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Growth, inequality, and poverty reduction in developing countries: recent global evidence

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Abstract

The study presents recent global evidence on the transformation of economic growth to poverty reduction in developing countries, with emphasis on the role of income inequality. The focus is on the period since the early-mid-1990s when growth in these countries as a group has been relatively strong, surpassing that of the advanced economies. Both regional and country-specific data are analysed for the $1.25 and $2.50-level poverty headcount ratios, using the most recent World Bank data. The study finds that *on average* income growth has been the major driving force behind both the declines and increases in poverty. The study, however, documents substantial regional and country differences that are masked by this 'average' dominant-growth story. While in the majority of countries, growth was the major factor behind falling or increasing poverty, inequality, nevertheless, played the crucial role in poverty behaviour in a large number of countries. And, even in those countries where growth has been the main driver of poverty reduction, further progress could have occurred under relatively favourable income distribution. For more efficient policymaking, therefore, idiosyncratic attributes of countries should be emphasised. In general, high initial levels of inequality limit the effectiveness of growth in reducing poverty, while growing inequality reduces poverty directly for a given level of growth. It would seem judicious, therefore, to accord special attention to reducing inequality in certain countries where income distribution is especially unfavourable. Unfortunately, the present study also points to the limited effects of growth and inequality-reducing policies in low-income countries.

Keywords: growth, inequality, poverty, developing countries

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1. Introduction

The last two decades have witnessed the economic emergence of developing countries, which have as a group exhibited relatively high GDP growth rates, in excess of those prevailing in the developed countries. The gap has been particularly apparent since the middle 1990s. Much of this 'shifting wealth' has, furthermore, been translated into increasing human development, such as poverty reduction. Global poverty has fallen substantially, with a major portion of the decline attributable to China. Even when China is omitted from the sample, poverty reduction is still considerable (Chen and Ravallion, 2008). This record of achievement has, however, been far from uniform. A number of countries have experienced little poverty reduction or even increasing poverty. Part of the disappointing performance is attributable to dismal growth, as experienced by many African countries in the 1980s and early 1990s, for example. High and growing income inequality, evident in several Latin American countries historically, could also prove to be a major culprit.

Even in China, which has experienced tremendous poverty declines, further reduction could have arguably still occurred in the absence of the increasing income inequality accompanying growth (Ravallion and Chen, 2007). Furthermore, among African countries, where the lack of growth appears to have been the main culprit generally, there are considerable disparities in terms of the ability of countries to translate growth into poverty reduction (Fosu, 2009). For example, Botswana has experienced tremendous income increases, even by global standards, but the growth has been transformed into only a minimal decline in poverty. In contrast, Ghana has succeeded in translating its relatively modest growth into considerable poverty reduction. The difference in the levels of income inequality between the two countries appears to explain much of this disparity in performance (ibid.).

Similarly, in Latin America, Costa Rica reduced its $1-level poverty from 21.4 percent in 1981 to 2.4 percent in 2005.[1] Over the same period, however, Brazil cut the poverty rate from 17.1 percent to 7.8 percent. Although a major part of this disparity was due to the fact that Costa Rica's GDP growth was more than twice that of Brazil, an appreciable portion could be attributed to the higher Gini coefficient of 0.58 for Brazil, as compared to 0.47 for Costa Rica. Bolivia's case is even more illustrative. While the country's mean monthly income increased slightly from 175.1 (2005 PPP-adjusted) dollars in 1990 to 203.5 dollars in 2005, its poverty rate ($1 standard) actually rose from 4.0 percent to 19.6 percent over the same period. The main culprit was the considerable increase in income inequality, with the Gini coefficient rising from 0.42 to 0.58 between 1990 and 2005 (World Bank, 2008).

[1] The poverty rate analysed herein is the headcount ratio and is at the '$1 standard', defined as the daily $1.25 2005 PPP-adjusted income currently adopted by the World Bank as representing the $1 standard (Chen and Ravallion, 2008; Ravallion et al., 2009). Similarly the '$2 standard' is the daily $2.50 2005 PPP-adjusted income. The $1 and $1.25 ($2 and $2.50) standards will be used interchangeably herein.

Thus, in explaining how the substantial growth in developing countries may have contributed to improving human development, particularly poverty reduction, it is crucial to understand the role of (income) inequality in the growth-poverty nexus (e.g., Bourguignon, 2003; Epaulard, 2003; Fosu, 2009; Kalwij and Verschoor, 2007; Ravallion, 1997; World Bank, 2006b). That inequality influences growth's transformation to poverty reduction, furthermore, suggests that even with the same level of growth, countries would face different likelihoods of attaining goal 1 of the Millennium Development Goals (MDG1) of halving poverty by 2015. Indeed, instead of the current seven percent average annual GDP growth that is generally accepted as the required rate for many developing countries to attain MDG1, there would be country-specific thresholds depending on the distribution of income inequality across countries (Fosu, 2009).

Based on the most current global panel data from the World Bank (see Chen and Ravallion, 2008), the present paper presents regional and comparable country evidence on poverty reduction. It explores the extent to which the recent generally strong growth of developing countries may have been translated into poverty reduction. In particular, the paper provides country estimates of the relative contributions of inequality and income to the inter-temporal behaviour of poverty for a large global sample.

Since the 1980s, the poverty rate has been trending considerably downward globally (World Bank, 2006a). A strand of the literature maintains that growth has been the main driver of this decline, with income distribution playing no special role (e.g., Dollar and Kraay, 2002). Nonetheless, attention to the importance of income distribution in poverty reduction has also been growing (e.g., Bruno et al., 1998; World Bank, 2006b). At the country level, a number of studies have decomposed the effects of inequality and income on poverty (e.g., Datt and Ravallion, 1992; Kakwani, 1993). Both Datt and Ravallion (1992) and Kakwani (1993) estimate substantial contributions by distributional factors as well as by growth. Regionally, based on cross-country African data, Ali and Thorbecke (2000) find that poverty is more sensitive to income inequality than it is to the level of income.

Several papers, furthermore, emphasise the importance of inequality in determining the responsiveness of poverty to income growth (e.g., Adams, 2004; Easterly, 2000; Ravallion, 1997). Based on the specification that the growth elasticity of poverty decreases with inequality, Ravallion (1997) econometrically tested the "growth-elasticity argument" that while low inequality helps the poor share in the benefits of growth, it also exposes them to the costs of contraction. Similarly, Easterly (2000) evaluated the impact of the Bretton Woods Institutions' programmes by specifying growth interactively with inequality in the poverty-growth equation and found that the effect of the programmes was enhanced by lower inequality. Moreover, while focusing on appropriately defining growth, Adams (2004) nonetheless provides estimates showing that the growth elasticity of poverty is larger for the group with the smaller Gini coefficient (less inequality).[2]

[2] We adopt here the convention of an *absolute-valued* elasticity.

Despite the above and other related studies, there appears to be limited recent comprehensive comparative global evidence on the transformation of growth to poverty reduction in developing countries. The few recent exceptions include Kalwij and Verschoor (2007), who present estimates for the major regions of the world. They find that there are considerable differences across regions in the income elasticity of poverty, mainly as a result of cross-regional disparities in income inequalities. They also report substantial regional differences in the inequality elasticity. That study, however, is based on a much smaller and earlier sample that ends in 1998. Moreover, the poverty rate at the $2-per-day standard was the only measure analysed by Kalwij and Verschoor, mainly because of the authors' interest in maximising the representation of countries from Eastern Europe and Central Asia, where the poverty rate at the $1 level has been minimal. Nor do Kalwij and Verschoor explore possible country-specific differences.

Fosu (2009) fills the above gap somewhat with evidence for African countries. Using 1980-2004 data from World Bank (2007), the author provides estimates for both the income and inequality elasticities at the $1 poverty level for SSA versus non-SSA. He finds substantial differences between the two regions. Perhaps more interestingly, Fosu additionally uncovers a large variation in the estimates of the income elasticity across sub-Saharan African (SSA) countries, thanks mainly to country differences in inequality levels. Most recently, Fosu (2010b) presents comparative evidence also based on the Word Bank (2007) data; however, that study does not provide country-specific results.

The current paper first sheds light on growth versus poverty performance for all the major regions of the world since 1980, using the most recent World Bank (2009a) data. It then focuses on the more recent period, starting in the early-mid-1990s when developing countries have grown relatively fast. A primary thrust of the paper is to explore how the strong income growth may have been translated into human development in the form of poverty reduction. This exploration is conducted for both the major regions of the world and a global sample of 80 countries for which sufficient comparative data exist. Of particular interest is the role of inequality, as well as income, in the transformation process at the country level. Results are provided for both the $1.25 and $2.50 standards.

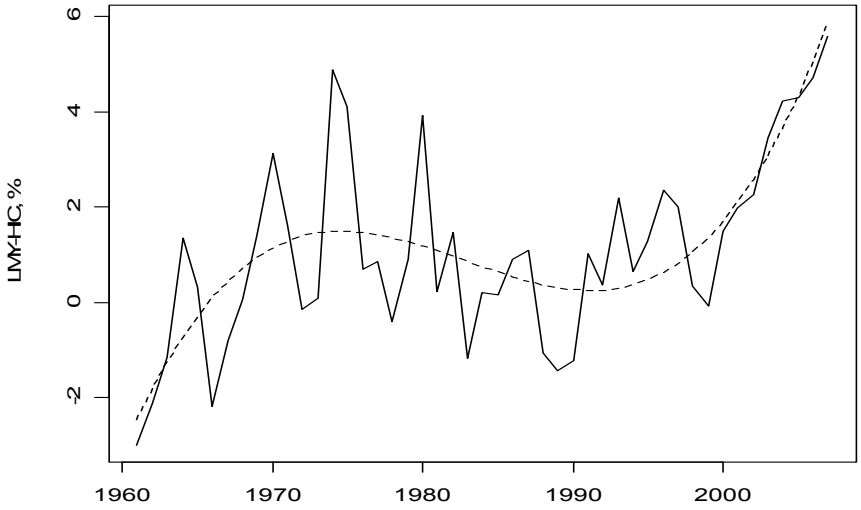
The present exercise should, thus, inform the policy debate on MDG1, for instance. More generally, though, the paper's country-specific results provide a useful comparative analysis that transcends the usual cross-country and regional analyses. After all, the challenge is at the country level, where policymakers must seek the optimal mix of emphases on economic growth versus inequality, in order to maximise poverty reduction. The findings of the current study should, therefore, prove useful for both focused research and policymaking, not only regionally but especially at the country level.

2. Comparative trends in growth and poverty

2.1 Regional GDP growth and poverty reduction, 1981-95 vs. 1996-2005

We present in this section the regional trends in GDP growth and poverty reduction for the periods 1981-1995 and 1996-2005. The sample period begins in 1981, when much of the globally comparable poverty data became available. These two sub-periods are chosen to reflect the dichotomy of the growth pattern of developing countries, which exhibit relatively strong growth in the latter period (Figure 1).[3]

Figure 1: Trend in developing-developed countries' GDP growth gap



Notes: LMY and HIC are 'low and middle-income' and 'high-income' countries, respectively. LMY-HIC is the GDP growth of LMY less GDP growth of HIC. The solid line depicts the actual values of (LMY-HIC) and the dotted line is the fitted values from a 3rd-order polynomial time trend. (Data source: World Bank 2009b.)

Table 1 presents the 1981-95 and 1996-2005 regional averages of per capita GDP growth and annualised growth rates of the headcount ratio based on the $1 ($1.25) and $2 ($2.50) standards.[4] The six regions are: East Asia and the Pacific (EAP), Eastern Europe and Central

[3] Note, though, that, as Figure 1 also shows, there was a similar increasing gap from the 1960s until the mid-1970s, but then a decline until the early-mid-1990s, when the more recent acceleration began.
[4] The annualised growth rates are calculated as the logarithmic differences between the poverty rates between 1996 and 2005, divided by the frequency of the intervening years.

Table 1: Per capita GDP growth vs. poverty reduction by region, 1981- 2005

	P.C GDP growth		$1.25 P_0 growth		$2.50 P_0 growth	
Region/variable – period	**1981-95**	**1996-05**	**1981-96**	**1996-05**	**1981-96**	**1996-05**
East Asia and Pacific (EAP)	6.894	6.355	-5.126	-8.481	-1.616	-4.331
Eastern Europe and Central Asia (EECA)	-3.434	4.138	6.769	-2.594	1.229	-3.911
Latin America and Caribbean (LAC)	0.140	1.394	-1.083	-3.176	-0.605	-2.538
Middle East and North Africa (MENA)	0.713	2.309	-4.347	-1.445	-1.215	-1.484
South Asia (SAS)	3.208	4.143	-1.548	-1.710	-0.296	-0.530
Sub-Saharan Africa (SSA)	-1.009	1.293	0.644	-1.597	0.270	-0.517

Notes: All figures are annual averages and are in percent. P.C. GDP growth rates are calculated from World Bank (2009b) as averages of annual regional values. P_0 is the headcount ratio and its growth rate is annualised: calculated as the logarithmic difference ($dlogP_0$) of ending-year value and beginning-year value, divided by the number of years between the two years, x 100 percent (data source: World Bank, 2009a).

Asia (EECA), Latin America and the Caribbean (LAC), Middle East and North Africa (MENA), South Asia (SAS), and sub-Saharan Africa (SSA).

We note, first, that EAP registered spectacular GDP growth per capita, resulting in substantial poverty reductions over both sub-periods. Second, for EECA, the large per-capita GDP decline in the first period seems to account for the considerable increase in poverty during that period; conversely, a substantial decrease in the poverty rate during the latter period accompanied that period's strong economic growth. Third, considerable poverty reduction seems to have resulted from the rather modest GDP growth in LAC, especially during the latter period. Fourth, the moderate GDP growth of MENA was transformed to appreciable poverty declines during the early sub-period, but the stronger growth in the latter period resulted in only modest poverty reduction.

In the case of SAS, the substantial GDP growths in both sub-periods appear to have been translated to only moderate poverty reduction. Finally, for SSA the per capita GDP decline in the first period seems to account for the poverty rise during that period; conversely, poverty reduction in the latter period appears to have resulted from appreciable economic growth that period. Interestingly, the rates of poverty decline since the mid-1990s were about the same between the SSA and SAS, despite the latter's much stronger GDP growth.

The above observations point to considerable regional differences in the responsiveness of poverty to GDP growth. For example, the finding of SAS's relatively modest poverty reduction, despite strong GDP growth in both sub-periods, suggests three possible explanations: (1) GDP

growth did not sufficiently reflect actual income growth;[5] (2) the responsiveness of poverty to income growth was weak; or (3) inequality may have increased. In contrast, the substantial poverty declines in EAP seem as expected, given the region's spectacular growth. Understanding such inter-regional discrepancies in the transformation of GDP growth to poverty reduction, however, would require a deeper analysis of the poverty function, which is undertaken in a subsequent section.

2.2 Poverty trends by region and for the 'emerging giants'

To shed further light on the trends in the global picture of poverty, Table 2 presents in greater detail the regional evidence corresponding to the two poverty standards. In addition to the six regions, evidence is provided for the two most populous countries and 'emerging giants', China and India. For the six regions, the Table presents $1.25 and $2.50-standard headcount ratios for 1981, 1996 and 2005; these years span the 1981-2007 period for which country data are sufficiently reliable to produce the regional averages (World Bank, 2009a).[6] Table 2 also reports statistics for these same years in the case of China. Evidence is presented for both rural and urban sectors, as well as for the overall economy, computed as a population-weighted mean of the two sectors. For India, the years are 1983, 1994 and 2005, since these are the specific years spanning the 1981-2007 period for which relatively reliable survey data are available.

Consider first the poverty trends at the $1.25 standard. In 2005, poverty was highest in SSA and lowest in MENA and EECA. Between 1981 and 2005, it declined for all regions except EECA, where the initial value was rather small to begin with. Among the remaining regions, in percent (logarithmic change) terms, the greatest reduction in poverty is observed for EAP, followed by MENA, LAC, SAS and SSA, in that order. There are differences across time, though. During 1981-1996, for example, poverty increased for EECA and SSA but declined for all other regions. In 1996-2005, however, poverty decreased for all regions. The largest decline (in percent terms) was in EAP, followed by LAC and EECA, then by SAS, SSA and MENA. Moreover, the fall in poverty was faster in the latter period in all regions except MENA, which had a low level of poverty to start with. Thus, for all practical purposes, the last decade has witnessed reductions in the poverty rate, at least at the $1.25 level, for all regions of the world.

In terms of the 'emerging giants', China's poverty rate at the $1.25 level fell in both sub-periods, but faster in the second period for both the urban and rural sectors. India's poverty also fell in both periods, but more rapidly in the second period for only the rural sector, though the decline

[5] 'Income' refers to the PPP-adjusted income from World Bank (2009a), derived from per capita consumption from household surveys or the interpolated private consumption from national accounts (Chen and Ravallion, 2008).

[6] Regional poverty data are available for other years over 1981-2007 as well, but we have opted to interpolate between the selected years for the growth rates, in order to provide comparable regional analysis for the two sub-periods.

