

Tilburg University

Two subjective definitions of poverty

Colasanto, D.; Kapteyn, A.J.; van der Gaag, J.

Publication date:
1983

[Link to publication in Tilburg University Research Portal](#)

Citation for published version (APA):

Colasanto, D., Kapteyn, A. J., & van der Gaag, J. (1983). *Two subjective definitions of poverty: Results from the Wisconsin basis needs study*. (Ter Discussie FEW; Vol. 83.18). Unknown Publisher.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

76
CBM
R

1983-18
7627
1983

SUBFACULTEIT DER ECONOMETRIE
18

REEKS TER DISCUSSIE



Bestemming 	TIJDSCHRIFTENBUROU BIBLIOTHEEK KATHOLIEKE HOGESCHOOL TILBURG	Nr.
---	--	--

No. 83.18

Two Subjective Definitions of Poverty:
Results from the Wisconsin Basis Needs Study

by

Diane Colasanto *)

Arie Kapteyn **)

Jacques van der Gaag ***)

*) Institute for Research on Poverty, University of Wisconsin, Madison, Wisconsin.

***) Tilburg University, Tilburg, The Netherlands.

***) The World Bank, Washington, D.C.

We thank Sheldon Danziger, Eugene Smolensky, and Denton Vaughn for comments on an earlier draft.

Abstract

In this Journal, Goedhart et al. (1977), proposed two new definitions of poverty, a "subjective" and a "political" definition. The implications of both definitions were illustrated using data from The Netherlands. In subsequent studies the proposed method was used to obtain poverty lines in the member countries of the European Community. In this note we operationalize these definitions for the U.S., using data from the Wisconsin Basic Needs Study. The results are very similar to the earlier European results.

1. Introduction

The Wisconsin Basic Needs Study (BNS) is a longitudinal survey of the economic well-being of Wisconsin households. Economic well-being is measured in various ways. Data are collected on objective household characteristics such as income, expenditures, employment, and other demographic characteristics. In addition, subjective items are included in the questionnaires to measure a variety of self-assessments of the economic situation of the household. In this note we report on results obtained with some of the subjective items from the first wave of the survey (conducted from March 1981 to May 1981). The items are used to operationalize two definitions of a poverty line for the U.S. based on a methodology proposed by Goedhart et al. (1977). These authors applied their methods to data from The Netherlands. In later papers by van Praag et al. (1980, 1982), the methods were applied to the member countries of the European Community.

The aim of this paper is to investigate the empirical feasibility of the methods in a U.S. context. In Section 2 we briefly describe both definitions. In Section 3 the data and operationalizations are discussed. In Section 4 empirical results are presented. These results turn out to be quite similar to the earlier Dutch and European results. Nevertheless, there remain a number of methodological questions which should be addressed before a definitive judgement on the value of the approach can be made. Some of these questions are briefly discussed in the concluding section.

2. Two Definitions of Poverty

The poverty line concept adopted in Goedhart et al. (1977) can be described as follows. It is assumed that an individual is able to state which income level is minimal, in the sense that below that income the individual is not able to make ends meet. We call this income the individual's minimum income, y_{\min} .¹ Of course, y_{\min} is subjective, i.e., it may depend on the individual's personal circumstances, it may be subject to reference group influences, or it may depend on previous consumption levels. Let us assume for the time being that an individual's y_{\min} only depends on his own income y and family size (the number of family members) f_s :

$$y_{\min} = f(y, f_s) \quad (1)$$

It seems reasonable to assume that y_{\min} increases with both y and f_s . Let us assume, moreover, that for a given family size, f_s , there exists an income level y_{\min}^* such that

$$y_{\min}^* = f(y_{\min}^*, f_s). \quad (2)$$

Under these conditions everyone living in a family of size f_s considers income to be too low to make ends meet if $y < y_{\min}^*$ and to be sufficient to make ends meet if $y > y_{\min}^*$. This makes y_{\min}^* a natural candidate for the definition of a poverty line. Note that in this formulation y_{\min}^* depends on f_s alone. Logically there is no barrier to differentiating the poverty line according to other characteristics, such as the age or sex of the family head, or the number of earners in a family.

