Adjusting for Differences in Needs and Economies of Scale in the Measurement of Poverty in Morocco

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Abstract

This note considers whether and how to introduce adjustments for differences in needs across family members and economies of scale in household consumption into the measurement of poverty. We outline the basic role that such adjustments, captured in an equivalence scale, are intended to play and illustrate how they can be incorporated into procedures for measuring poverty. We assess to what extent analysis of household survey data can guide the selection of specific equivalence scales. We argue that, given the uncertain interpretation of equivalence scales estimated from survey data, the best way in which to incorporate adjustments for household composition and size is to assess sensitivity of the poverty profile to a wide variety of alternative adjustment parameters, without necessarily endorsing any one single scale.

Introduction and Summary of Findings

Poverty measurement in Morocco, as in many other countries, has conventionally been undertaken with a measure of per-capita income or consumption as the underlying concept of economic well-being. Strong, but often implicit, assumptions underpin such an approach. Notably, the utilization of a per capita measure of individual welfare is premised on the assumption that there exist no economies of size in household consumption, in the sense that the per capita cost of reaching a specific welfare level does not fall as household size increases. Similarly, a per capita measure does not allow for differences in needs arising
from differences in family composition (in terms of age, gender, activity levels, etc., of family members). A growing literature is arguing that if these assumptions are relaxed, comparisons of poverty between large and small households, or between other demographically defined population groups (such as female-headed versus male-headed households) might not be robust. These warnings are important because they point to an underlying poverty profile in a country that may be sensitive, at least in certain dimensions, to seemingly arcane methodological assumptions. To the extent that government policy is informed by such poverty profiles, it too may be thrown into question as different assumptions are posited.

This note considers options available to incorporate “equivalence scales” into the analysis of poverty. One of the objectives is to examine how adjustments for economies of scale in consumption and for differences in needs could be accommodated, without returning to the basic, fundamental, task of specifying new poverty lines for different household groups. The note proposes a normalization procedure whereby an existing poverty line, constructed in terms of a per-capita notion of wellbeing, can be modified in such a way that meaningful poverty estimates can be derived from an adult-equivalent consumption measure of wellbeing.

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1 Drèze and Srinivasan (1997) study these issues in the context of India. There, anthropological, demographic and sociological evidence points strongly to widows being a highly vulnerable group in Indian society. But poverty rates based on per-capita consumption measures calculated from household surveys, indicate that widow-headed households are among the least poor in Indian society. By relaxing slightly the assumption of no economies of size, Drèze and Srinivasan (1997) overturned these poverty comparisons dramatically, bringing the consumption-based evidence much more into line with evidence from other sources. Deaton and Paxson (1997) have also investigated the sensitivity of poverty comparisons in a set of six developing countries (including one, Ukraine, among the transition economies). They note that particularly in the two richest countries of their sample (Ukraine and Taiwan), poverty rankings between the elderly and children were most sensitive to alternative assumptions regarding economies of size in consumption.

2 Lanjouw, Lanjouw, Milanovic and Paternostro (2004) illustrate how the expected distributional incidence of public pensions or child benefit could change dramatically with changes in assumptions concerning differences in needs or the extent of economies of scale in household consumption.
The note then turns to a brief, intuitive, exposition of the arguments that prevail in the current economics literature against the idea of estimating an equivalence scale from household survey data. These arguments are compelling, and it is therefore doubtful that an equivalence scale produced on the basis of such econometric estimates will receive widespread acceptance and endorsement. Absent further progress in the methodologies underpinning the estimation of equivalence scales, it is hard to see how such empirically derived scales can be viewed as anything other than arbitrary.

While there are few prospects for a widely supported empirically estimated equivalence scale, the issue remains of considerable importance. It is worth emphasizing that an analysis of poverty based on a per-capita measure of consumption is implicitly imposing an arbitrary, and very strong, assumption that there are no differences in needs across family members and no economies of scale in household consumption. This assumption is very unappealing and is increasingly rejected in conventional poverty analysis.