Table 2: Trends in poverty (headcount ratio) by region, 1981-2005

	Level (%)			Mean annual change (%)		Mean annual log-difference (%)	
A. $1.25 standard							
	1981	1996	2005	1981-1996	1996-2005	1981-1996	1996-2005
EAP	77.67	36.00	16.78	-2.78	-2.14	-5.13	-8.48
EECA	1.67	4.61	3.65	0.20	-0.11	6.77	-2.59
LAC	12.87	10.94	8.22	-0.13	-0.30	-1.08	-3.18
MENA	7.87	4.10	3.60	-0.25	-0.06	-4.35	-1.45
SAS	59.35	47.05	40.34	-0.82	-0.75	-1.55	-1.71
SSA	53.37	58.78	50.91	0.36	-0.87	0.64	-1.60
China	84.02	36.37	15.92	-3.18	-2.27	-5.58	-9.18
China (rural)	94.08	49.48	26.11	-2.97	-2.60	-4.28	-7.10
China (urban)	44.48	8.87	1.71	-2.37	-0.80	-10.75	-18.29
	1983	1994	2005	1983-1994	1994-2005	1983-1994	1994-2005
India	55.51	49.40	41.64	-0.56	-0.71	-1.06	-1.55
India (rural)	57.78	52.46	43.83	-0.48	-0.78	-0.88	-1.63
India (uban)	48.25	40.77	36.16	-0.68	-0.42	-1.53	-1.09
B. $2.50 standard							
	1981	1996	2005	1981-1996	1996-2005	1981-1996	1996-2005
EAP	95.38	74.85	50.69	-1.37	-2.68	-1.62	-4.33
EECA	15.22	18.30	12.87	0.21	-0.60	1.23	-3.91
LAC	31.58	28.84	22.95	-0.18	-0.65	-0.61	-2.54
MENA	38.96	32.47	28.41	-0.43	-0.45	-1.21	-1.48
SAS	92.55	88.53	84.41	-0.27	-0.46	-0.30	-0.53

SSA	80.89	84.23	80.40	0.22	-0.43	0.27	-0.52
China	99.54	76.40	48.08	-1.54	-3.15	-1.76	-5.15
China (rural)	100.00	88.00	69.79	-0.80	-2.02	-0.85	-2.58
China (urban)	97.75	52.07	17.80	-3.05	-3.81	-4.20	-11.93
	1983	1994	2005	1983-1994	1994-2005	1983-1994	1994-2005
India	91.52	89.94	85.70	-0.14	-0.39	-0.16	-0.44
India (rural)	92.81	92.51	89.04	-0.03	-0.32	-0.03	-0.35
India (urban)	87.39	82.68	77.32	-0.43	-0.49	-0.50	-0.61

Notes: EAP = East Asia and Pacific; EECA = Eastern Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = Middle East and North Africa; SAS = South Asia; and SSA = Sub-Saharan Africa (*source*: World Bank, 2009a).

was sufficient for translating into a faster poverty reduction for the whole economy. China's poverty also fell much faster than India's in both sub-periods, overall and by sector. Furthermore, poverty in China decreased substantially more in the urban than in the rural sector, further exacerbating the urban-rural difference over time. For India, the decline was faster in the urban area during the first period, but the reverse was the case in the latter period. It is also noteworthy that poverty fell less in India than in the SAS region generally for each of the sub-periods. Moreover, poverty reduction in India during the latter period was about the same as that in SSA, despite the fact that India's GDP growth was much faster than SSA's.

We now consider poverty trends at the $2.50 standard. The observations are generally similar to those above for the $1.25, though there are appreciable differences as well. During the entire 1981-2005 period, poverty declined the most in EAP and the least in SSA. It rose during 1981-1996 for EECA and SSA, but fell in all regions during 1996-2005. The lowest declines in the latter period were in SAS and SSA (about equally), though the poverty rate in 2005 was highest in SAS, not in SSA, contrary to the finding at the $1.25 standard.

Considering the two emerging giants, again, poverty at the $2.50 standard fell faster in the second period for both China and India. Furthermore, China's poverty declined much faster than India's during both sub-periods. The poverty rate at this standard for China also fell more rapidly in urban than in rural areas in both periods. India's poverty similarly fell faster in the urban area than in the rural sector in both periods, in contrast with the above observation at the $1.25 level, where the decline was faster in the rural area in the latter period. Furthermore, in 2005 India's poverty at the $2.50 standard was slightly higher than that in SAS as a whole and was about five percentage points higher than that in SSA. Finally, India's poverty declined slightly less than that of either SAS or SSA during the latter period.

2.3 Current poverty rates: global evidence by country

For the 80 countries that have sufficient data for the early-mid-1990s and also for the 2000s, we first examine the distributions of their poverty rates during the latest year in the 21st century for which data are available.[7] This is done in Table 3. We find that at the $1.25 standard, the poverty rate ranges from 0.0 percent in Belarus (2005), Estonia (2005) and Latvia (2005) to 88.5 percent in Tanzania (2000), with a median of 17.9 percent.

[7] The selection criterion is intended to ensure that we can also consistently and comparably analyse changes in the poverty rate over time for the same set of countries. The wider interval of early-mid-1990s is used as the starting point, in order to include as many countries as possible in the sample, for a number of the countries had data in the early but not in the mid-1990s, and vice versa. Note that the average over the starting period could not be used, due to the need for annualising. The closest year to 1996 with data within 1990-1996 is selected as the starting year, because more of the countries have data for the mid-1990s but not for the earlier 1990s. The latest year in the 21st century for which data are available is used as the end-period for the analysis.

Table 3: Poverty rates ($1.25 and $2.50 standards); 80 countries, latest year

Country	Region	Year	P_0, $1.25	P_0, $2.50
Albania	EECA	2005	0.85	16.30
Argentina - urban	LAC	2005	4.50	15.23
Armenia	EECA	2003	10.63	61.37
Azerbaijan	EECA	2005	0.03	1.74
Bangladesh	SAS	2005	50.47	88.29
Belarus	EECA	2005	0.00	0.94
Bolivia	LAC	2005	19.62	36.77
Brazil	LAC	2007	5.21	17.57
Burkina Faso	SSA	2003	56.54	88.27
Burundi	SSA	2006	81.32	96.12
Cambodia	EAP	2004	40.19	78.37
Cameroon	SSA	2001	32.81	68.84
CAR	SSA	2003	62.43	88.05
Chile	LAC	2006	0.19	5.57
China - rural	EAP	2005	26.11	69.79
China - urban	EAP	2005	1.71	17.80
Colombia	LAC	2006	16.01	34.81
Costa Rica	LAC	2005	2.37	13.22
Côte d'Ivoire	SSA	2002	23.34	58.56
Djibouti	MENA	2002	18.84	54.19
Dominican Rep.	LAC	2005	4.98	21.63
Ecuador	LAC	2007	4.69	18.45
Egypt	MENA	2004	1.99	35.51
El Salvador	LAC	2005	10.97	26.77
Estonia	EECA	2004	0.00	3.14
Ethiopia	SSA	2005	39.04	87.96
Georgia	EECA	2005	13.44	41.28
Ghana	SSA	2005	29.99	65.60
Guinea	SSA	2003	70.13	91.86
Guinea-Bissau	SSA	2002	48.83	86.68
Honduras	LAC	2006	18.19	36.47
India - rural	SAS	2004	43.83	89.04
India - urban	SAS	2004	36.16	77.32
Indonesia - rural	EAP	2005	24.01	77.41
Indonesia - urban	EAP	2005	18.67	59.56
Iran	MENA	2005	1.45	14.79
Jamaica	LAC	2004	0.24	11.76
Jordan	MENA	2006	0.38	9.01
Kazakhstan	EECA	2003	3.12	27.56

Kenya	SSA	2005	19.72	51.06
Kyrgyz Rep.	EECA	2004	21.81	66.49
Lao PDR	EAP	2002	43.96	86.43
Latvia	EECA	2004	0.00	2.07
Lesotho	SSA	2002	43.41	70.81
Madagascar	SSA	2005	67.83	94.83
Malaysia	EAP	2004	0.54	14.71
Mali	SSA	2001	51.43	85.38
Mauritania	SSA	2000	21.16	56.79
Mexico	LAC	2006	0.65	9.27
Moldova	EECA	2004	8.14	42.76
Mongolia	EAP	2005	22.38	64.24
Morocco	MENA	2007	2.50	24.38
Mozambique	SSA	2002	74.69	93.91
Nepal	SAS	2003	55.12	84.81
Nicaragua	LAC	2005	15.81	41.34
Niger	SSA	2005	65.88	90.92
Nigeria	SSA	2003	64.41	89.70
Pakistan	SAS	2004	22.59	76.24
Panama	LAC	2006	9.48	23.11
Paraguay	LAC	2007	6.45	19.98
Peru	LAC	2006	7.94	25.38
Philippines	EAP	2006	22.62	56.08
Poland	EECA	2005	0.10	1.67
Romania	EECA	2005	0.75	7.73
Russian Fed.	EECA	2005	0.16	4.08
Senegal	SSA	2005	33.50	72.35
South Africa	SSA	2000	26.20	50.73
Sri Lanka	SAS	2002	13.95	53.55
Swaziland	SSA	2000	62.85	86.97
Tanzania	SSA	2000	88.52	98.16
Thailand	EAP	2004	0.40	20.50
Tunisia	MENA	2000	2.55	21.05
Turkey	EECA	2005	2.72	14.70
Uganda	SSA	2005	51.53	83.72
Ukraine	EECA	2005	0.10	1.37
Uruguay - urban	LAC	2006	0.02	8.39
Venezuela	LAC	2006	3.53	15.71
Vietnam	EAP	2006	21.45	61.85
Yemen	EAP	2005	17.53	61.69
Zambia	SSA	2004	64.29	87.26

Mean	23.27	47.70
Median	17.86	50.90
Min	0.00	0.94
Max	88.52	98.16
SD	23.99	32.00
Quintiles		
1	1.33	14.77
2	8.94	31.91
3	22.04	61.50
4	44.93	85.59

Notes: These are the 80 countries with data for 2000 or onward, as well as data in the early-mid-1990s (1990-1996); see the text for details of the selection criteria. P_0 is the headcount ratio. Year indicated in parentheses is the latest year for which there is data (data source: World Bank, 2009a).

With respect to the emerging giants, China's urban and rural poverty rates at the $1.25 level are 1.7 percent and 26.1 percent, respectively, with the latter above the 'global' median of 17.9 percent. Thus, 'extreme' poverty has become essentially a rural phenomenon in China. In contrast, at 43.8 percent and 36.2 percent, respectively, India's rural and urban poverty rates are well above the 'global' median. It appears then that India's strong GDP growth in the more recent period may not have similarly reduced poverty.

Similar observations hold at the $2.50 poverty standard. Here the range is from 0.9 percent in Belarus to 98.2 percent in Tanzania, with a median of 47.7 percent. For the emerging giants, China's respective urban and rural poverty rates are 17.8 percent and 34.8 percent, which are both below the 'global' median. In contrast, at 77.3 percent and 89.0 percent, respectively, India's urban and rural poverty rates are both substantially above the 'global' median, as in the case at the $1.25 standard.

2.3.1 Growth vs. poverty reduction by country, early-mid-1990s to present

For the global sample of 80 countries, Table 4a presents, over the early-mid-1990s to the present, data on per capita GDP and income growths, and on the growth of poverty at both the $1.25 and $2.50 standards. Also reported in the Table are data on the growth of inequality, represented by the Gini coefficient. The goal here is to assess how GDP growth or income growth may have been translated to poverty reduction at the country level.

Table 4a: Growths of GDP per-capita, income and inequality vs. poverty growth, early-mid-1990s to present

Country	Region	GDP pc	Income	$1.25 P_0	$2.50 P_0	Gini
Albania	EECA	6.004	0.763	16.077	0.473	1.400
Argentina - urb.	LAC	0.921*	-1.051	11.700	3.515	0.327
Armenia	EECA	9.381	-3.580	-7.122	2.608	-3.903
Azerbaijan	EECA	7.401	4.374	-62.506	-34.310	-7.310
Bangladesh	SAS	3.250	-0.121	0.184	0.069	-0.072
Belarus	EECA	5.809	3.504	-24.964	3.203	2.139
Bolivia	LAC	1.288	1.002	10.552	2.450	2.167
Brazil	LAC	1.112	1.888	-7.142	-4.584	-0.664
Burkina Faso	SSA	3.182	1.536	-2.557	-0.251	-2.748
Burundi	SSA	-2.532	0.756	-0.252	-0.091	-0.013
Cambodia	EAP	5.935	1.859	-1.890	-0.950	0.892
Cameroon	SSA	1.694	5.792	-9.001	-3.598	-0.989
CAR	SSA	-0.699	5.060	-2.823	-0.585	-3.419
Chile	LAC	3.458	1.499	-8.168	-8.414	-0.572
China - rural	EAP	8.376*	4.433	-7.103	-2.576	0.714
China - urban	EAP	8.376*	6.573	-17.681	-8.945	1.673
Colombia	LAC	1.029	0.772	1.676	0.543	0.424
Costa Rica	LAC	2.193	3.199	-12.160	-5.367	0.035
Côte d'Ivoire	SSA	-0.145	3.168	1.448	-0.799	3.958
Djibouti	MENA	-1.643	-7.937	22.929	13.644	1.387
Dominican Rep.	LAC	3.793	0.786	-1.827	-0.384	0.284
Ecuador	LAC	1.651	4.562	-9.377	-5.108	0.343
Egypt	MENA	2.494	1.552	-2.356	-2.757	0.718
El Salvador	LAC	1.241	1.992	-3.469	-3.202	-0.556
Estonia	EECA	7.610	3.510	-61.350	-4.808	-2.947
Ethiopia	SSA	2.706	1.244	-4.384	-0.329	-2.947
Georgia	EECA	7.590	-3.906	12.207	7.745	1.042
Ghana	SSA	2.211	3.340	-3.802	-1.934	0.819
Guinea	SSA	1.585	-1.628	-0.722	0.367	-3.309
Guinea-Bissau	SSA	-2.205	-6.242	7.174	2.170	0.808
Honduras	LAC	1.748	3.621	-3.677	-3.332	0.014
India - rural	SAS	4.812*	1.199	-1.634	-0.348	0.576
India - urban	SAS	4.812*	1.167	-1.091	-0.609	0.822
Indonesia - rur.	EAP	1.971*	3.443	-7.399	-1.779	0.763
Indonesia - urb.	EAP	1.971*	4.219	-7.779	-3.079	0.686
Iran	MENA	2.985	-1.519	0.190	0.180	-1.057
Jamaica	LAC	0.300	4.434	-24.763	-3.934	1.467
Jordan	MENA	2.129	1.339	-14.189	-7.169	-0.995

Kazakhstan	EECA	5.672	-0.334	-6.680	-0.434	-0.607
Kenya	SSA	0.340	3.376	-3.364	-2.337	1.134
Kyrgyz Rep.	EECA	2.643	-7.816	1.442	5.284	-4.446
Lao PDR	EAP	4.242	1.652	-2.363	-0.569	0.698
Latvia	EECA	7.209	5.518	-75.503	-14.682	1.535
Lesotho	SSA	2.503	-3.671	-1.313	0.728	-2.641
Madagascar	SSA	0.126	1.755	-0.554	0.193	0.200
Malaysia	EAP	3.008	-2.818	-14.984	-1.796	-2.742
Mali	SSA	2.879	6.005	-4.292	-0.971	-2.165
Mauritania	SSA	0.995	2.321	-2.012	-1.784	0.917
Mexico	LAC	1.450	4.957	-23.738	-10.397	-0.089
Moldova	EECA	3.247	1.746	-6.122	-1.835	0.305
Mongolia	EAP	3.541	-0.998	1.748	1.008	-0.051
Morocco	MENA	2.088	0.222	0.119	-0.437	0.247
Mozambique	SSA	4.813	3.647	-1.422	-0.299	0.954
Nepal	SAS	1.691	4.782	-2.706	-1.127	2.846
Nicaragua	LAC	2.572	2.696	-6.005	-2.809	-0.621
Niger	SSA	-0.139	2.827	-1.555	-0.417	0.502
Nigeria	SSA	1.743	0.040	-0.882	-0.260	-1.141
Pakistan	SAS	1.728	4.268	-9.458	-2.215	1.058
Panama	LAC	2.267	0.676	-2.717	-1.391	-0.248
Paraguay	LAC	-0.510	-0.364	-5.639	-2.662	-0.874
Peru	LAC	2.430	1.928	-0.787	-0.886	0.691
Philippines	EAP	2.099	1.423	-1.811	-1.103	0.220
Poland	EECA	4.605	8.827	-29.323	-28.956	0.743
Romania	EECA	3.175	5.895	-17.192	-4.749	1.006
Russian Fed.	EECA	3.563	0.538	-34.218	-12.270	-2.303
Senegal	SSA	1.778	2.694	-4.359	-1.676	-0.507
South Africa	SSA	1.434	-0.584	4.019	0.870	0.413
Sri Lanka	SAS	3.725	2.674	-2.242	-2.089	2.115
Swaziland	SSA	1.046	5.255	-3.725	-1.051	-2.993
Tanzania	SSA	2.546	-4.282	2.204	0.346	0.256
Thailand	EAP	2.496	1.462	-19.411	-3.677	-0.274
Tunisia	MENA	3.564	3.371	-18.653	-6.878	-0.412
Turkey	EECA	3.102	1.279	2.352	-1.273	0.365
Uganda	SSA	3.580	3.115	-2.475	-0.982	1.532
Ukraine	EECA	2.467	4.210	-32.890	-27.105	-2.434
Uruguay - urb.	LAC	1.106*	-0.723	-35.553	4.096	0.551
Venezuela	LAC	-0.696	4.333	-14.272	-8.416	-1.161
Vietnam	EAP	6.009	5.183	-7.779	-2.784	0.407
Yemen	EAP	2.201	-4.848	10.409	7.417	-0.351
Zambia	SSA	0.980	-0.830	0.439	0.046	0.236

Mean	2.739	1.600	-7.504	-2.533	-0.190
Median	2.448	1.750	-3.093	-1.077	0.252
Min	-2.532	-7.937	-75.503	-34.310	-7.310
Max	9.381	8.827	22.929	13.644	3.958
SD	2.394	3.186	15.725	6.844	1.770
Quintiles					
1	1.094	-0.408	-14.205	-4.064	-1.074
2	2.041	1.315	-4.886	-1.811	-0.060
3	2.776	2.695	-2.150	-0.578	0.417
4	4.315	4.281	0.185	0.350	0.925

Notes: Data are annual or annualised averages and in %. Per-capita GDP growth rates are the 1995-2005 means of annual values from World Bank (2009b). P_0 is the headcount ratio. Growth rates of P_0, Mean Income and Gini (measuring inequality) are calculated as the log-differences using latest-year and start-year (most recent in 1990-96) values, divided by the number of years between the two periods, x 100 percent (*source*: World Bank, 2009a); see text for further details. Note that for Belarus, Estonia and Latvia, the latest value for $1.25-standard P_0 is reported as 0; for the purpose of computing the growth rate, this value has been approximated by 0.001. This approximation suggests that the corresponding estimates should be viewed with some caution.