We shall denote y_{\min}^* as the "subjectively defined poverty line" or, simply, the subjective poverty line. Note that the assumed ability of the respondent to state his own minimum income does not require interpersonal utility comparisons. This contrasts with other approaches, such as those based on experts' judgements (see e.g., Orshansky, 1965) or based on a representative citizen's opinion approach (e.g., Rainwater, 1974).

An alternative definition considered in the earlier papers is the "politically determined poverty line." The poverty line, under this definition, is an income level corresponding to a specific point on a continuous distribution of welfare. The choice of the specific point, i.e., the welfare level attached to the poverty line, is made through the political process. In the next section we describe the operationalization of both definitions of a poverty line.

3. Data and Operationalization

The data used in the analysis are from the first wave of the BNS.² The interviews were conducted by personal interviewers in respondents' homes during the period March to May 1981.

Respondents for the BNS were selected from five populations using different sampling procedures. The first sample ($n = 878$) is a cross-section sample of Wisconsin households selected through area probability sampling methods. The second sample is a systematic sample from administrative lists of December 1980 recipients of assistance from the Aid to Families with Dependent Children program ($n = 142$). The other three samples were selected through random-digit-dialling telephone sampling procedures and were screened over the telephone to determine eligibility.

These telephone samples represent the populations of female-headed households with dependent children ($n = 164$), households headed by a person over the age of 65 ($n = 304$), and low income households ($n = 328$). The data have been weighted to compensate for the different probabilities of selection of respondents in the five samples. The weighting procedure allows the results to be generalized to the state population of households as a whole. The weighted sample size is the same as the unweighted sample size ($n = 1816$).

The overall response rate is 67%. There was substantial variation in response rate over subsamples, due to differences in the form of the initial contact with respondents (personal visit from the interviewer, letter and return postcard from the Wisconsin Department of Health and Social Services, or telephone call from the interviewer). The response rate is 72% for the cross-section sample, 43% for the AFDC sample, 73% for the female-head sample, 63% for the aged sample, and 72% for the low income sample. The sampling weights incorporate some adjustments for nonresponse.

A household is defined in the BNS as a single person living independently, or as a set of people living together who are either (a) related by blood, marriage, or other legal arrangement, or (b) share most major expenses. The respondent is the person with the most responsibility for the financial well-being of the household. In cases where two or more people share the financial responsibility equally, the respondent was determined by a random process.

A respondent's minimum income, y_{\min} , is measured by asking the minimum income question (MIQ):

"Living where you do now and meeting the expenses you consider necessary, what would be the very smallest amount of income per month--after taxes--your household would need to make ends meet?"

As an operationalization of the amount of welfare a respondent would derive from different income levels, the individual welfare function of income (WFI) has been adopted (see, e.g., van Praag, 1971; van Praag and Kapteyn, 1973). A respondent's WFI is measured by asking the income evaluation question (IEQ):

"I'm going to ask you to think about the amount of money per month--after taxes--that would make you feel terrible about your household's income; then we will work up to an amount that would make you feel delighted about your household's income. It may help if you look at this list with me while I ask the questions."

Let's start at the top with terrible. How much income per month and after taxes would leave you feeling terrible about your household's income?"

"Now let's move to unhappy. As we go to each next level, each of your answers should be larger than the one before, of course."