Given a relatively straightforward method for incorporating equivalence scales into the analysis of poverty, but no clearly preferred, specific, equivalence scale, one way forward is to undertake extensive sensitivity analysis regarding the impact of alternative assumed equivalence scales on measured poverty. The note indicates that while, in the general approach proposed here, overall poverty rates are unlikely to change much as a result of postulating a particular equivalence scale, the poverty profile may well change sharply.

As has been suggested above, the poverty profile is arguably the most important output from a basic analysis of poverty. While summary statistics on the extent of
poverty, such as a headline poverty rate, often receive most attention in the popular press, it is the profile of poverty that provides the key information on patterns of poverty, and on the specific characteristics of population groups who are confronted by poverty. Such information is central to the design of policy. This note argues, therefore, that sensitivity in the poverty profile is extremely important.

The note provides some initial exploratory calculations to suggest that the demographic profile of poverty in Morocco is indeed sensitive to alternative equivalence scale adjustments. Specifically, the analysis suggests that while adjustments for differences in needs between working age adults and dependents do not imply great sensitivity, adjustments that allow for economies of scale in consumption indicate considerable sensitivity. Conventional practice, which assumes away any economies of scale through the employment of a per-capita measure of welfare, tends to find that large households are more poor than small households. By association, household characteristics that are correlated with household size, also appear more poor in the conventional poverty profile. However, once a modest degree of economies of scale is allowed for, this relationship breaks down – the relationship between poverty and household size weakens noticeably. If a considerable degree of economies of scale is allowed for, a new demographic profile of poverty emerges: household characteristics such as female-headedness, become strongly associated with poverty. These initial impressions warrant more detailed investigation.

If the emerging findings proposed here find confirmation in more detailed analysis, policy makers should be advised to exercise caution in pursuing poverty reduction objectives through measures that are closely linked to the demographic
structure of the population. For example, the question of whether a pensions policy aimed at providing income support to the elderly is pro-poor or not, may well depend significantly on equivalence scale adjustments. Fortunately, the sensitivity analysis proposed here offers a straightforward way in which to examine such questions.

**Adult Equivalence Scales**

The concepts of economies of size and of differences in need are related, but not identical. Economies of size imply that there is a decreasing per capita cost for reaching a given welfare level as household size increases. For a given household size, the relevance of such economies can most easily be seen to depend on the share in total household’s expenditure on public goods, like housing or durables, within the household (see Deaton and Paxson, 1998, Drèze and Srinivasan, 1997, Lanjouw and Ravallion, 1995). On the other hand, households may also vary in terms of heterogeneous consumption needs that different household members have. For example children might have lower nutritional requirements and thus lower food costs than adults.

A convenient way in which to jointly capture the effect of economies of scale and differences in need is to introduce a simple two parameter form of “equivalence scale” (Creedy and Sleeman, 2004). Let $y_i$ denote the consumption level of the $i^{\text{th}}$ household, for $i=1,\ldots,N$. The number of individuals in the household is $n_i$, while the household’s demographic structure is described by the vector $d_i$. This vector provides the number of individuals in various demographic groups based on age and gender classifications. Using these definitions, the adult equivalent size of household $i$ may be expressed as:
This size is normalized so that $m(1,d=\text{adult})=1$. Household income is adjusted to obtain the equivalent income or ‘living standard’, given by:

$$s_i = \frac{y_i}{m_i}.$$  

A household consisting of one adult with an income of $y$ therefore has the same ‘living standard’ as an n-person household with an income of $y \times m(n,d)$. Further progress requires the form of $m_i = m(n_i,d_i)$ to be specified.

