Analysis of the Demery & Squire "Adjustment and Poverty" Evidence

By

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Introduction[1]

Along with the debate over whether World Bank-IMF type programs stimulate growth has gone a controversy about the impact of these programs on poverty and income distribution. In a recent article in *The World Bank Research Observer*, Demery and Squire argue that new survey data provide evidence that "poverty was more likely to decline in those [African countries] that improved their macroeconomic balances than in those that did not" (Demery and Squire 1996, p. 39). They draw the conclusion that the household survey data "...provide the most compelling evidence to date that *improvements in the macroeconomic policy regime of the kind usually associated with World Bank and IMF-supported adjustment programs are consistent with a decline in the incidence of poverty overall"* (pp. 44-45, emphasis added). They go beyond noting "consistency" to assert:

> These results do not establish causality, but, at least in the six countries for which we have evidence, we can conclude that failure to implement an adjustment program has been doubly harmful to the poor - they lose the benefits that adjustment can bring, and they suffer worse deprivation under likely alternative policy regimes characterized by larger fiscal deficits and overvalued exchange rates. This is a frequent finding of modeling exercises - heterodox polices, often designed to protect the poor, end up making matters worse for them.[2]

This extremely strong conclusion, that orthodox adjustment results in poverty reduction in sub-Saharan Africa, is based upon household expenditure surveys from six countries, on the one hand, and the methodology of a World Bank report for quantifying changes in macroeconomic policy (World Bank 1994). The "most compelling evidence to date" involves comparing changes in poverty in six countries to changes in an index of improvement in macroeconomic policy. The latter, found in *Adjustment in Africa*, has been widely criticized for its methodological and analytical shortcomings.[3]

The surveys upon which the conclusions are drawn are for two years each for six countries. Apparently none of the surveys were specifically designed to test the impact of adjustment on poverty. For three of the countries the first and second surveys were carried out by different organizations (in Ethiopia, Kenya and Tanzania). In terms of coverage, the surveys for three countries were "national" (Cote d'Ivoire, Ghana Tanzania), two surveyed rural areas only (Kenya and Tanzania), and one country's

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[1] This paper is published in *Journal of International Development,* Vol. 9, No. 6 (1997).

[2] Demery and Squire, 1996, p. 46. Note the implicit and unsupported allegation that heterodox policies involve larger fiscal deficits and exchange rate over-valuation. Despite the reference to 'heterodox policies' in this quotation and elsewhere, and allusions to 'critics' of World Bank structural adjustment polices, the authors cite the work of no critics (the only candidate in the list of references is the *Oxfam Poverty Report*, which does not focus on Africa). Of the thirty-two references, twenty are to studies by the World Bank, commissioned by the World Bank, or by World Bank professionals, and seven more are the poverty surveys upon which the article is based or statistical sources.

[3] See Mosley, Subasat and Weeks (1995) and Mosley and Weeks (1994), where it is demonstrated that the methodology for the *Adjustment in Africa* indices of policy is unsound and that the econometric results using the reported data set are not reproducible.

sampling is described as "regional" (Ethiopia).[4] The reader is assured that the surveys are all broadly representative. The authors treat them as accurately reflecting changes in poverty for each country as a whole,[5] *therefore consistent with macroeconomic trends*.

The first step in our critique demonstrates that the policy index used by Demery and Squire (Demery & Squire 1996, Tables 5 & 6) to indicate whether a country's macro regime was "of the kind usually associated with World Bank and IMF-supported adjustment programs" is invalid for its purpose. This index claims to measure the relative improvement in overall macro policy across the six countries, based upon orthodox adjustment criteria. The index derives from the weighted aggregation of three previously calculated indices, fiscal policy, monetary policy, and exchange rate policy (see Table 1, which gives the direction of change for each index by country and the overall aggregate). Both the sub-indices and the aggregate index are *ordinal*. At most, they do no more than order the countries; they can not be interpreted as indicating by how much more policy improved in one country compared to another. Therefore, their comparison to a cardinal measure (head count of poverty) is problematical.

