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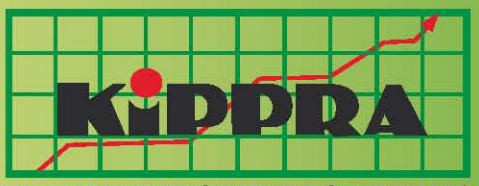

The KENYA INSTITUTE for PUBLIC
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Poverty, Growth and Inequality Decomposition: A Household Survey Analysis

Nancy Nafula, Lydia Ndirangu and Eldah Onsomu

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Social Sector Division

Kenya Institute for Public Policy
Research and Analysis

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Abstract

This study mainly attempts to quantify the relative contribution of economic growth and redistribution to poverty changes in Kenya. This is important for policy since a prudent poverty reduction strategy needs to focus on both the level of growth and on the pattern of that growth. The study makes use of three sets of data bases: The Welfare Monitoring Surveys for 1994 and 1997, and the Kenya Integrated Household and Budget Survey 2005/06 to inform the analysis.

Given that the rising inequality in the 1994-2005/06 period has reduced the effectiveness of growth on poverty, the study simulates the impact on poverty of the possible growth paths. Further analysis shows decomposition of inequality by expenditure components.

The results show that both growth and redistribution determine the level of poverty. Further analysis using simulation exercises demonstrates that poverty reduction can be effectively achieved through a growth with redistribution strategy. These findings corroborate the general information in the literature from African economies that growth in household incomes appears more likely to be essential for long-term poverty reduction and that it would be more effective if poverty alleviation programmes are targeted disproportionately in favour of rural areas.

Abbreviations and Acronyms

ADB	Asian Development Bank
CT	Cash Transfers
KIHBS	Kenya Integrated Household Budget Survey
LACs	Latin American Countries
MDGs	Millennium Development Goals
WMS	Welfare Monitoring Survey

Table of Contents

1. Introduction

Economic growth as measured by rate of change in per capita real gross domestic product (GDP) is the main standard of measure used to determine economic success. Thus, growth oriented economic policies have been promoted on the ground that they create opportunities for the poor people to increase their income. However, there are concerns that the benefits of growth do not always reach the poor. The growth processes in most developing countries are such that incomes of the poor groups increase at a slower rate than the average income (Kakwani, 1993). Evidence shows that some countries see a much faster decline in poverty with the same or lower level of growth in income compared to others (Bourguignon, 2004).

The first target of the Millennium Development Goals (MDGs) is to halve extreme poverty; it becomes necessary to fully understand the relationship between growth and inequality and its relative importance in poverty reduction. Indeed, achieving this MDG target requires deliberate policies to either accelerate growth, or redistribute resources, provided that the instruments used to do so do not at the same time slow down growth. Social protection programmes have been successfully applied in most instances to protect the vulnerable. The cash transfer (CT) programmes are of particular interest and have been successfully used to redistribute incomes and hence reduce poverty. With the knowledge that "initial conditions" of greater asset and income equity enhance growth rates, and encouraged by success in Latin American countries (LAC), different varieties of such transfer programmes are increasingly being implemented in African countries.

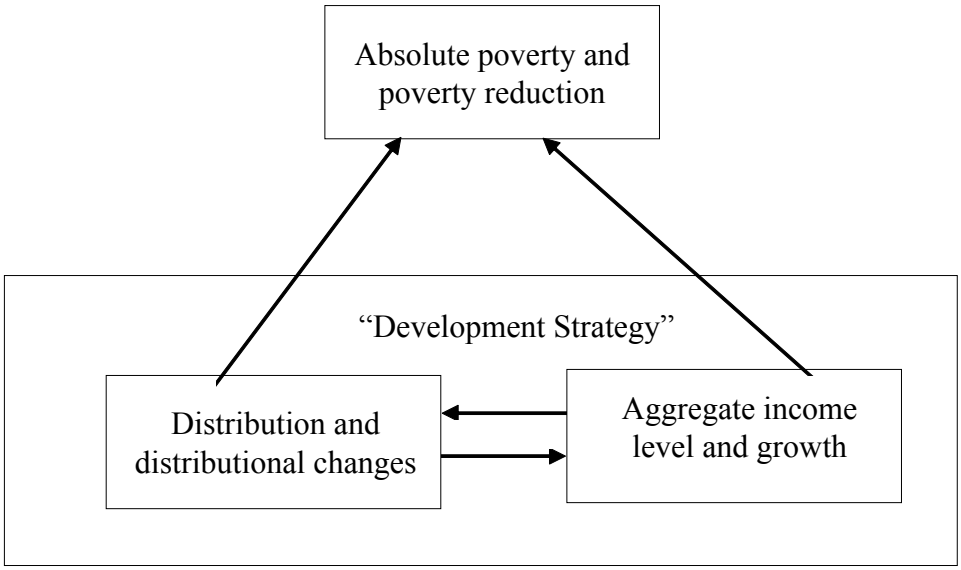
The aim of this study is to determine the contribution of growth and inequality components in poverty reduction. It further analyses the extent to which the poor benefit from economic growth during the study period. The study also attempts to analyse inequality in the distribution of household consumption expenditure. These analyses benefit from various methodologies as applied in the literature by Kakwani (1993), Kakwani and Son (2003), Lerman Yitzhaki (1985) and Yitzhaki (1983).

2. Conceptual Framework

A change in the distribution of income can be decomposed into two effects, a proportional change in all incomes that leaves the distribution of relative income unchanged (a growth effect) and a change in the distribution of relative incomes, which by definition is independent of the mean (a distributional effect). According to theory, a change in poverty is a function of growth, distribution and a change in distribution. It is clear that both growth and inequality changes play a major role in generating changes in poverty. However, the impact of these phenomena will depend on the initial level of income and inequality.

The existence of an identity linking changes in the level of poverty reduction in any given country with changes in average growth and changes in inequality would imply that a prudent poverty reduction strategy would have to focus on both the level of growth and on the pattern of that growth; that is, on who benefits from that growth. But what is the relative importance of the growth and redistribution elements in poverty reduction? This framework attempts to answer this question using Kenyan data.

Figure 1: The poverty-growth-inequality triangle



Source: Bourguignon (2004)

3. Methodology and Data

3.1 Growth-inequality Decomposition

To analyse the impact of changes in the welfare measure (expenditure) and changes in the distribution (inequality) on poverty, we decompose poverty changes into growth and inequality components. The growth component represents the change in the poverty measure due to changes in mean welfare when holding the relative distribution of the reference period constant. The redistribution component is the change in poverty due to a change in the Lorenz curve, while keeping the mean income constant at the reference period.