For many of these countries, reasonably strong GDP growth seems to have resulted in substantial poverty reduction: (e.g., Azerbaijan, Brazil, Cameroon, Chile, China, Costa Rica, Ecuador, Egypt, El Salvador, Estonia, Ghana, Honduras, Indonesia, Jamaica, Jordan, Kenya, Latvia, Mali, Mauritania, Moldova, Pakistan, Poland, Romania, Russian Federation, Senegal, Sri Lanka, Swaziland, Thailand, Tunisia, Uganda, Ukraine and Vietnam). In several other countries, however, strong GDP growth was accompanied by only modest poverty reduction, either because the growth did not result in similar increases in income or because inequality increased to thwart the transformation process (e.g., Albania, Georgia, India, Iran, Kyrgyz Republic, Mongolia, and Yemen).

To better illustrate this poverty-growth linkage by country, we order by deciles the 80 sample countries with respect to their GDP and income per capita growth rates, on the one hand, and the poverty rates, on the other. The results are summarised in Table 4b as country 'poverty transformation efficiency' (PTE) vectors; the first two coordinates indicate the decile rankings of per-capita GDP and income growths, respectively, while the last two coordinates indicate the

Table 4b: 'Poverty transformation efficiency', by country

Country	Efficiency vector	Country	Efficiency vector
Albania	(2, 8, 10, 9)	Kyrgyz Rep.	(5, 10, 9, 10)
Argentina - urban	(9, 9, 10, 10)	Lao PDR	(3, 6, 6, 7)
Armenia	(1, 10, 3, 9)	Latvia	(1, 1, 1, 1)
Azerbaijan	(1, 2, 1, 1)	Lesotho	(5, 10, 7, 9)
Bangladesh	(4, 8, 8, 8)	Madagascar	(9, 5, 8, 8)
Belarus	(2, 3, 2, 3)	Malaysia	(4, 9, 2, 5)
Bolivia	(8, 7, 10, 10)	Mali	(4,1, 5, 6)
Brazil	(8, 5, 4, 2)	Mauritania	(9, 5, 7, 4)
Burkina Faso	(4, 6, 6, 8)	Mexico	(8, 2, 2, 1)
Burundi	(10, 7, 8, 8)	Moldova	(4, 6, 4, 5)
Cambodia	(2, 5, 7, 6)	Mongolia	(3, 9, 9, 9)
Cameroon	(7, 1, 3, 3)	Morocco	(6, 8, 8, 7)
CAR	(10, 1, 6, 6)	Mozambique	(2, 4, 7, 7)
Chile	(3 , 6, 3, 2)	Nepal	(7, 2, 6, 5)
China - rural	(1, 2, 4, 4)	Nicaragua	(5, 4, 4, 3)
China - urban	(1, 1, 3, 2)	Niger	(10, 4, 7, 7)
Colombia	(9, 7, 9, 9)	Nigeria	(7, 8, 8, 8)
Costa Rica	(6, 4, 2, 2)	Pakistan	(7, 3, 3, 4)
Côte d'Ivoire	(10, 4, 9, 6)	Panama	(6,. 8, 6, 5)
Djibouti	(10, 10, 10, 10)	Paraguay	(10, 8, 4, 4)
Dominican Rep.	(3, 7, 7, 7)	Peru	(6, 5, 8, 6)
Ecuador	(8 , 2, 3, 2)	Philippines	(6, 6, 7, 5)
Egypt	(5, 6, 6, 3)	Poland	(2, 1, 1, 1)
El Salvador	(8, 5, 5, 3)	Romania	(4, 1, 2, 2)
Estonia	(1, 3, 1, 2)	Russian Fed.	(3, 8, 1, 1)
Ethiopia	(5, 7, 5, 7)	Senegal	(7, 5, 5, 5)
Georgia	(1, 10, 10, 10)	South Africa	(8, 9, 10, 9)
Ghana	(6, 3, 5, 4)	Sri Lanka	(3, 5, 6, 4)
Guinea	(8, 10, 10, 9)	Swaziland	(9, 2, 5, 6)
Guinea-Bissau	(10, 9, 8, 9)	Tanzania	(5, 10, 9, 8)
Honduras	(7, 3, 5, 3)	Thailand	(5, 6, 2, 3)
India - rural	(2, 7, 7, 7)	Tunisia	(3, 4, 1, 1)
India - urban	(2, 7, 8, 6)	Turkey	(4, 7, 9, 5)
Indones. - rural	(7, 4, 4, 5)	Uganda	(3, 4, 6, 6)
Indones. - urban	(7, 3, 3, 3)	Ukraine	(5, 3, 1, 1)
Iran	(4, 9, 9, 8)	Uruguay - urb.	(8, 9, 2, 10)
Jamaica	(9, 2, 1, 3)	Venezuela	(10, 2, 2, 1)
Jordan	(6, 6, 3, 2)	Vietnam	(1, 1, 4, 4)

Kazakhstan	(2, 8, 4, 7)	Yemen	(6, 10, 10, 10)
Kenya	(9, 3, 5, 4)	Zambia	(9, 9, 9, 8)

Notes: **'Efficiency vector'** has the deciles ranks as coordinates. For example, Albania's efficiency vector of (2, 8, 10, 9) means that the country's deciles ranks are 2, 8, 10 and 9, respectively, on per-capita GDP growth, per-capita income growth, poverty reduction at the $1.25 standard and poverty reduction at the $2.50 standard.

respective reductions in the $1.25 and $2.50-level poverty rates.[8] For example, the (2, 8, 10, 9) vector for Albania means that the country was in the 2nd and 8th top deciles for per-capita GDP and income growths, respectively, but in the 10th and 9th top deciles of poverty reduction at the $1.25 and $2.50 standards, respectively. Hence, Albania performs rather poorly in transforming GDP growth to poverty reduction, explained mainly by the weak translation of GDP to income growth. Actually, Georgia's PTE vector of (1, 10, 10, 10) demonstrates this phenomenon too well. The country's per-capita GDP growth places it in the top decile; however, Georgia performs among the worst decile on both income growth and poverty reduction.

Conversely, according to the PTE vectors in Table 4b, there are many countries where income has actually outperformed GDP, including: Cameroon, CAR, Costa Rica, Cote d'Ivoire, Ecuador, Ghana, Honduras, Indonesia, Jamaica, Kenya, Mexico, Nepal, Pakistan, Romania, Senegal, Swaziland, and Venezuela. Given, further, that income is generally a better reflector of poverty than GDP is, GDP growth would underestimate poverty performance in these countries. And, there are those countries which performed quite well on all the four coordinates and have, thus, translated strong GDP growth to substantial declines in poverty, including: Azerbaijan, Jamaica, Latvia, Mexico, Poland, the Russian Federation, Tunisia, Ukraine and Venezuela.

Turning to the emerging giants, India's respective rural and urban PTE vectors of (2, 7, 7, 7) and (2, 7, 8, 8) imply that the country's stellar performance on GDP growth was poorly translated to income growth; however, India's record of poverty reduction fairly matches its income performance.[9] Apparently, the main culprit is the minimal increase in income despite the strong GDP growth (Table 4a). In contrast, China's rural and urban PTE vectors are (1, 2, 4, 4) and (1, 1, 3, 2), respectively. Hence, its GDP growth appears to be a good indicator of income performance; nonetheless, according to these vectors, the country's performance on poverty, relative to its economic growth, seems somewhat below par.

[8] A lower-number decile for the GDP or income growth indicates a grouping of higher-growth countries, and a lower-number decile for the poverty rates indicates a grouping of larger poverty-reduction countries.
[9] India's per-capita GDP grew at a stellar annual average rate of nearly 5.0 percent, and yet the average annual rate of poverty reduction was only 1.6 percent and 1.1 percent for the rural and urban sectors, respectively. Although part of the weak performance on poverty may be due to increases in inequality (Table 4a), the weak GDP-income linkage appears to be the main culprit, as the PTE vectors amply imply (Table 4b).

3. Transforming growth to poverty reduction – a quantitative assessment

3.1 Existing literature and estimating equation

The above discussion suggests that differences in regional or country experiences in poverty reduction may be attributable in considerable part to disparities in economic growth. Indeed, according to a strand of the literature, growth is the most powerful, if not the only, agent for poverty-reduction (e.g., Dollar and Kraay, 2002). Nonetheless, as we have also observed, there are many countries where GDP or income growth may not adequately be translated to poverty reduction.

As alluded to in the introduction, however, an increasing number of studies have shown that inequality may play a crucial role in the transformation of growth to poverty reduction (e.g., Adams, 2004; Bourguignon, 2003; Easterly, 2000; Epaulard, 2003; Fosu, 2009; Kalwij and Verschoor, 2007; Ravallion, 1997). In general, less initial inequality would imply a greater (absolute) value of the income elasticity, ceteris paribus, so that a larger amount of poverty decline would accompany a unit of growth.[10]

We explore herein the global evidence on the transformation of income growth, as well as changes in inequality, to poverty reduction, with inequality serving as an important intermediation factor. Different types of models have been used to capture this relationship. One type involves separate estimation of the poverty equation for different Gini coefficients (e.g., Adams, 2004). Closely related to this specification is a model that includes an interaction of growth with initial inequality (e.g., Easterly, 2000; Fosu, 2009; Ravallion, 1997). Other models also symmetrically include an interactive term involving (logarithmic) income and (logarithmic) Gini coefficient (e.g., Fosu, 2008, 2010a,b,c), so that the implied elasticity would entail the levels (rather than growths) of income and inequality.

For the current study, we opt for the relatively fully specified poverty equation, whose derivation is guided by the assumption that income is log-normally distributed (Bourguignon, 2003; Epaulard, 2003; Fosu, 2009; Kalwij and Verschoor, 2007):[11]

$$(1) \qquad p = b_1 + b_2 y + b_3 y G^I + b_4 y(Z/Y) + b_5 g + b_6 g G^I + b_7 g(Z/Y) + b_8 G^I + b_9 Z/Y$$

where p is the growth in the poverty rate, y is income growth, g is growth in the Gini coefficient, G^I is the initial Gini coefficient (expressed in logarithm), Z/Y is the ratio of the poverty line Z to

[10] Note, though, that a perverse outcome is conceivable, since redistributing from the non-poor to the poor in a very low-income economy could actually increase the poverty rate, so that less inequality might engender greater poverty in such countries; see Fosu (2010a, 2010b, 2010c), for instance, for an elaboration of this point.

[11] Indeed, the basic relationship is an identity (Bourguignon, 2003), which renders the specification potentially the most comprehensive. For derivation details, see Bourguignon (2003), Epaulard (2003), and Kalwij and Verschoor (2007).

income Y (expressed in logarithm), and b_j (j=1,2,…,9) are the respective coefficients to be estimated.

The sign of b_2 is anticipated to be negative, so that an increase in income growth should reduce poverty growth, ceteris paribus. In contrast, b_3 is expected to be positive, for a higher level of initial inequality would decrease the rate at which growth acceleration is transformed to poverty reduction. The sign of b_4 should be positive as well, consistent with the hypothesis, based on the lognormal income distribution, that a larger income (relative to the poverty line) would have associated with it a higher income-growth elasticity[12] (Bourguignon, 2003; Epaulard, 2003; Fosu, 2009; Kalwij and Verschoor, 2007).

The sign of b_5 is theoretically positive, for a worsening income distribution is expected to increase poverty, ceteris paribus. In contrast, b_6 cannot generally be signed; however, it would be negative if there was diminishing poverty-increasing effect of rising inequality. The sign of b_7 would also be negative, as in a relatively low-income economy (high Z/Y) improving income distribution (lowering g) might exacerbate poverty by increasing the likelihood of more people falling into poverty. Finally, b_8 and b_9 are likely to be positive; rising initial inequality or increasing poverty line relative to income should, ceteris paribus, exacerbate poverty, respectively, though these coefficients do not affect the income or inequality elasticity of poverty (Bourguignon 2003; Epaulard, 2003; Fosu, 2009; Kalwij and Verschoor, 2007).

From equation (1), the respective income and inequality elasticities are obtained as:

(2) $E_y = b_2 + b_3 G^I + b_4 Z/Y$

(3) $E_g = b_5 + b_6 G^I + b_7 Z/Y$

Hence, given the above expected signs, E_y and E_g are generally anticipated to be negative and positive, respectively, so that increasing income growth should reduce the growth of poverty, while inequality acceleration would exacerbate poverty increases. It is conceivable, though, that perverse signs of the elasticities could occur. For example, in a highly unequal (high G^I) and low-income (high Z/Y) economy, the magnitude of the combined positive-signed b_3 and b_4 could actually overwhelm the magnitude of the negative-signed b_2. Similarly, in such an economy, E_g could be negative. These two elasticities, which are estimated next, would be crucial in determining what happens to poverty reduction over time in a given economy.

[12] We shall ignore the sign and adopt the convention of referring to the income elasticity by its magnitude.

3.2 Data, estimation and results

The data used in the present analysis are derived from the most recent World Bank global database,[13] which yields at most 392 usable unbalanced panel observations, involving some 123 countries over 1977-2007.[14] Separate regression equations are estimated for the $1.25 and $2.50 poverty standards. Summary statistics by region for the poverty rates, income inequality (Gini coefficient) and mean income are reported in the appendix, Table A1.[15] Note that the averages are non-weighted and, due to missing data, sample composition may vary over time. Hence, only the statistics for the entire sample period are reported for the various regions. Nonetheless, the respective regional sample poverty rates presented in Table A1 are strikingly close to the population-weighted values shown earlier in Table 2.

Using the above unbalanced panel data, equation (1) is estimated by applying three procedures: random-effects (RE), country fixed-effects (FE), and generalised method of moments (GMM).[16] Following Kalwij and Verschoor (2007), various versions of the equation are estimated, with special attention paid to the regional effects. Note that all the level variables used in the estimation are expressed in (natural) logarithm, while the growth variables are the logarithmic changes. Due to GMM's ability to control for possible endogeneity of the explanatory variables,[17] the GMM results are selected as the most preferred and are reported in the text as Tables 5.1 and 5.2, for the $1.25 and $2.50 standards, respectively.

The regression results seem rather similar between the two poverty standards, and show that all the estimated coefficients are as expected. The estimates also suggest that any variation in the income and inequality elasticities across regions, and presumably across countries, is mainly attributable to differences in attributes. In particular, according to model (5), once the poverty function is fully specified, there are little regional differences with respect to the income elasticity, similarly to the finding in Kalwij and Verschoor (2007).[18] From the results of this model in Tables 5.1 and 5.2, we can re-write the respective income and inequality elasticity equations (2) and (3), first for the $1.25 poverty standard, as:

(4) $E_y = -9.757 + 2.307\ G^I + 1.333\ Z/Y$

(5) $E_g = 14.391 - 3.649\ G^I - 2.754\ Z/Y$

[13] See World Bank, 2009a.
[14] There are 320 and 392 usable observations for the $1.25 and $2.50 poverty standards, respectively.
[15] We do not report the summary data for the growth rates because they would not be reliable, as the periods are not standardised across observations. That is, growth rates are calculated over different period lengths, depending on data availability, so that their averages are not technically reliable.
[16] Only the GMM results are, however, reported here. The other (FE and RE) estimates are very similar to the GMM and can be made available by the author upon request.
[17] In particular, income and inequality may be endogenously determined.
[18] The Hansen J test suggests that the instruments are generally 'valid' in all the models except for model (3). An F test furthermore indicates that one cannot reject the null hypothesis that the coefficients of the regional variables are equal when the model is fully specified, a result that is qualitatively buttressed by the virtually equal SEE and uncentred R^2 between models (4) and (5), especially in Table 5.1.

(6) $E_y = -9.757 + 2.307\ G^I + 1.333\ Z/Y$

(7) $E_g = 14.391 - 3.649\ G^I - 2.754\ Z/Y$

And, for the $2.50 poverty standard, we obtain:

(8) $E_y = -8.178 + 1.902\ G^I + 0.912\ Z/Y$

(9) $E_g = 5.336 - 1.155\ G^I - 1.513\ Z/Y$

It is deducible from equations (4) and (6) that the income elasticity (in absolute value) decreases with initial inequality, G^I, and with Z/Y. Hence, regions/countries with lower initial levels of inequality and higher incomes relative to the poverty line would exhibit larger poverty responsiveness to income changes. Similarly, from equations (5) and (7), we deduce that regions/countries with lower initial inequality levels or larger incomes relative to the poverty line would also possess higher values of the inequality elasticity. Conversely, low-income, high-inequality localities would have both low (absolute-valued) income and inequality elasticities.

