A PROBLEM IN DEMAND AGGREGATION: PER CAPITA DEMAND AS A FUNCTION OF PER CAPITA EXPENDITURE

Werner Hildenbrand

1. Introduction

The expenditure elasticity for a certain commodity is a well defined concept if it refers to a single individual. Yet this case is irrelevant and the concept is never used in such a situation. In all applications the concept of expenditure elasticity refers to a population (a group of individuals): one wants to know how *per capita* demand for a certain commodity of a given population changes if *per capita* expenditure of that population varies.

We take it as a fact that "people are different"; different in tastes (preferences), income and other characteristics (attributes). In this context the concept of expenditure elasticity is relevant and used. Yet how the concept is defined in this case?

Obviously, what is needed is a *functional relationship* between *per capita demand* and *per capita expenditure*, ceteris paribus, i.e. a "macro"–demand function.

Consequently, either one assumes the existence of such a relationship right away, than the problem is "solved" by assumption. Or one has to specify a micro–economic model of a population (group of households), which allows "people to be different", such that the impact of a change in *per capita* expenditure is well determined.

In this note we shall discuss the conceptual difficulties for the existence of a macro–demand function, i.e., a functional relationship between *per capita* demand, prices of all commodities and *per capita* expenditure. We shall also discuss the question under which conditions on the underlying micro–model one can estimate the expenditure elasticities from cross–section data.

In section 2 we shall first define the market demand function and then in section 3, we shall discuss the aggregation problem.

2. Mean demand

The basic primitive concept of traditional demand theory is the *individual demand function*; it is assumed that for every individual household there is a functional relationship f between his expenditure (budget, total outlay) b, the prevailing price system p and his demand x for the various commodities.

$$x = f(p, b) \in R^l_+, \qquad p \in R^l_+, \qquad b \geq 0.$$

This functional relationship f is thought to be determined by individual characteristics of the household which are relevant in the consumption decision. Some of these consumption characteristics are directly observable others are not.

In neoclassical demand theory all individual consumption characteristics are summarized by the concept of an *individual preference relation* $\preceq$ (or utility function). Given an individual preference relation $\preceq$, then the "hypothesis of preference maximization" determines the individual demand function $f(\cdot, \cdot, \preceq)$. Of course these demand functions $f(\cdot, \cdot, \preceq)$ will have certain general properties reflecting the fact that they are obtained as the result of a maximization problem. Thus, the "hypothesis of preference maximization" is a general and elegant way to *parametrize a certain class* $f(\cdot, \cdot, \preceq)$ *of individual demand functions*, the parameter being the preference relation. Since we have no reasonable criterion to decide which preference relation describes plausible consumption behaviour[1] the class of individual demand functions defined in this way is very large.

Let $\mathcal{P}$ denote the set of all preference relations on $\mathbf{R}^l_+$, which lead to continuously differentiable demand functions $f(p, \cdot, \preceq)$ with respect to b.

For the purpose of demand analysis an individual household i is completely characterized by his expenditure b^i and his preference relation $\preceq^i$, i.e., by a point $(b^i, \preceq^i)$ in the cartesian product $R_+ \times \mathcal{P}$.

---

[1] The choice of a particular preference relation $\preceq$ is typically justified by the plausibility of the demand function $f(\cdot, \cdot, \preceq)$ which is derived from it.

A group G of households is then represented by a "cloud" $\{(b^i, \preceq^i)\}_{i \in G}$ of points in $R_+ \times \mathcal{P}$.

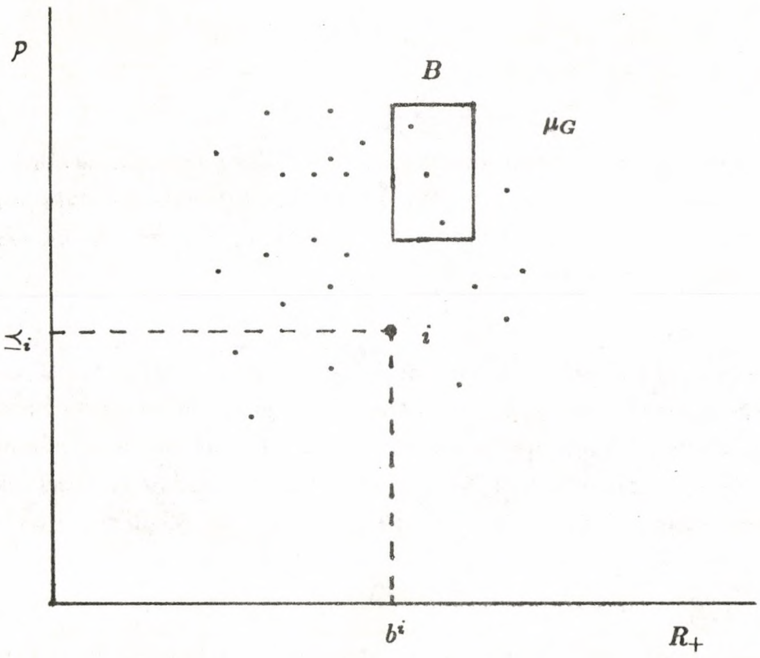

Figure 1

Since we are mainly interested in large groups G of households we shall describe the "cloud" of points in $R_+ \times \mathcal{P}$ by its (empirical) joint *distribution* μ_G, i.e.,

$$\mu_G(B) = \frac{1}{\#G} \#\{i \in G \mid (b^i, \preceq^i) \in B\}, \quad B \subset R_+ \times \mathcal{P}.$$