If there are $n_{k,i}$ individuals of demographic type $k=1,\ldots,K$ in the $i^{th}$ household, the adult equivalent size may be written as:

$$m_i = \left( \sum_{k=1}^{K} \alpha_k n_{k,i} \right)^{\theta}.$$  

The term $\theta$ represents the measure of economies of scale within the household. When this parameter takes a value of 1 it implies that there are no economies of scale in consumption while a value of 0 implies perfect scale economies (in the sense that the consumption by one family member of a good does not reduce at all the amount available for consumption by other family members – as in the case of a pure public good). This
formulation is an extension of the simpler form, $n^\theta$, introduced by Buhmann et al (1988) and Coulter et al (1992). Cutler and Katz (1992), Banks and Johnson (1994) and Jenkins and Cowell (1994) distinguish between the number of adults, $n_{a,i}$, and children, $n_{c,i}$, such that:

$$m_i = (n_{a,i} + \alpha n_{c,i})^\theta.$$  \hspace{1cm} (4)

The parameter $\alpha$ measures the “size” of children relative to adults. While we distinguish here between adults and children only, it is of course possible to make much finer distinctions between the needs of family members. For example, one might make a distinction between the needs of males of females, or on the basis of activity levels of different family members. We will experiment below with different values of $\alpha$ and $\theta$ to explore the implications for measured poverty and the poverty profile of allowing for differences in needs across family members and the possibility of economies of scale in household consumption.

**Incorporating Equivalence Scales into Poverty Measurement**

Given the two-parameter equivalence scale given in (4), capturing both the effect of economies of scale in consumption and differences in needs between family members, equivalent income, can be expressed as:
Suppose household consumption is 100, with the household comprising two adults and two children. Suppose that the equivalence scale specifies that a child “needs” half as much consumption to reach the same welfare level as an adult, and that the economies of scale parameter, $\theta$, takes a value of 0.6. For this household, per-capita consumption is equal to 25. If we assume away any differences in needs or economies of scale this would be the economic welfare level attributed to each individual in the household.\(^3\) Incorporating the equivalence scale, adult equivalent consumption is 51.7 ($100/[(2+(0.5)*2)**0.6]$). Thus, following adjustment with the equivalence scale, the living standard of the household is expressed in terms of the well-being of a single adult. It is clear that given the composition of the household and the assumed equivalence scale, welfare per person in this household is considerably higher than what would be assumed in the per-capita case. The normalization proposed by (5) ensures that when composition and size are assumed to have a bearing on the cost of reaching a particular welfare level, welfare can be compared across households of different sizes and composition.

In the context of measuring poverty, however, the question arises as to which poverty line adult equivalent income, $s_i$, should be compared to. In Morocco, where to date poverty measurement has generally been carried out on a per-capita basis, the poverty line represents the minimum per-capita expenditure required by a person to be considered non-

\[ s_i = \frac{y_i}{(n_{a,i} + \alpha n_{c,i})^{\theta}}. \] (5)

\(^3\) We assume, as is conventional practice, that within-household distribution of consumption is equal. This assumption is unrealistic, but absent additional information it is not clear that an alternative assumption is preferable.
This poverty line has been developed in a manner that accords with common practice in many countries of first specifying a food poverty line and then adding a non-food component to that line so as to allow for essential non-food spending. The food poverty line is based on observed consumption behavior (from survey data) and represents the per capita cost of purchasing a bundle of food items that has been calibrated to yield a specified minimum number of calories (for example, 2000 kcal per person per day). In Morocco, the non-food component, again in accordance with common practice, has also been estimated from survey data and represents the amount spent on non-food items by those households whose total per capita expenditure is just equal to the food poverty line. Given that such households are sacrificing some essential food spending (in the sense of sacrificing their ability to reach their calorie requirement) in order to purchase certain non-food items, it can be argued that those non-food expenditures should be viewed as essential. This amount of non-food spending is then added to the food poverty line to yield the final poverty line. While there are grounds for debate as to whether this approach to setting the poverty line is most appealing, it suffices for our purposes to note that in Morocco a line has been specified that is in broad accordance with international practice.