Income Evaluation Sheet

	Amount
Terrible\$
Unhappy\$
Mostly dissatisfied\$
Mixed\$
Mostly satisfied.\$
Pleased\$
Delighted\$

For reasons given in the aforementioned articles, we assign the numbers $1/14$, $3/14$, ..., $13/14$ to the labels "Terrible," "Unhappy," ..., "Delighted."³ Thus, an individual's response to the IEQ yields seven pairs of incomes and welfare levels, where welfare is measured on a $[0,1]$ scale. It should be stressed that the use of the word "welfare" does not

imply anything more, nor anything less, than that the numbers on the [0,1] scale represent some dimension of well-being defined by the labels in the IEQ. For each respondent we measure the WFI by fitting a lognormal curve through the seven pairs of incomes and welfare levels. Thus, an individual's WFI is described by the two parameters, μ and σ , of the fitted lognormal curve. The parameter μ describes the location of an individual's WFI, and σ describes its slope. Again, we refer to the earlier papers for details and a justification of this procedure.⁴

An individual's WFI measures the relation between income and the welfare the individual expects to derive from it, where welfare is measured on a [0,1] -scale. The word "expects" is used deliberately. Although respondents presumably know how they feel about their own income, they may easily be mistaken about the amount of satisfaction (welfare) associated with income levels different from their own. This tendency is brought out by the observation in the earlier studies that the parameter μ depends on income and family size. So, if income changes, the WFI shifts. For example, if an individual who currently earns \$30,000 a year states that \$40,000 a year would make him "Pleased," this judgement is based on his current WFI. If his own income actually increases to \$40,000, his WFI would shift to a new position. Quite possibly, according to the new WFI, \$40,000 will no longer make him feel "Pleased", but maybe just "Mostly Satisfied." In the subsequent analysis the dependence of the location of an individual's WFI on his own income and family size will be taken into account.

The income measure used in the analysis is total household income for 1980. The total measure is derived from separate questions about the receipt of income by source (30 categories). After all sources had been

ascertained, the interviewer asked for the amount of income received from each source in 1980 by anyone in the household. Total income was not computed for cases where the respondent either refused to report or didn't know the income amount for a major income source, i.e., wages, salaries, business income, or farm income (2.8% had missing income information for a major source).

The income amounts reported were before-tax amounts. After-tax incomes were estimated for this analysis. In the estimation it was assumed that all married couples filed joint income tax returns and that every household used the standard deduction. Extra personal exemptions were given for respondents and their spouses over the age of 65. Taxes could not be estimated for the 13.9% of households with complex structures, e.g., two families or unrelated people living together, and therefore these households are excluded from the analysis. The 1980 state and federal tax tables were used to calculate the tax burden of respondents given their total 1980 household income. Social security income, income from welfare, child support, Veteran's benefits, worker's compensation, survivor's benefits, foster child care payments, unemployment compensation (up to the allowable limit) and (for State taxes only) a portion of military income were not taxed. Income from all other sources was taxed at the same rate.

4. Empirical Results

As in the earlier analyses, relation (1) is specified as a log-linear relationship.

$$\ln y_{\min} = \alpha_0 + \alpha_1 \ln fs + \alpha_2 \ln y + \epsilon \quad (3)$$

where ϵ is an error term satisfying the classical assumptions. Suppressing the error term and combining (1), (2) and (3) yields the poverty line

$$y_{\min}^* = \exp\left\{\frac{\alpha_0 + \alpha_1 \ln f_s}{1 - \alpha_2}\right\} = \exp\left(\frac{\alpha_0}{1 - \alpha_2}\right) \cdot f_s^{\alpha_1/(1-\alpha_2)} \quad (4)$$

Note, once again, the dependence of the poverty line on family size. The dependence is completely determined by $\alpha_1/(1 - \alpha_2)$, which approximately represents the percentage increase in y_{\min}^* if f_s increases by 1%.