Given a fixed poverty line *z*, the poverty level at time *t* may be expressed as

$P = P(\mu, l)$. Thus, given the poverty line *z*, poverty at time $t=0$ will be denoted by

$$P_{00} = P(\mu_0, l_0) \quad (1)$$

Where μ_0 denotes the mean income level at time $t=0$ and l_0 denotes the Lorenz curve at time $t=0$. Similarly, poverty at time $t=1$, will be given by:

$$P_{11} = P(\mu_1, l_1) \quad (2)$$

The change in poverty between two time period is given by

$$P_{11} - P_{00} = P(\mu_1, l_1) - P(\mu_0, l_0) \quad (3)$$

A number of methods have been used in the literature to decompose poverty (e.g. Datt and Ravallion, 1992; Kakwani and Subbarao, 1990; and Jain and Tendulkar, 1990). The choice of method to decompose the change in poverty into growth and redistribution components depends on properties that an individual wishes the decomposition to satisfy. In our case, the decomposition will be path independent and complete (no residual). The Datt and Ravallion (1992) decomposition method yields a residual.

Kakwani and Subbarao (1990) carry out the decomposition in the following way:

$$P_{11} - P_{00} = (P_{10} - P_{00}) + (P_{11} - P_{10}) \quad (4)$$

Jain and Tendulkar (1990) propose an alternative way:

$$P_{11} - P_{00} = (P_{11} - P_{01}) + (P_{01} - P_{00}) \quad (5)$$

The first term on the right hand side of each of equations (4) and (5) denotes the growth component, which gives the change in poverty purely due to change in mean welfare. The growth component in (4) is measured by holding the distribution of income fixed at l_0 while letting the mean income change from μ_0 to μ_1. The growth component in (5) is measured by holding fixed the income distribution at

l_1 and letting the mean income change from μ_o to μ_1. Similarly, the second term in each of the equations is the distribution component, which gives the change in poverty purely due to the change in the distribution of income. In equation (4), the distribution component is measured by holding the mean income level fixed at μ_1 and changing the distribution of income from l_o to l_1. In equation (5), the distribution component is measured by holding the mean income level fixed at μ_o and changing the distribution of income from l_o to l_1. In general, the growth component and the distribution component as measured in (4) will be different from the growth and distribution component, respectively, as measured in (5). As there is no theoretical reason to prefer the base year to the final year as the bench mark or vice versa, there is no reason to prefer either of the decomposition to the other.

According to Kolenikov and Shorrocks (2003), the two effects from two growth components and two effects from the distribution component should be averaged separately, such that decomposition remains path independent:

$$P_1 - P_0 = \left(\frac{(P_0 - P_0) + (P_1 - P_0)}{2}\right) + \left(\frac{(P_1 - P_0) + (P_0 - P_0)}{2}\right) \quad (6)$$

The first growth component gives the change in poverty due to a change in the mean income when distribution is held fixed at time *t=0* while the second gives the change in poverty when distribution is held fixed at time *t=1*. Similarly, the first distribution component gives the change in poverty due to a change in distribution when the mean income is held fixed at time *t=0* and the second gives the change in poverty when the mean income is held fixed at time *t=0*.

According to Shorrocks (1999), this method of decomposition is equivalent to the Shapley decomposition approach. He points output that this is the only method of decomposition that satisfies the following requirements: i) the decomposition should be path independent; ii) the decomposition should be complete; iii) and the components of the decomposition should be given by the marginal effect of changing one factor, holding constant all the other factors.

3.2 Estimating the Degree of Pro-poorness of Growth

To further explore the extent to which the poor benefited from economic growth during the study period, we computed the poverty equivalent growth rate (PEGR) of Kakwani and Son, (2003). The PEGR takes into account both the magnitude of economic growth and the benefits of growth that the poor receive. As noted above, poverty reduction depends on: (i) the magnitude of economic growth - the larger the growth, the greater the reduction in poverty; and (ii) changes in inequality

accompanying the growth process - an increase in inequality reduces the impact of growth on poverty.

The PEGR is defined as the growth rate (γ^*) that would result in the same level of poverty reduction as the present growth rate (γ) if the growth process had not been accompanied by the change in inequality (when everyone in the society received the same proportional benefits of growth). The actual proportional rate of poverty reduction is given by $\delta\gamma$, where δ is the total poverty elasticity. If growth were distributional neutral, then γ^* would achieve a proportional reduction in poverty equal to $\eta\gamma^*$, which should be equal to $\delta\gamma$; where η is the growth elasticity of poverty (Kakwani, 1993). Thus, PEGR denoted by γ^* is given by:

$$\gamma^* = (\delta/\eta)\gamma = \varphi\gamma \tag{7}$$

Where $\varphi = \delta/\eta$ is the pro-poor index (Kakwani and Pernia, 2000).

Growth is pro-poor (pro-rich) if γ^* (PEGR) is greater (less) than γ, i.e. when $\varphi>1$, the poor benefit proportionately more than the non-poor. If $0<\gamma^*<1$, then growth is accompanied by increasing inequality but poverty still declines. This situation is characterized by a trickle down process, when the poor receive proportionately less benefits of growth than the non-poor. In situations where inequality increases so much that the beneficial impact of economic growth is more than offset by adverse impact of rising inequality, γ^* is negative.

3.3 Decomposing Inequality by Expenditure Components

The decomposition of the Gini coefficient by factor method is used in this analysis (Lerman and Yitzhaki, 1985; Yitzhaki, 1983). The method has been used to decompose inequality by income components, making it therefore possible to evaluate how income sources are distributed and how changes in income sources benefit the poor and the rich.

Extending the approach of Shorrocks (1982), Lerman and Yitzhaki (1985), the Gini coefficient for total income inequality, G, can be represented as:

$$G = \sum_{k=1}^{K} S_k G_k R_k \tag{8}$$

Where S_k is component k's share of total expenditures, G_k is the relative Gini of component k. High $G_{k's}$ are an indication that there are differences in consumption expenditures. R_k is the Gini correlation between the expenditure component k with the distribution of total consumption. If component k is unequally distributed and in favour of those at top of the consumption distribution, R_k is large and

positive. An increase in R_k will increase total inequality. However, if it is unequally distributed but in favour of the poor, an increase in R_k will reduce total inequality. The change in total inequality will therefore be influenced by:

- Change in expenditure share in to total expenditure (income) (S_k);
- How equally or unequally distributed the expenditure (income) component is (G_k); and
- The correlation between the expenditure (income) component and the distribution of total expenditure (income) (R_k).