More important than this, the weights assigned to the three sub-indices are arbitrary: .37 for fiscal policy, .12 for monetary policy, and .51 for exchange rate policy.[6] One is told: "the final index is a weighted average of performance in each of the three areas of policy, the weights reflecting the importance of each component in determining growth as revealed by cross-country regression analysis" (Demery & Squire 1996, p. 44). they refer readers to an unpublished World Bank working paper for details.[7] Without inspecting that reference, the reader would know that the weights used are no less arbitrary than ones selected out of a hat. First, each of the three policy indices is itself a combination of indices (Demery & Squire 1996, p. 57, footnote 3), *which are not*

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[4] We are told, 'In all but one case, the surveys were designed to be nationally representative or representative of the rural population.' In the one case the authors state, '...although it is not nationally representative, the survey is sufficiently broad-based to be considered representative of a large section of rural Ethiopia' (Demery & Squire, 1996, p. 41).

[5] Once the poverty statistics are presented in Table 2, Demery and Squire at no point qualify their conclusions with respect to the representativeness or accuracy of the surveys for each country as a whole. For example, on page 42 they refer to 'the change in poverty' and 'decomposing the change in poverty'. On the following page, they write, 'But in three cases -- Kenya, Nigeria, and Tanzania --real expenditure of the poorest of the poor declined, even though the incidence of poverty fell *nation-wide*' (emphasis added). For Kenya and Tanzania the surveys covered rural areas only (see Table 1).

[6] These weights can be calculated by treating the numbers in Table 5 ('Index of Changes in Macroeconomic Policies (weighted average performance)') as a system of simultaneous equations. They are reported in footnote 3 of Demery & Squire.

[7] This item is cited as Lawrence Bouton, Christine Jones, and Miguel Kiguel, 1994. 'Macroeconomic Reform in Africa: 'Adjustment in Africa' Revisited,' Policy research Working Paper 1394, Policy research Department, World Bank, Washington, D. C., Processed. It should be noted that these are not the weights used in the original document, 'Adjustment in Africa'. Why the one and not the other set of weights is used by Demery & Squire is not discussed. For detailed analysis of the weighting problem in *Adjustment in Africa*, see Mosley, Subasat & Weeks (1995). The fact that a different set of weights replaced the original so quickly after publication of the official document does not inspire confidence in the results.

weighted using regression analysis.[8]   The justification of using simple averages at one level of calculation, but regression-generated weights at another is not obvious. If simple averaging was adequate to construct each sub-index, why bother with the regression analysis? Or, if the latter carries such analytical power, why not use it consistently?

The regression exercise itself is made dubious by its cross-sectional nature, which applies the same weights to each country. Generating the same weight across all countries implicitly assumes that the policies operate within a similar framework in all countries. This is clearly not the case. To take but the most obvious example, some of the countries in the cross-sectional regression operated with fixed exchange rates (e.g., CFA countries), while others had flexible regimes. Basic macro theory tells one that policy interactions are fundamentally different in the two circumstances; i.e., it is invalid to include then in the same regression if one hopes for meaningful coefficients. This implies a further point: theory would predict certain positive growth outcomes would be associated with a *deterioration* in the World Bank policy indices. Consider the case in which a government operating under a flexible exchange rate regime increases government expenditure through the sale of bonds to the central bank. From a position of general equilibrium, this results in a deterioration in both the fiscal policy index (increased deficit) and the monetary policy index (increased money growth via monetizing the deficit). Basic IS/LM/BP analysis tells one that an increase in imports results from the excess demand, which puts downward pressure on the exchange rate. Under the flexible exchange rate regime a devaluation results, which prompts an improvement in the exchange rate policy index. Given the weights used by Demery and Squire, this sequence of events could reward the country with an overall improvement in its macro policy index, even though *the aggregate improvement was achieved, indeed initiated, by the violation of World Bank principles of sound fiscal and monetary policy*! In Table 1 (from Demery and Squire, Table 5) we find exactly this combination for Ethiopia. In the same vein, let government pursue a loose monetary policy (the index deteriorates), which (again) provokes a devaluation (the index improves). If exports respond quickly, the economy expands, which induces an increase in public sector revenues (fiscal policy index improves). Again, an overall improvement in policy performance follows from an initial violation of "sound" macro policy. There are two such cases in Table 1, Kenya and Nigeria. Of course, other theoretical stories can be told for these three countries.[9] That is precisely the point: the indices are so theoretically