With this notation we have the identity

$$\frac{1}{\#G} \sum_{i \in G} f(p, b^i, \preceq^i) = \int_{R_+ \times \mathcal{P}} f(p, b, \preceq) d\mu_G.$$

<u>Definition:</u> *The mean* (per capita) *demand* (or market demand) *of a group of households (which is described by the joint distribution μ of expenditure and preferences) is defined by*

$$F(p, \mu) := \int_{R_+ \times \mathcal{P}} f(p, b, \preceq) d\mu$$

This definition of mean demand can be extended to more general distributions μ than the empirical distributions of *finite groups of households*. This will be done in the sequel, in particular, we shall consider distributions μ where the corresponding marginal distributions of expenditures are given by densities, like the log normal distribution. If the space $\mathcal{P}$ of preferences is endowed with a metric (see e.g. Hildenbrand 1974) then we can extend the above definition of mean demand to any (Borel) probability distribution on the cartesian product $R_+ \times \mathcal{P}$. We shall always assume that the mean of the expenditure distribution is finite.

Remark

In applied demand analysis and in some econometric models (e.g. D.W. Jorgensen, L.J. Lau and T.M. Stoker 1982) one often uses a more specific version of this model. One starts with a list $a_1, a_2 \ldots, a_n$ of *observable* consumption characteristics, called *attributes* (e.g., families' total expenditures, family size, age (sex) composition of the families,...) and postulates a functional relationship between the price system p, the attributes $a = (a_1, a_2 \ldots a_n)$ and the demand vector $x \in R^l$,

$$x = g(p, a), \quad p \in R^l_+, \quad a \in A.$$

The group of households (population) is then described by a distribution α of attributes. Thus, mean demand is defined by

$$F(p, \alpha) = \int_A g(p, a) d\alpha.$$

To link this model to our preference based formulation, we start from the hypothesis that individual preference relations are dependent on attributes, $\preceq_a$. There is no list of *observable attributes* – as detailed and long this list might be – such that households with the same attributes $a = (a_1, a_2 \ldots)$ have identical demand behavior. Thus, there is a gap between prices of all commodities, observable attributes and demand. Indeed, individual preference relations (utilities) have been invented to fill this gap. Consequently, $g(p, a)$ is not in a strict sense an individual micro-demand relationship. It has to be interpreted as an average, the mean demand of all those households in the group with attributes a (households of type a.) Thus, in the notation of our model, where the group of households is described by a joint distribution μ of expenditures and preferences we define

$$g(p, a) = \int_{\mathcal{P}} f(p, b, \preceq) d\mu \mid a,$$

where $\mu \mid a$ denotes the conditional distribution of preferences given the attribute

$$a = (a_1 = b_1, a_2, \ldots)$$

Thus

$$F(p, \mu) = \int f(p, b, \preceq) d\mu = \int_A (\int_{\mathcal{P}} f(p, b, \preceq) d\mu \mid \alpha) d\alpha = \int_A g(p, a) d\alpha.$$

The usefulness of the "attribute–model" (A, g, α) rests on the *hypothesis that the demand relation* $g(p, a)$ *for types of households is* relatively *stable* for variations of the distribution μ, in particular, if the distribution μ changes over time. Thus, if the distribution μ changes and if the function $g(p, a)$ does not change (e.g. if the conditional distributions $\mu \mid a$ do not change) then the change of the distribution μ can be attributed solely to a change of the observable distribution α on the space A of attributes.

The advantage or disadvantage of these two models are obvious. The advantage of the attribute–model is that the distribution α, and hence its evolution over time, can, in principle, be observed since by definition the attributes are observable. The disadvantage of this model (from a theoretical point of view!) is that it is not clear which general properties of the function $g(p,a)$ one can postulate, since $g(p,a)$ is the mean demand of all households of type a. For example, the axiom of revealed preferences does not necessarily hold. In other words, the attribute–model assumes that the aggregation problem for households of the same type is settled. On the other hand, in the preference–model the individual demand functions are canonically defined (through $\preceq$), and the general properties of the functions $f(\cdot,\cdot,\preceq)$ are well known. The disadvantage, of course, is the fact, that the full distribution μ is not observable.

In the literature the function $g(p,a)$ is often interpreted as an individual demand relation by adding a random term

$$g(p,a)+\epsilon_a$$

where ϵ_a represents a random vector with expectation $E(\epsilon_a)=0$, which is supposed to take into account the different consumption behavior within the type a. Thus, ϵ_a is a random vector on the probability space

$$(\mathcal{P},\mu \mid a);\quad \epsilon_a(\preceq)=\int_{\mathcal{P}} f(p,b,\preceq)d\mu \mid a - f(p,b\preceq).$$

In this generality there is no substantial difference between the attribute–model $\int_A g(p,a)d\alpha$ and the preference–model $\int_{R_+\times\mathcal{P}} f(p,b,\preceq)d\mu$. Yet, the two models differ substantially as soon as one specifies the functional form of g (e.g. linear in a $A\subset R^n$) and the stochstic structure of the random terms ϵ_a (e.g. independence or homoscedasticity.) The following discussion applies to both models.

3. Mean (per capita) demand as a function of mean (per capita) expenditure

3.1. The motivation for considering mean demand as a function of mean expenditure comes mainly from applied demand analysis. If one wants to estimate a demand system the above definition of market demand as

$$F(p,\mu) = \int_{R_+ \times \mathcal{P}} f(p,b,\preceq) d\mu$$

is much too detailed. The full distribution μ of agents' characteristics on $R_+ \times \mathcal{P}$ can, of course, not be observed.