The change in total inequality over the two periods can be calculated as:

$$\Delta G = \sum_{k=1}^{n} \overline{c}_k \Delta s_k + \sum_{k=1}^{n} \overline{s}_k \overline{R}_k \Delta G_k + \sum_{k-1}^{k} \overline{s}_k \overline{G}_k \Delta R_k \qquad (9)$$

where $c_k = R_k G_k$ is the concentration index for expenditure component *k*, which measures how evenly distributed *k* is over the total expenditure. If C_k is greater than the Gini index, then the k[th] income component is distributed in favour of the non-poor. $\overline{c}_k$ and $\overline{s_k}$ are the means of the concentration index and the share of the k[th] expenditure component for the two periods. The first term on the right hand side of equation (9) captures the change in share of the k[th] component in total expenditure; the second term captures the pure inequality effect of k[th] component, and the third term the correlation between total expenditure and each of k components.

The above inequality decomposition is also useful in examining how marginal changes in expenditures for particular components affect overall inequality. Consider a small change in expenditure for commodity k equal to ex_k. if e represents a percentage change in expenditure for k , it can be shown (see Stark, et al. 1986) that the partial derivative of the Gini coefficient with respect to a percent change e in source k is equal to:

$$\frac{\partial G / \partial e_k}{G} = \frac{R_k G_k S_k}{\overline{s_k}\, G} - S_k \qquad (10)$$

The percent change in inequality resulting from a small percent change in income from source *k* equals the original contribution of component *k* to income inequality minus source *k's* share of total expenditure. The direction of the relative marginal relationship indicates the effect at the margin of an increase in expenditures for a component on overall inequality. The increase would be pro-poor if the effect is negative. The marginal changes are computed for 2005/06.

3.4 Data

Data analysis in this study is based on three household surveys: the Welfare Monitoring Survey II (WMS 1994), the Welfare Monitoring Survey III (WMS 1997) and the Kenya Integrated Household and Budget Survey (KIHBS) 2005/06. All these data sets were collected by the Kenya National Bureau of Statistics (KNBS) in the respective years.

The 1994 WMS was conducted in June to August 1994, a period just before the harvest time when most households experience severe shortfalls in the consumption of staple foods. The 1997 WMS was conducted in April to June, a period following the short rains harvests for districts with two agricultural seasons, and the onset of the hunger season in those districts with one agricultural season. KIHBS data collection took 12 months starting May 2005, and therefore was able to control for seasonality.

The two WMSs were based on the same sampling frame — the National Sample Survey and Evaluation Programme (NASSEP III), while that of KIHBS survey was based on the updated version, the NASSEP IV sampling frame. Another difference between KIHBS 2005/06 and WMS is geographical coverage. The KIHBS 2005/06 covered all districts, while the WMS excluded some clusters in the ASAL districts. While KIHBS 2005/06 is representative, the composition of individual households covered in the survey is different from the previous WMS. The differences in the data collection methodologies, therefore, make it difficult to perfectly compare results from the data sets.

The three micro-level surveys contain information covering a variety of dimensions, including incomes and expenditures, education of all household members, labour supply, asset ownership, and land holdings. The welfare indicator used is the expenditure per adult equivalent. A household is classified as poor if its per capita expenditure is less than the absolute minimum expenditure required to meet subsistence food and non-food needs. A separate food poverty line is computed for rural and urban areas.

3.4.1 Poverty lines

The poverty lines used in this study were derived by the KNBS. Two poverty lines are used, i.e. the food and non-food poverty lines. The food poverty line is derived in a way that meets the subsistence caloric requirements based on the FAO/ WHO recommendations of 2,250 calories per day per adult. In order to compute the overall poverty line, some adjustment is done to account for the basic non-food requirements of the population. The non-food poverty line is also estimated

separately for rural and urban areas. The non-food poverty line for rural areas excludes expenditure on house rent (majority of households own their houses).

Housing rent is included in the computation of the urban non-food urban poverty line. Table 3.1 shows the computed food and absolute poverty lines for the three surveys for rural and urban areas. The corresponding poverty rates are shown in Table 3.2. Despite the differences in the timing of the two surveys, i.e. WMS 1994 and WMS 1997, poverty rates declined between the two time periods. Also presented in Table 3.2 are poverty projections based on 1997 data for year 2000 (Mwabu et al., 2002). These projections are included just to show the poverty trends in the country. However, they are not utilized in the subsequent analysis.

Table 3.1: Estimated poverty lines: 1994, 1997 and 2005/6

Year	Rural		Urban	
	Food	Absolute	Food	Absolute
1994	703.0	978.3	874.7	1489.6
1997	927.1	1238.8	1253.9	2648.0
2005/6	988.0	1562.2	1474.4	2912.8

Source: Kenya National Bureau of Statistics (2007)

Table 3.2: Poverty incidence in Kenya: 1994, 1997, 2000 and 2005/6

Author	Reference Year	Data Source	Poverty Incidence
Mwabu et al. (2000)	1994	1994 WMS II	39.7% rural population 28.6% urban population 38.8% national population
KNBS (2007)	1994	1994 WMSII	46.8% rural population 29.0% urban population 40.3% national population

Republic of Kenya (2000)	1997	1997 WMS III	52.9% rural population 49.2% urban population 52.3% national population
Mwabu et al. (2002)	2000	Predictions based on 1997 WMS	59.6% rural population 51.5% urban population 56.8% national population
KNBS (2007)	2005/2006	KIHBS	49.1% rural population 33.7% urban population 45.9% national population

Source: Economic Survey 1994, 1997; Mwabu et al 2000; and Mwabu et. al. 2002; Kenya National Bureau of Statistics (2007)

4. Results and Discussion

4.1 Relative Importance of Growth and Redistribution in Poverty Reduction

4.1.1 Ex-post analysis on the role of growth and redistribution on poverty reduction

The decomposition of the total change in poverty levels goes beyond answering the basic question of whether poverty declined or increased. It quantifies the relative contributions of economic growth and redistribution to changes in poverty. Table 4.1 shows that the importance of the two components varied during the two study periods. While the redistribution component dominated during 1994-1997, the growth component was dominant in the period 1997-2005/06. If the Lorenz curve had remained constant as observed in 1994, the headcount index would have decreased by 12.9 per cent between 1994 and 1997. However, since the disparity in welfare increased (21.7%), the headcount ratio actually rose by 8.8 per cent — the rise in inequality off-set the gains from growth in reducing the headcount ratio and depth of poverty. The poor, however, became more similar among themselves (the expenditure distribution for the poor narrowed), since the poverty severity declined. Overall, the distribution of income that occurred with economic growth during the ten year period (1994-2005/06) benefited the non-poor more than the poor, since all the redistribution effects are positive.