On the basis of the BNS sample, (3) is estimated as

$$\ln y_{\min} = 0.820 + 0.244 \ln f_s + 0.439 \ln y \quad N = 1372 \quad (5) \\ (0.022) \quad (0.021) \quad R^2 = 0.45$$

with standard errors in parentheses.⁵

The subjective poverty line implied by these estimates is presented in the first column of Table 1. The column headed "welfare level" is explained below. The next to the last column of Table 1 presents "equivalence scale values" that represent the poverty line for each family size expressed as a percentage of the poverty line for a family of four. The last column presents equivalence scale values for The Netherlands from Goedhart et al. (1977). Before discussing these results, we present the results regarding the political poverty line.

Following the earlier research a log-linear relationship is specified to explain the location parameter μ of the WFI on the basis of family size and income:

$$\mu = \beta_0 + \beta_1 \ln f_s + \beta_2 \ln y + u \quad (6)$$

Table 1
 Poverty Lines Derived from Equations (4) and (5)

Family Size	Poverty Line	Welfare Level	Equivalence Scale Values	
			BNS	Goedhart et al. ^a
1	4,313	0.37	55	65
2	5,831	0.39	74	81
3	6,955	0.40	88	92
4	7,882	0.41	100	100
5	8,686	0.41	110	107
6	9,402	0.42	119	113
7	10,054	0.42	128	119
8	10,656	0.43	135	123

^aBased on their equation (12).

with u an error term satisfying the classical assumptions. The BNS estimation results are:

$$\mu = 0.978 + 0.204 \ln fs + 0.445 \ln y \quad N = 1372 \quad (7)$$

$$(0.023) \quad (0.021) \quad R^2 = 0.42$$

As in previous research, no significant relationship could be found between the slope parameter σ and income or family size.

Suppressing the error term u , taking σ equal to its sample mean (0.49), and using the estimates in (7), one can compute for any income level and family size the corresponding welfare level. This procedure yields the second column in Table 1. Conversely, for a given family size and welfare level one can use (7) and σ to compute the income needed to reach that welfare level. Thus, for any welfare level deemed minimal by politicians, we can compute the corresponding political poverty line in dollars. These are presented in Table 2 with their associated equivalence scale values.

Turning now to a discussion of Table 1, we notice that the BNS equivalence scale values are more dispersed than the ones obtained in the Dutch study by Goedhart et al. (1977). They are also more dispersed than the values reported by van Praag, Hagenars, and van Weeren (1980) for the member countries of the European Community. This may reflect the higher level of public services provided for families with children in The Netherlands [and other European countries], e.g. inexpensive day care facilities, low or zero school tuition, and heavily subsidized housing.

To compare the BNS equivalence scale values for the subjective poverty line to the equivalence scale values implied by the official U.S. poverty line requires a further differentiation of the subjective poverty

Table 2
Politically Determined Poverty Lines

Family Size	Welfare Level			Equivalence Scale Values	
	0.40	0.45	0.50	BNS	Goedhart et al. ^a
1	\$4,659	\$5,212	\$5,825	60	69
2	6,011	6,724	7,515	78	83
3	6,977	7,805	8,723	90	92
4	7,755	8,675	9,696	100	100
5	8,418	9,417	10,525	109	106
6	9,001	10,070	11,254	116	112
7	9,526	10,656	11,910	123	116
8	10,005	11,193	12,510	129	121

^aBased on their equation (3).

line. The U.S. poverty line is not only differentiated according to family size but also according to the age (below or over 65) and sex of the family head, and whether the household is farm or non-farm. The subjective poverty line can be differentiated according to the same factors by adding dummy variables to equation (5). This yields

$$\begin{aligned} \ln y_{\min} = & 0.770 + 0.259 \ln fs + 0.449 \ln y + 0.037 (\text{FEM}) + \\ & (0.024) \quad (0.021) \quad (0.031) \\ & 0.038 (\text{AGED}) - 0.091 (\text{FARM}), \quad N = 1372 \quad (8) \\ & (0.032) \quad (0.063) \quad R^2 = 0.45 \end{aligned}$$

where

FEM = 1 if the household is headed by a female and there are no adult males in the household

0 otherwise

AGED = 1 if the respondent (household head) is 65 or older

0 otherwise

FARM = 1 if anyone in the household is currently a self-employed farmer

0 otherwise

Table 3 presents the BNS equivalence scale values implied by this estimation and the corresponding U.S. poverty line equivalence scale values. The dispersion of the values is quite similar for these two equivalence scales calculated for the U.S. For example, for nonfarm families with male heads under 65 the U.S. poverty line equivalence scale ranges from 53 for a one-person household to 134 for a six-person household. The BNS equivalence scale ranges from 52 to 121 for the same families.