In these applications $F(p,\mu)$ is often interpreted as a short-run demand system[2] i.e., all commodities refer to a certain period t. Thus, let μ_t describe the distribution of agents' characteristics in period t and consider a time series (μ_t), $t = 1,\ldots,T$ of joint distributions of agents' characteristics. Let B_t denote the mean expenditure associated with the distribution μ_t.

Problem 1: Under which condition on the evolution (μ_t), does there exist a function $C(p,B)$, the *"macro"-demand function*, such that

$$F(p,\mu_t) = C(p,B_t) \text{ for every } t \text{ and } p\ ?$$

Remark: The question is not restricted to the interpretation of t as "time". One might consider a subset D (not just a one-parameter path) of distributions on $R_+ \times \mathcal{P}$ and ask whether $F(p,\mu) = C(p,B)$ for every $\mu \in D$ and p.

In most empirical demand studies (see e.g. the survey paper by Brown and Deaton (1972) in *The Economic Journal*) market demand is written in the simplified form $C(p,B)$. One then typically is interested in

$\frac{\partial}{\partial B} C_h(p,B)$, the *marginal propensity to consume* (MPC) commodity h out of per capita expenditure B

or

$\frac{B}{C_h(p,B)} \frac{\partial}{\partial B} C_h(p,B)$, the *expenditure elasticity* (EE) for the group μ of commodity h.

Problem 2: Given a solution to Problem 1, under which condition on the evolation (μ_t) is it possible to estimate the MPC or EE from cross-section data of family expenditures?

---

[2] This interpretation strictly speaking requires an intertemporal setting (for an analysis of short-run demand functions, see e.g., Grandmont (1982)). We neglect the intertemporal aspect in order to simplify the presentation. The present analysis has to be extended if it were applied to a situation where the intertemporal aspect cannot be neglected, for example, in the theory of consumption functions.

The distribution μ_t cannot be observed. In principle, one can observe the expenditure and demand vector for every individual i in the group G :

$$(b_t^i, f_t^i(p_t, b_t^i))_{i \in G}$$

Let ν_t denote the joint distribution of expenditure and demand, i.e., ν_t is the image measure of μ_t under the mapping

$$(b, \preceq) \to (b, f(p, b \preceq)).$$

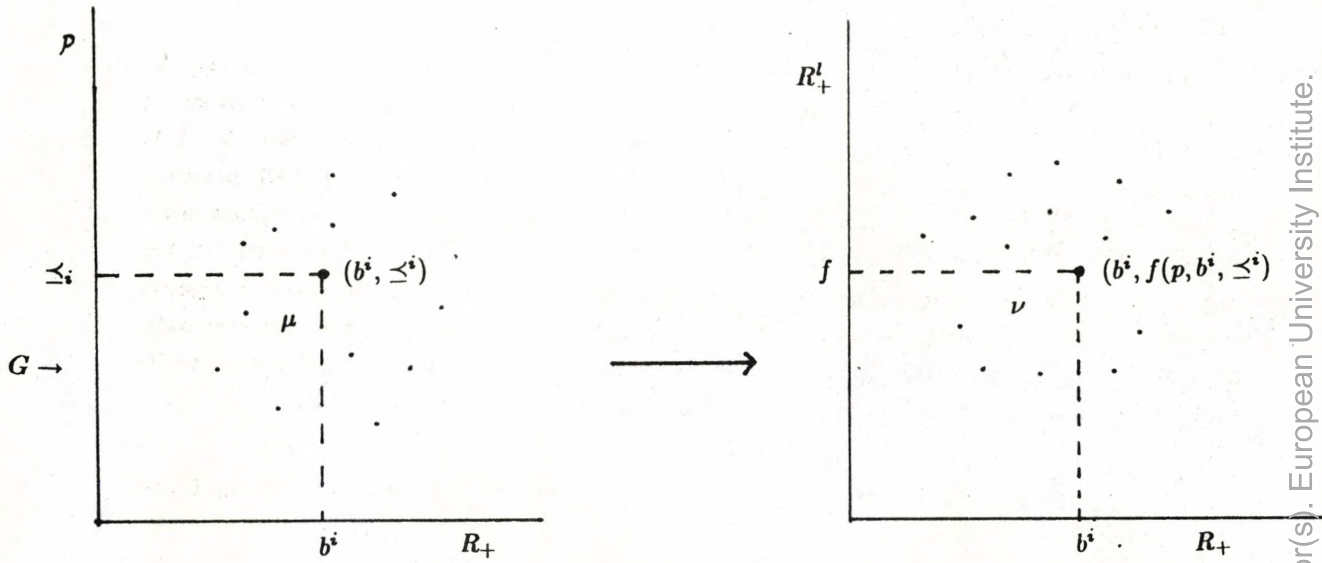

Figure 2

We assume that cross-section data of family expenditures give us, in principal, a sample distribution of ν_t! If the distribution ν_t is known one can compute

1) the *empirical distribution function of expenditure* V_t

$$V_t(\xi) = \mu_t(\{b, \preceq) \in R_+ \times \mathcal{P} \mid b \leq \xi\}) = \nu_t(\{(b, x) \in R_+^{l+1} \mid b \leq \xi\})$$

and

2) the *Engel curve of the group* for every commodity h, i.e.,

$$f_h^{\mu_t}(p,b) = \int f_h(p,b,\preceq)d\mu_t \mid b = E(\nu_t \mid b)_h$$

where $\mu_t \mid b$ (resp. $\nu_t \mid b$) denotes the conditional distribution of μ_t (resp. ν_t) given b, i.e., $\mu_t \mid b$ (resp. $\nu_t \mid b$) denotes the distribution of preferences (resp. demand vectors) of those households whose expenditure is equal to b. If it is clear from the context which distribution μ is used then I shall write $\bar{f}$ instead of f^{μ}.