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[8] Fiscal policy combines the change in the fiscal deficit and total state revenue. One reads, 'If the change in total revenues was less than -4 [percent], the fiscal score was decreased by 1; if the change was greater than three, the score was increased by 1' (Demery&Squire 1996, p. 57, footnote 3). One might ask, what is the theoretical basis of these percentage ranges? And, why increase (decrease) by unit, rather than some other ordinal number? The monetary policy index combines changes in the money supply *and* the rate of inflation. In this case, 'The overall monetary policy score was, *where possible*, a simple average of [the two]' (*Ibid.*). The exchange rate index included both the real effective exchange rate and the parallel market premium on the official exchange rate, 'as a simple average' (*Ibid.*). In each case theory tells one that the two combined measures are not independent of each other, biasing the outcome.

[9] The two stories here have superficial credibility in part because the indices used by Demery and Squire make no attempt to sort out time lags, between policies or between policies and performance. Each index refers to the same time period with no reference to possible disequilibria at the outset or end of the periods.

ambiguous that their interpretations are many and varied. They do not show that "recent history in this handful of African countries...suggests close links between poverty on the one hand and macroeconomic balances and growth on the other" (Demery & Squire 1996, p. 46).

Weights should not be determined on the basis of regression analysis alone; they must be first derived *theoretically*. Without a theoretical foundation, the weights, even should they show high statistical significance, may represent a correlation as spurious as an empirical link between sightings of storks and incidents of human births. The regression weights are arbitrary, because all theory tells one that the three indices may be both interactive (in which case treating them as separate results in biased statistics) and any two derivative from the third (they are not independent variables). For example, if one holds to a strict New Classical theory of aggregate general equilibrium, economies are constrained by the monetary supply; thus, the weight on monetary policy would be unity and the other weights zero.[10] Further, if one held to the operation of the law of one price, then the exchange rate weight should be zero, independently of the theory determining the weights on fiscal and monetary policy. A statistical exercise might show spurious and significant correlation for all three indices, due to time lags and the impact of non-policy influences. Non-theoretical regression weights are worse than those drawn from a hat, because they carry an undeserved aura of verisimilitude for unwitting non-specialists, who, to a great extent, are the intended users of the World Bank policy conclusions.

Once the weights are revealed as arbitrary, the alleged relationship between policy performance and poverty (Table 6 in Demery & Squire) collapses. One observes in Table 1 that for only two of the six countries are the three policy changes all non-negative (Ghana and Tanzania). For two other countries, Cote d'Ivoire and Ethiopia, two of the three are negative, yet the aggregate index for the former is negative and positive for the latter. This is purely an artifact of the arbitrary aggregation procedure, with no clear policy implication. Figure 1 demonstrates this point. Assume there be two policy indices, and a country in time period 0 scores 2,1 (point a), and in time period 1 scores 1,2 (point b). If the weights are in the ratio 2:1, then the overall index measures an deterioration in policy (line w1); but an equal weighting shows no change (line w2); and a 1:2 weighting reports that policy has improved (line w3). Four of the six countries suffer from this ambiguity (the two mentioned above plus Kenya and Nigeria, whose overall outcome is given in bold type), *which is unavoidable in the absence of theoretically determined weights*.

[Table 1 about here]

The failure to consider initial and final conditions implies that the index presumes that the economies were in general equilibrium at the terminal dates.

[10] Of the three indices, only that for monetary policy seems to have a theoretical basis, because it assigns the highest score to a near-zero change in the ratio of the money supply to GDP (Demery&Squire 1996, p. 57, footnote 3). This rule is implied if one assumes money to be neutral.