Table 3
Equivalence Scale Values, Non-Farm Families*

Family Size + Sex of Head	Age of Head			
	< 65		65+	
	BNS	U.S. ^a	BNS	U.S. ^a
1 male	52	53	56	47
1 female	56	49	60	47
2 male	72	66	77	59
2 female	77	64	83	59
3 male	87	78	94	
3 female	93	76	100	
4 male	100	100	107	
4 female	107	100	115	
5 male	111	118	119	
5 female	119	117	127	
6 male	121	134	130	
6 female	129	133	139	

*The base household poverty level calculated from the BNS is \$7,761. The base household poverty level from the 1981 U.S. poverty line is \$9,291 (U.S. Bureau of the Census, 1982b).

^aEquivalence scale values implicit in U.S. poverty line. From U.S. Bureau of the Census (1982a).

There are two notable differences between both scales. The BNS equivalence scale implies that female-headed households and older people need a higher income to make ends meet than male-headed or young households of the same size (note the positive coefficients for FEM and AGED in equation (8)). This is opposite from the assumption implicit in the U.S. poverty line, and also from the results obtained by Danziger et al. (1982), where female-headed and aged households are allocated lower incomes. However, the BNS coefficients for FEM and AGED are only marginally larger than their standard errors in the estimation results.⁶

When the actual income levels implied by the subjective poverty line are considered relative to the U.S. poverty line, we find that the BNS amount is \$1530 less for a nonfarm family of four headed by a male under age 65 (note Table 3).⁷ A similar result is reported in Goedhart et al. (1977), where the subjective poverty line was estimated as substantially lower than the statutory minimum income in the Netherlands. In contrast, Danziger et al. (1982) obtained estimates of the subjective poverty line that were greater than the U.S. poverty line. In their data, which were from the sixth wave of the Income Survey Development Program of the Survey of Income and Program Participation, there was some ambiguity about the reporting task required of respondents to the MIQ. Specifically, there may have been confusion on the part of the respondents about whether the income concept was before-tax or after-tax amounts. This may have caused an upward bias on their results.

As a final comment on Table 1 we notice the rather low welfare levels associated with y_{\min}^* . This is a general finding with the approach. Goedhart et al. (1977) report a welfare level associated with y_{\min}^* equal to 0.35, for a family of four. Van Praag, Hagenaars, and van Weeren

(1980) report welfare levels ranging from 0.27 for France to 0.42 for Denmark.

Finally, let us turn to a discussion of the political poverty lines (Table 2). Once again, the equivalence scale we calculate is more dispersed than was found in the Dutch study. The dispersion is also greater than in most European countries. Van Praag, Hagenars, and van Weeren (1980) report political poverty lines where only the equivalence scale values for Denmark show more dispersion than the BNS poverty line. Comparing Table 2 to Table 1, we notice that the dispersion of BNS equivalence scale values in Table 2 is somewhat less than in Table 1. In view of the welfare levels associated with y^*_{\min} in Table 1, it is not surprising that the dollar amounts associated with the politically determined welfare levels 0.45 and 0.50 are above those associated with the subjective poverty line.