But should adult equivalent income be compared against a poverty line that represents the per capita cost of reaching the minimum welfare level? Proceeding in this way would not be correct because we would not be comparing like with like. The best course of action in this case is to return to the whole exercise of setting the poverty line and to develop a separate poverty line that is appropriate for each household size and

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4 Expressed in terms of 1998/9 dirhams, one such poverty line that enjoys widespread use takes a value of 3037 dirhams per person per year in rural areas, and 3922 dirhams in urban areas (Direction de la Statistique, 2003, and World Bank, 2004).
5 A variety of specific procedures have been proposed within this broad approach. These are carefully reviewed in Ravallion (1994). See also Deaton (1997).
composition combination. Such an approach has been followed, for example in Hungary (Van de Walle, Ravallion and Gautam, 1994). Producing such poverty lines is a complex and time consuming exercise, and also would also pose considerable data demands. It is not certain, for example, that there would be enough observations in the dataset for each household type to be able to reliably estimate the appropriate non-food share for that household type.

Another option is to derive some normalization rule for the poverty line that converted it from a “per capita” line into an equivalent-adult poverty line (see Drèze and Srinivasan, 1997). The existing poverty line, \( z \), represents the minimum per capita expenditure needed to avoid falling into poverty. Both the food consumption bundle and the non-food adjustment that lie behind the calculation of this poverty line have come from analysis of household survey data and are based on behavior of the average household. Total expenditure of the average household needed to avoid being poor is thus:

\[
y^* = z \times (n_{a,i} + n_{c,i}).
\] (6)

where \( n \) refers to the average number of, respectively adults and children. To convert the average household expenditure into equivalent adult expenditure we must divide by the equivalence scale given in (4)

\[
z^* = \frac{y^*}{\left(\frac{n_{a,i} + n_{c,i}}{n_{a,i} + \alpha n_{c,i}}\right)} = z \times \left(\frac{n_{a,i} + n_{c,i}}{n_{a,i} + \alpha n_{c,i}}\right)^{-\theta}.
\] (7)
Applying this normalization in the measurement of poverty ensures that the adult equivalent expenditure of each household would be compared to the adult equivalent expenditure required by the *average* household (in terms of composition and size) to avoid falling into poverty, \( z^* \).

An implication of working with this normalization is that the overall poverty rate measured in terms of adult equivalents will be close, although not identical, to that which obtained when poverty was analyzed in terms of per capita expenditures and a per capita poverty line. We shall see below that as more extreme values of \( \alpha \) and \( \theta \) are posited, the gap between the per capita approach and the adult-equivalent approach in terms of measured poverty will become more pronounced.

**Estimating Equivalence Scales from Survey Data**

So far we have considered how to approach the measurement of poverty if one had a set of parameters that captured the different needs of family members (\( \alpha \)) and the appropriate economies of scale factor (\( \theta \)). But where do \( \alpha \) and \( \theta \) come from?

There is a large literature that explores methodologies available to derive equivalence scales. Amongst economists the preferred approach has been to construct parameters to correct for differences in needs and economies of scale, based on household behavior as observed in survey data. Deaton (1997) provides a detailed overview of the issues associated with such efforts. He emphasizes two serious problems.

First, Deaton (1997) illustrates how methods to calculate equivalence scales from the empirical estimation of demand functions suffer from a fundamental problem of under-
identification. The problem of under-identification was demonstrated by Pollack and Wales (1979) and implies that while an equivalence scale can calculated from estimated demand equations, it is not possible, unless explicit additional assumptions are made, to exclude other plausible explanations for the observed demand behavior; explanations that might imply quite different equivalence scales. For example, survey data might indicate that, in otherwise identical households, boys below the age of 15 consume twice as much food as girls. This is consistent with an equivalence scale suggesting that boys need twice as much food as girls. It is, however, also entirely consistent with intrahousehold discrimination against girls, and has little to do with actual needs. Estimation of demand models does not tell us which explanation is correct, but the decision as to which equivalence scale is appropriate does depend on the explanation. Additional assumptions are needed and they need to be made explicit.

