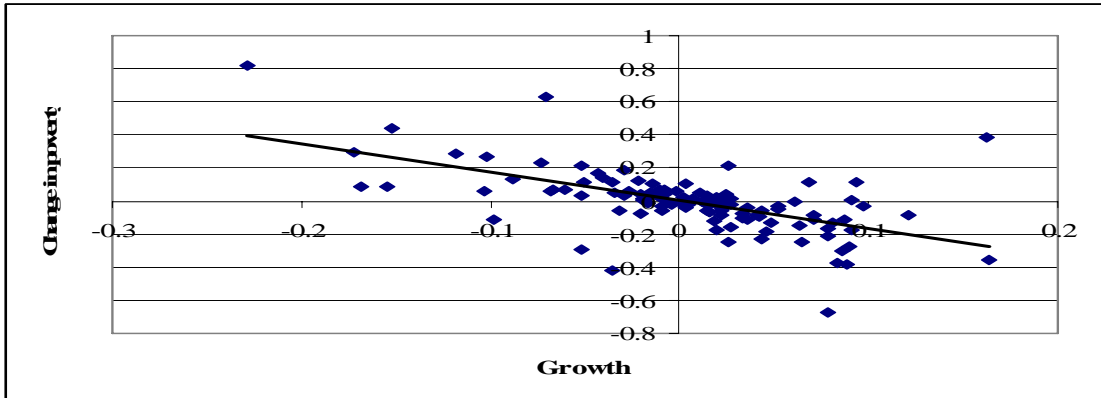


Figure 2. Growth and changes in inequality (1970s)

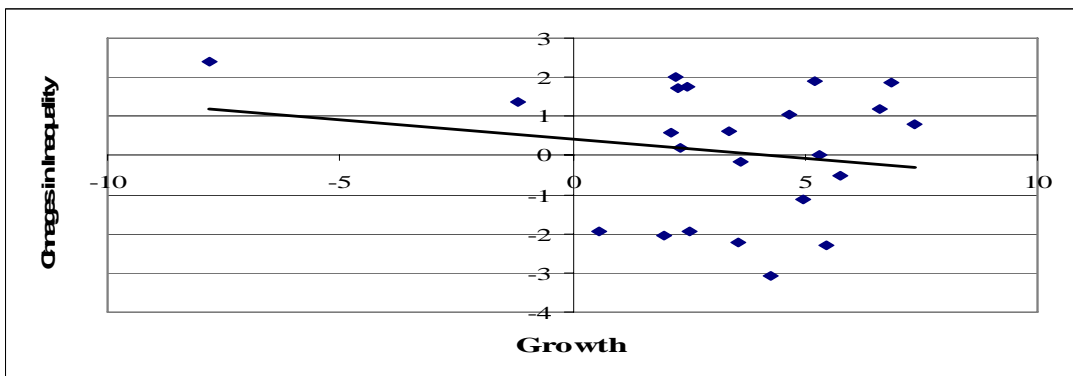


Figure 3. Growth and changes in inequality (1980s)

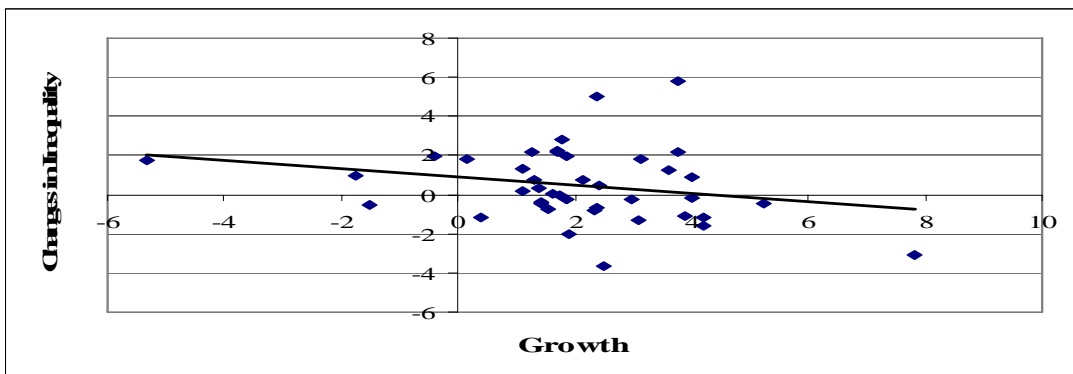


Figure 4. Growth and changes in inequality (1990s)