Table 5.1: Inequality, income growth and poverty – GMM regression results, 1980-2007: $1.25

Variable/model	(1)	(2)	(3)	(4)	(5)
Constant	-0.046	-0.007	-0.022	-0.447	-0.204
	(-1.28)	(-0.72)	(-2.05)	(-2.87)	(-1.73)
dlog Y_{it}	-0.330				-9.757
	(-3.89)				(-4.14)
dlog Y_{it} x log G_{it-1}				1.844	2.307
				(1.64)	(3.54)
dlog Y_{it} x log(Z/Y_{it-1})				1.525	1.333
				(6.57)	(6.43)
dlog G_{it}			1.714	13.161	14.391
			(3.86)	(3.09)	(4.22)
dlog G_{it} x log G_{it-1}				-3.178	-3.649
				(-2.80)	(-3.97)
dlog G_{it} x log(Z/Y_{it-1})				-2.681	-2.754
				(-5.97)	(-7.06)
log G_{it-1}				0.123	0.055
				(2.80)	(1.67)
log(Z/Y_{it-1})				0.025	0.011
				(2.24)	(1.24)
dlog Y_{it} x region dummy					
East Asia and Pacific (EAP)		-1.470	-1.436	-7.598	
		-4.31	(-3.76)	(-1.90)	
Latin America and the Caribbean (LAC)		-1.213	-0.821	-7.393	
		(-2.10)	(-1.69)	(-1.64)	
East Europe and Central Asia (EECA)		-2.554	-2.040	-8.026	
		(-3.11)	(-1.69)	(-2.05)	
Middle East and North Africa (MENA)		0.134	-2.475	-8.594	
		(0.04)	(-1.90)	(-1.97)	
South Asia (SAS)		-1.523	-1.062	-7.432	
		(-2.52)	(-2.09)	(-1.86)	
Sub-Saharan Africa (SSA)		-0.598	-0.452	-9.140	
		(-2.48)	(-1.17)	(-2.11)	
N	320	320	320	320	320

Uncentred R^2	0.11	0.34	0.41	0.64	0.64
SEE	0.307	0.265	0.252	0.196	0.196
Hansen J	0.238[a]	8.164[b]	25.157[c]	13.367[d]	23.888[e]
	[0.63]	[0.23]	[0.01]	[0.42]	[0.16]

Notes: The dependent variable is the log-difference of headcount ratio ($1.25/day); heteroscedastic robust t-statistics in parentheses; Hansen J statistic tests for over-identification of instruments (p-values in brackets). All regressors involving dlog Y_{it} are considered endogenous and are instrumented. All models are estimated using 2-step GMM.

[a]Critical value, $\chi^2_{0.05}(1) = 3.84$;instruments: $logY_{it-1}$ and $dlogPOP_{it}$. [b]Critical value, $\chi^2_{0.05}(6) = 12.59$; instruments: regional dummy variables, $logY_{it-1}$ interacted with dummy variables and $dlogPOP_{it}$. [c]Critical value is $\chi^2_{0.05}(12) = 21.02$; instruments: regional dummy variables, $logY_{it-1}$ and $logG_{it-1}$ interacted with regional dummy variables and $dlogPOP_{it}$. [d]Critical value, $\chi^2_{0.05}(13) = 22.36$; instruments: regional dummy variables, $logY_{it-1}$ and $logG_{it-1}$ interacted with regional dummy variables, $dlogPOP_{it}$, $logY_{it-1}$ x $logG_{it-1}$, $logY_{it-1}$ x $log(Z/Y_{it-1})$ and $logG_{it-1}$ x $logG_{it-1}$. [e]Critical value, $\chi^2_{0.05}(18) = 28.87$; instruments: same as listed in [d].

Table 5.2: Inequality, income growth and poverty – GMM regression results, 1980-2007: $2.50

Variable/model	(1)	(2)	(3)	(4)	(5)
Constant	0.013	-0.000	-0.005	-0.076	-0.025
	(1.57)	(-0.15)	(-1.32)	(-1.39)	(-0.48)
dlog Y_{it}	-1.252				-8.178
	(-3.60)				(-6.94)
dlog Y_{it} x log G_{it-1}				0.984	1.902
				(2.09)	(6.05)
dlog Y_{it} x log(Z/Y_{it-1})				0.984	0.912
				(8.33)	(8.07)
dlog G_{it}			1.426	1.786	5.336
			(6.32)	(1.05)	(2.91)
dlog G_{it} x log G_{it-1}				-0.187	-1.155
				(-0.42)	(-2.42)
dlog G_{it} x log(Z/Y_{it-1})				-1.538	-1.513
				(-11.96)	(-10.40)
log G_{it-1}				0.021	0.007
				(1.38)	(0.50)
log(Z/Y_{it-1})				0.004	0.000
				(0.91)	(0.06)
dlog Y_{it} x region dummy					
East Asia and Pacific (EAP)		-0.653	-0.966	-4.455	
		(-4.48)	(-4.65)	(-2.68)	
Latin America and the Caribbean (LAC)		-0.883	-0.880	-4.414	
		(-5.52)	(-5.11)	(-2.41)	
East Europe and Central Asia (EECA)		-2.908	-2.045	-5.225	
		(-4.13)	(-4.18)	(-3.16)	
Middle East and North Africa (MENA)		-1.475	-2.308	-4.943	
		(-1.26)	(-3.97)	(-2.78)	
South Asia (SAS)		-0.365	0.001	-4.368	
		(-1.75)	(0.00)	(-2.67)	
Sub-Saharan Africa (SSA)		-0.244	-0.322	-5.303	
		(-2.13)	(-1.19)	(-2.95)	

N	342	342	342	342	342
Uncentred R^2	0.49	0.65	0.73	0.89	0.87
SEE	0.150	0.124	0.109	0.069	0.074
Hansen J	0.04	12.17	28.675	11.274	23.315
	[0.84]	[0.06]	[0.00]	[0.59]	[0.18]

Notes: For details, see notes for Table 5.1.
[a]Critical value is $\chi^2_{0.05}(1) = 3.84$. [b]Critical value is $\chi^2_{0.05}(6) = 12.59$. [c]Critical value is $\chi^2_{0.05}(12) = 21.02$. [d]Critical value is $\chi^2_{0.05}(13) = 22.36$. [e]Critical value is $\chi^2_{0.05}(18) = 28.87$. Respective instruments are shown in notes for Table 5.1.

Estimates of the income and inequality elasticities, generated from equations (4) - (7) at the $1.25 and $2.50 poverty levels, are reported in Table 6 for the various regions.[19] Since the country composition is likely to change over time, the sample statistics of the sub-periods may

Table 6: Estimated income and inequality elasticities by region, 1980 - present

$1.25 poverty line

Income elasticity

	1980s	**1990s**	**2000-**	**Overall**
Global	-2.427	-2.244	-2.396	-2.335
East Asia and Pacific (EAP)	-2.019	-2.127	-2.397	-2.163
Europe and Central Asia (EECA)	-4.683	-3.499	-3.519	-3.683
Latin America and The Caribbean (LAC)	-2.803	-2.922	-3.016	-2.928
Middle East and North Africa (MENA)	-3.029	-3.095	-3.034	-3.062
South Asia (SAS)	-2.031	-2.136	-2.038	-2.055
Sub-Saharan Africa (SSA)	-1.498	-1.112	-1.359	-1.256

Inequality elasticity

Global	3.343	3.048	3.375	3.224
East Asia and Pacific (EAP)	2.333	2.638	3.233	2.704
Europe and Central Asia (EECA)	7.524	5.358	5.425	5.706
Latin America and The Caribbean (LAC)	4.443	4.669	4.891	4.696
Middle East and North Africa (MENA)	4.647	4.696	4.581	4.647
South Asia (SAS)	2.266	2.527	2.474	2.391
Sub-Saharan Africa (SSA)	1.523	0.842	1.276	1.096

[19] Elasticity estimates based on the FE and RE models are similar to those of the GMM; however, they are not reported here for reasons of parsimony, but can be made available by the author upon request.

$2.50 poverty line

Income elasticity

	1980s	1990s	2000-	Overall
Global	-1.344	-1.196	-1.296	-1.261
East Asia and Pacific (EAP)	-1.112	-1.164	-1.339	-1.196
Europe and Central Asia (EECA)	-3.027	-2.136	-2.142	-2.274
Latin America and The Caribbean (LAC)	-1.508	-1.598	-1.651	-1.597
Middle East and North Africa (MENA)	-1.737	-1.809	-1.762	-1.782
South Asia (SAS)	-1.149	-1.208	-1.098	-1.143
Sub-Saharan Africa (SSA)	-0.682	-0.383	-0.573	-0.494

Inequality elasticity

Global	1.333	1.235	1.423	1.321
East Asia and Pacific (EAP)	0.651	0.880	1.237	0.922
Europe and Central Asia (EECA)	3.265	2.287	2.343	2.457
Latin America and The Caribbean (LAC)	2.184	2.296	2.436	2.323
Middle East and North Africa (MENA)	2.092	2.056	1.998	2.043
South Asia (SAS)	0.545	0.721	0.804	0.668
Sub-Saharan Africa (SSA)	0.410	0.124	0.302	0.229

Notes: These are derived from the GMM estimates from Tables 5.1 and 5.2 and equations (4) - (7) of the text.

not be reliable. We therefore focus on the elasticity estimates for the overall 1981-2007 period. According to the income elasticity estimates, the greatest responsiveness of poverty to income growth is exhibited by EECA, followed by LAC and MENA with similar values. EAP comes next, followed closely by SAS, while SSA has the least value. These results appear to hold for both poverty standards; however, as to be expected, the respective elasticities are lower for the $2.50 poverty standard than for the $1.25.

The differences in income elasticity by region seem to be driven by differences in inequality, but also by disparities in income levels. For example, for both poverty standards, the highest elasticity enjoyed by the EECA is attributable to the stylised fact that the region exhibits the lowest initial inequality as well as the highest mean income. LAC's moderate elasticity is driven by high levels of both mean income and inequality, which tend to counteract one another, while MENA's moderate elasticity is attributable to modest income as well as moderate inequality. Meanwhile, EAP's and SAS's moderate-to-low elasticity (absolute) values are explained by their

relatively low mean incomes and medium levels of inequality. Finally, SSA exhibits the lowest income elasticity, thanks to both its low income and high inequality.

The regional comparison of inequality elasticity estimates, also shown in Table 6, is similar between both poverty standards and mirrors the pattern observed for the income elasticity. That is, EECA exhibits the largest value, suggesting that its poverty rate is the most prone to distributional changes in income distribution, followed by LAC and MENA, then by EAP, and subsequently by SAS, with SSA displaying the least responsiveness. As in the case of the income elasticity, EECA's high value of the inequality elasticity is attributable to its low level of inequality and high income; LAC's moderate value results from its high income counteracted by high inequality, while MENA's moderate elasticity derives from modest levels of both income and inequality. EAP's and SAS's low-to-moderate values are attributable to their relatively low incomes and moderate levels of inequality. Finally, the smallest estimated value of the inequality elasticity for SSA is explained by high inequality and low mean income.

To most effectively reduce poverty, therefore, it appears that EECA, in one extreme, should be particularly concerned about rising inequality, which tends to increase poverty relatively easily. Meanwhile, in the light of its high income elasticity, modest growth should lead to relatively large poverty reductions. In the other extreme, SSA would require a larger dose of growth acceleration to reduce poverty, while worsening income distribution should generally be of less concern. Furthermore, for each region, inequality elasticity tends to be larger than the income elasticity, suggesting that changes in income distribution, where feasible, can have relatively large effects on poverty reduction.

The above elasticity results are further elaborated in Figures 2 and 3 for the $1.25 poverty level.[20] Figure 2 graphs the (absolute-valued) income elasticity, E_y, as a function of initial inequality using equation (4), at the global mean income relative to the $1.25 poverty line. Figure 3 does likewise, but for the inequality elasticity, E_g. The respective data points for the regions, as well as the global vector, are also plotted. As apparent, both E_y and E_g decrease with initial inequality, while the regional points are distributed around the respective graphs. Note that a point above (below) a graph at a given value of the Gini coefficient indicates a higher (lower) regional income relative to the poverty line. Thus, by virtue of their lower initial inequality levels, SAS, EAP and SSA would all have exhibited higher income and inequality elasticities than LAC, respectively, were it not for LAC's higher income. In the case of EECA, its higher income and inequality elasticity levels than SAS's, for instance, are explained mainly by its superior income level. In contrast, the larger EECA elasticity levels than LAC's are attributable to the former's lower level of inequality.

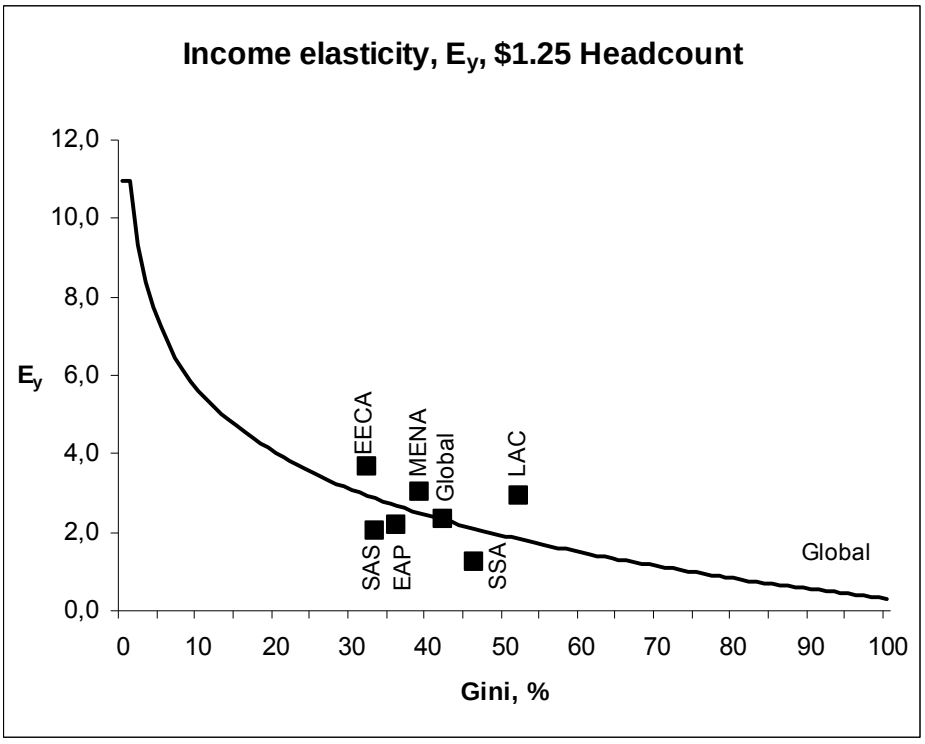
These regional estimates, however, confound the intra-regional heterogeneity. In the case of SSA, Fosu (2009) finds a considerable variation in both the income and inequality elasticities among countries. As the author argues, SSA countries with very high levels of inequality may

[20] The respective graphs for the $2.50 poverty level are similar and are not reported here.

require a relatively large emphasis on income distribution as a way of boosting the income elasticity via decreasing inequality. The most efficient poverty-reduction approach would, therefore, be country-specific.

Table A2 in the Appendix presents estimates of the income and inequality elasticities for all the 123 countries in the World Bank database for both the $1.25 and $2.50 poverty standards. These estimates are based on the latest year for which a given country has data and may, therefore, not be strictly comparable across countries. Nevertheless, we can draw some fairly general conclusions.

Figure 2: Income elasticity vs. initial income inequality



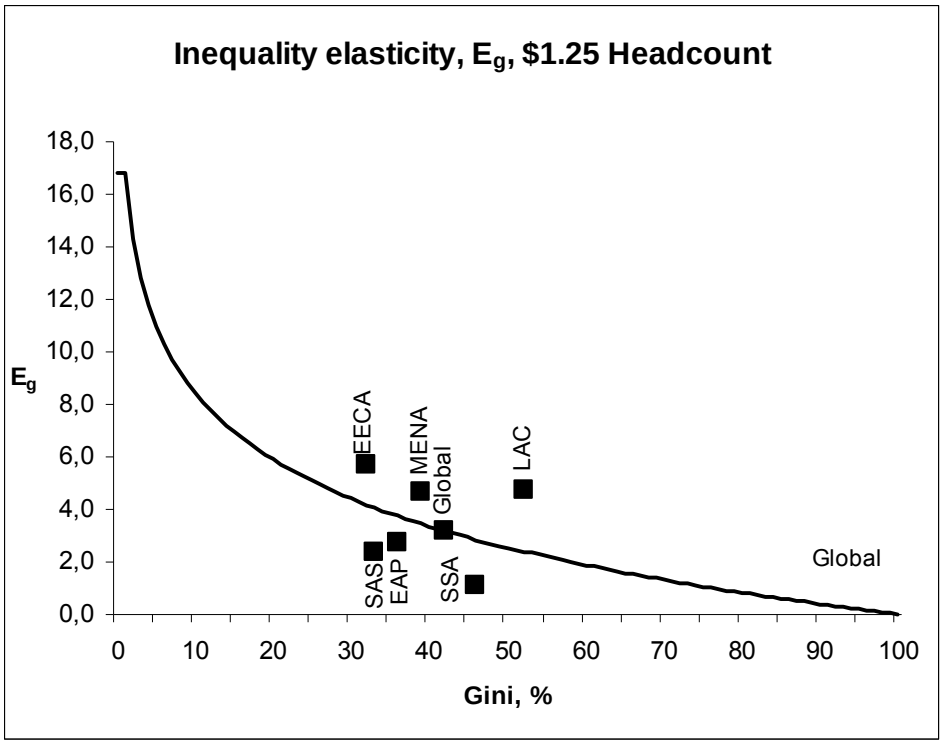
First, the income elasticity estimates are nearly all negative,[21] suggesting that income growth would reduce poverty in practically all countries for both poverty standards. Second, nearly all the inequality elasticity estimates are positive;[22] hence, increases in inequality would, in general, raise poverty. Third, the estimated elasticites at the $1.25 standard are, respectively, larger than those at the $2.50 standard, as to be expected, since moving people out of poverty at the higher

[21] The only exception is Liberia and for the $2.50 standard; the result is attributable to the country's low mean income that was appreciably below the poverty line.