In the following I shall neglect the statistical aspect of the problem. That is to say, the cross–section data of family expenditures at time t give us at best a sample distribution of ν_t. Hence every number which is derived from cross–section data is a random variable. I do not study in this paper the statistical properties of such random variables. I shall, however, assume in the following that the distributions ν_t are known. I think that this is a characteristic difference between economic theory and econometrics. The theorist uses full information, i.e., the distribution ν_t, while the econometrician explicitly takes into account that one can only observe a sample distribution of ν_t. To carry out then the statistical analysis one has, unfortunately, often to make strong and unjustifiable assumptions on the distribution μ, in particular, on its support.[3] For a theoretical analysis some of these assumptions are not necessary.

There would be a trivial solution to Problem 1 and 2 if one could assume that the Engel curves for every commodity h were

(i) *linear* in b

and

(ii) *independent of* t, at least at the relevant domain of the expenditure distribution, i.e., $f_h^{\mu_t}(p,b) = \bar{f}(p,b)$.

---

[3] For an econometric approach to the problem of aggregation which is in the line of this note we refer to the work of T.M.Stoker, in particular to "Completeness, Distribution Restrictions, and the Form of Aggregate Functions" , Econometrica 1985.

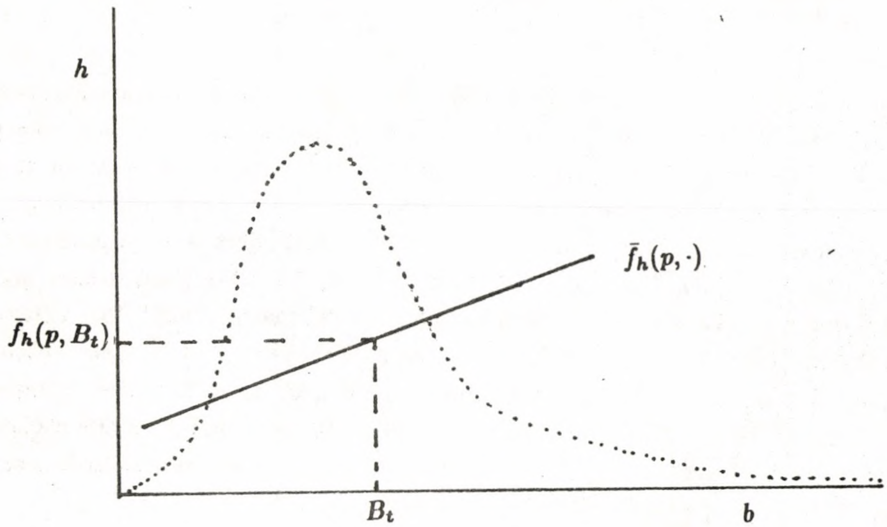

Figure 3

Indeed, in this case one obtains

$$F(p,\mu_t) = \int_{R_+} \bar f(p,b)dV_t(b) = \bar f(p,B_t).$$

The textbook example (e.g., Deaton and Muellbauer (1980) Chapter 6 or the survey paper by Shafer and Sonnenschein (1982)) for such a case is the situation where all households have the *same homothetic* preference relation.[4] Note that homothetic, but not identical preferences do not imply that the Engel curve $\bar f(p,\cdot)$ is linear, nor does linearity of $\bar f(p,\cdot)$ imply that the individual demand functions $f(p,b,\preceq)$ are linear in b.

In any case cross–section studies of family expenditures indicate clearly that Engel curves $\bar f(p,\cdot)$ for specific commodities are typically not linear, even if restricted to the relevant domain of the expenditure distribution. Even for very broad commodity aggregates is this assumption not well supported by empirical evidence.

---

[4] In this case $\bar f(p,\cdot)$ is even homogeneous of degree one, thus one has $EE = 1$, hence there is nothing to be estimated. The empirical analysis is needed only to check the hypothesis of the linearity of the Engel curve $\bar f(p,\cdot)$.

If we take it for granted that typically Engel curves $\bar{f}(p,\cdot)$ are not linear then mean demand depends on the distribution of expenditures.[5] This fact, of course, is well–known and is emphasized in the literature. Some economists build their theory on this fact; for example, Keynes, if he proposes measures of redistribution of income with the aim of stimulating market demand. However, in the econometric models the distributional effect is often neglected. The importance of the distributional aspect is very clearly discussed by J. Marschak in several papers in the 1930s (*Econometrica* (1939) and *Review of Economic Statistics* (1939)), by T. Haavelmo, (*Econometrica* (1947)) and by P. de Wolff (*Economic Journal* (1941)). They also discuss the use of cross–section data and come to quite different conclusions. As we shall see the reason for this apparent contradiction is that they make quite different assumptions on the evolution of (μ_t). For a more recent reference we refer to the excellent discussion of the aggregation problem in E. Malinvaud, *Théorie Macro–Economique* (1981) Chapter 2.2.