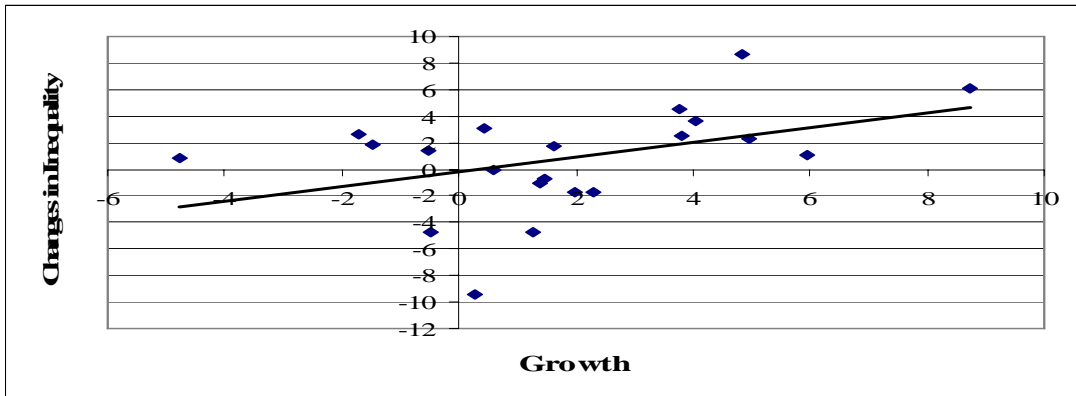


Figure 5. Growth and changes in inequality (1980s) Balanced Sample

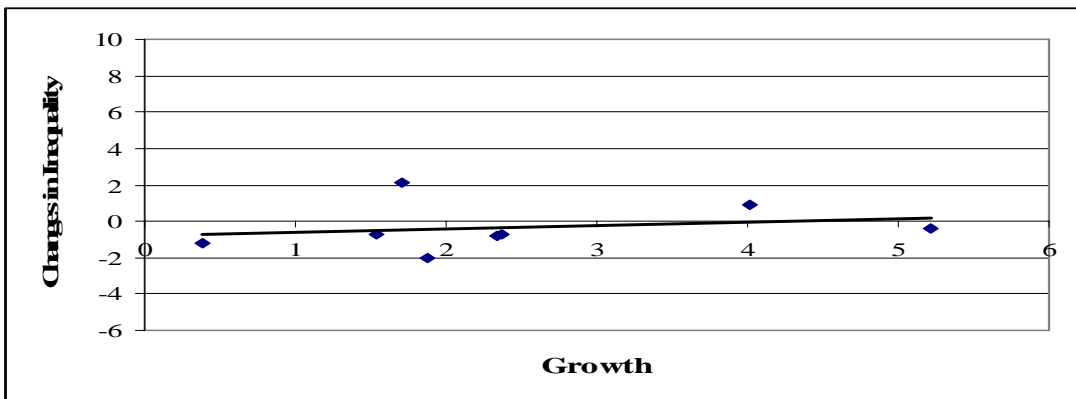


Figure 6. Growth and changes in inequality (1990s) Balanced Sample

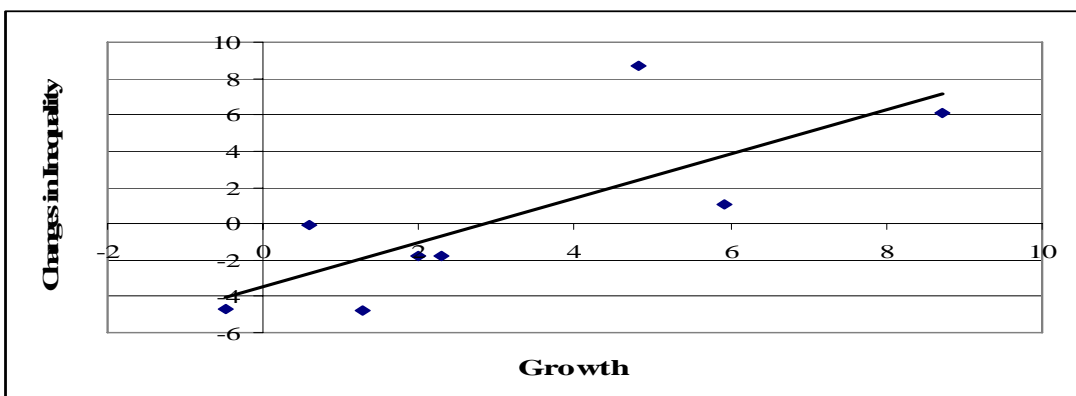