[22] The exceptions are: Liberia, for both of the poverty standards; and Burundi, Guinea, Malawi, Mozambique, Rwanda, Tanzania and Zambia, where the mean incomes are appreciably below the $2.50 poverty line. Note, however, that the magnitudes of these negative estimates are generally rather small.

poverty line would require greater effort. Fourth, consistent with the above regional observations, the elasticities are generally largest for the EECA and lowest for the SSA countries. Indeed, the hitherto observed regional orderings appear to hold.[23] Fifth, as earlier observed above for the regions, the inequality elasticity seems to be appreciably larger than the respective income elasticity at the country level, especially for the $1.25 poverty level; however, this outcome does not seem to hold generally at the $2.50 standard.[24]

Figure 3: Inequality elasticity vs. initial income inequality



We now focus on the results for the two emerging giants. China exhibits much larger income and inequality elasticities in the urban than in the rural sector. This finding holds for both poverty standards and implies that economic growth in the urban area would be more readily translated to poverty reduction, but then poverty in that sector would also be relatively susceptible to the poverty-increasing effect of rising inequality. In India, however, the reverse appears to be the case, with the income and inequality elasticities slightly larger in the rural area generally.[25] Finally, India's estimated elasticities are appreciably less than China's, respectively, especially for the urban sector.

[23] The few exceptions include Haiti and Nepal, whose income elasticity estimates seem lower than the average for SSA.

[24] This difference in results between the two poverty standards is attributable to the much larger partial effect of inequality on poverty at the $1.25 than at the $2.50 level (compare intercepts in equations (5) and (7)) with the intercepts of equations (4) and (6)).

[25] The only exception is the estimated inequality elasticity at the $2.50 level, which is slightly larger for the urban sector.

3.3 Explaining poverty reduction by country, early-mid-1990s to present

A major objective of the current paper is to examine how the recent strong growth of developing countries may have been translated to human development such as poverty reduction. The above elasticity estimates for the 123 countries inform us of the expected changes in poverty in response to increasing growth in income or in inequality for the particular (latest) year for which a given elasticity estimate is provided. For current policy purposes, these estimates are the most pertinent.

To meet the above objective of explaining recent growth performance and poverty reduction, however, we need to situate the elasticity estimates in the relevant period. The income and inequality elasticities are, therefore, recomputed over the early-mid-1990s for the select global sample of 80 countries, using equations (4) – (7).[26] The results are presented in Tables A3.1 and A3.2 of the Appendix, respectively, for the $1.25 and $2.50 standards.[27] Also reported are the mean annualised growths in income, inequality and poverty, for we are interested in the extent to which the observed poverty changes might be decomposable into income and inequality factors.

According to Tables A3.1 and A3.2, the income elasticity estimates are generally negative, while those of the inequality elasticity are positive, as anticipated.[28] Hence, income increases or inequality decreases in a given country would be translated to poverty reduction over the period of the analysis: the early-mid-1990s to the present. Note from these tables also that the magnitudes of the elasticites tend to be, respectively, larger for the $1.25 than for the $2.50 standard, as to be expected.

To shed further light on the differential abilities of the various countries to transform economic growth to poverty reduction since the early-mid-1990s, the income and inequality elasticity estimates are ordered by country in Tables 7.1 and 7.2 for the $1.25 and $2.50 poverty

[26] As explained earlier, the 80 countries were selected according to the following criteria: in each case, the starting date is the latest year for which there is data within 1990-96, and the ending date is the latest year within 2000-2007. The selection criteria are designed to maximise the number of included countries, while providing a reasonable degree of period standardisation. Although the current method does not achieve perfect comparability across countries, it represents a reasonable attempt to explain recent poverty reduction by country for a large global sample. Given differences of year-coverage across countries, all statistics are annualised by dividing by the number of years between the end points for each country.

[27] These are the values reported under columns A and C of tables A3.1 and A3.2, respectively. Note that the estimates under columns B and D are illustrative only; they are indicative of the importance of initial inequality alone, with the role of income suppressed.

[28] For the $1.25 standard, CAR appears as the only exception with a positive value for the income elasticity; at the $2.50 standard, the two exceptions are CAR and Guinea. There are several exceptions for the inequality elasticity estimates, though: CAR, Guinea, Mali, Mozambique and Swaziland for the $1.25 standard (column C of Table A3.1); and Burkina Faso, Burundi, CAR, Guinea, Madagascar, Mali, Mozambique, Niger, Swaziland and Zambia for the $2.50 standard (Table A3.2, column C). The main rationale for the 'perverse' results is that these countries had appreciably lower mean incomes than the poverty line, hence the greater preponderance of exceptions under the $2.50 standard.

standards, respectively. These results show that a country with a high (absolute) value of income elasticity also tends to exhibit a high value of inequality inelasticity, as already observed above for the 'current-year' estimates.[29] This is primarily because countries with large incomes (relative to the poverty line) displayed high magnitudes of both elasticities (equations (2) and (3)). The implication of the result, as earlier observed, is that lower-income countries would require greater income growth for a given expected poverty reduction; however, these countries would also need to be less concerned about inequality increases, and conversely.

Table 7.1: Countries in deciles on income and inequality elasticities, early-to-mid 1990s, *$1.25* poverty standard

Decile	Income elasticity	Inequality elasticity	Decile	Income elasticity	Inequality elasticity
	(min-max)	(min-max)		(min-max)	(min-max)
1.	Albania	Burkina Faso	6.	Armenia	Azerbaijan
	Argentina - urb.	CAR		Côte d'Ivoire	China - urban
	Belarus	Guinea		India - rural	Colombia
	Estonia	Madagascar		Indonesia - rur.	Ecuador
	Latvia	Mali		Kyrgyz Rep.	El Salvador
	Romania	Mozambique		Pakistan	Kyrgyz Rep.
	Ukraine	Swaziland		South Africa	Moldova
	Uruguay - urb.	Zambia		Sri Lanka	Thailand
2.	Chile	Burundi	7.	Bangladesh	Brazil
	Georgia	Lesotho		India - urban	Egypt
	Iran	Nepal		Indones. - urb.	Jordan
	Jamaica	Niger		Kenya	Morocco
	Malaysia	Nigeria		Lao PDR	Paraguay
	Poland	Senegal		Mauritania	Tunisia
	Russian Fed.	Tanzania		Nicaragua	Venezuela
	Turkey	Uganda		Philippines	Yemen
3.	Bolivia	Cambodia	8.	Cambodia	Bolivia
	Costa Rica	Cameroon		Cameroon	Costa Rica
	Djibouti	China - rural		China - rural	Djibouti
	Kazakhstan	Ethiopia		Ethiopia	Dominican Rep.
	Mexico	Ghana		Ghana	Kazakhstan

[29] Note that countries with the highest (absolute) values of the income elasticity are in decile 1, while those with the highest values of inequality elasticity are in decile 10. This convention is adopted in the light of the generally opposite effects of income and inequality changes on poverty. Note also that the absolute magnitudes of the elasticities could not be used here, since some countries may have the perverse opposite sign, as indicated above.

	Morocco	Guinea-Bissau		Honduras	Mexico
	Peru	Indones. - urb		Tanzania	Panama
	Yemen	Vietnam		Vietnam	Peru
4.	China - urban	Bangladesh	9.	Burundi	Albania
	Dominican Rep.	Honduras		Guinea-Bissau	Chile
	Egypt	India - rural		Lesotho	Georgia
	Jordan	India - urban		Nepal	Iran
	Panama	Kenya		Niger	Jamaica
	Paraguay	Lao PDR		Nigeria	Malaysia
	Tunisia	Mauritania		Senegal	Poland
	Venezuela	Pakistan		Uganda	Turkey
5.	Azerbaijan	Armenia	10.	Burkina Faso	Argentina - urb.
	Brazil	Côte d'Ivoire		CAR	Belarus
	Colombia	Indonesia - rur.		Guinea	Estonia
	Ecuador	Mongolia		Madagascar	Latvia
	El Salvador	Nicaragua		Mali	Romania
	Moldova	Philippines		Mozambique	Russian Fed.
	Mongolia	South Africa		Swaziland	Ukraine
	Thailand	Sri Lanka		Zambia	Uruguay - urb.

Notes: Country categorisation into deciles is based on the 'overall' income and inequality elasticities presented in the Appendix Tables A3.1. Growth rates are calculated using the latest observation of period 1990-1996 and the most recent 2000s value. Countries are arranged alphabetically in each decile.

Table 7.2: Countries by decile on income and inequality elasticities, early-to-mid 1990s, *$2.50* poverty standard

Decile	Income elasticity (min-max) $2.50	Inequality elasticity (min-max) $2.50
1.	Albania	CAR
	Argentina - urb.	Burundi
	Belarus	Guinea
	Estonia	Madagascar
	Latvia	Mali
	Romania	Mozambique
	Ukraine	Niger
	Uruguay - urban	Swaziland
2.	Djibouti	Burkina Faso
	Georgia	Nepal
	Iran	Nigeria
	Jamaica	Senegal
	Kazakhstan	Tanzania
	Poland	Uganda
	Russian Fed.	Vietnam
	Turkey	Zambia
3.	Bolivia	Cambodia
	Chile	Cameroon
	Costa Rica	China - rural
	Egypt	Ethiopia
	Malaysia	Ghana
	Morocco	Guinea-Bissau
	Peru	Lao PDR
6.	Armenia	Armenia
	Bangladesh	Ecuador
	Côte d'Ivoire	Egypt
	Ecuador	El Salvador
	India - rural	Kyrgyz Rep.
	Indonesia - rur.	Moldova
	Kyrgyz Rep.	South Africa
	Pakistan	Thailand
7.	Cambodia	Colombia
	China - rural	Djibouti
	India - urban	Jordan
	Indonesia - urb.	Kazakhstan
	Lao PDR	Morocco
	Mauritania	Tunisia
	Philippines	Venezuela
	South Africa	Yemen
8.	Ethiopia	Bolivia
	Ghana	Costa Rica
	Honduras	Georgia
	Kenya	Jamaica
	Nepal	Paraguay
	Nicaragua	Peru
	Tanzania	Poland

	Yemen	Lesotho		Vietnam	Romania
4.	China - urban	Bangladesh	9.	Burundi	Albania
	Dominican Rep.	India - rural		Cameroon	Brazil
	Jordan	India - urban		Guinea-Bissau	Dominican Rep.
	Mexico	Indonesia - rural		Lesotho	Iran
	Panama	Indonesia - urban		Niger	Malaysia
	Paraguay	Kenya		Nigeria	Mexico
	Tunisia	Mauritania		Senegal	Panama
	Venezuela	Pakistan		Uganda	Turkey
5.	Azerbaijan	Azerbaijan	10.	Burkina Faso	Argentina - urb.
	Brazil	China - urban		CAR	Belarus
	Colombia	Côte d'Ivoire		Guinea	Chile
	El Salvador	Honduras		Madagascar	Estonia
	Moldova	Mongolia		Mali	Latvia
	Mongolia	Nicaragua		Mozambique	Russian Fed.
	Sri Lanka	Philippines		Swaziland	Ukraine
	Thailand	Sri Lanka		Zambia	Uruguay - urb.

Notes: Country categorisation into deciles is based on the 'overall' income and inequality elasticities presented in the Appendix Tables A3.2. Growth rates are calculated using the latest observation of period 1990-1996 and the most recent 2000s value. Countries are arranged alphabetically in each decile.

We now present in Tables 8.1 and 8.2, for the $1.25 and $2.50 standards, respectively, the evidence by country on the relative poverty-reduction contributions of income and inequality by country, during the early-mid-1990s to the present. For better clarity of interpretation, this reporting is done for countries exhibiting poverty declines separately from those experiencing increases in poverty.

Table 8.1: **Poverty ($1.25 headcount ratio) growth, contribution of inequality and mean income growth to poverty reduction, early-mid-1990s-present**

A. Countries experiencing poverty reduction

			A	**B**	**A + B**
					Pred
Country	**Region**	**Pov_g**	**E_Y*dlnY**	**E_G*dlnG**	**Pov_g**
Armenia	EECA	-7.122	8.580	-13.363	-4.783
Azerbaijan	EECA	-62.506	-11.656	-27.118	-38.774
Belarus	EECA	-24.964	-17.208	16.707	-0.501
Brazil	LAC	-7.142	-5.505	-3.198	-8.704
Burkina Faso	SSA	-2.557	-1.220	-0.715	-1.936
Burundi	SSA	-0.252	-0.881	-0.007	-0.888
Cambodia	EAP	-1.890	-3.354	1.813	-1.541
Cameroon	SSA	-9.001	-8.362	-1.497	-9.859
CAR*	SSA	-2.823	1.454	6.023	7.476
Chile	LAC	-8.168	-5.124	-3.304	-8.428
China - rural	EAP	-7.103	-7.872	1.268	-6.603
China - urban	EAP	-17.681	-19.252	6.686	-12.566
Costa Rica	LAC	-12.160	-10.217	0.181	-10.036
Dominican Rep.	LAC	-1.827	-2.453	1.434	-1.020
Ecuador	LAC	-9.377	-12.016	1.402	-10.614
Egypt	MENA	-2.356	-4.829	3.228	-1.601
El Salvador	LAC	-3.469	-5.377	-2.338	-7.714
Estonia	EECA	-61.350	-14.269	13.219	-1.050
Ethiopia	SSA	-4.384	-1.848	-4.188	-6.035
Ghana	SSA	-3.802	-5.636	1.463	-4.173
Guinea*	SSA	-0.722	0.722	2.081	2.803
Honduras	LAC	-3.677	-6.394	0.032	-6.362
India - rural	SAS	-1.634	-2.650	1.466	-1.184
India - urban	SAS	-1.091	-2.438	2.056	-0.382
Indonesia - rur.	EAP	-7.399	-7.968	2.048	-5.920
Indonesia - urb.	EAP	-7.779	-8.254	1.559	-6.694
Jamaica	LAC	-24.763	-14.958	7.789	-7.169
Jordan	MENA	-14.189	-4.137	-4.806	-8.943

Kazakhstan	EECA	-6.680	1.097	-3.014	-1.917
Kenya	SSA	-3.364	-6.101	2.645	-3.456
Lao PDR	EAP	-2.363	-3.390	1.597	-1.793
Latvia	EECA	-75.503	-23.416	10.401	-13.015
Lesotho*	SSA	-1.313	4.383	-3.391	0.992
Madagascar	SSA	-0.554	-1.505	0.057	-1.448
Malaysia	EAP	-14.984	9.512	-15.174	-5.661
Mali*	SSA	-4.292	-0.529	2.602	2.073
Mauritania	SSA	-2.012	-4.510	2.262	-2.248
Mexico	LAC	-23.738	-15.623	-0.456	-16.080
Moldova	EECA	-6.122	-4.710	1.146	-3.564
Mozambique	SSA	-1.422	-2.403	-0.158	-2.561
Nepal	SAS	-2.706	-6.678	3.336	-3.342
Nicaragua	LAC	-6.005	-5.026	-1.609	-6.635
Niger	SSA	-1.555	-3.107	0.297	-2.809
Nigeria	SSA	-0.882	-0.047	-1.060	-1.107
Pakistan	SAS	-9.458	-9.174	2.646	-6.528
Panama	LAC	-2.717	-2.044	-1.239	-3.283
Paraguay	LAC	-5.639	1.079	-4.127	-3.048
Peru	LAC	-0.787	-6.203	3.548	-2.654
Philippines	EAP	-1.811	-2.972	0.608	-2.364
Poland	EECA	-29.323	-32.323	4.229	-28.094
Romania	EECA	-17.192	-22.965	5.992	-16.973
Russian Fed.	EECA	-34.218	-1.930	-13.718	-15.648
Senegal	SSA	-4.359	-3.032	-0.445	-3.477
Sri Lanka*	SAS	-2.242	-6.977	7.533	0.556
Swaziland*	SSA	-3.725	-0.808	2.582	1.774
Thailand	EAP	-19.411	-4.251	-1.229	-5.480
Tunisia	MENA	-18.653	-10.268	-1.927	-12.196
Uganda	SSA	-2.475	-3.995	1.533	-2.462
Ukraine	EECA	-32.890	-17.240	-15.845	-33.085
Uruguay - urb.*	LAC	-35.553	3.075	3.982	7.057
Venezuela	LAC	-14.272	-13.057	-5.479	-18.536
Vietnam	EAP	-7.779	-8.194	0.607	-7.587
	Mean	-11.406	-6.072	-0.022	-6.094

B. Countries experiencing poverty increases

			A	B	A + B
Country	**Region**	**Pov_g**	**E_Y*dlnY**	**E_G*dlnG**	**Pred Pov_g**
Albania	EECA	16.077	-2.916	8.253	5.338
Argentina - urb.	LAC	11.700	4.135	2.177	6.312
Bangladesh	SAS	0.184	0.257	-0.174	0.083
Bolivia	LAC	10.552	-3.176	10.742	7.566
Colombia*	LAC	1.676	-2.113	1.865	-0.248
Côte d'Ivoire	SSA	1.448	-7.903	13.516	5.613
Djibouti	MENA	22.929	26.000	6.973	32.973
Georgia	EECA	12.207	13.203	5.474	18.677
Guinea-Bissau	SSA	7.174	8.655	1.222	9.877
Iran*	MENA	0.190	5.142	-5.748	-0.606
Kyrgyz Rep.	EECA	1.442	20.209	-17.896	2.313
Mongolia	EAP	1.748	2.673	-0.189	2.484
Morocco	MENA	0.119	-0.705	1.205	0.500
South Africa	SSA	4.019	1.370	1.491	2.861
Tanzania	SSA	2.204	6.203	0.297	6.500
Turkey*	EECA	2.352	-4.349	1.976	-2.373
Yemen	EAP	10.409	15.401	-1.721	13.680
Zambia	SSA	0.439	0.633	0.064	0.696
	Mean	5.937	4.595	1.640	6.236

Notes:

A: Predicted poverty growth by income, B: predicted poverty growth by inequality; A+B: predicted poverty growth by both income and inequality.