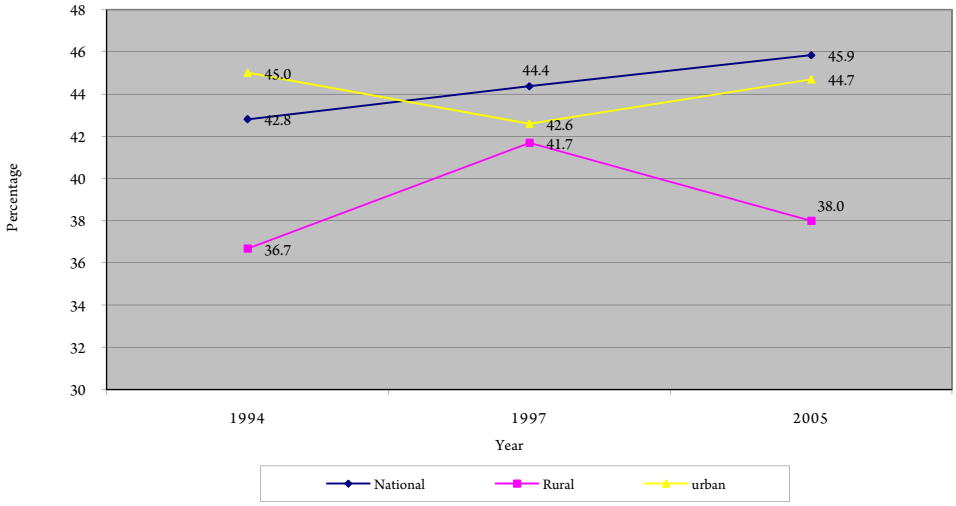
Even for the period 1997-2005/06 when the growth effect dominated, distribution neutral growth would have reduced the proportion of the poor by 19.6 per cent points instead of the observed 6 per cent points. Nevertheless, there was a decline in the variance of the distribution during this period, especially with regard to head count ratio. This was very pronounced in urban areas where the redistribution effect improved from 33 percentage points to 4.3 percentage points. Consequently, the urban head count ratio reduced by more than twice the national average (i.e. from 8.8 percentage points in 1994-1997 to 15.2 percentage points in 1997 to 2005/6). Nevertheless, the urban Gini coefficient increased from about 43 per cent in 1997 to about 45 per cent in 2005/06 (Figure 4.1), pointing to varying growth rates across the distribution.

Table 4.1 Decomposition of changes in poverty into growth and redistribution components in Kenya, 1994, 1997 and 2005/06

Year		Total change in poverty (%)	Growth	Redistribution
		Head count ratio		
1994-1997	National	8.8	-12.9	21.7
	Rural	6.6	-12.1	18.7
	Urban	20.0	-12.8	32.9
1997-2005	National	-6.0	-19.6	13.6
	Rural	-3.4	-15.0	11.5
	Urban	-15.2	-19.5	4.3
		Poverty gap ratio		
1994-1997	National	1.8	-7.0	8.8
	Rural	1.1	-6.5	7.7
	Urban	5.4	-7.3	12.8
1997-2005	National	-2.1	-10.5	8.4
	Rural	-1.4	-8.1	6.8
	Urban	-4.0	-8.5	4.5
		Severity of poverty		
1994-1997	National	-0.3	-4.2	3.9
	Rural	-0.7	-4.0	3.3
	Urban	1.7	-4.2	5.9
1997-2005	National	-0.4	-6.1	5.6
	Rural	-0.1	-4.8	4.7
	Urban	-1.2	-4.5	3.3

Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

Figure 4.1: Trends in Gini coefficient: 1994-2005/06



Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

4.1.2 Ex-ante impact analysis of the role of growth and redistribution in poverty reduction

The analysis above shows the actual effects of growth and distribution on poverty reduction in the country during 1994-2005/06. The results show that economic growth has contributed positively to poverty reduction efforts. However, rising inequality has retarded the impact of growth on poverty. As a consequence, the issue of inequality has become of major concern in Kenya. In particular, questions abound regarding what growth paths to follow in order to achieve desired pro-poor impacts. Existing evidence for Latin America show that redistribution is more effective in lowering poverty than growth, but very little is known for African countries. Such evidence can offer some insight into how low-income Central American countries compare to low income African countries in terms of the role of growth and redistribution in shaping poverty.

To this end, this section analyses ex-ante the likely impact of growth rates with different distributional and growth effects on poverty reduction for Kenya. Using the consumption growth rate observed for 1997-2005/06 period of 1 per cent (shown in Table 4.2), we assess the impact on poverty (incidence, depth and severity) in the next two decades for four scenarios:

(a) both the rate and pattern of aggregate growth are maintained (baseline);

(b) non-redistributive growth (inequality constant) occur;

(c) no growth occurs, but redistribution takes place (inequality decreases);

(d) if inequality-reducing (pro-poor) growth occur. To simplify the analysis, we assume equal distribution growth (EDG).

Table 4.2 provides the total poverty elasticity, the growth elasticity of poverty, and the inequality effects realized during 1997-2005/06.

Table 5 2: Total poverty elasticity: 1997-2005/06

	Growth elasticity of poverty	Inequality effect	Total poverty elasticity	Poverty equivalent growth rate
Head count ratio	-4.70	3.26	-1.34	0.29
Poverty gap ratio	-7.31	5.85	-0.93	0.13
Severity of poverty	-8.92	8.19	-0.49	0.05

Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

The poverty-growth elasticity is the percentage change in poverty, which would occur with an increase in the mean expenditure of 1 per cent while keeping the distribution fixed. Similarly, the poverty-inequality elasticity is the percentage change in poverty that would occur with a decrease in the Gini coefficient of one per cent while keeping the mean expenditure fixed. Table 4.2 shows poverty-growth and poverty inequality elasticities for 2005/06. The results show that both poverty-growth and poverty-inequality elasticities are quite high. A 1 per cent increase in the mean expenditure reduces the headcount ratio by 4.7 per cent and, similarly, a 1 per cent decrease in the Gini coefficient would reduce the head count ratio by 3.26 per cent. Both the poverty-growth and poverty-inequality elasticities are larger for more sensitive measures of poverty, i.e. poverty depth and poverty severity than the head count. The magnitudes for poverty severity are more than double in both cases (i.e. poverty-growth and poverty inequality elasticities). This suggests that growth may be more effective in reducing severity of poverty than simply reducing the proportion of the population who are poor.