Figure 7. Growth and changes in inequality. Country cases

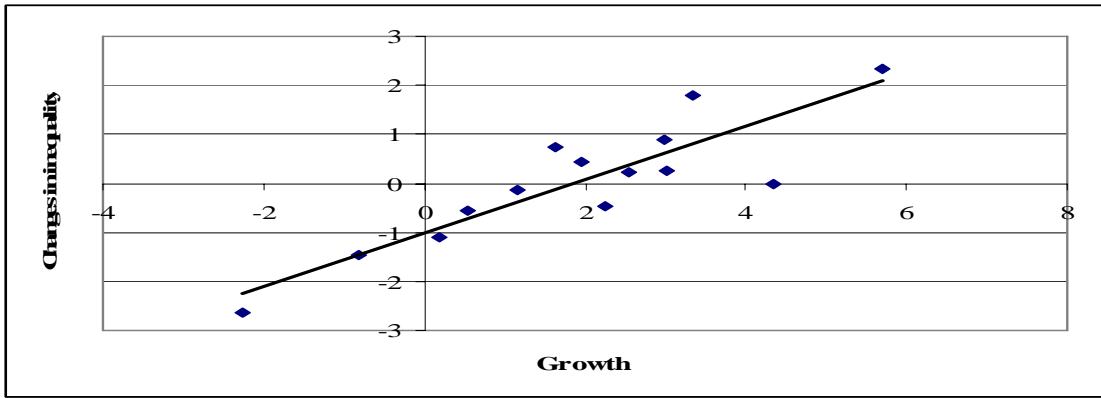


Figure 8. Growth and growth in the non agricultural sector.

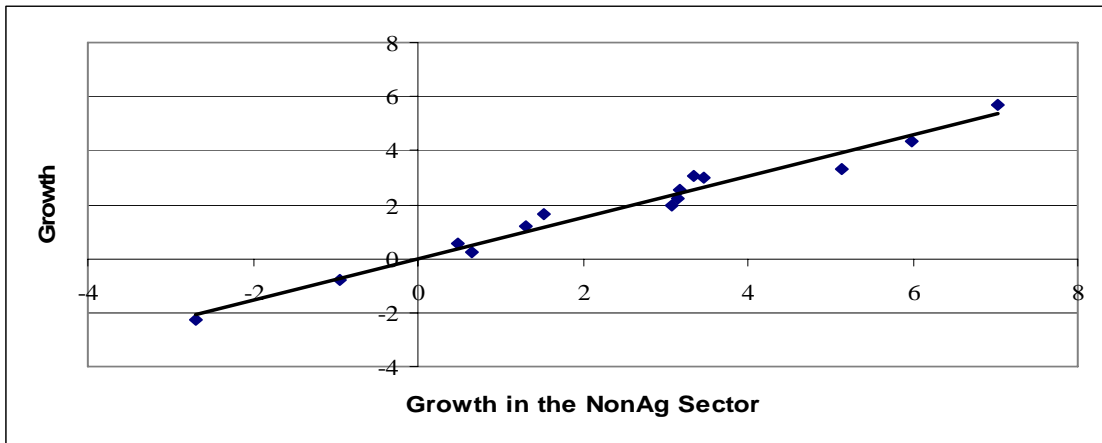


Figure 9 Growth and growth in the agricultural sector.