5. Discussion

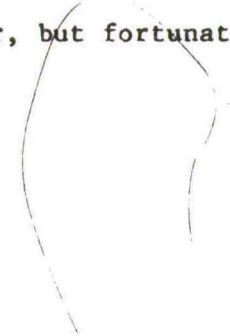
The BNS results are similar in many respects to the results obtained for The Netherlands in 1975 by Goedhart et al. (1977), and results for the European Community obtained by van Praag, Hagenars, and van Weeren (1980). The most salient feature of y^*_{\min} is its low level compared to the U.S. poverty line and the low welfare level attached to it. Both outcomes are in close agreement with the Dutch results.

It has been argued in Goedhart et al. (1977) that on methodological grounds y^*_{\min} has much to recommend it. There are, however, also some issues that deserve further investigation. The most crucial question is how respondents interpret the phrase "the very smallest amount of income... your household would need to make ends meet." In our analysis

we assume that the respondent expects to be able to subsist on that amount of money. It is of interest to know whether the respondent correctly takes into account all necessary expenses, such as the replacement of worn-out durables. Before the results can be put into practice, a further investigation into the meaning attached to y_{\min}^* is required. In itself this requirement is not peculiar to the subjective approach. Experts' judgements as used to construct the Bureau of Labor Statistics' worker family budgets, for example, also must be based on decisions as to what is and what is not necessary to subsist. The main difference is that in the subjective approach one uses the assessments of individuals about their own living situations, rather than assessments generated by experts on someone else's situation.

A second issue, which is relevant to any definition of a poverty line, is the extent to which cultural and social factors are incorporated. To put it differently, is poverty absolute or relative? With respect to the subjective poverty line, this question is answered rather straightforwardly. In principle, one would expect an individual's y_{\min} to be influenced by income or consumption patterns in the social reference group and by previous incomes (habit formation). Analogous to analyses by Kapteyn et al. (1980) one can extend equation (3) to account for these factors. The data from subsequent waves of data collection in the BNS are ideally suited for this purpose.

A final question that comes up frequently when discussing the use of subjective questions to assess welfare levels is to what extent the results are comparable to those obtained by the more conventional revealed preference approach, based on "objective" market data. We cannot answer this question in this paper, but fortunately the BNS also contains



objective data, so that poverty measures based on observed consumption can be developed and compared to the measures derived with the subjective approach in subsequent analyses.

Footnotes

¹By "income" we mean invariably "after tax household income." The words "family" and "household" are used interchangeably, as well as the words "he" and "she."

²For a more detailed description of the study design, see Colasanto (1980).

³Note that the labels correspond to the Delighted/Terrible scale used by Andrews and Witney (1976).

⁴See also van Herwaarden and Kapteyn (1981) for tests of the assumed lognormal shape of the WFI.

⁵Income is measured by thousands of dollar per annum.

⁶The subjective poverty line is expressed as an after-tax amount, while the U.S. poverty line is a pre-tax amount. The equivalence scale values for the U.S. poverty line change slightly when taxes are taken into account. The biggest changes are for families of size five or six (where the values are reduced). Eleven of the 16 values do not change, or change by only 1. Overall, the after-tax scale is less similar than the pre-tax to the BNS scale.

⁷The difference between the two poverty lines when both are expressed as after-tax amounts is reduced by approximately \$600. Strictly speaking, the BNS subjective poverty line is valid for Wisconsin only. Using survey data from a state with a much higher or lower median income may yield different results. The median family income in 1979 was \$17,930 in Wisconsin and \$16,830 in the U.S. as a whole (U.S. Bureau of the Census, 1982c).