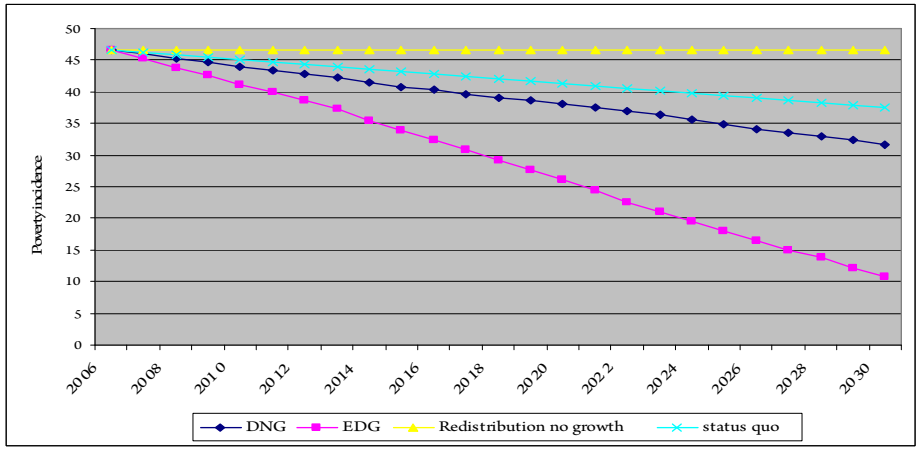
Under scenario one, the rate and pattern of aggregate growth as observed during 1997-2005/06 is maintained. As observed above, the growth process during this period was accompanied by a huge rise in inequality, which reduced the effectiveness of growth on poverty. Instead of simulating a growth rate of 1 per

cent per annum, we simulate the calculated PEGR rate of 0.29 for head count ratio, 0.13 for poverty gap and 0.05 for poverty severity.

In order to compare the effectiveness of the first scenario in reducing poverty with the other three scenarios, we also adopt the 1 per cent growth rate in consumption but in scenario 2, we assume a distribution neutral growth. In the third scenario with redistribution but no growth, we assume a 1 per cent redistribution of income from the richest 20 per cent to the poorest 20 per cent. The fourth scenario assumes that a 1 per cent increase in per capita consumption is distributed equally across. As such, the poor in this scenario benefit from growth proportionately more than the rich.

The predicted trends in reduction of poverty for the four scenarios are presented in Figure 4.2, Figure 4.3 and Figure 4.4.

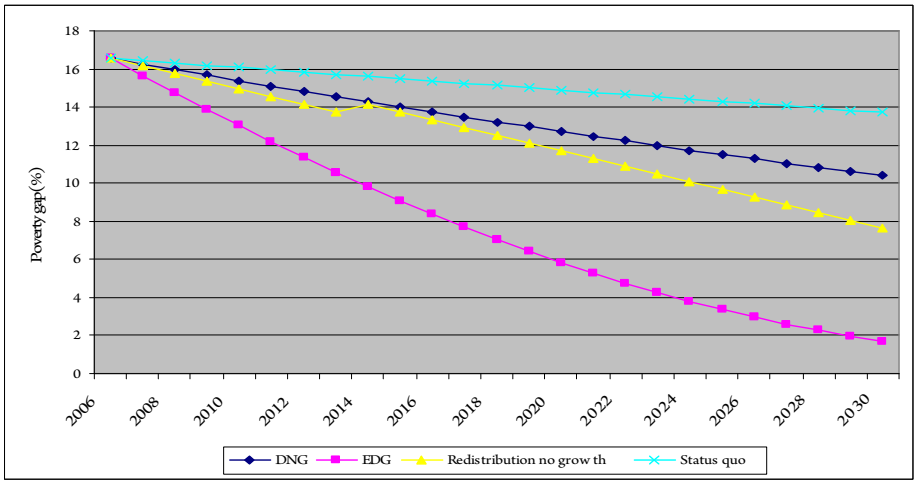
Figure 4.2: Simulated trends in headcount ratio for varying rates and patterns of growth



Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

Note: EDG represents equal distribution growth while DNG represents distribution neutral growth

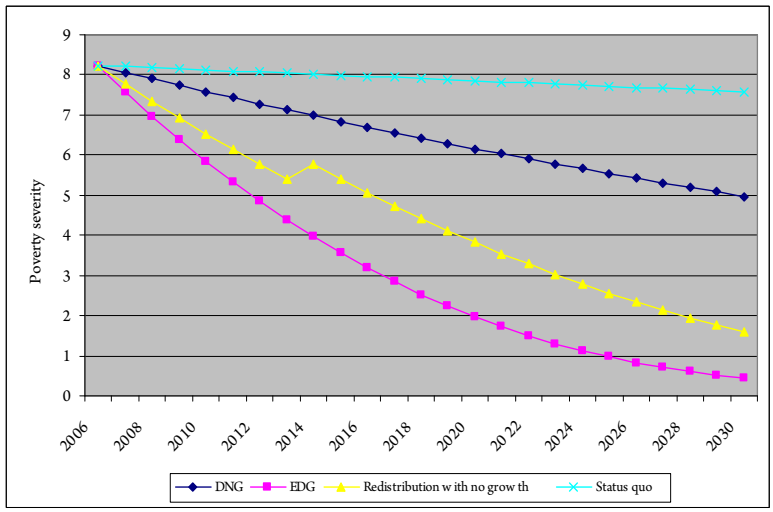
Figure 4.3: Simulated trends in poverty gap for varying rates and patterns of growth



Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

Note: EDG represents equal distribution growth while DNG represents distribution neutral growth

Figure 4.4: Simulated trends in poverty severity for varying rates and patterns of growth



Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

Note: EDG represents equal distribution growth while DNG represents distribution neutral growth

It can be seen from Figure 4.2, Figure 4.3 and Figure 4.4 that the most effective mode of poverty reduction is that which combines policies to promote economic growth and income redistribution; i.e. scenario 4 labelled EDG. With the pro-poor growth path, at 1 per cent growth rate in consumption, it would be possible to half poverty by 2022. The degree of inequality as measured by the poverty severity index would by then be about 1 per cent. Using the same growth rate but adopting the growth pattern observed in the period 1997 (status quo), there is hardly any impact on poverty reduction. About 37 per cent of the population will still be below the poverty line in 2030. In fact, in terms of reduction in poverty gap and severity of poverty (Figure 4.3 and Figure 4.4), this scenario is much worse than if no growth were to occur but redistribution takes place.

However, the fact that redistribution with no growth has no impact on the poverty incidence reveals that economic growth is necessary (but not sufficient) if Kenya is to reduce poverty levels and thereby make progress towards achievement of MDG 1 of halving extreme poverty. The ratio of poverty reduction achieved by the pro-poor growth scenario (scenario 4) to distribution neutral growth (DNG) provides an indication of the efficiency of the distribution. This ratio is on average 2.5, implying that equal distribution growth raises 2.5 times as many people out of poverty as non-redistributive growth.

While the evidence above supports arguments against a trickle down perspective that emphasises growth at the expense of redistribution, unlike LACs, a growth with redistribution strategy would be the most effective in lowering poverty in Kenya. This is opposed to middle income LACs where redistribution has been more effective than growth in poverty reduction. The current efforts by the Kenyan government to increase social transfers, therefore, offer much promise for poverty reduction, especially if combined with proposed economic growth stimuli. That is, the study advocates for a policy package that balances growth and inequality (i.e. scenario 4). Simulations with different rates of growth instead of 1 per cent lead to similar conclusion.