The problems do not end there. One of the most commonly proposed identifying assumptions, aimed at overcoming the objections raised above, is to assume that the share of the budget that a household devotes to food purchases correctly indicates welfare between households of differing demographic composition. This assumption underpins the Engel method for estimating an equivalence scale reflecting both differences in needs and economies of scale in consumption. Lanjouw and Ravallion (1995) present an illustration with Pakistan data of the kind of equivalent scale that can be calculated based on this approach.6

6 While there exist many empirical applications of the Engel method for calculating equivalence scales intending to capture the effect of differences in needs, relatively few try also to incorporate the economies of scale parameter. Deaton and Paxson (1998) explore an alternative to the Engel approach for estimating the economies of scale parameter, but when they apply this approach to a large number of empirical settings they consistently observe behavior that is difficult to interpret in a coherent manner.
Deaton (1997), drawing on an argument by Nicholson (1976), shows however, that the identifying assumption of the Engel approach is far from convincing. The Engel approach rests on the notion that the foodshare is an inverse indicator of welfare; the higher the foodshare the lower is welfare. Suppose a child is born to a previously childless couple, and that we know exactly by how much to compensate the parents so that they can provide for their child without having to cut into their own consumption. In this case, the parents are exactly as well off as before and will presumably consume much the same pattern of goods as before. However, the child’s consumption patterns are different to those of the parents – more biased in the direction of food. Hence, the family’s food share will go up, even though the parents have been fully compensated. Under the Engel assumption the family is now worse off, and requires further compensation to reduce the food share to its original level. The Engel compensation is over compensation and the estimates of child costs based on this approach are too high. Ultimately, the flaw in the Engel approach is that the assumption that food share identifies welfare is not supported.

Other methods for estimating equivalence scales have been proposed, but none have been found to be entirely satisfactory. This leaves the quest for an empirically derived equivalence scale unresolved. It is always possible to dismiss the concerns raised above: the available methods will certainly yield some kind of empirical estimate. However, it seems extremely unlikely that any equivalence scale estimated from survey data will (or should) receive widespread endorsement.

**Sensitivity Analysis as an Alternative to Specifying an Equivalence Scale**
The preceding discussion highlights the difficulties associated with analyzing household behavior for the purpose of calculating equivalence scales. This does not mean, however, that the analysis of poverty should not attempt to take into account the possibility that there may exist differences in needs across family members and economies of scale in household consumption. There are essentially two ways in which our assessment of poverty may be affected by these considerations. First, overall measured poverty will vary depending on whether one works with a per capita measure of consumption or some kind of equivalence scale adjusted measure. Second, the profile of poverty may change depending on whether or not equivalence scales are used.

Fortunately, as was shown in the preceding sections, it is straightforward to postulate different values for $\alpha$ and $\theta$ in (5) and (7) and thereby to check how both our overall assessment of poverty is affected by these demographic factors and our assessment of the profile of poverty changes.

Table 1 presents a stylized example of how sensitivity of overall poverty rates can be checked. We use the 1998/99 EPM household survey data for rural areas, and the 3037 dirham per capita poverty line as reference point. For reasons of expediency, rather than differentiating between children and adults in our example, we differentiate between working age adults and dependents (defined as children 15 years or below, and adults aged 65 and above). In the first cell of the first column we present the head count rate that is associated with a parameter value of 1 for $\alpha$ and also 1 for $\theta$. This cell indicates the head count rate of 27% for rural areas that derives from the standard per-capita approach to measuring poverty.
Table 1
Sensitivity of Headcount Estimate in Rural Areas To Alternative Assumptions Regarding Needs of Family Members and Economies of Scale in Household consumption