[Figure 1 about here]

Having demonstrated that little information is conveyed by the macroeconomic policy indices, we turn to the other key measure in the Demery and Squire article, the poverty measures. Our procedure is initially to accept that these surveys are individually and collectively representative of each country as a whole, and then demonstrate that the poverty figures are inconsistent with generally-accepted statistics on per capita income growth (produced by the World Bank itself). We find it surprising that Demery and Squire did not carry out this simple and basic consistency check. The first step in the analysis is to inspect the measured poverty levels, given in the first two data columns of Table 2. The "Year 1" column gives the percentage of household in poverty by the "head count" method. Poverty in each "Year 1" survey was defined as that percentage of households with expenditure below a given fraction of "mean expenditure" for the sample as a whole (Demery & Squire 1996, pp. 41-42).[11] As data column four shows, this fraction is .54 for Cote d'Ivoire, Ethiopia, and Kenya, and .5, .67, and .41 for Ghana, Nigeria and Tanzania, respectively. Let the absolute expenditure implied by these fractions be: $EP_{i,t=1} = \alpha_i EM_{i,t=1}$ (poverty level expenditure for country i equals the arbitrary fraction for each country, times mean expenditure in year 1). The absolute expenditure level implied by this fraction of mean expenditure is carried forward as the poverty line to the "Year 2" survey, providing an absolute poverty measure which is the same for both years (at least in principle). Thus, the percentage for "Target Year 1" is the proportion of households in that year measured to have expenditure below $\alpha_i EM_{i,t=1}$.

In their article Demery and Squire provide a "decomposition" of the change in poverty, between the "effect of changes in economic growth" and the "effect of changes in inequality" (see p. 43, Table 3). The data column "Growth Only" reports the former; i.e., the level of poverty in the second survey on the assumption of no distributional changes.[12] This decomposition is key to the empirical critique below. Before employing it for our calculations, we note that by providing the decomposition, Demery and Squire offer support evidence for one of the most important heterodox critiques of orthodox adjustment: that these programs are associated with an increase in the inequality of income. In four of the five countries with improved indicators (all but Ghana), the decomposition shows that income growth was associated with greater inequality. For Kenya and Tanzania, the effect is staggering: over half of the growth-generated reduction in poverty is wiped out by increased inequality. Such a finding might prompt some to seriously consider alternative adjustment strategies. However, neither should the multilaterals be chagrined or the critics smug about this result. As shown below, the poverty statistics are highly suspect, *in as far as they purport to measures changes at the national level*.[13]

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[11] Demery and Squire repeatedly use 'income' interchangeably with 'expenditure'.

[12] It is to be stressed that this decomposition is taken from the Demery and Squire article.

[13] The last phase is important. It is not the intent to criticise the poverty surveys, but to criticise their use in the manner of Demery and Squire.

[Table 2 about here]

Armed with the "growth only" effect on poverty, one can proceed to calculate the per capita expenditure increase (decrease for Cote d'Ivoire) necessarily implied by the reported reductions (rise for Cote d'Ivoire) in poverty between the two surveys for each country. If there is no change in the distribution of income, the expenditure increase (decrease) is equal to the difference between the absolute poverty line $(\alpha_i EM_{i,t=1})$ and the expenditure level in Year 1 which corresponds to the "growth only" level of poverty for Year 2. The household expenditure level associated with the "growth only" level of poverty ("Target") can be written as

$$EP_{i,t=2} = \alpha_i(1+\gamma)EM_{i,t=1}$$

Where γ is the required growth of per capita expenditure. In other words, with no change in distribution, poverty is reduced by per capita income rising past successive percentage points of the household distribution. The only unknown in this equation are $EP_{i,t=2}$ and γ. If $EP_{i,t=2}$ is established, the implied growth rate, γ, can be calculated. To determine $EP_{i,t=2}$ we need to know the cumulative distribution of poverty households over the range of household expenditure which includes that for target poverty level and the poverty line $(\alpha_i EM_{i,t=1})$; that is, the relevant distributional function.[14] Figures 2 and 3 show two possible distribution functions for the Kenya data. The points (10.1, 27) and (51.5, 54)[15] in each figure are those provided by Demery and Squire. In Figure 2 the distribution function is assumed to be linear between the known points; in Figure 3, it is assumed to be linear in logarithms of household expenditure. The X-axis is placed to intersect the Y-axis at the Year 2 poverty level. Thus, the intersection of the X-axis with the cumulative distribution gives the level of expenditure in Year 1 that correspond to the Year 2 poverty level. For Kenya the expenditure levels in Year 1 associated with the "growth only" reduction in poverty for Year 2 are .500EM and .486EM, respectively. The difference between these and the poverty line, .54EM for Kenya, is the increase required in per capita expenditure to achieve the Year 2 level of poverty.