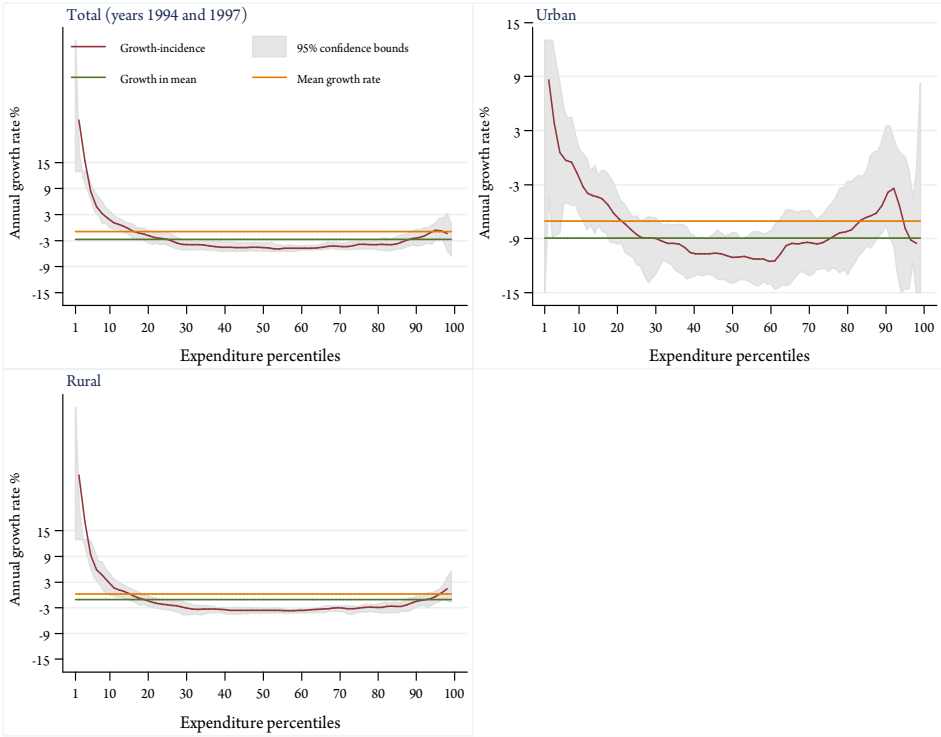
4.1.3 Differential consumption mobility

Various consumption (income) groups participate differently in the growth process and, therefore, benefit differently from it. This distinction provides answers as to who are the winners and losers in the growth process. Of much interest is whether, and to what extent, the most disadvantaged moved upward along the consumption ladder during the growth process. Towards this end, we construct the growth incidence curve (GIC) (Ravallion and Chen, 2003) . The GIC enables

a focus on growth rates at different points in the overall distribution. Ranking households from the poorest to the richest in each of the two years, it then plots the annualized growth rate at each percentile point in the distribution, comparing the later distribution with the earlier. The curve describes how the gains from growth were distributed.

The national, urban and rural GIC for the 1994-1997 are shown in Figure 4.5. Apart from the poorest of the population (on the left-hand side of the figure) who experienced positive annual growth in consumption during the period, most of the quintiles experienced negative or near zero growth rates. The positive growth rates experienced by the poorest, especially in rural areas, probably explains the slight decline in severity of poverty observed in Table 4.1. The worst growth rate was experienced by percentiles 20-60 in urban areas. Although the urban GIC is mainly U-shaped, suggesting that the receding growth was pro-poor; the large standard errors at this end reduces the reliability of this extreme observation.

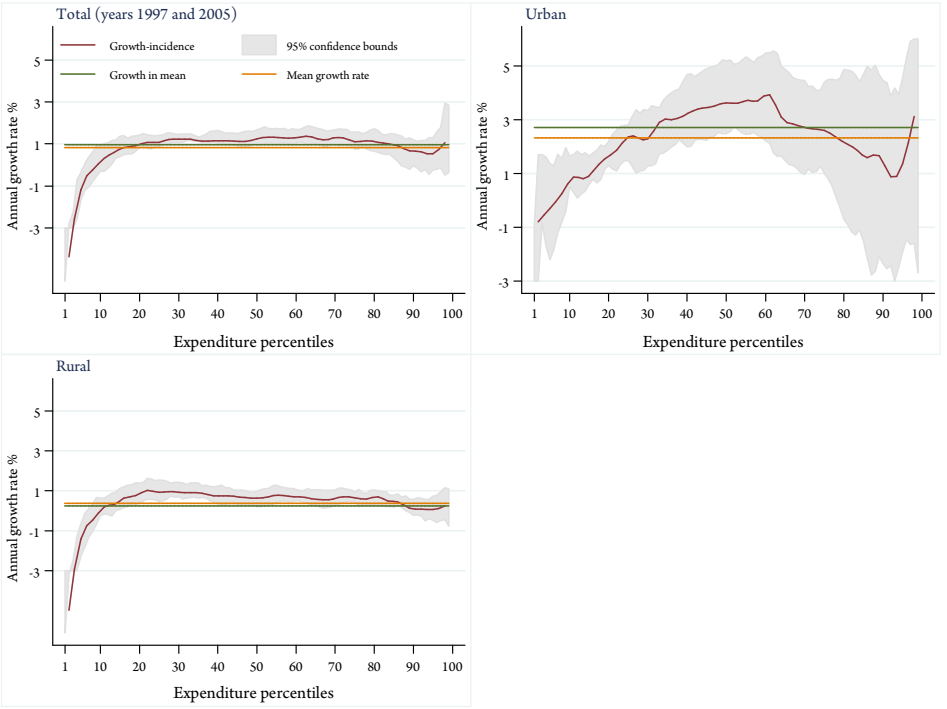
Figure 4.5: The growth incidence curves for national, urban and rural areas: 1994-1997



Nevertheless, the shape of the curve is supportive of the slightly lower urban Gini in 1997 (Figure 4.1).

The growth process changed during 1997-2005/06 (Figure 4.6). The GIC is upward slopping at lower percentiles, implying increasing inequality (a faster rate of growth in higher percentile groups), a point already demonstrated by the slight increase in the national and urban Gini coefficients. The mean growth rate for the poor is particularly lower than the growth rate in mean consumption for urban areas. The urban GIC takes on an inverted U-shape, with the highest growth rates achieved by the 30-60 percentile groups. Beyond 60 percentile, growth was more equalizing but again the standard errors in this range are large.

Figure 4.6: The growth incidence curves for national, urban and rural areas: 1997-2005/06



4.2 Estimating the Degree of pro-poorness of Growth

The pro-poor index and PEGR is separately computed for head count ratio, poverty gap ratio and severity of poverty for the periods 1994-1997 and 1997-2005/06 (Table 4.3).