*Countries with perverse signs for predicted poverty (different from the observed): CAR (perverse signs for both income and inequality elasticities, with mean income < poverty line); Guinea (perverse sign for inequality elasticity, with mean income < poverty line); Mali (perverse sign for inequality elasticity, with mean income < poverty line); Swaziland (perverse sign for inequality elasticity, with mean income < poverty line); Uruguay-urban (unexplained: correct signs for elasticities, poverty should have increased); Iran (correct signs of elasticities, borderline); Lesotho (correct signs for elasticities, borderline); Colombia (correct signs for elasticities, borderline)); Sri Lanka (correct signs for elasticities, borderline?); and Turkey (correct signs for the elasticities, borderline?).

Table 8.2: **Poverty ($2.50 headcount ratio) growth, contribution of inequality and mean income growth to poverty reduction, early-mid-1990s-present**

A. Countries experiencing poverty reduction

			A	B	A + B
					Pred
Country	**Region**	**Pov_g**	**E_Y*dlnY**	**E_G*dlnG**	**Pov_g**
Azerbaijan	EECA	-34.310	-6.751	-10.520	-17.271
Brazil	LAC	-4.584	-2.916	-1.657	-4.573
Burkina Faso*	SSA	-0.251	-0.220	0.384	0.164
Burundi	SSA	-0.091	-0.403	0.004	-0.398
Cambodia	EAP	-0.950	-1.720	0.530	-1.189
Cameroon	SSA	-3.598	-3.553	-0.476	-4.028
CAR*	SSA	-0.585	3.331	3.724	7.054
Chile	LAC	-8.414	-2.864	-1.695	-4.559
China - rural	EAP	-2.576	-4.267	0.218	-4.049
China - urban	EAP	-8.945	-11.826	2.341	-9.485
Costa Rica	LAC	-5.367	-5.804	0.087	-5.717
Côte d'Ivoire*	SSA	-0.799	-4.468	5.227	0.759
Dominican Rep.	LAC	-0.384	-1.367	0.704	-0.663
Ecuador	LAC	-5.108	-6.359	0.681	-5.678
Egypt	MENA	-2.757	-2.929	1.272	-1.657
El Salvador	LAC	-3.202	-2.877	-1.130	-4.007
Estonia	EECA	-4.808	-8.786	6.054	-2.733
Ethiopia	SSA	-0.329	-0.862	-0.870	-1.732
Ghana	SSA	-1.934	-2.827	0.374	-2.454
Honduras	LAC	-3.332	-2.816	0.015	-2.801
India - rural	SAS	-0.348	-1.555	0.362	-1.194
India - urban	SAS	-0.609	-1.348	0.625	-0.724
Indonesia - rur.	EAP	-1.779	-4.790	0.492	-4.298
Indonesia - urb.	EAP	-3.079	-4.432	0.461	-3.972
Jamaica	LAC	-3.934	-8.820	3.551	-5.269
Jordan	MENA	-7.169	-2.362	-2.226	-4.589
Kazakhstan	EECA	-0.434	0.660	-1.277	-0.617
Kenya	SSA	-2.337	-2.844	1.114	-1.729
Lao PDR	EAP	-0.569	-1.931	0.377	-1.554
Latvia	EECA	-14.682	-14.792	4.564	-10.228
Malaysia	EAP	-1.796	5.429	-7.437	-2.008
Mali*	SSA	-0.971	2.035	2.048	4.083
Mauritania	SSA	-1.784	-2.269	0.867	-1.402
Mexico	LAC	-10.397	-8.712	-0.225	-8.938
Moldova	EECA	-1.835	-2.745	0.442	-2.302

Morocco	MENA	-0.437	-0.412	0.538	0.126
Mozambique	SSA	-0.299	-0.339	-0.463	-0.802
Nepal	SAS	-1.127	-3.115	0.309	-2.806
Nicaragua	LAC	-2.809	-2.267	-0.764	-3.031
Niger	SSA	-0.417	-1.239	-0.093	-1.332
Nigeria	SSA	-0.260	-0.017	-0.159	-0.177
Pakistan	SAS	-2.215	-5.260	0.704	-4.556
Panama	LAC	-1.391	-1.103	-0.634	-1.738
Paraguay	LAC	-2.662	0.596	-2.001	-1.405
Peru	LAC	-0.886	-3.547	1.684	-1.863
Philippines	EAP	-1.103	-1.536	0.243	-1.294
Poland	EECA	-28.956	-19.851	1.832	-18.018
Romania	EECA	-4.749	-14.568	2.463	-12.104
Russian Fed.	EECA	-12.270	-1.118	-6.746	-7.864
Senegal	SSA	-1.676	-1.048	-0.076	-1.123
Sri Lanka	SAS	-2.089	-4.051	2.819	-1.232
Swaziland*	SSA	-1.051	1.854	1.810	3.664
Thailand	EAP	-3.677	-2.382	-0.569	-2.951
Tunisia	MENA	-6.878	-5.910	-0.867	-6.777
Turkey	EECA	-1.273	-2.546	0.921	-1.625
Uganda	SSA	-0.982	-1.729	0.096	-1.633
Ukraine	EECA	-27.105	-10.807	-6.959	-17.766
Venezuela	LAC	-8.416	-7.359	-2.569	-9.928
Vietnam	EAP	-2.784	-4.122	0.097	-4.025
	Mean	-4.399	-3.570	0.010	-3.560

B. Countries experiencing poverty increases

			A	**B**	**A + B**
Country	**Region**	**Pov_g**	**E_Y*dlnY**	**E_G*dlnG**	**Pred Pov_g**
Albania	EECA	0.473	-1.826	3.478	1.652
Argentina - urb.	LAC	3.515	2.434	1.082	3.517
Armenia*	EECA	2.608	4.591	-5.798	-1.207
Bangladesh	SAS	0.069	0.147	-0.044	0.103
Belarus*	EECA	3.203	-11.339	7.023	-4.316
Bolivia	LAC	2.450	-1.833	4.943	3.110
Colombia*	LAC	0.543	-1.109	0.945	-0.164
Djibouti	MENA	13.644	15.438	3.060	18.498
Georgia	EECA	7.745	7.864	2.437	10.301
Guinea	SSA	0.367	-0.079	2.496	2.417
Guinea-Bissau	SSA	2.170	3.373	0.460	3.833

Iran	MENA	0.180	2.988	-2.717	0.271
Kyrgyz Rep.	EECA	5.284	10.554	-8.791	1.763
Lesotho*	SSA	0.728	1.319	-1.514	-0.195
Madagascar*	SSA	0.193	-0.381	-0.041	-0.423
Mongolia	EAP	1.008	1.566	-0.071	1.495
South Africa	SSA	0.870	0.678	0.749	1.427
Tanzania	SSA	0.346	3.091	0.003	3.094
Uruguay - urb.	LAC	4.096	1.853	1.954	3.807
Yemen	EAP	7.417	8.991	-0.771	8.219
Zambia	SSA	0.046	0.082	-0.018	0.064
	Mean	2.712	2.305	0.422	2.727

Notes: A: Predicted poverty growth by income; B: predicted poverty growth by inequality; A+B is predicted poverty both income and inequality.
*Countries with perverse signs for predicted poverty growth (different from the observed): Similar reasons as in Table 8.1; note that there are a few more countries with perverse elasticity signs for the $2.50 standard, due to the greater likelihood of mean income falling below the poverty line.

The results show that, *on average*, income growth primarily drove both poverty declines and increases. Among countries experiencing poverty reduction, income growth was responsible for practically 100 percent of the predicted poverty reduction for both poverty standards. And, in the case of countries exhibiting poverty increases, negative income growth contributed on average 74 percent and 85 percent of the predicted poverty increases for the $1.25 and $2.50 standards, respectively.

There are, however, major differences across countries. In many countries, improvements in the income distribution contributed further to the favourable poverty-reduction role of income growth. Brazil, for instance, experienced substantial poverty declines, thanks to the favourable changes in both income and inequality (increasing income and decreasing inequality), though a larger share emanated from income growth: 63 percent versus 37 percent for either poverty standard (Tables 8.1 and 8.2). Azerbaijan's poverty decline also resulted from both income growth and a decrease in inequality, but with the primary reduction actually coming from income distribution: 30 percent (39 percent) for income versus 70 percent (61 percent) for inequality at the $1.25 ($2.50) standard. Indeed, countries experiencing both favourable income and inequality contributions to poverty reduction include additionally (at the $1.25 level): Cameroon, Chile, El Salvador, Ethiopia, Jordan, Nicaragua, Panama, Russian Federation, Thailand, Tunisia, Ukraine and Venezuela.

Rising inequality, however, seems to have thwarted the poverty-reduction efforts of increasing income in many countries (see Tables 8.1 and 8.2). China's tremendous poverty decline would have been even higher without worsening inequality; the predicted fall in poverty at the $1.25 level in the rural sector would have been 7.9 percent annually, instead of the current 6.6 percent

(Table 8.1). More dramatically, rising inequality in China's urban sector reduced the rate of poverty declines by some 6.7 percentage points annually (Table 8.1). Similarly at the $2.50 poverty level, increases in inequality considerably reduced the rates of predicted poverty reduction in both sectors of China's economy (Table 8.2).

Indeed, rising inequality led to increases in poverty overall in several countries, despite the poverty-reduction impact of income growth, such as in: Albania, Bolivia and Cote d'Ivoire (Table 8.1). In a number of countries, however, reduced growth was responsible for rising poverty, notwithstanding increasingly favourable income distribution over time, including: Armenia, Iran, Kyrgyz Republic, Mongolia and Yemen (Table 8.1). And, in many cases, both income levels and their distribution worsened to exacerbate the poverty picture, such as in: Argentina-urban, Djibouti, Georgia, Guinea Bissau, South Africa and Tanzania for both poverty standards (Tables 8.1 and 8.2).

3.4 Some country-simulation illustrations

3.4.1 India: linkage between GDP and income matters

As already discussed above, India's relatively modest poverty reduction since the mid-1990s resulted primarily from the modest income growth, despite its substantial GDP growth. If income had grown at the same rate as (per capita) GDP of 4.8 percent annually (Table 4a), then the (predicted) contribution of growth to poverty reduction ($1.25 standard) would have been more than 10.0 percent, [30] instead of less than 2.5 percent, annually (Table 8.1).

3.4.2 Bolivia: rising inequality hurts

Bolivia's $1.25-level poverty rate has risen by 10.5 percent annually since the mid-1990s, despite a 1.0 percent annual income growth, thanks to a worsening income distribution (Table A3.1). Suppose income inequality had not changed. Then (predicted) poverty would have *fallen* annually by 3.2 percent, instead of currently *rising* by 7.6 percent (Table 8.1).

3.4.3 Russian Federation: falling inequality helps

The ($2.50-level) poverty rate of the Russian Federation fell by 12.3 percent (7.9 percent predicted) annually as of the mid-1990s, despite its meagre annual income growth rate of 0.54 percent, because its income inequality fell by 2.3 percent annually (Table A3.2). In the absence of this favourable income distribution, poverty would be predicted to fall by only 1.1 percent (Table 8.2).

[30] That is, 4.8(-2.2) = -10.6 for rural and 4.8(-2.1) = -10.1 for urban.

3.4.4 Burkina Faso vs. Chile: low income is a bane; high income is a boon

Burkina Faso (BF) had a lower level of inequality than Chile did (Gini coefficient of 0.51 vs. 0.55). Its inequality has decreased much faster than Chile's since the mid-1990s (2.75 percent vs. 0.57 percent annually), while both countries' incomes grew equally at 1.5 percent annually (sources: Table A3.1 and World Bank, 2009a). Yet, Chile managed to reduce its ($1.25-level) poverty by 8.2 percent annually, compared with BF's of only 2.6 percent (Table A3.1). This difference is due to BF's relatively low income ($40.8 vs. $387.2 monthly). If BF had enjoyed the same level of income as Chile, its respective income and inequality elasticities would have been –3.82 and 6.51,[31] instead of –0.79 and 0.26 (Table A3.1), with a predicted poverty decline of 23.63 percent,[32] instead of 1.94 percent (Table 8.1).

4 Summary and conclusion

The current paper has examined the poverty-reduction performance in developing countries during the more recent period of relatively rapid growth globally. Using the most recent comparable data from World Bank (2009a), we first presented evidence on GDP growth, income growth, and poverty reduction since the 1980s for the various regions of the world: EAP, EECA, LAC, MENA, SAS and SSA. The regional evidence is provided for two periods: 1981 to mid-1990s and mid-1990s to the present, with a focus on the latter strong-growth sub-period. Also examined is a global sample of 80 countries for which available data would permit reasonably comprehensive country comparative analysis.

The paper finds that, except for EECA, poverty measured at both the $1 ($1.25 2005 PPP-adjusted income) per day and $2 ($2.50 2005 PPP-adjusted income) per day decreased for all regions during the entire 1981-2005 period. Similarly, with the exception of MENA, all regions exhibited greater poverty declines in the latter sub-period. Two regions, EECA and SSA, showed increases in poverty rates during the earlier sub-period; however, poverty has declined for all regions since the mid-1990s.

The greatest poverty reduction during 1981-2005 occurred in EAP, LAC, EECA, SAS, SSA and then MENA, in that order at the $1.25 level; at the $2.50 standard, the order was EAP, EECA, LAC, MENA, then SAS and SSA (about the same). Qualitatively, the observed patterns of poverty decline at the regional level appear to correspond well with the GDP growth over both sub-periods. During 1981-1995, EECA and SSA experienced rising poverty rates in response to negative per capita GDP growth, while the remaining regions registered both positive GDP growth and poverty reduction.

[31] That is, based on equations (4) and (5), respectively, -9.757 + 2.307(ln 51) + 1.333 ln(37/387.2) = -3.82 and 14.391 – 3.649 (ln 51) – 2.754 ln(37/387.2) = 6.51.
[32] That is, (-3.82)(1.5) + (6.51)(-2.75) = -23.63.

In the latter sub-period, per capita GDP increased for all regions. Moreover, those regions experiencing higher GDP growths also exhibited greater declines in poverty. The rate at which GDP growth was translated to poverty reduction, however, differed across regions. The transformation rate was particularly low for SAS, especially at the $2.50 standard.

As the two most populous nations and 'emerging giants', the performance of China and India has received special attention in the present study. While both countries have registered substantial poverty reductions since 1981, the rate of decrease is much larger for China than for India. Income growth in India has been rather minimal, despite its substantial per-capita GDP performance. Once this phenomenon is noted, India's relatively modest poverty reduction, especially during the mid-1990s to the present, is not unusual.

In contrast, income growth in China more closely reflects its GDP growth. Moreover, while relatively large in both sectors, the bulk of poverty decline in China was in the urban sector, rendering current poverty essentially a rural phenomenon. To a lesser degree, a similar observation holds for India, where the urban bias is observed at the $2.50 standard; at the $1.25 level, however, the rate of poverty reduction was actually larger in the rural than in the urban sector during the more recent period.

The study then concentrates on the global sample of 80 countries for which sufficient data were available for the early-mid-1990s to the present (2000s). We find that there is a wide range of observed relationships between income growth and poverty reduction. For the majority in the sample, income growth seemed to be a reasonable reflection of the observed poverty reduction. A number of countries, however, exhibited strong income growth but low poverty reduction, and conversely. Apparently, income inequality was a major mediating factor for these countries. Also of importance was the level of income (relative to the poverty line), which tended to increase the responsiveness of poverty reduction to both income and inequality changes. Indeed, the measure of 'relative income-poverty transformation efficiency' vectors presented in the current paper suggests that there is qualitatively a large cross-country variation in the transformation of economic growth to poverty reduction.

Estimating the income and inequality elasticities based on the latest year for which data were available for the 123 countries in the World Bank database, we find a large cross-country variation of responsiveness of poverty to both income and inequality growths. The elasticities were also computed for the early-mid-1990s for 80 countries with comparable data. We observe a large range of cross-country values for both elasticities. Initial income inequality differences and disparities in income levels crucially determined the responsiveness of poverty reduction to income and inequality growths in many countries. Lower-inequality and higher-income countries exhibited greater abilities to transform a given growth rate to poverty reduction. Such countries would also enjoy larger inequality elasticities, suggesting that increasing inequality would be more deleterious to poverty in these countries than in their low-income counterparts.

In particular, low-income countries would conversely require greater efforts on both income growth and decreases in inequality to reduce their poverty levels. Yet it is these countries that must urgently decrease their poverty levels. This quandary suggests not only that low-income countries must try harder internally, but also that a reasonable case can be made for external assistance.