Problem 1, but not necessarily Problem 2, has again an obvious solution (a "solution" by assumption) if we restrict the evolution (μ_t) to a *one–parameter* family, where the *parameter can be chosen to be the mean B_t of the expenditure distribution* in period t. There are, of course, alternative ways to specify such parametrization of the evolution (μ_t). Different specifications will lead to different macro–demand functions $C(p, B)$.

[5] There is a well–known exceptional case, studied by Gorman (1953) and Nataf (1953), where the *statistical* Engel curves of the group might not be linear and still mean demand depends only on mean expenditures. Indeed, if preferences are such that for every commodity h the *individual* demand function $f(p, b, \preceq)$ is on the relevant domain of the expenditure distribution, *linear in b* and has for all households the same slope S_h, then

$$F_h(p,\mu) = \int_{R_+ \times P} (f_h(p, B, \preceq) - (B - b)S_h)d\mu = \int_P f_h(p, B, \preceq)d\mu_{\preceq},$$

where $\mu_{\preceq}$ denotes the marginal distribution of preferences of the distribution μ. Thus, if in addition to the strong assumptions on the indivudual demand functions the marginal distribution $\mu_{\preceq}$ of preferences is fixed, then meand demand depends only on mean expenditure. This, however, is too special a case to be considered as a solution to problem 1.

3.2. The evolution (V_t) of the expenditure distribution

The *empirical distribution function* V_t of individual expenditures for a finite group $\{b_t^i\}_{i\in G}$ is defined by

$$V_t(b) = \frac{1}{\#G}\{i \in G \mid b_t^i \leq b\}$$

In Figure 4a (resp. 4b) we have plotted a non-parametric (resp. log-normal) estimation of the distribution functions for the group of *all households in the Family* Expenditure Survey in Great Britain[5] [a] for every second year from 1969 to 1981.

The mean expenditure B_t and the median increased steadily:[b]

mean	27215	31915	41262	57671	74691	99183	136550
median	24932	29067	37520	52985	68425	91126	121250

Let V_t^* denote the *normalized distribution function*, i.e.,

$$V_t^*(b) = \frac{1}{\#G}\#\{i \in G \mid \frac{b_t^i}{B_t} \leq b\}.\text{Thus } V_t(b) = V_t^*(\frac{1}{B_t} \cdot b).$$

Of crucial importance for our analysis is the surprising, yet empirical fact that the normalized distribution function V_t^* for large household groups do not change essentially over time.

Figure 5 shows the normalized distribution functions V_t^* for the expenditure distributions of Figure 4.

The approximate constancy of the relative dispersion over the years from 1969 to 1981 can also be illustrated by looking at the Lorenz curves of the distribution functions V_t, as shown in Figure 6.

The Gini–coefficient does not change very much:

t	69	71	73	75	77	79	81
Gini	0.31	0.32	0.32	0.31	0.31	0.32	0.32

We remark that the normalized distribution functions V_t^* described for example by the variance, higher moments or the Gini–coefficient) can not be explained by the mean expenditure B_t.

In the Figures 4, 5 and 6 we have chosen for individual expenditure b_t^i the entry "net income" as defined in the above mentioned Family Expenditure survey. The survey also contains alternative definitions: normal gross income, current gross income and total expenditure.

---

5) Office of Population Censuses and Surveys, Social Survey Division, and Department of Employment: Family Expenditure Survey. The Family Expenditure Data were supplied by the SSRC Data Archive at the University of Essex, U.K.

a) The analysis of the Family Expenditure Survey data was carried out by K.Hildenbrand. I would like to thank him for his permission to use his results.

b) Both measures are recorded in tenths of pence per week.