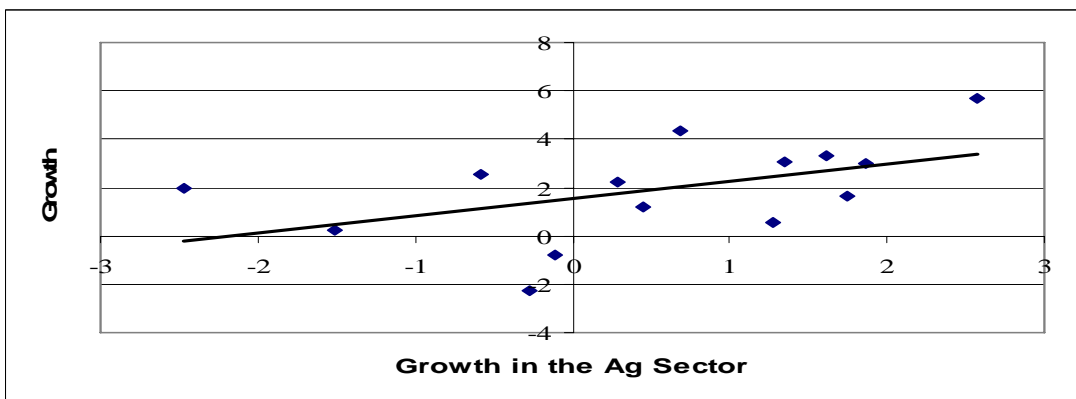


Figure 10. Sectoral growth rates.

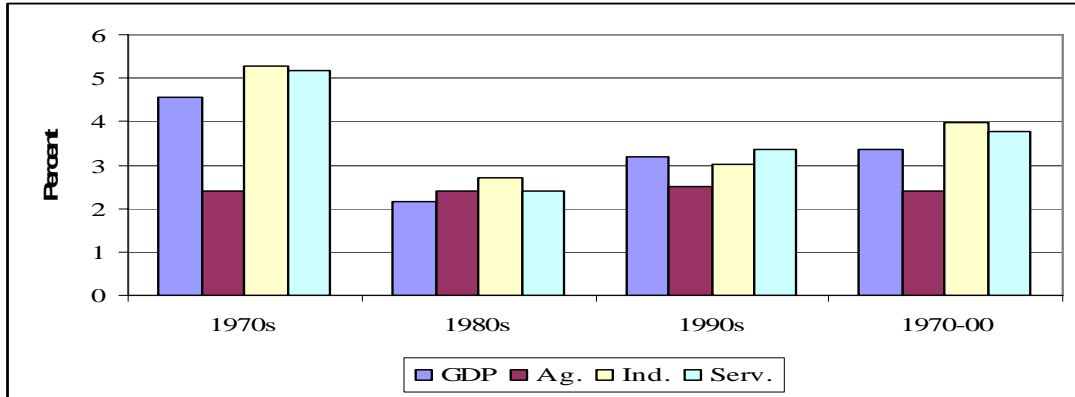


Figure 11. Share of the poor in rural areas

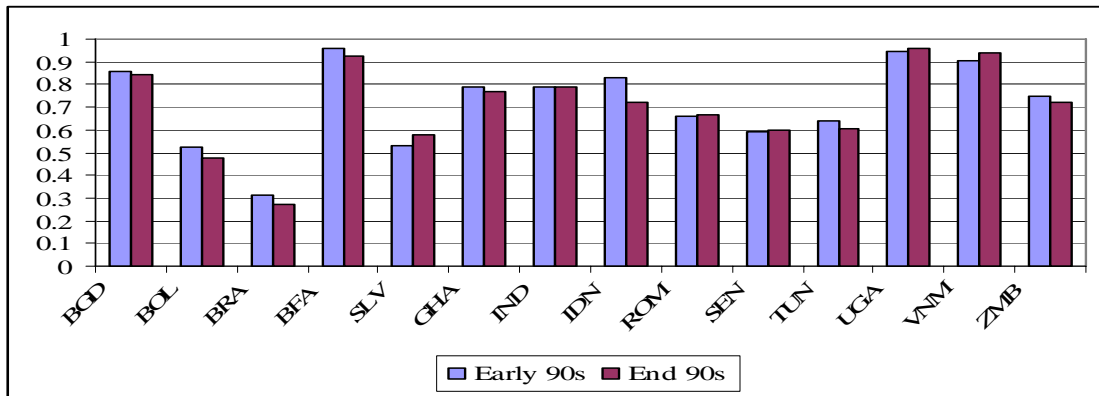


Figure 12. Growth and Poverty Reduction. Country cases