[Figures 2 and 3 go about here]

For simplicity, we shall use the estimate implied by the strictly linear functions. Inspection of the assumed distribution functions for Kenya and the other countries shows

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[14] For all the countries except Ethiopia, Demery and Squire provide two points on the distribution: the point for the poverty line (e.g., .54EM for Kenya) and a 'hard-core poverty line', defined as poorest ten percent of households for Cote d'Ivoire and Nigeria, 10.2 percent for Ghana, 10.1 percent for Kenya, and 10.3 percent for Tanzania. By definition we know a third point, where mean expenditure and the proportion in poverty are both zero. See Demery & Squire 1996, p. 44 (Table 4), where the percentage in 'hard-core' poverty and associated percentages of mean expenditure are given.

[15] For each pair the poverty percentage is given first and the percentage of mean expenditure second.

that a simple linear approximation must *understate* the necessary change in expenditure, since the cumulative distributions are convex in form. Therefore, we can be confident that our estimates of the implied growth rate are not overstatements. Data column five in Table 2 gives the fraction of mean expenditure in Year 1 corresponding to the Year target poverty level, followed by the change in household expenditure required to reach that poverty target. The penultimate column gives two measures of the change in per capita income over the relevant periods.[16] The top number is from the World Bank data base "Stars", which measures per capita GDP in US dollars. Demery and Squire prefer a measure in constant units of the domestic currency, which appears as the bottom number.[17] In several cases the difference between the measures is notable, even startling. To avoid bickering over which data series is appropriate, the discussion below uses the numbers preferred by Demery and Squire.

The essential point is: if the Demery and Squire link between macro orthodoxy and poverty be credible, then the changes in poverty across countries must be consistent with the changes in per capita income. They are not. For two countries, Ethiopia and Tanzania, the per capita expenditure change implied in the poverty surveys differs from the preferred measure of per capita income change by over fifty percentage points. For two more countries, Cote d'Ivoire and Kenya, the percentage point difference is much lower, but still in double digits. Only for Ghana and Kenya are the two statistics credibly similar. It would be obvious even to the novice that a discrepancy between the expenditure and income changes undermines the poverty estimates, as shown in the final column of Table 2. There, we have calculated the poverty level implied by the per capita income change (based on the numbers endorsed by Demery and Squire). In order to assess whether the survey poverty statistics or the per-capita-income-implied poverty statistics are significantly different, one needs a relatively non-arbitrary criterion. For this purpose we assume that the survey poverty measures have a margin of error of ten percent each way, at an acceptable level of statistical confidence. With this criteria, for only two of the countries, Ghana and Kenya, are the two estimates of poverty in the second survey year not significantly different (see data columns three and eight). For the other four countries, the hypothesis that poverty declined as measured by the survey cannot be confirmed, implying that the link between orthodox macro policy and poverty reduction is also not confirmed (noted as "denied" in the table). But the hypothesis must also be judged as not confirmed for Kenya, because with such a margin of error one cannot exclude the possibility that poverty was at the same level in year 1 and year 2. The more accurate the surveys (smaller the assumed margin of error), the more strongly is the Demery and Squire hypothesis rejected; the larger the margin of error, the weaker is their statistical evidence. Thus, for five of the six countries, statistical inference dictates that the relationship between macro orthodoxy and poverty reduction has not been established.

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[16] While per capita expenditure and per capita national income are not the same thing, one would expect a rather close correspondence.

[17] The numbers for 'GDP per capita in constant 1987 local currency' came via the editor of this journal, from one of the authors of the article under criticism.