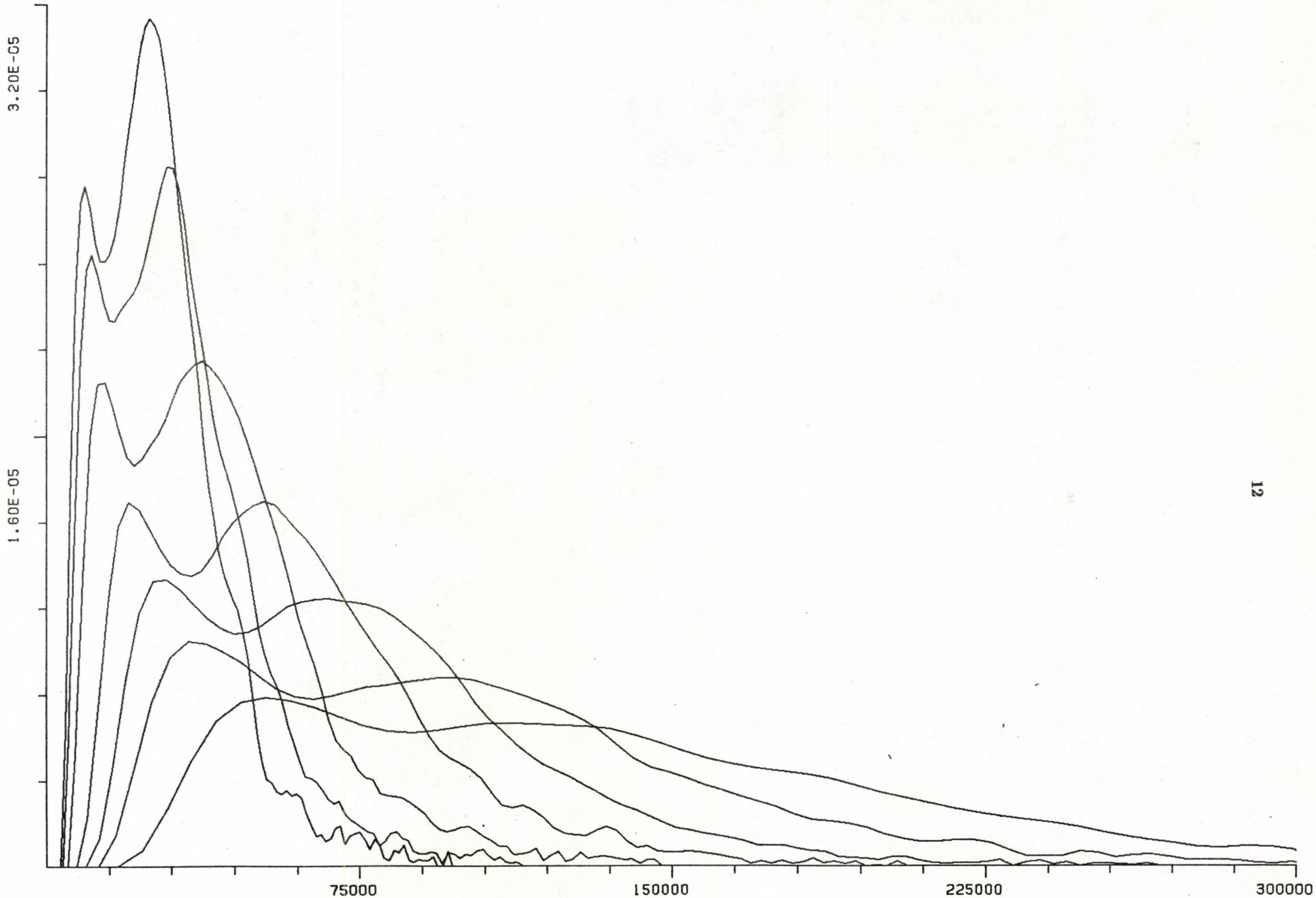

Figure 4a: Non-parametric estimation of the distribution functions of expenditures for all households (1969, 1971, 1973, 1975, 1977, 1979, 1981) ("Discrete Maximum Penalized Likelihood Estimation")