Despite major differences in the roles of income and inequality in changes in the poverty picture since the early-mid-1990s, some generalities seem in order. First, most of the 80 countries (about 75 percent) registered poverty reduction. Second, *on average*, nearly all of this success could be attributable to income growth, rather than inequality changes. Third, among the countries experiencing rising poverty rates, most of this record was, *on average*, due to income declines: 74 percent (85 percent) to income versus 26 percent (15 percent) to inequality for the $1.25 ($2.50) standard.

The above 'average' results are in concert with previous studies that extol the dominant virtues of growth (e.g., Dollar and Kraay, 2002). While analytically appealing, however, this growth-dominant story is inadequate, for we have also documented herein major differences across countries globally. In some sense, our findings are consistent with Ravallion's (2001) that looking beyond the averages can uncover country-specific differences in what happens to inequality during growth. We have gone a step further, however, by estimating the implications of such differences for poverty reduction by region and for a large number of countries, using the most recent poverty dataset from the World Bank.

The current results suggest that adopting the appropriate pro-poor growth strategies requires some understanding of idiosyncratic country attributes.[33] After all, policies are by and large country-specific, and the present study does indeed find that there are substantial differences in the abilities of countries to translate economic growth into poverty reduction, based on their respective inequality and income profiles. By shedding light on this transformation process by country, these findings, at least, provide a 'road-map' for undertaking country studies to uncover the underpinning idiosyncratic factors. Understanding such country-specific profiles is crucial in crafting polices for most effectively achieving poverty reduction globally.

[33] There is a large volume of the literature on pro-poor poverty; for a recent review, see Grimm et al. (2007).

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Appendix

Table A1. Inequality, income growth and poverty reduction, 1980-2007: summary statistics (levels) by region

Table A1.1: Poverty rate (headcount ratio, $1.25 per day, 2005 PPP): $P_{\$1.25}$

Region	Mean	SD	Min	Max
Global	22.58	24.30	0	94.08
East Asia and Pacific (EAP)	32.43	23.07	0.40	94.08
Europe and Central Asia (EECA)	5.80	11.48	0	63.53
Latin America and The Caribbean (LAC)	10.88	9.08	0	54.90
Middle East and North Africa (MENA)	5.02	4.60	0	18.84
South Asia (SAS)	45.30	16.91	13.95	80.19
Sub-Saharan Africa (SSA)	52.64	21.61	4.84	92.55

Table *A1.2: Poverty rate (headcount ratio, $2.50 per day, 2005 PPP): $P_{\$2.50}$*

Region	Mean	SD	Min	Max
Global	44.72	32.27	0	100
East Asia and Pacific (EAP)	67.14	26.57	11.96	100
Europe and Central Asia (EECA)	19.61	25.51	0.00	91.71
Latin America and The Caribbean (LAC)	27.53	13.48	2.21	79.06
Middle East and North Africa (MENA)	29.90	13.27	7.71	61.69
South Asia (SAS)	84.49	11.06	53.55	97.32
Sub-Saharan Africa (SSA)	79.09	17.34	24.07	99.93

Table A1.3: Inequality (Gini, %): G

Region	Mean	SD	Min	Max
Global	41.69	10.68	16.83	74.33
East Asia and Pacific (EAP)	35.99	7.79	17.79	50.88
Europe and Central Asia (EECA)	31.73	6.56	16.83	53.70
Latin America and The Caribbean (LAC)	51.97	5.76	34.48	62.99
Middle East and North Africa (MENA)	38.80	4.05	30.13	47.42
South Asia (SAS)	33.25	4.90	25.88	47.30
Sub-Saharan Africa (SSA)	45.58	8.49	28.90	74.33

Table *A1.4: Monthly mean income, 2005 PPP $: Y*

Region	**Mean**	**SD**	**Min**	**Max**
Global	169.47	123.90	14.93	692.90
East Asia and Pacific (EAP)	89.98	65.23	20.76	328.17
Europe and Central Asia (EECA)	242.66	149.57	37.66	692.90
Latin America and The Caribbean (LAC)	240.88	82.45	64.48	537.46
Middle East and North Africa (MENA)	153.76	46.17	84.02	251.94
South Asia (SAS)	53.48	16.45	29.26	100.06
Sub-Saharan Africa (SSA)	62.70	37.74	14.93	209.40

Notes: Source: World Bank, 2009.

Table A2: Estimated income and inequality elasticities for *all countries* at the *latest data-year* (in parentheses), $1.25 and $2.50 poverty standards

Country	Region	Elasticity		Elasticity	
		Income	Inequality	Income	Inequality
		$1.25	$1.25	$2.50	$2.50
Albania (´05)	EUCA	-3.623	5.625	-2.217	2.443
Algeria (´95)	MENA	-3.067	4.553	-1.815	1.911
Angola (´00)	SSA	-1.036	0.923	-0.262	0.348
Argentina - urb. (´05)	LAC	-3.624	6.091	-2.084	3.052
Armenia (´03)	EUCA	-2.693	3.730	-1.574	1.422
Azerbaijan (´05)	EUCA	-4.934	7.582	-3.333	2.945
Bangladesh (´05)	SAS	-1.994	2.267	-1.101	0.603
Belarus (´05)	EUCA	-4.879	8.033	-3.131	3.623
Benin (´03)	SSA	-1.765	1.963	-0.896	0.564
Bhutan (´03)	SAS	-2.108	2.886	-1.068	1.235
Bolivia (´05)	LAC	-2.619	4.184	-1.347	2.133
Bosnia-Herzegovina (´04)	EUCA	-4.456	7.436	-2.761	3.506
Botswana (´93)	SSA	-1.891	2.731	-0.834	1.374
Brazil (´07)	LAC	-3.458	5.855	-1.939	3.003
Bulgaria (´03)	EUCA	-4.223	6.730	-2.668	2.947
Burkina Faso (´03)	SSA	-1.549	1.544	-0.740	0.355
Burundi (´06)	SSA	-1.310	0.854	-0.632	-0.172
Cambodia (´04)	EAP	-1.846	2.219	-0.925	0.773
Cameroon (´01)	SSA	-1.944	2.491	-0.972	0.976
Cape Verde (´01)	SSA	-2.272	3.310	-1.156	1.532
CAR (´03)	SSA	-1.176	0.879	-0.453	0.071
Chad (´02)	SSA	-1.369	1.176	-0.615	0.157
Chile (´06)	LAC	-3.936	6.780	-2.285	3.463
China - rural (´05)	EAP	-2.339	3.065	-1.312	1.106
China - urban (´05)	EAP	-3.499	5.429	-2.116	2.380
Colombia (´06)	LAC	-2.717	4.392	-1.412	2.251
Colombia - urb. (´91)	LAC	-3.166	5.174	-1.762	2.570
Comoros (´04)	SSA	-1.365	1.704	-0.457	0.855
Congo, Dem. Rep. (´05)	SSA	-1.268	1.092	-0.510	0.205
Congo, Rep. (´05)	SSA	-1.329	1.288	-0.532	0.366
Costa Rica (´05)	LAC	-3.659	6.099	-2.126	3.007
Côte d'Ivoire (´02)	SSA	-2.112	2.931	-1.060	1.287
Croatia (´05)	EUCA	-5.860	10.101	-3.790	4.791
Czech Rep. (´96)	EUCA	-5.679	9.599	-3.704	4.417
Djibouti (´02)	MENA	-2.449	3.414	-1.353	1.390
Dominican Rep. (´05)	LAC	-3.215	5.246	-1.805	2.587
Ecuador (´07)	LAC	-3.322	5.560	-1.850	2.831

Egypt (´04)	MENA	-3.198	4.718	-1.936	1.922
El Salvador (´05)	LAC	-3.012	4.820	-1.667	2.348
Estonia (´04)	EUCA	-4.283	7.085	-2.641	3.319
Ethiopia (´05)	SSA	-2.331	2.839	-1.367	0.824
Gabon (´05)	SSA	-2.997	4.586	-1.715	2.065
Gambia, The (´03)	SSA	-1.863	2.391	-0.897	0.971
Georgia (´05)	EUCA	-2.695	3.944	-1.514	1.699
Ghana (´05)	SSA	-2.046	2.657	-1.055	1.032
Guatemala (´06)	LAC	-2.725	4.313	-1.446	2.135
Guinea (´03)	SSA	-1.026	0.563	-0.352	-0.107
Guinea-Bissau (´02)	SSA	-1.844	2.032	-0.977	0.531
Guyana (´98)	LAC	-3.071	4.820	-1.743	2.256
Haiti (´01)	LAC	-1.036	0.938	-0.257	0.368
Honduras (´06)	LAC	-2.605	4.098	-1.354	2.043
Honduras - urb. (´86)	LAC	-2.769	4.434	-1.468	2.223
Hungary (´04)	EUCA	-4.997	8.358	-3.188	3.864
India - rural (´04)	SAS	-2.239	2.676	-1.297	0.754
India - urban (´04)	SAS	-2.052	2.524	-1.101	0.850
Indonesia - rur. (´05)	EAP	-2.617	3.422	-1.565	1.137
Indonesia - urb. (´05)	EAP	-2.387	3.284	-1.310	1.318
Iran (´05)	MENA	-3.546	5.632	-2.117	2.572
Jamaica (´04)	LAC	-3.584	5.903	-2.087	2.868
Jordan (´06)	MENA	-3.661	5.853	-2.201	2.681
Kazakhstan (´03)	EUCA	-3.309	5.004	-1.994	2.123
Kenya (´05)	SSA	-2.287	3.277	-1.185	1.465
Kyrgyz Rep. (´04)	EUCA	-2.568	3.442	-1.496	1.241
Lao PDR (´97)	EAP	-2.111	2.488	-1.187	0.709
Latvia (´04)	EUCA	-4.470	7.464	-2.771	3.520
Lesotho (´02)	SSA	-1.478	1.713	-0.600	0.687
Liberia (´07)	SSA	-0.172	-0.985	0.294	-0.794
Lithuania (´04)	EUCA	-4.292	7.098	-2.649	3.321
Macedonia (´03)	EUCA	-3.955	6.497	-2.391	3.062
Madagascar (´05)	SSA	-1.083	0.778	-0.364	0.084
Malawi (´04)	SSA	-1.160	0.724	-0.479	-0.108
Malaysia (´04)	EAP	-3.613	5.758	-2.166	2.634
Mali (´01)	SSA	-1.648	1.731	-0.813	0.445
Mauritania (´95)	SSA	-2.427	3.342	-1.345	1.331
Mexico (´06)	LAC	-3.704	6.213	-2.151	3.085
Moldova, Rep. (´04)	EUCA	-2.892	4.200	-1.693	1.724
Mongolia (´05)	EAP	-2.557	3.422	-1.488	1.233
Morocco (´07)	MENA	-3.125	4.834	-1.807	2.190
Mozambique (´02)	SSA	-0.819	0.228	-0.184	-0.220
Namibia (´93)	SSA	-1.619	2.391	-0.584	1.356
Nepal (´03)	SAS	-1.381	1.395	-0.567	0.425
Nepal - rural (´84)	SAS	-1.676	1.441	-0.933	0.021

Nepal - urban (´84)	SAS	-1.842	2.038	-0.972	0.542
Nicaragua (´05)	LAC	-2.468	3.753	-1.278	1.806
Niger (´05)	SSA	-1.149	0.832	-0.433	0.051
Nigeria (´03)	SSA	-1.134	0.776	-0.430	0.002
Pakistan (´04)	SAS	-2.552	3.350	-1.504	1.144
Panama (´06)	LAC	-3.246	5.415	-1.795	2.760
Papua N. Guinea (´96)	EAP	-1.788	2.317	-0.822	0.993
Paraguay (´07)	LAC	-3.209	5.303	-1.779	2.672
Peru (´06)	LAC	-3.074	4.945	-1.711	2.414
Philippines (´06)	EAP	-2.301	3.216	-1.220	1.364
Poland (´05)	EUCA	-4.339	7.167	-2.689	3.337
Romania (´05)	EUCA	-3.941	6.229	-2.450	2.735
Russian Fed. (´05)	EUCA	-4.153	6.864	-2.539	3.232
Rwanda (´00)	SSA	-0.733	0.041	-0.128	-0.331
Senegal (´05)	SSA	-2.047	2.561	-1.084	0.905
Sierra Leone (´03)	SSA	-1.503	1.528	-0.685	0.407
Slovak Rep. (´96)	EUCA	-5.211	8.631	-3.384	3.885
Slovenia (´04)	EUCA	-5.682	9.814	-3.645	4.695
South Africa (´00)	SSA	-2.257	3.427	-1.102	1.711
Sri Lanka (´02)	SAS	-2.477	3.501	-1.363	1.461
St. Lucia (´95)	LAC	-2.374	3.328	-1.280	1.397
Suriname (´99)	LAC	-2.721	4.287	-1.448	2.108
Swaziland (´00)	SSA	-0.988	0.661	-0.276	0.080
Tajikistan (´04)	EUCA	-2.532	3.390	-1.465	1.230
Tanzania (´00)	SSA	-0.881	0.014	-0.326	-0.599
Thailand (´04)	EAP	-3.258	5.153	-1.887	2.397
Timor-Leste (´01)	EAP	-1.618	1.685	-0.788	0.431
Togo (´06)	SSA	-2.116	2.558	-1.173	0.793
Trinidad-Tobaga (´92)	LAC	-3.350	5.283	-1.966	2.424
Tunisia (´00)	MENA	-3.292	5.177	-1.922	2.377
Turkey (´05)	EUCA	-3.494	5.660	-2.042	2.691
Turkmenistan (´98)	EUCA	-2.253	3.029	-1.212	1.196
Uganda (´05)	SSA	-1.536	1.598	-0.707	0.448
Ukraine (´05)	EUCA	-4.565	7.395	-2.913	3.282
Uruguay (´89)	LAC	-4.275	7.251	-2.583	3.547
Uruguay - urb. (´06)	LAC	-3.935	6.646	-2.322	3.290
Uzbekistan (´03)	EUCA	-1.847	2.075	-0.968	0.583
Venezuela (´06)	LAC	-3.500	5.678	-2.045	2.705
Vietnam (´06)	EAP	-2.417	3.284	-1.349	1.271
Yemen (´05)	EAP	-2.442	3.333	-1.366	1.296
Zambia (´04)	SSA	-0.866	0.410	-0.192	-0.057
n = 123					
Mean		-2.667	3.893	-1.493	1.676
Median		-2.532	3.422	-1.366	1.422
Min		-5.860	-0.985	-3.790	-0.794

Max		-0.172	10.101	0.294	4.791
SD		1.180	2.339	0.841	1.232
Quintiles					
1		-3.619	1.708	-2.122	0.481
2		-2.794	3.186	-1.592	1.235
3		-2.284	4.400	-1.218	2.111
4		-1.619	5.854	-0.759	2.803
Mean	EAP	-2.485	3.434	-1.393	1.360
	EUCA	-3.994	6.377	-2.475	2.846
	LAC	-3.125	5.067	-1.740	2.494
	MENA	-3.191	4.883	-1.879	2.149
	SAS	-2.036	2.453	-1.101	0.782
	SSA	-1.549	1.681	-0.699	0.536

Notes: Computations based on equations (2) and (3) of the text and GMM results (equations (4)-(7)).