There are two possible reasons for the discrepancies between the results of the surveys and the World Bank national income statistics. First, it may be that the surveys are inaccurate or accurate but not representative of income and expenditure changes at the national level. If this is the case, then conclusions cannot be drawn about the effect of macroeconomic policy on poverty; i.e., the Demery and Squire argument stalls from the outset. A second possibility is that the surveys accurately represent changes at the national level, but the World Bank data base is grossly inaccurate for four of the six countries covered by the surveys. If this possibility is entertained, the implications are, if anything, more unpleasant. It implies that the statistics used by hundreds of researchers and the World Bank itself cannot be taken seriously. This would mean, for example, that the attempt by the World Bank in *Adjustment in Africa* to relate macroeconomic policy performance to growth was fundamentally flawed on data grounds alone.

As a final point, we note that seven of the seventeen text pages of the Demery and Squire article are devoted to a comparison of the performances of Cote d'Ivoire and Ghana, with the former compared unfavorably to the latter. In the absence of reliable evidence from other countries, even a rigorous comparison of two countries need carry no lessons for the rest of the sub Saharan region. However, the comparison is far from rigorous. More serious than the lack of a clear analytical framework for making the comparison is that *it refers experience over two different time periods*, 1985-1988 for Cote d'Ivoire and 1988-1992 for Ghana. This alone renders the discussion impressionistic and subjective.

If the statistics provided by Demery and Squire provide the most "compelling evidence to date" that World Bank-IMF type adjustment programs are consistent with poverty reduction, then the implication for the other evidence is unflattering. Elsewhere it has been shown that the evidence that World Bank programs foster economic growth in Africa is unconvincing (Mosley, Subasat & Weeks 1995). Demery and Squire have shown, albeit inadvertently, that the same conclusion holds for the evidence that these programs are associated with poverty reduction.

References

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Table 1: Direction of Change of "Index of Macroeconomic
          Policies" (between survey years)

Countries	Change in:			
	Fiscal Policy	Monetary Policy	Exchange Rate Policy	Overall (average)
Cote d'Ivoire	minus	plus	minus	**minus**
Ethiopia	minus	minus	plus	**plus**
Ghana	no change	plus	plus	plus
Kenya	plus	minus	plus	**plus**
Nigeria	plus	minus	plus	**plus**
Tanzania	plus	plus	plus	plus

Source: Demery & Squire 1996, p. 45 (table 5).

Figure 1: Policy Performance and Index Weighting

Policy
No. 1

Weights:
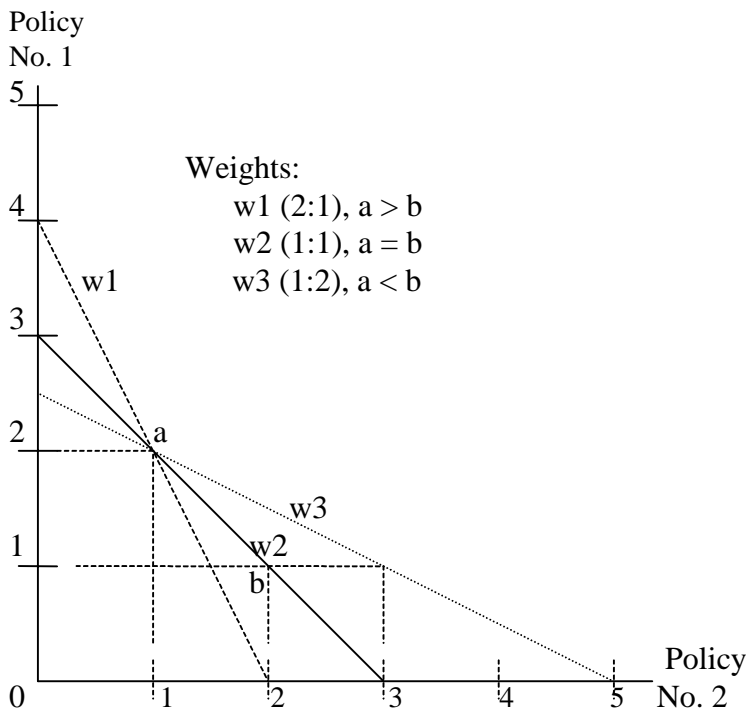 w1 (2:1), a > b
  w2 (1:1), a = b
  w3 (1:2), a < b