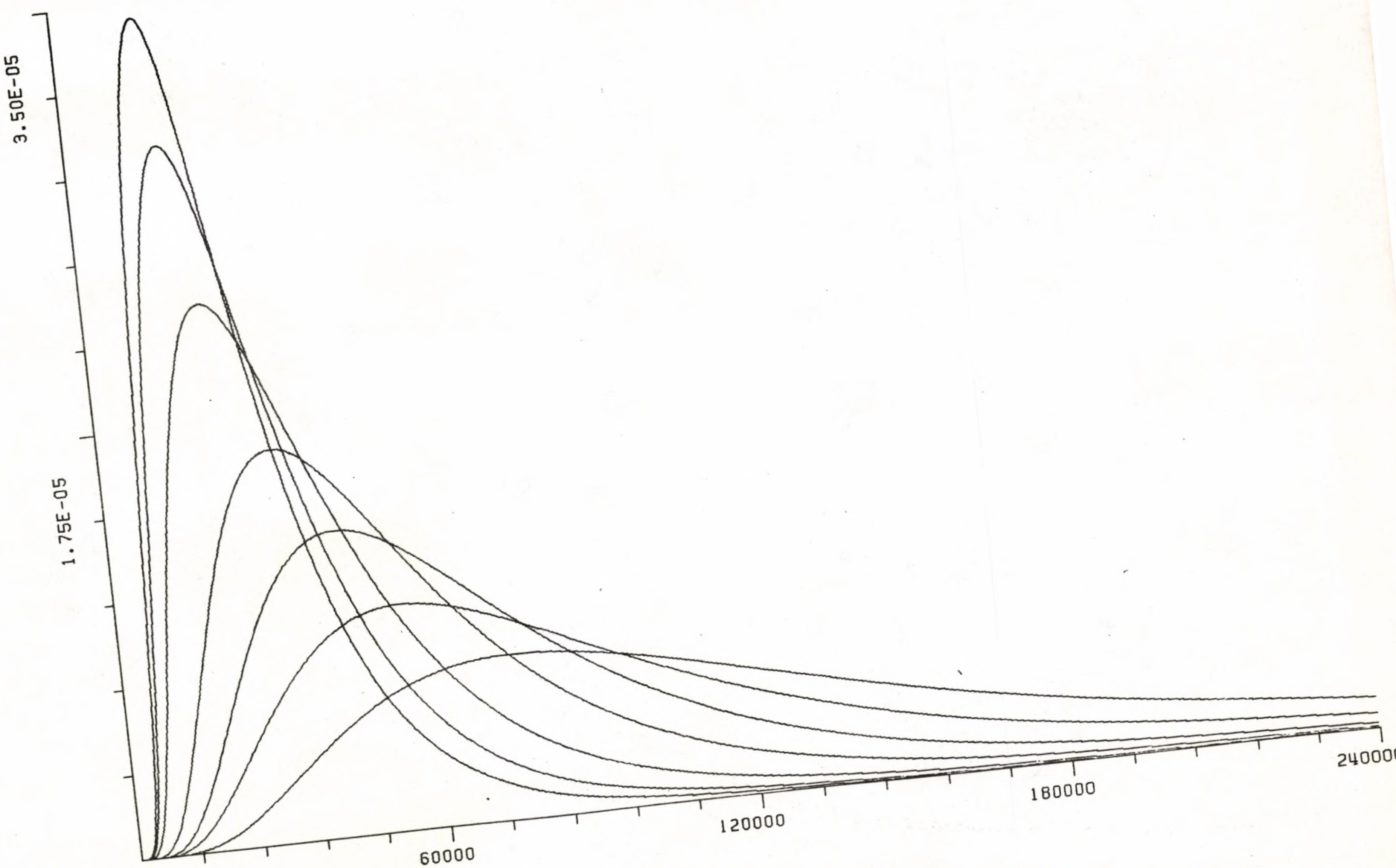

Figure 4b: Log–normal estimation for the data of Figure 4a

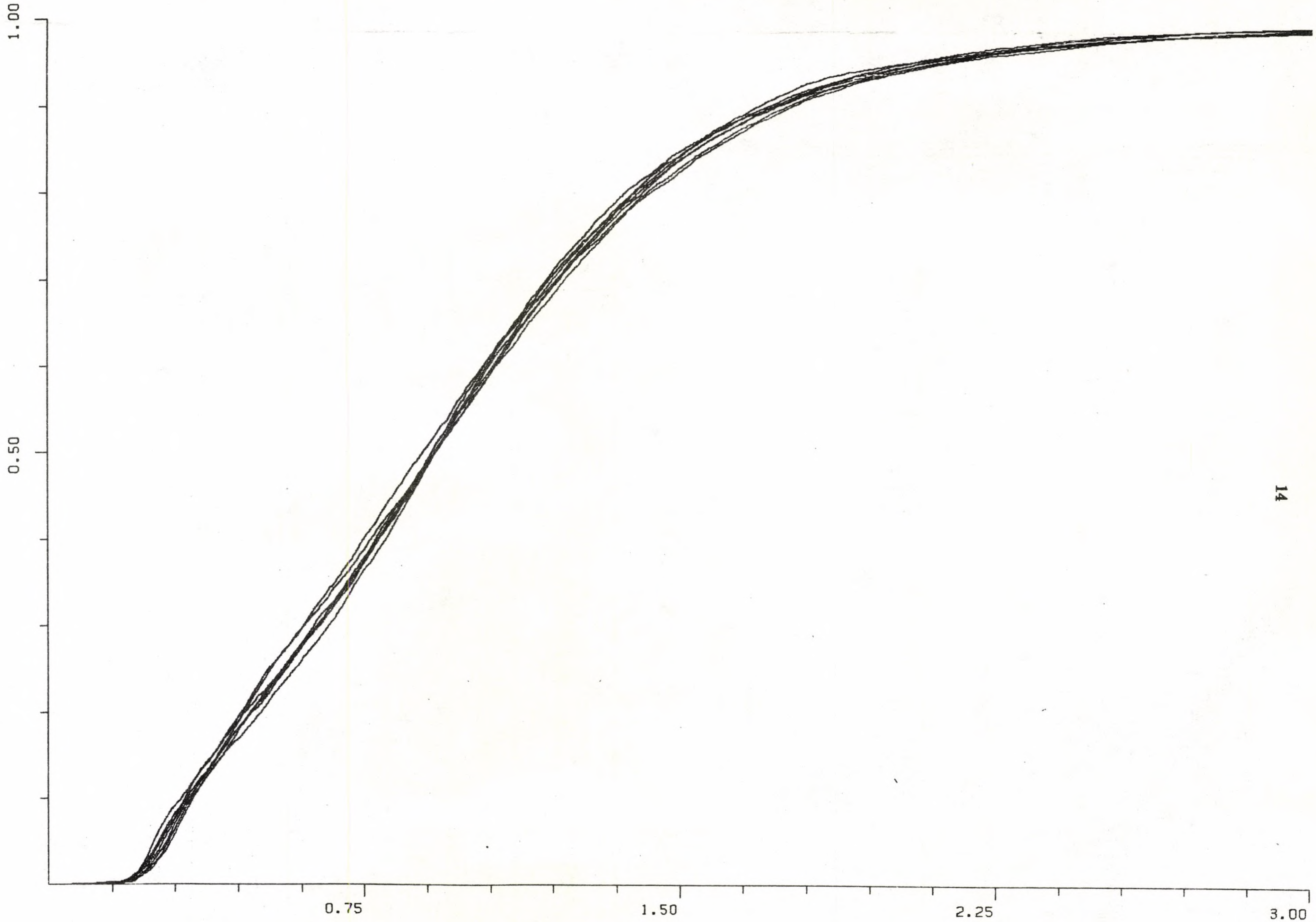

Figure 5: Normalized distribution functions for the group of all households

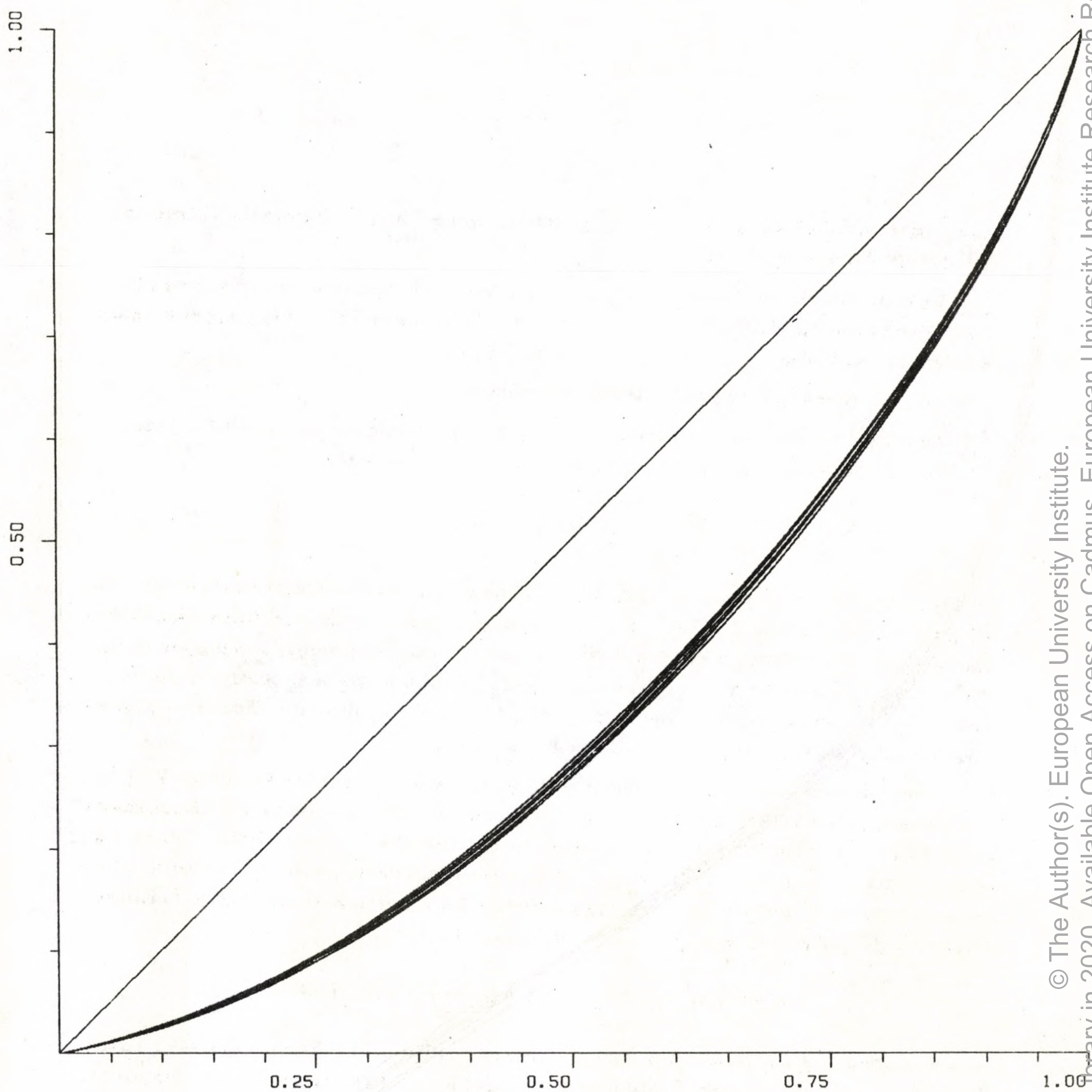

Figure 6: Lorenz curves of the distribution functions V_t

In all cases one obtains essentially the same pictures. Figures 7 and 8 illustrate the distribution for the entry "total expenditure".

This approximate constancy over time of the normalized expenditure distributions is, of course, well known in the literature on personal income distributions.[6] The foregoing discussion motivates the following

Assumption 1: *(the law of constant relative dispersion)*

The normalized distribution functions V_t^* do not change along the evolution (μ_t). Thus, there is a distribution function V^* with mean equal to one such that

$$V_t(b) = V^*(\frac{1}{B_t} \cdot b)$$

This is, indeed, a strong assumption on the evolution of the distributions of expenditures. It implies that the Gini-coefficient and the Lorenz curve of the expenditure distributions V_t do not depend on t. However, as we have shown, the assumption is surprisingly well supported by empirical studies provided it is applied to the group of *all* households in a country. It is known that the law of constant relative dispersion does hold less well for subgroups, like self-employed heads of household or retired individuals (see Figures 9 and 10).