<table>
<thead>
<tr>
<th>Differences in Need, α</th>
<th>Economies of Scale Parameter, θ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>Prime Age Adult=1</td>
<td></td>
</tr>
<tr>
<td>Dependent (&lt;15 or &gt;65)</td>
<td>0.27</td>
</tr>
<tr>
<td>Prime Age Adult=1</td>
<td></td>
</tr>
<tr>
<td>Dependent (&lt;15 or &gt;65) =0.8</td>
<td>0.26</td>
</tr>
<tr>
<td>Prime Age Adult=1</td>
<td></td>
</tr>
<tr>
<td>Dependent (&lt;15 or &gt;65) =0.6</td>
<td>0.25</td>
</tr>
<tr>
<td>Prime Age Adult=1</td>
<td></td>
</tr>
<tr>
<td>Dependent (&lt;15 or &gt;65) =0.4</td>
<td>0.25</td>
</tr>
<tr>
<td>Prime Age Adult=1</td>
<td></td>
</tr>
<tr>
<td>Dependent (&lt;15 or &gt;65) =0.2</td>
<td>0.24</td>
</tr>
</tbody>
</table>

As we allow for an increasingly lower cost of reaching a given welfare level for dependents, while continuing to assume no economies of scale (θ=1), we can see that the headcount declines slowly from 27%. Even if we assume that the cost of reaching a specific welfare level for a dependent is only about 20% that of an working age adult, measured poverty declines only to about 24%.

If, instead, we decide to probe sensitivity of the poverty rate to an increasing presence of scale economies in consumption (θ declines towards zero) we see that overall poverty declines as well, but again, only relatively slowly. In general, measured poverty is somewhat more sensitive to the presence of scale economies than to cost differences between dependents and working age adults. If we focus on the likely poverty rate that would occur in the presence of both “plausible” economies of scale and differences in needs, we might focus on the cells covering the 0.4≤ θ≤0.8 range and an α value of around 0.6. Table 1 suggests that in this case the estimated poverty rate in rural areas might be...
around the 20-23% range, instead of the 27% figure obtained on the basis of a per-capita approach.

Of course, that overall measured poverty does not vary sharply following adjustments for household composition and size is in part due to specific approach taken to normalize the poverty line, as described by (7). However, the arguments behind that normalization are not altogether unreasonable and do provide an opportunity to incorporate these demographic factors of concern in a way that does not radically alter our broad assessment of the extent of poverty in Morocco. From the perspective of communication and continuity, this property is of some appeal.

As has been argued above, it is arguably of far greater interest to policy makers to examine how the poverty profile changes once allowances are made for differences in household size and composition, and varying assumptions are applied regarding how these characteristics enter into the equivalence scale. We consider this question again, on the basis of a very simple set of stylized calculations. Tables 2a and 2b produce a very basic poverty profile that focuses on a set of household characteristics that are closely associated with demographic structure of the household. As argued by Drèze and Srinivasan (1997) when we compare household groups with roughly similar demographic characteristics (e.g. when we compare poverty levels across rural regions) we would not expect to see the relative position of household groups in terms of poverty to vary markedly once equivalence scales are introduced. However, groups defined in terms of characteristics that are associated with household size and composition may well shift in their relative position.

Table 2a starts with an assumption that household members do not vary in terms of needs ($\alpha=1$), and then considers how the poverty profile changes as the value of $\theta$ is
allowed to change (economies of scale are allowed for). Table 2b reproduces the same analysis but now assumes that the cost of reaching a given welfare level for a dependent is only half that of a working age adult (α=0.5).

Table 2a
Sensitivity of Headcount Estimate in Rural Areas To Alternative Assumptions Regarding Economies of Scale in Household consumption
(Assuming no differences in need)

<table>
<thead>
<tr>
<th>Household Type</th>
<th>Frequency in survey</th>
<th>Mean Household Size</th>
<th>Economies of Scale Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>All households</td>
<td>100%</td>
<td>6.36</td>
<td>0.27</td>
</tr>
<tr>
<td>Single Male</td>
<td>0.6%</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Single Female</td>
<td>1.9%</td>
<td>1.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Male Headed</td>
<td>88%</td>
<td>6.67</td>
<td>0.28</td>
</tr>
<tr>
<td>Female Headed</td>
<td>12%</td>
<td>4.11</td>
<td>0.17</td>
</tr>
<tr>
<td>Widow Headed</td>
<td>8%</td>
<td>3.80</td>
<td>0.17</td>
</tr>
<tr>
<td>Household with Widow</td>
<td>21%</td>
<td>6.46</td>
<td>0.29</td>
</tr>
</tbody>
</table>
Table 2b
Sensitivity of Headcount Estimate in Rural Areas To Alternative Assumptions Regarding Economies of Scale in Household consumption
(Assuming Equivalence of 0.5 relative to Prime Age Adult for Children Below 15 and Adults Above 65)