Table 2: Poverty Measures and Expenditure/Income Changes
          for Six African Countries

Country & years	Poverty (%): Year 1 Survey	Year 2: Survey	Growth only	Poverty fraction Survey Year 1	Expend of mean Target Year 1	Percent: Implied expend increase, Growth Only	Per cap income increase, Wd Bk data base	Poverty level for income increase, Wd Bk data base
Cote d'Ivoire 1985, 88	30.0	45.9	49.4	.54	.67	-21	-12 **-11**	38.8 **denied**
Ethiopia 1989, 94	59.0	41.0	35.5	.54	.36	+50	- 10 **-6**	62.5 **denied**
Ghana 1988, 92	36.9	31.4	32.1	.50	.47	+ 7	+ 5 **+4**	close, confirmed
Kenya 1982, 92	51.5	48.7	45.3	.54	.50	+ 8	0 **+3**	49.0, **denied**
Nigeria 1985, 92	43.0	34.1	29.4	.67	.52	+25	-24 **+8**	37.6 **denied**
Tanzania 1983, 91	64.6	50.5	31.2	.41	.19	+71	-16 **+17**	55.4 **denied**

Notes:
"**Confirmed**" or "**denied**" in the last column refers to the Demery & Squire hypothesis: poverty declined in the country in question (except for Cote d'Ivoire where an increase is predicted).
By columns:
1. The years in which the surveys were done are given below the country names.
2. "Year 1, survey" is the reported level of poverty for Year 1.
3. "Year 2, survey" is the reported level of poverty for Year 2.
4. "Year 2, Growth only" is the level of poverty implied by no distributional change (Demery & Squire 1996, p. 43, Table 3).
5. "Poverty expend, fraction of mean, Year 1" is the fraction of "mean expenditure" at which the poverty line was set (Demery & Squire 1996, p. 42, Table 2).
6. "Poverty expend, fraction of mean, Target Year 1" is the fraction of mean expenditure necessary such that the Year 2 "growth only" poverty proportion would hold (see text).
7. "Implied expend increase, growth only" is the increase in mean expenditure from Year 1 to Year 2 that would achieve the Year 2 growth only poverty percentage. Via the editor *of The World Bank Research Observer*, I received the communication that Demery & Squire judge that these estimates "are not far off the actuals (computed from the household survey data), except for Tanzania". The appropriate estimate for Tanzania from the household surveys was not provided in the communication. In the absence thereof (and the method of calculation) the Tanzania estimate remains in the table.
8. "Per cap income increase Wd Bk Data Base" gives as the top number the change in per capita income in dollars (World Bank Atlas method), and the bottom number in constant prices of the local currency. The latter was not calculated by the author, but provided by Demery & Squire via the editor of this journal.
9. "Poverty level for income increase Wd Bk Data Base" is the poverty level implied by the per capita income increases provided by Demery and Squire (see note to column 8).
Sources:
Data columns 1-4 are from Demery & Squire 1996, Tables 2 and 3. Columns 5 and 6 are calculations based on the previous columns, other information in the article, and use of simple distribution functions (see text). The last two columns are explained above.

Figure 1: Kenya: Cumulative Poverty Percentage
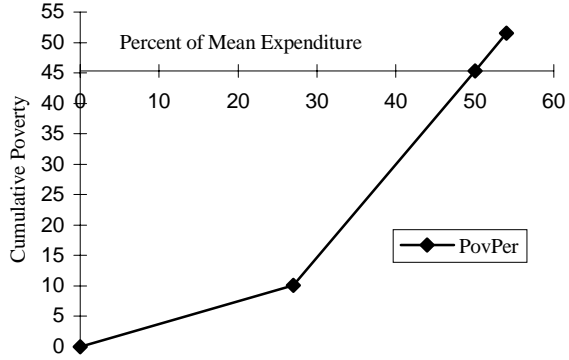by Fraction of Mean Expenditure 1982
(intersection at Em = 50%)

Figure 2: Kenya: Cumulative Poverty Percentage by
Proportion (Log) of Mean Expenditure 1982
(intersection at Em = 48.7%)