Table 4.3: Poverty equivalent growth rate

Year		Consumption growth rate	Total poverty elasticity	Pro-poor index	Poverty equivalent growth rate
	Head count ratio				
1994-1997	National	-2.63	2.58	-1.47	-3.86
	Rural	-1.03	4.67	-1.83	-1.89
	Urban	-8.18	2.77	-0.64	-5.21
1997-2005	National	1.00	-1.44	0.31	0.31
	Rural	0.23	-3.69	0.23	0.05
	Urban	2.99	-1.28	0.78	2.33
	Poverty gap ratio				
1994-1997	National	-2.63	1.36	-3.89	-10.24
	Rural	-1.03	2.17	-5.42	-5.58
	Urban	-8.18	2.12	-1.33	-10.86
1997-2005	National	1.00	-1.46	0.20	0.20
	Rural	0.23	-3.80	0.16	0.04
	Urban	2.99	-1.06	0.47	1.41
	Severity of poverty				
1994-1997	National	-2.63	-0.42	14.00	36.87
	Rural	-1.03	-2.32	5.71	5.89
	Urban	-8.18	1.26	-2.47	-20.21
1997-2005	National	1.00	-0.73	0.08	0.08
	Rural	0.23	-0.63	0.02	0.06
	Urban	2.99	-0.73	0.27	0.80

Source: Author's computation using WMS 1994-1997 and KIHBS 2005/06

Kenya's economy experienced negative growth in the period 1994-1997. Real per capita consumption declined at an annual rate of 2.63 per cent. This observed growth rate was higher than the PEGR of -3.86 per cent, implying that the poor were disproportionately adversely affected by the recession. This is also shown by the large negative PEGR for poverty gap (-10%). However, expenditure distribution among poor households narrowed. The national PEGR (37%) for poverty severity is greater than actual growth rate during the period 1994-1997. But this is not the case for the urban poor. The recession was highly un-equalizing among the urban poor as the PEGR is negative 20.2.

For the period 1997-2005/06 when the country experienced positive growth rate of 1 per cent per annum, a PEGR of 0.3 per cent indicates that the non-poor benefited proportionately more than the poor. About 0.7 per cent of growth rate was lost because the country did not follow a pro-poor growth path. The PEGR for poverty severity for 1997-2005/06 is only 0.08 per cent compared to the actual annual growth rate of 1 per cent. This result is in agreement with the upward slopping GIC for the lowest percentile (Figure 4.6).

Given that the computed pro-poor indices are generally less than 1, it can be concluded that Kenya's growth process during the study period has generated proportionately more benefits to the non-poor than the poor. Consequently, the rising inequality has generated discontent among the population, and anecdotal evidence shows that rising inequality was largely responsible for the 2008 post-election crisis.

Underlying the above observed inequality in consumption are the differences among social groups in expenditure components that make up the total expenditure. Decomposing the inequality measure, e.g. the Gini coefficient by expenditure or income components can assist in understanding the determinants of observed inequality and how changes in this component impact on the poor and the rich. Such information is useful for designing pro-poor policies.

4.3 Decomposing Inequality by Expenditure Components

The objective of this section is to analyse inequality in the distribution of household consumption expenditure, and to examine the relationship between various expenditure components and total expenditure. While examination of household incomes is ideal because it allows for analysis of returns to different activities (and therefore, the distribution of benefits to those who are involved in such activities), a major difficulty in this case is that household incomes are very commonly underestimated in multipurpose household surveys. This is because of

the diversity of income sources, some of which may be casual and/or short term; the difficulty of estimating income from own account activities for which accounts are rarely kept; and respondents' common reluctance to reveal incomes.

The Welfare Monitoring Surveys used in this study suffered from these shortcomings. In fact, no official statistics on income are available for WMS 1997 and KIHBS 2005/06. For this reason, we use consumption expenditure to examine how changes in consumption components impacted on the poor. An off-shoot benefit of this method is that it can be used to assess the effect of fiscal policies (tax or subsidies) on spending patterns of consumers. This is because it yields the impact of marginal changes in expenditures for specific commodities on the inequality of total expenditure. The overall Gini coefficient is used to produce an estimate of inequality in the distribution of total household consumption expenditures over the population.

4.3.1 Explaining changes in total inequality

According to Table 4.4, the concentration index of the total non-food expenditure is greater than the Gini Index of total expenditure in the three years. This suggests that non-food expenditure is unevenly distributed, and on the whole favours the non-poor households. As a result, non-food expenditure increases total inequality. The rise in the concentration index of non-food expenditure over the study period thus led to an increase in national inequality. Although the correlation R_k for food and non-food are both large, food expenditure is more evenly distributed. An increase in R_k for food expenditure would thus decrease inequality.

Table 4.5 explains changes in total inequality during 1994-2005/06. The results show that the correlation effects are all positive for the non-food expenditure. However, much of the observed increase in total inequality is due to an increase in its share. Inequality in total expenditure increased by 2.9 per cent points during 1994-1997, and 6.3 per cent points in the 1997-2005/06 period. The big increase during 1997-2005/06 is attributed to rise in inequality for urban non-food expenditure. As mentioned above, when the R_k is large and positive and G_k is also large, an increase in R_k will increase total inequality. It can be noted that the distribution of food expenditure also worsened in urban areas. The pure inequality effect and the correlation effects for food component rose by about 2.1 and 0.4 per cent points, respectively. This combined with increase in inequality for non-food expenditure resulted in overall increase in urban inequality. That of rural areas dropped.

Table 4.4: Expenditure shares, inequality and correlation: 1997-2005/06

Expenditure share	Expenditure share			Gini index			Correlation			Concentration index		
	1994	1997	2005	1994	1997	2005	1994	1997	2005	1994	1997	2005
National												
Total food	0.67	0.65	0.47	0.40	0.37	0.40	0.93	0.93	0.90	0.38	0.35	0.36
Total non-food	0.33	0.35	0.53	0.60	0.71	0.69	0.86	0.92	0.96	0.52	0.65	0.66
Total expenditure				0.43	0.44	0.46						
Rural												
Total food	0.72	0.73	0.63	0.40	0.37	0.35	0.94	0.94	0.90	0.38	0.35	0.31
Total non-food	0.28	0.27	0.37	0.54	0.66	0.57	0.80	0.86	0.88	0.43	0.58	0.50
				0.37	0.42	0.38						
Urban												
Total food	0.72	0.73	0.63	0.36	0.33	0.38	0.88	0.84	0.86	0.32	0.27	0.33
Total non-food	0.28	0.27	0.37	0.58	0.58	0.62	0.91	0.94	0.97	0.53	0.55	0.60
				0.45	0.43	0.45						

Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

Table 4.5: Explaining changes in total inequality: 1994-2005

	1994-1997				1997-2005			
	Contribution due to change in				Contribution due to change in			
	Shares	Inequality	Correlation	**Total effect**	Shares	Inequality	Correlation	**Total effect**
National								
Food	-0.94	-1.850	-0.22	-3.01	-6.09	1.122	-0.53	-5.50
Non-food	1.52	3.202	1.24	5.96	11.34	-0.796	1.24	11.78
Total expenditure				2.95				6.28
Rural								
Food	0.29	-2.207	-0.05	-1.97	-3.23	-1.136	-1.05	-5.41
Non-food	-0.40	2.763	1.09	3.45	5.26	-2.584	0.26	2.93
Total expenditure				1.48				-2.48
Urban								
Food	-1.74	-1.648	-0.70	-4.08	-3.12	2.062	0.36	-0.70
Non-food	3.16	0.235	0.96	4.35	5.95	1.821	0.81	8.58
Total expenditure				0.27				7.88

Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

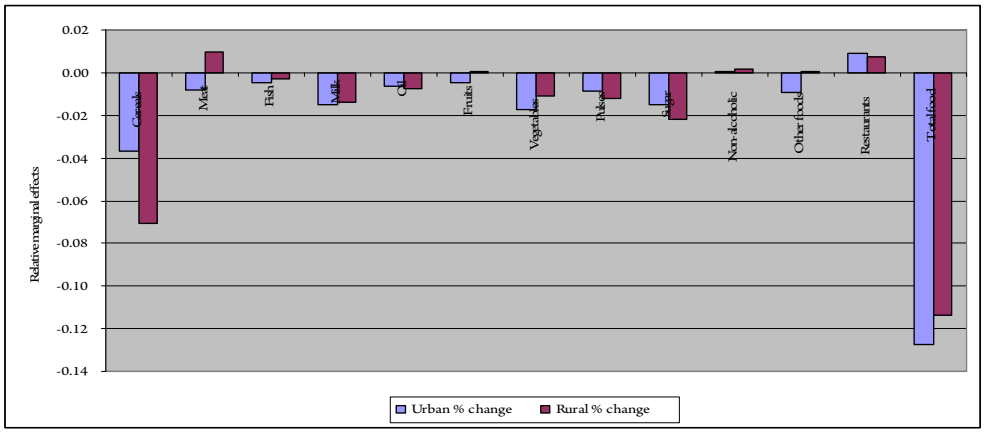
4.3.2 Effect of marginal changes in expenditure component on inequality

Table 4.6 shows the expenditure inequality effects by budget components for 2005/6. Changes in expenditure that would lead to reduction in equality have a negative relative marginal effect, and vice versa. The results confirm that increases in food expenditures tend to reduce inequality while that of non-food expenditures increase inequality, holding all else constant. The high $G_{k's}$ of the non-food items and their high overall Gini (0.57 for rural and 0.62 for urban) is an indication that there are large differences in consumption expenditures. Among food items, increases in cereal expenditure would reduce inequality the most (Figure 4.7). A 1 per cent increase in cereal expenditure, all else constant, was associated with a reduction in the Gini of total income by about 0.07 per cent and 0.03 per cent in rural and urban areas, respectively. This shows that cereal expenditure favoured the poor more than the rich. From a policy perspective, subsidies or tax reduction on cereal products would reduce inequality and more so in rural areas.

Of significance among the non-food items is the positive marginal change in education expenditure (Table 4.6). The positive sign of the marginal effect is a signal that the poor pay proportionately more than the rich for education. This is confirmed by the expenditure correlation (R), which is larger than the overall Gini index for both rural and urban areas.

Table 4.7 provides a detailed expenditure component for education. Students in non-poor households would benefit more from government subsidies on tuition fees. This is significant for Kenya given that the government has been implementing subsidised secondary school education programme since 2008 in addition to the free primary school education introduced in 2003.

Figure 4.7: Relative marginal effects food commodities



Source: Author's computation using WMS 1994-1997 and KIHBS 2005/06

Table 4.6: Relative marginal effects of education expenditure: 2005/06

	Rural					**Urban**				
Source	S_k	G_k	R_k	Share	% Change	Sk	G_k	R_k	Share	% Change
Food	0.63	0.35	0.90	0.52	-0.114	0.38	0.38	0.86	0.25	-0.128
Non-food	0.37	0.57	0.88	0.48	0.114	0.62	0.62	0.97	0.75	0.128
Education	0.05	0.82	0.48	0.05	0.001	0.05	0.88	0.61	0.05	0.003
Medical	0.03	0.86	0.43	0.03	-0.001	0.04	0.91	0.65	0.05	0.008
Transport & communication	0.06	0.82	0.78	0.10	0.040	0.14	0.80	0.91	0.21	0.066
Utilities	0.05	0.60	0.70	0.06	0.005	0.07	0.56	0.81	0.07	-0.006
Other expenditure	0.20	0.63	0.82	0.27	0.068	0.35	0.63	0.94	0.42	0.065
Total expenditure		0.383					0.495			

Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

Table 4.7: Relative marginal effects of education expenditure

Source	Sk	Gk	Rk	Share	% Change
Tuition	0.66	0.92	0.99	0.69	0.031
Books	0.07	0.92	0.92	0.07	-0.002
School uniforms	0.08	0.76	0.88	0.06	-0.018
Extra-curriculum	0.08	0.76	0.88	0.06	-0.018
School boarding	0.06	0.98	0.93	0.07	0.003
School transport	0.05	0.98	0.95	0.06	0.004
Total education expenditure		0.869			

Source: Authors' computation using WMS 1994-1997 and KIHBS 2005/06

5. Conclusion

Based on three latest national household surveys — 1994, 1997 and 2005/06, this study attempted to quantify the relative contribution of economic growth and redistribution to changes in poverty. The analysis reveals that, while the distribution component dominated the growth process during the 1994-1997 periods, the growth component was dominant in the period 1997-2005/06. In both cases, the distribution effect is positive and growth was generally anti-poor in both urban and rural areas. A lower than unity pro-poor index shows that Kenya's growth process during the ten year period generated proportionately more benefits to the non-poor than the poor.

Having observed that rising inequality in the 1994-2005/06 period reduced the effectiveness of growth on poverty reduction, we analyse ex-ante the impact on poverty reduction of possible growth paths that Kenya could follow in the next two decades. The simulation exercise demonstrates that poverty reduction can most be effectively achieved through a growth with redistribution strategy.

Decomposition of inequality reveals how changes in expenditure pattern benefit the poor and non-poor as well as how marginal changes affect overall inequality. The analysis shows that most of the observed increases in inequality were due to a rise in the share of non-food expenditure. In general, a rise in non-food expenditure is associated with increase in inequality; while that of food expenditure is associated with a decrease in inequality. An examination of inequality effects by expenditure components reveals that marginal changes on tuition increases overall inequality. This is of much significance to Kenya, given the education subsidy programmes under implementation. The results suggest that students from non-poor households benefits more than the poor from tuition fees subsidies.

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