<table>
<thead>
<tr>
<th>Household Type</th>
<th>Frequency in survey</th>
<th>Average Equivalent Adults Per Household</th>
<th>Economies of Scale Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1.00</td>
<td>0.80</td>
</tr>
<tr>
<td>All households</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Male</td>
<td>0.6%</td>
<td>0.90</td>
<td>0.04</td>
</tr>
<tr>
<td>Single Female</td>
<td>1.9%</td>
<td>0.75</td>
<td>0.03</td>
</tr>
<tr>
<td>Male Headed</td>
<td>88%</td>
<td>5.16</td>
<td>0.26</td>
</tr>
<tr>
<td>Female Headed</td>
<td>12%</td>
<td>3.21</td>
<td>0.18</td>
</tr>
<tr>
<td>Widow Headed</td>
<td>8%</td>
<td>3.09</td>
<td>0.21</td>
</tr>
<tr>
<td>Household with Widow</td>
<td>21%</td>
<td>5.00</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Table 2a demonstrates that the demographic profile of poverty is rather sensitive to assumptions about economies of scale. When $\theta = 1$ the poverty rate amongst male headed households and amongst households in which widows reside, are a bit higher than the average poverty rate in the population as whole. Poverty among female headed households is some 10 percentage points lower than in the population as a whole. As $\theta$ is allowed to decline from 1 toward zero, the relative position of these population groups changes markedly. When $\theta = 0.4$ the poverty rates amongst female headed households and widow-headed households are now considerably higher than in the population as a whole.

The reason for this sensitivity can be easily understood given the average size of households amongst these population groups. Because the size of male-headed...
households and households with widows is not far different from the population on average, the poverty rate of these households relative to the overall average poverty rate does not change much. However, for small households, such as those headed by women one’s assessment of their poverty relative to overall poverty is sharply dependent on what one assumes concerning economies of scale in household consumption.

A more detailed demographic profile is likely to yield richer insights into the relative poverty of different population groups. A recent study by Lanjouw, Lanjouw, Milanovic and Paternostro (2004) illustrates this for a number of countries undergoing economic transition. Table 3 shows for the case of Hungary, how conclusions as to the relative poverty of elderly households relative to households with young children, vary sharply as a function of the assumed economies of scale parameter. In this study overall poverty is held constant as 20% of the population, irrespective of the assumed equivalence scale. Even a fairly modest adjustment for economies of scale (eg $\theta = 0.7$) suggests that, in sharp contrast to the per capita case ($\theta = 1.0$), the elderly face no lower
risk of poverty than households with a two children. It is well worth subjecting a detailed demographic profile of poverty in Morocco to similar sensitivity analysis.

Table 2b indicates that in Morocco broad conclusions are unchanged when we allow also for differences in family composition (and assume that the cost of reaching a given welfare level for a dependent is only half that of a working age adult). This finding echoes that in Drèze and Srinivasan (1997) who find little sensitivity of even the demographically linked poverty profile to different assumptions as to the relative cost of children versus adults, but find a great deal of sensitivity of the profile to assumptions about economies of scale.

The implication of the analysis above is that while overall poverty measures may be expected to remain fairly stable after introducing equivalence scales, it is likely that
the poverty profile may vary. In particular, the profile will vary most sharply with assumptions about economies of scale in consumption. But even here, the changes in the poverty profile will be most noticeable only in terms of household characteristics that are strongly associated with the demographic structure of households.
References


