POVERTY LINES: AN ALTERNATIVE METHOD OF ESTIMATION

In an article in this *Journal*, Goedhart et al. [1] proposed a new concept of poverty lines based on what family heads perceive to be the minimum necessary income for their own family. This note suggests an alternative method of estimating the same concept of poverty lines based on the opinion of family heads as to how adequate is their current family income. The new method, in addition to making it possible to use a different type of data, has certain interesting new features.

DEFINITION OF THE POVERTY LINE

The study by Goedhart et al. utilized the data of a survey of 2885 Dutch families conducted in January 1975. The key question in the survey was the following one: "We would like to know which net family income would, in your circumstances, be the absolute minimum for you. That is to say, that you would not be able to make both ends meet if you earned less." The answer to this question, referred to in the study as the *respondent's minimum income* (y_{min}), was regressed against actual income and family size:

(1) $$y_{min} = \beta_0 + \beta_1(fs) + \beta_2(y) + \epsilon$$

where *fs* is the size of the family; *y* is net family income; ϵ is a random disturbance term with zero expectation, distributed identically for each family, and β_0, β_1, β_2 are parameters.[1]

As expected, y_{min} was found to be positively related to family size. However, it was also found to be positively related to actual income, indicating that the perception of minimum income is a relative concept and depends on the level of income to which the individual has been accustomed. Goedhart et al. concluded from this observation that "a respondent's perception of the poverty line is distorted by the fact that his actual income is not equal to his minimum income level." They argued that there is only one income level where this misperception does not obtain: where
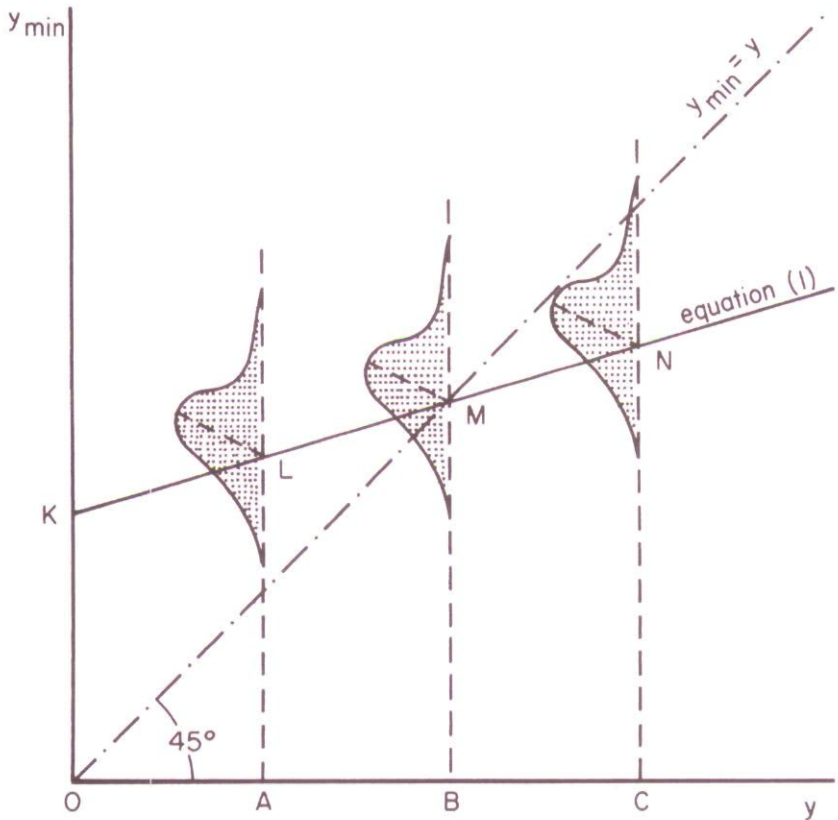
FIGURE 1
THE RELATION BETWEEN MINIMUM INCOME AND
ACTUAL INCOME FOR A GIVEN FAMILY SIZE

actual income and minimum incomes are equal. In terms of Figure 1, this occurs at the point M, and therefore the poverty line is equal to BM.

AN ALTERNATIVE METHOD OF ESTIMATION

Point M has one interesting property. Given the normality assumption about ϵ, of those individuals with family income equal to the poverty line (i.e., equal to OB) half would be reporting a y_{min} that is higher than their family income, while the other half would be reporting a y_{min} that is lower than their family income. In other words, half of the individuals at that particular family income level would consider their income as inadequate (i.e., below the "absolute minimum"), while the other half will consider their income as adequate. This property is unique to point M. At any rate

to the left of M, such as L, more than half of the individuals would be reporting a y_{min} that is higher than their income. The converse would be true for any point to the right of M, such as N.

In the place of equation (1), the following equation could be estimated:

$$(2) \qquad y_{adq} = \alpha_0 + \alpha_1 (fs) + \alpha_2 + \delta$$

where the various terms have the same interpretation as in (1) and y_{adq} is an "index of adequacy" that takes the following values:

$$y_{adq} = 1 \qquad \text{if} \qquad y_{min} < y$$
$$y_{adq} = 0.5 \qquad \text{if} \qquad y_{min} = y$$
$$y_{adq} = 0 \qquad \text{if} \qquad y_{min} > y$$

The poverty line is equal to the level of y that makes y_{adq}, in equation (2), equal to 0.5. In principle, this poverty line would be equal to the one corresponding to point M in Figure 1.[2]

The new method makes it possible to estimate poverty lines based on the opinion of family heads as to how adequate is their income. For example, family heads could be asked the following question: "How adequate do you consider your family income? (check one) 1. Adequate. 2. Fairly adequate. 3. Barely adequate. 4. Inadequate." If the poverty line is identified with the level of income at which people barely meet their needs, then y_{adq} would take the value 1 if choice 1 or 2 is checked, 0.5 if choice 3 is checked, and 0 if choice 4 is checked.

CONCLUSION

The method proposed here, although essentially equivalent to the one proposed by Goedhart et al., has interesting new features. First, it has the obvious advantage of utilizing data of existing surveys in which people were asked to evaluate the adequacy of their family income. Second, it may well be that it is easier for individuals to express a view on the adequacy of their incomes than actually to specify what the level of minimum income is. If this is the case, the new method would be more reliable.

There are also several respects in which either the new approach or that of Goedhart et al. could be extended. First, there is flexibility about the choice of the poverty line. For example, the poverty line could be defined as the level of income where people's evaluation of the adequacy of their incomes is between barely adequate and fairly adequate. In this

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2   The specification of equation (2) does not have to be linear, of course. Since the dependent variable is limited to values in the 0 to 1 range, one specification worth experimenting with is the logit one.

case, y_{adq} takes the value 1 if choice 1 or 2 is checked, 0 if choice 3 or 4 is checked. Second, the approach suggested could be applied to link income to the adequacy of meeting various types of need, such as for housing and day care. For example, family heads could be asked to evaluate the adequacy of their housing or child-care arrangements. Indexes of adequacy, similar to y_{adq}, could be constructed for each particular type of need. By relating these indexes to family income, for example, one could determine the range of income over which certain types of need are not met adequately.

CONSTANTINE KAPSALIS
Economic Council of Canada

REFERENCE

1. Theo Geodhart, Victor Halberstadt, Arie Kapteyn, and Bernard van Praag. "The Poverty Line: Concept and Measurement." *Journal of Human Resources* 12 (Fall 1977): 503–20.