References

- Andrews, F.M., Withey, S.B. (1976), Social Indicators of Well-Being: Americans' Perception of Life-Quality. Plenum Press, New York.
- Colasanto, D. (1980), "The Wisconsin Basic Needs Project," Proceedings of the Twentieth National Workshop on Welfare Research and Statistics, U.S. Government Printing Office, Washington, D.C.
- Danziger, S., J. van der Gaag, E. Smolensky, M. Taussig (1981), "The Direct Measurement of Welfare Levels: How Much Does it Take to Make Ends Meet?" Institute for Research on Poverty.
- Goedhart, T., V. Halberstadt, A. Kapteyn, B.M.S. van Praag (1977), "The Poverty Line: Concept and Measurement," The Journal of Human Resources, vol. 12, pp. 503-520.
- Kapteyn, A., T.J. Wansbeek, J. Buyze (1980), "The Dynamics of Preference Formation," Journal of Economic Behavior and Organization, vol. 1, pp. 123-157.
- Orshansky, M. (1965), "Counting the Poor: Another Look at the Poverty Profile," Social Security Bulletin, vol. 28, pp. 3-29.
- Rainwater, L. (1974), What Money Buys: Inequality and the Social Meanings of Income, Basic Books, New York.
- U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 133, Characteristics of the Population Below the Poverty Level: 1980, U.S. Government Printing Office, Washington, D.C., 1982a.
- U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 134, Money Income and Poverty Status of Families and Persons in the United States: 1981, U.S. Government Printing Office, Washington, D.C., 1982b.

- U.S. Bureau of the Census, Provisional Estimates of Social, Economic and Housing Characteristics, U.S. Government Printing Office, Washington, D.C., 1982c.
- Van Herwaarden, F.G. and A. Kapteyn (1981), "Empirical Comparison of the Shape of Welfare Functions," European Economic Review, vol. 15, pp. 261-286.
- Van Praag, B.M.S. (1971), "The Welfare Function of Income in Belgium: An Empirical Investigation," European Economic Review, vol. 2, pp. 337-369.
- Van Praag, B.M.S. and A. Kapteyn (1973), "Further Evidence on the Individual Welfare Function of Income: An Empirical Investigation in the Netherlands," European Economic Review, vol. 4, pp. 33-62.
- Van Praag, B.M.S., A.J.M. Hagenaars, H. van Weeren (1980), Poverty in Europe, Report for the European Community.
- Van Praag, B.M.S., A.J.M. Hagenaars, H. van Weeren (1982), "Poverty in Europe," The Review of Income and Wealth, vol. 28, pp. 345-359.

IN 1982 REEDS VERSCHENEN:

01. W. van Groenendaal	Building and analyzing an econometric model with the use of a hybrid computer; part I.	jan.
02. M.D. Merbis	System properties of the interplay model	jan.
03. F. Boekema	Decentralisatie en regionaal sociaal-economisch beleid	maart
04. P.T.W.M. Veugelers	Een monetaristisch model voor de Nederlandse economie	maart
05. F. Boekema	Morfologie van de "Wolstad". Over het ontstaan en de ontwikkeling van de ruimtelijke geleding en structuur van Tilburg.	april
06. P. van Geel	Over de (on)mogelijkheden van het model van Knoester.	mei
07. J.H.M. Donders, F.A.M. van der Reep	De betekenis van het monetaire beleid voor de Nederlandse economie, presentatie van een analyse aan de hand van een eenvoudig model	mei
08. R.M.J. Heuts	The use of non-linear transformation in ARIMA-Models when the data are non-Gaussian distributed	juni
09. B.B. van der Genugten	Asymptotic normality of least squares estimators in autoregressive linear regression models.	juni
10. J. Roemen	Van koetjes en kalfjes I	juli
11. J. Roemen	Van koetjes en kalfjes II	juli
12. M.D. Merbis	On the compensator Part I Problem formulation and preliminaries	juli
13. P. Slangen	Bepaling van de optimale beleidsparameters voor een stochastisch kasbeheersprobleem met continue controle	aug.
14. M.D. Merbis	Linear - Quadratic - Gaussian Dynamic Games	aug.