Table A3.1: Income and inequality elasticities vs. poverty reduction since the *early-mid-1990s*, for the 80 countries, *$1.25* poverty standard

		Period: 1990-96		Period: 1990-96		Early-mid-1990s to 2000s		
		Income elasticity		Inequality elasticity		Income growth	Inequality growth	Poverty rate growth
Country	**Region**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Albania	EECA	-3.822	-1.979	5.896	2.089	0.763	1.400	16.077
Argentina - urban	LAC	-3.935	-0.876	6.663	0.345	-1.051	0.327	11.700
Armenia	EECA	-2.397	-1.005	3.423	0.548	-3.580	-3.903	-7.122
Azerbaijan	EECA	-2.665	-1.557	3.710	1.422	4.374	-7.310	-62.506
Bangladesh	SAS	-2.112	-1.870	2.416	1.916	-0.121	-0.072	0.184
Belarus	EECA	-4.911	-2.668	7.812	3.179	3.504	2.139	-24.964
Bolivia	LAC	-3.169	-1.132	4.956	0.749	1.002	2.167	10.552
Brazil	LAC	-2.915	-0.342	4.816	-0.501	1.888	-0.664	-7.142
Burkina Faso	SSA	-0.794	-0.699	0.260	0.065	1.536	-2.748	-2.557
Burundi	SSA	-1.164	-1.668	0.556	1.596	0.756	-0.013	-0.252
Cambodia	EAP	-1.804	-1.348	2.033	1.091	1.859	0.892	-1.890
Cameroon	SSA	-1.444	-0.884	1.513	0.356	5.792	-0.989	-9.001
CAR	SSA	0.287	-0.261	-1.762	-0.629	5.060	-3.419	-2.823
Chile	LAC	-3.419	-0.501	5.779	-0.249	1.499	-0.572	-8.168
China - rural	EAP	-1.776	-1.754	1.777	1.732	4.433	0.714	-7.103
China - urban	EAP	-2.929	-2.093	3.996	2.269	6.573	1.673	-17.681
Colombia	LAC	-2.736	-0.444	4.396	-0.339	0.772	0.424	1.676
Costa Rica	LAC	-3.194	-0.907	5.118	0.393	3.199	0.035	-12.160
Côte d'Ivoire	SSA	-2.495	-1.439	3.415	1.235	3.168	3.958	1.448
Djibouti	MENA	-3.276	-1.441	5.029	1.238	-7.937	1.387	22.929
Dominican Rep.	LAC	-3.121	-0.730	5.052	0.113	0.786	0.284	-1.827
Ecuador	LAC	-2.634	-0.641	4.090	-0.027	4.562	0.343	-9.377
Egypt	MENA	-3.111	-1.830	4.499	1.853	1.552	0.718	-2.356

El Salvador	LAC	-2.700	-0.684	4.205	0.040	1.992	-0.556	-3.469
Estonia	EECA	-4.066	-1.569	6.598	1.441	3.510	2.004	-61.350
Ethiopia	SSA	-1.485	-1.249	1.421	0.934	1.244	-2.947	-4.384
Georgia	EECA	-3.380	-1.419	5.254	1.202	-3.906	1.042	12.207
Ghana	SSA	-1.687	-1.357	1.787	1.105	3.340	0.819	-3.802
Guinea	SSA	-0.444	-1.041	-0.629	0.605	-1.628	-3.309	-0.722
Guinea-Bissau	SSA	-1.387	-0.641	1.512	-0.027	-6.242	0.808	7.174
Honduras	LAC	-1.766	-0.483	2.372	-0.278	3.621	0.014	-3.677
India - rural	SAS	-2.210	-2.021	2.544	2.156	1.199	0.576	-1.634
India - urban	SAS	-2.089	-1.599	2.501	1.487	1.167	0.822	-1.091
Indonesia - rural	EAP	-2.314	-2.182	2.683	2.410	3.443	0.763	-7.399
Indonesia - urban	EAP	-1.956	-1.500	2.274	1.330	4.219	0.686	-7.779
Iran	MENA	-3.386	-1.064	5.438	0.641	-1.519	-1.057	0.190
Jamaica	LAC	-3.374	-1.279	5.309	0.981	4.434	1.467	-24.763
Jordan	MENA	-3.090	-1.061	4.828	0.636	1.339	-0.995	-14.189
Kazakhstan	EECA	-3.286	-1.622	4.962	1.524	-0.334	-0.607	-6.680
Kenya	SSA	-1.807	-0.742	2.333	0.132	3.376	1.134	-3.364
Kyrgyz Rep.	EECA	-2.586	-0.567	4.025	-0.144	-7.816	-4.446	1.442
Lao PDR	EAP	-2.052	-1.878	2.288	1.928	1.652	0.698	-2.363
Latvia	EECA	-4.244	-1.965	6.774	2.067	5.518	1.535	-75.503
Lesotho	SSA	-1.194	-0.290	1.284	-0.583	-3.671	-2.641	-1.313
Madagascar	SSA	-0.858	-0.918	0.285	0.411	1.755	0.200	-0.554
Malaysia	EAP	-3.376	-0.822	5.534	0.259	-2.818	-2.742	-14.984
Mali	SSA	-0.088	-0.706	-1.202	0.075	6.005	-2.165	-4.292
Mauritania	SSA	-1.943	-1.044	2.466	0.610	2.321	0.917	-2.012
Mexico	LAC	-3.152	-0.709	5.127	0.080	4.957	-0.089	-23.738
Moldova	EECA	-2.698	-1.600	3.757	1.489	1.746	0.305	-6.122
Mongolia	EAP	-2.678	-1.677	3.679	1.610	-0.998	-0.051	1.748
Morocco	MENA	-3.171	-1.293	4.883	1.004	0.222	0.247	0.119
Mozambique	SSA	-0.659	-1.001	-0.166	0.542	3.647	0.954	-1.422
Nepal	SAS	-1.396	-1.385	1.172	1.149	4.782	2.846	-2.706

Nicaragua	LAC	-1.864	-0.455	2.590	-0.322	2.696	-0.621	-6.005
Niger	SSA	-1.099	-1.316	0.591	1.040	2.827	0.502	-1.555
Nigeria	SSA	-1.174	-0.938	0.929	0.442	0.040	-1.141	-0.882
Pakistan	SAS	-2.150	-1.855	2.501	1.892	4.268	1.058	-9.458
Panama	LAC	-3.025	-0.441	4.995	-0.345	0.676	-0.248	-2.717
Paraguay	LAC	-2.967	-0.758	4.720	0.157	-0.364	-0.874	-5.639
Peru	LAC	-3.217	-0.975	5.133	0.501	1.928	0.691	-0.787
Philippines	EAP	-2.089	-1.061	2.759	0.636	1.423	0.220	-1.811
Poland	EECA	-3.662	-1.724	5.688	1.685	8.827	0.743	-29.323
Romania	EECA	-3.895	-2.168	5.956	2.388	5.895	1.006	-17.192
Russian Fed.	EECA	-3.589	-0.863	5.956	0.323	0.538	-2.303	-34.218
Senegal	SSA	-1.125	-0.836	0.878	0.281	2.694	-0.507	-4.359
South Africa	SSA	-2.344	-0.391	3.612	-0.423	-0.584	0.413	4.019
Sri Lanka	SAS	-2.609	-1.625	3.562	1.529	2.674	2.115	-2.242
Swaziland	SSA	-0.154	-0.286	-0.863	-0.589	5.255	-2.993	-3.725
Tanzania	SSA	-1.448	-1.633	1.160	1.542	-4.282	0.256	2.204
Thailand	EAP	-2.908	-0.985	4.489	0.516	1.462	-0.274	-19.411
Tunisia	MENA	-3.047	-1.193	4.675	0.845	3.371	-0.412	-18.653
Turkey	EECA	-3.399	-1.160	5.419	0.793	1.279	0.365	2.352
Uganda	SSA	-1.282	-1.254	1.000	0.942	3.115	1.532	-2.475
Ukraine	EECA	-4.095	-1.879	6.509	1.930	4.210	-2.434	-32.890
Uruguay - urban	LAC	-4.254	-1.082	7.224	0.670	-0.723	0.551	-35.553
Venezuela	LAC	-3.013	-0.963	4.717	0.481	4.333	-1.161	-14.272
Vietnam	EAP	-1.581	-1.510	1.493	1.347	5.183	0.407	-7.779
Yemen	EAP	-3.177	-1.279	4.902	0.981	-4.848	-0.351	10.409
Zambia	SSA	-0.762	-0.542	0.296	-0.184	-0.830	0.236	0.439
n=80								
Mean		-2.425	-1.183	3.395	0.829	1.600	-0.128	-7.504
Median		-2.622	-1.107	3.694	0.709	1.750	0.270	-3.093
Min		-4.911	-2.668	-1.762	-0.629	-7.937	-7.310	-75.503
Max		0.287	-0.261	7.812	3.179	8.827	3.958	22.929

SD	1.088	0.533	2.170	0.843	3.186	1.759	15.725
Quintiles							
1	-3.304	-1.640	1.394	0.073	-0.408	-1.008	-14.205
2	-2.921	-1.302	2.572	0.532	1.315	-0.028	-4.886
3	-2.135	-0.995	4.493	1.018	2.695	0.456	-2.150
4	-1.434	-0.705	5.157	1.552	4.281	0.964	0.185

Notes:

A: Overall income elasticity; B: Income elasticity attributable to initial inequality; C: Overall inequality elasticity; D: Inequality elasticity attributable to initial inequality; E: Annualised (log-difference) growth of mean income; F: Annualised (log-difference) growth of inequality; G: Annualised (log-difference) growth of the poverty rate. For each country the latest year in 1990-1996 is used as the start-year and the most recent year with data in the 2000s as the end-year; details in text. Note that for Belarus, Estonia and Latvia, the latest $1.25 headcount ratio value is 0 and has been replaced with 0.001 in order to compute the growth rates (source provides data for .01 in some cases). Income and inequality elasticity estimates are derived from equations (4) and (5) of the text, respectively, using country 1990-96 mean values for the initial Gini coefficient, G^I, and for the poverty line relative to income, Z/Y.

Table A3.2: Income and inequality elasticities vs. poverty reduction since the *early-mid-1990s*, for the 80 countries, *$2.50* poverty standard

		Period: 1990-96		Period: 1990-96		Early-mid-1990s to 2000s		
		Income elasticity		Inequality elasticity		Income Growth	Inequality growth	Poverty rate Growth
Country	**Region**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Albania	EECA	-2.394	-1.766	2.485	1.442	0.763	1.400	0.473
Argentina - urb.	LAC	-2.317	-0.856	3.312	1.219	-1.051	0.327	3.515
Armenia	EECA	-1.283	-0.962	1.485	0.954	-3.580	-3.903	2.608
Azerbaijan	EECA	-1.543	-1.418	1.439	1.231	4.374	-7.310	-34.310
Bangladesh	SAS	-1.209	-1.676	0.613	1.387	-0.121	-0.072	0.069
Belarus	EECA	-3.236	-2.334	3.284	1.787	3.504	2.139	3.203
Bolivia	LAC	-1.828	-1.067	2.281	1.018	1.002	2.167	2.450
Brazil	LAC	-1.544	-0.416	2.495	0.622	1.888	-0.664	-4.584
Burkina Faso	SSA	-0.143	-0.711	-0.140	0.801	1.536	-2.748	-0.251
Burundi	SSA	-0.532	-1.509	-0.334	1.286	0.756	-0.013	-0.091
Cambodia	EAP	-0.925	-1.245	0.595	1.126	1.859	0.892	-0.950
Cameroon	SSA	-0.613	-0.862	0.481	0.894	5.792	-0.989	-3.598
CAR	SSA	0.658	-0.349	-1.089	0.894	5.060	-3.419	-0.585
Chile	LAC	-1.911	-0.547	2.965	0.702	1.499	-0.572	-8.414
China - rural	EAP	-0.963	-1.580	0.305	0.702	4.433	0.714	-2.576
China - urban	EAP	-1.799	-1.859	1.399	1.329	6.573	1.673	-8.945
Colombia	LAC	-1.436	-0.500	2.226	0.674	0.772	0.424	0.543
Costa Rica	LAC	-1.814	-0.882	2.452	0.905	3.199	0.035	-5.367
Côte d'Ivoire	SSA	-1.410	-1.321	1.321	1.172	3.168	3.958	-0.799
Djibouti	MENA	-1.945	-1.322	2.207	1.173	-7.937	1.387	13.644
Dominican Rep.	LAC	-1.739	-0.736	2.481	1.173	0.786	0.284	-0.384
Ecuador	LAC	-1.394	-0.663	1.985	0.772	4.562	0.343	-5.108
Egypt	MENA	-1.887	-1.643	1.772	0.772	1.552	0.718	-2.757
El Salvador	LAC	-1.445	-0.698	2.033	0.793	1.992	-0.556	-3.202
Estonia	EECA	-2.503	-1.428	3.021	1.237	3.510	2.004	-4.808
Ethiopia	SSA	-0.693	-1.164	0.295	1.076	1.244	-2.947	-0.329

Georgia	EECA	-2.013	-1.303	2.339	1.161	-3.906	1.042	7.745
Ghana	SSA	-0.847	-1.253	0.457	1.131	3.340	0.819	-1.934
Guinea	SSA	0.049	-0.992	-0.754	0.973	-1.628	-3.309	0.367
Guinea-Bissau	SSA	-0.540	-0.663	0.569	0.772	-6.242	0.808	2.170
Honduras	LAC	-0.778	-0.532	1.100	0.693	3.621	0.014	-3.332
India - rural	SAS	-1.297	-1.800	0.628	1.490	1.199	0.576	-0.348
India - urban	SAS	-1.156	-1.452	0.760	1.463	1.167	0.822	-0.609
Indonesia - rur.	EAP	-1.391	-1.933	0.645	1.252	3.443	0.763	-1.779
Indonesia - urb.	EAP	-1.051	-1.370	0.672	1.544	4.219	0.686	-3.079
Iran	MENA	-1.967	-1.011	2.571	1.202	-1.519	-1.057	0.180
Jamaica	LAC	-1.989	-1.188	2.420	1.091	4.434	1.467	-3.934
Jordan	MENA	-1.765	-1.008	2.237	0.982	1.339	-0.995	-7.169
Kazakhstan	EECA	-1.978	-1.471	2.104	1.263	-0.334	-0.607	-0.434
Kenya	SSA	-0.842	-0.746	0.983	0.823	3.376	1.134	-2.337
Kyrgyz Rep.	EECA	-1.350	-0.602	1.977	0.823	-7.816	-4.446	5.284
Lao PDR	EAP	-1.169	-1.682	0.540	1.391	1.652	0.698	-0.569
Latvia	EECA	-2.681	-1.754	2.972	1.435	5.518	1.535	-14.682
Lesotho	SSA	-0.359	-0.373	0.573	0.596	-3.671	-2.641	0.728
Madagascar	SSA	-0.217	-0.891	-0.207	0.911	1.755	0.200	0.193
Malaysia	EAP	-1.927	-0.812	2.712	0.863	-2.818	-2.742	-1.796
Mali	SSA	0.339	-0.716	-0.946	0.805	6.005	-2.165	-0.971
Mauritania	SSA	-0.977	-0.995	0.945	0.974	2.321	0.917	-1.784
Mexico	LAC	-1.758	-0.719	2.530	0.806	4.957	-0.089	-10.397
Moldova	EECA	-1.572	-1.453	1.449	0.806	1.746	0.305	-1.835
Mongolia	EAP	-1.569	-1.516	1.378	1.291	-0.998	-0.051	1.008
Morocco	MENA	-1.853	-1.200	2.181	1.099	0.222	0.247	-0.437
Mozambique	SSA	-0.093	-0.959	-0.485	0.952	3.647	0.954	-0.299
Nepal	SAS	-0.651	-1.276	0.109	1.145	4.782	2.846	-1.127
Nicaragua	LAC	-0.841	-0.509	1.230	0.679	2.696	-0.621	-2.809
Niger	SSA	-0.438	-1.219	-0.185	1.110	2.827	0.502	-0.417
Nigeria	SSA	-0.436	-0.907	0.140	0.921	0.040	-1.141	-0.260
Pakistan	SAS	-1.233	-1.663	0.666	1.380	4.268	1.058	-2.215
Panama	LAC	-1.633	-0.497	2.557	0.672	0.676	-0.248	-1.391

Paraguay	LAC	-1.638	-0.759	2.289	0.831	-0.364	-0.874	-2.662
Peru	LAC	-1.840	-0.938	2.435	0.939	1.928	0.691	-0.886
Philippines	EAP	-1.079	-1.009	1.100	0.982	1.423	0.220	-1.103
Poland	EECA	-2.249	-1.555	2.465	1.314	8.827	0.743	-28.956
Romania	EECA	-2.471	-1.921	2.449	1.537	5.895	1.006	-4.749
Russian Fed.	EECA	-2.078	-0.845	2.929	1.537	0.538	-2.303	-12.270
Senegal	SSA	-0.389	-0.823	0.149	0.870	2.694	-0.507	-1.676
South Africa	SSA	-1.161	-0.456	1.815	0.647	-	0.413	0.870
Sri Lanka	SAS	-1.515	-1.474	1.333	1.265	2.674	2.115	-2.089
Swaziland	SSA	0.353	-0.370	-0.605	0.595	5.255	-2.993	-1.051
Tanzania	SSA	-0.722	-1.480	0.010	1.269	-	0.256	0.346
Thailand	EAP	-1.629	-0.946	2.078	0.944	1.462	-0.274	-3.677
Tunisia	MENA	-1.753	-1.117	2.104	1.048	3.371	-0.412	-6.878
Turkey	EECA	-1.990	-1.090	2.524	1.032	1.279	0.365	-1.273
Uganda	SSA	-0.555	-1.168	0.062	1.079	3.115	1.532	-0.982
Ukraine	EECA	-2.567	-1.683	2.859	1.392	4.210	-2.434	-27.105
Uruguay - urb.	LAC	-2.564	-1.026	3.545	1.392	-	0.551	4.096
Venezuela	LAC	-1.698	-0.928	2.211	0.993	4.333	-1.161	-8.416
Vietnam	EAP	-0.795	-1.379	0.239	1.207	5.183	0.407	-2.784
Yemen	EAP	-1.854	-1.188	2.197	1.207	-	-0.351	7.417
Zambia	SSA	-0.099	-0.581	-0.077	0.723	-	0.236	0.046
n=80								
Mean		-1.327	-1.109	1.404	1.056	1.600	-0.128	-2.533
Median		-1.423	-1.047	1.444	1.040	1.750	0.270	-1.077
Min		-3.236	-2.334	-1.089	0.595	-	-7.310	-34.310
Max		0.658	-0.349	3.545	1.787	8.827	3.958	13.644
SD		0.774	0.439	1.160	0.271	3.186	1.759	6.844
Quintiles								
1		-1.930	-1.486	0.284	0.804	-	-1.008	-4.064
2		-1.631	-1.208	1.053	0.954	1.315	-0.028	-1.811
3		-1.193	-0.954	2.088	1.136	2.695	0.456	-0.578
4		-0.644	-0.715	2.468	1.287	4.281	0.964	0.350

Notes:
A: Overall income elasticity; B: Income elasticity attributable to initial inequality; C: Overall inequality elasticity; D: Inequality elasticity attributable to initial inequality; E: Annualised (log-difference) growth of mean income; F: Annualised (log-difference) growth of inequality; G: Annualised (log-difference) growth of the poverty rate. For each country the latest year in 1990-1996 is used as the start-year and the most recent year with data

in the 2000s as the end-year; details in text. Note that for Belarus, Estonia and Latvia, the latest $1.25 headcount ratio value is 0 and has been replaced with 0.001 in order to compute the growth rates (source provides data for .01 in some cases).. Income and inequality elasticity estimates are derived from equations (6) and (7) of the text, respectively, using country 1990-96 mean values for the initial Gini coefficient, G^I, and for the poverty line relative to income, Z/Y.

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