- | | | |
|---|--|-------|
| 15. P. Hinssen
J. Kriens
J. Th. van Lieshout | Een kasbeheermodel onder
onzekerheid | sept. |
| 16. A. Hendriks en
T. van der Bij-Veenstra | "Van Bedrijfsverzamelgebouw
naar Bedrijvencentrum" | okt. |
| 17. F.W.M. Boekema
A.J. Hendriks
L.H.J. Verhoef | Industriepolitiek, Regionaal
beleid en Innovatie | okt. |
| 18. B. Kaper | Stability of a discrete-time,
macroeconomic disequilibrium
model. | okt. |
| 19. P.F.P.M. Nederstigt | Over de toepasbaarheid van
het Amerikaanse 'Diagnosis
Related Group'-systeem in
Nederland | nov. |
| 20. J.J.A. Moors | Auditing and Bayes' Estimation | nov. |
| 21. J. Plasmans
H. Meersman | An Econometric Quantity Ratio-
ning Model for the Labour
Market. | nov. |
| 22. J. Plasmans
H. Meersman | Theorieën van de werkloos-
heid. | nov. |
| 23. B.B. van der Genugten | Een model ter beschrijving van
de ontwikkeling van de veestapel
in Nederland. | nov. |
| 24. F.A. Kense | De omzet/artikel concentratie-
curve als beleidsinstrument | nov. |
| 25. R.T.P. Wiche | Populaire wetten/specificatieve
wetten, oftewel
Over het ethisch en maatschap-
pelijk belang van een korrekte
interpretatie van generische
uitspraken | dec. |
| 26. J.A.M. Oonincx | Micro-computers, standaard-
pakketten, administratieve
gegevensverwerking en infor-
matieverzorging | dec. |

IN 1983 REEDS VERSCHENEN

- | | | |
|---|---|-------|
| 01. F. Boekema
L. Verhoef | Enterprise Zones.
Vormen Dereguleringszones een
adequaat instrument van regio-
naal sociaal-economisch beleid? | jan. |
| 02. R.H. Veenstra
J. Kriens | Statistical Sampling in Internal
Control Systems by Using the
A.O.Q.L.-System. | jan. |
| 03. J. Kriens
J.Th. van Lieshout
J. Roemen
P. Verheyen | Management Accounting and
Operational Research | jan. |
| 04. P. Meys | Het autoritair etatisme | jan. |
| 05. H.J. Klok | De klassieke politieke
economie geherwaardeerd | febr. |
| 06. J. Glombowski
M. Krüger | Unemployment benefits and
Goodwin's growth cycle model | febr. |
| 07. G.J.C.TH. van Schijndel | Inkomstenbelasting in een
dynamisch model van de onder-
neming | febr. |
| 08. F. Boekema
L. Verhoef | Local initiatives: local enter-
prise agency/trust, business in
the community | febr. |
| 09. M. Merbis | On the compensator, Part II,
Corrections and Extensions | febr. |
| 10. J.W. Velthuijsen
P.H.M. Ruys | Profit-non-profit: een wiskundig-
economisch model | febr. |
| 11. Arie Kapteyn
Huib van de Stadt
Sara van de Geer | The Relativity of Utility:
Evidence from Panel Data. | mrt. |
| 12. W.J. Oomens | Economische interpretaties van
de statistische resultaten van
Lydia E. Pinkham | mrt. |
| 13. A. Kapteyn
J.B. Nugent | The impact of weather on the
income and consumption of
farm households in India:
A new test of the permanent
income hypothesis? | april |
| 14. F. Boekema
J. van der Straaten | Wordt het milieu nu echt
ontregeld? | april |

IN 1983 REEDS VERSCHENEN (vervolg):

- | | | |
|----------------------------------|--|-------|
| 15. H. Grennen
Th. van Bergen | De universitaire economen
over het regeringsbeleid | april |
| 16. M.D. Merbis | On the compensator
Part III, Stochastic Nash and
Team Problems | april |
| 17. H.J. Klok | Overheidstekort, rentestand
en groeivoet; terug naar een
klassieke norm voor de over-
heidsfinanciën? | mei |