If one considers the remaining differences in the normalized distribution functions V_t^* (see e.g. Figure 5) as still relevant, then in the macro-demand function one has to take into account in addition to the mean B_t other characteristics of the distribution V_t as well. Note, however, we are not interested here in the distributions V_t per se;we do not discuss econdenz inequality. The relevant question is whether the remaining differences in the normalized distribution functions V_t^* have a relevant influence on mean demand, i.e., on the integral

$$\int \bar{f}(p,b)dV_t(b) = \int \bar{f}(p, B_t \cdot b)dV_t^*(b) \sim \int \bar{f}(p, B_t \cdot b)dV^*(b).$$

At this point I will not pursue a discussion and justification of the "law of constant relative dispersion". For the time being I take it as an example for a simple assumption which leads to a *one-parameter* family of distribution functions V_t, where the *mean* B_t *each distribution can be chosen as the parameter.*

[6] e.g. G. Vangrevelinghe, "Les niveaux de vie en France –1956 et 1966". *Economie et Statistique* No.1 1969, G. Banderier "Répartition et évolution des revenus fiscaux des ménage" *Economie et Statistique* No. 16, 1970 and G. Göseke and K.D. Bedau (1974), Verteilung und Schichtung der Einkommen der privaten Haushalte in der BRD von 1950–1975. Deutsches Institut für Wirtschaftsforschung, Heft 31, (Duncker und Humblot, Berlin), A.S. Blinder, "The level and distribution of Income Well-Being", in: *The American Economy in Transition* (ed. M. Feldstein), Univ. of Chicago Press 1980, J. Hartog and J.G. Venbergen, Dutch treat, long-run changes in personal income distribution, *De Economist* 126, Nr.4, 1978

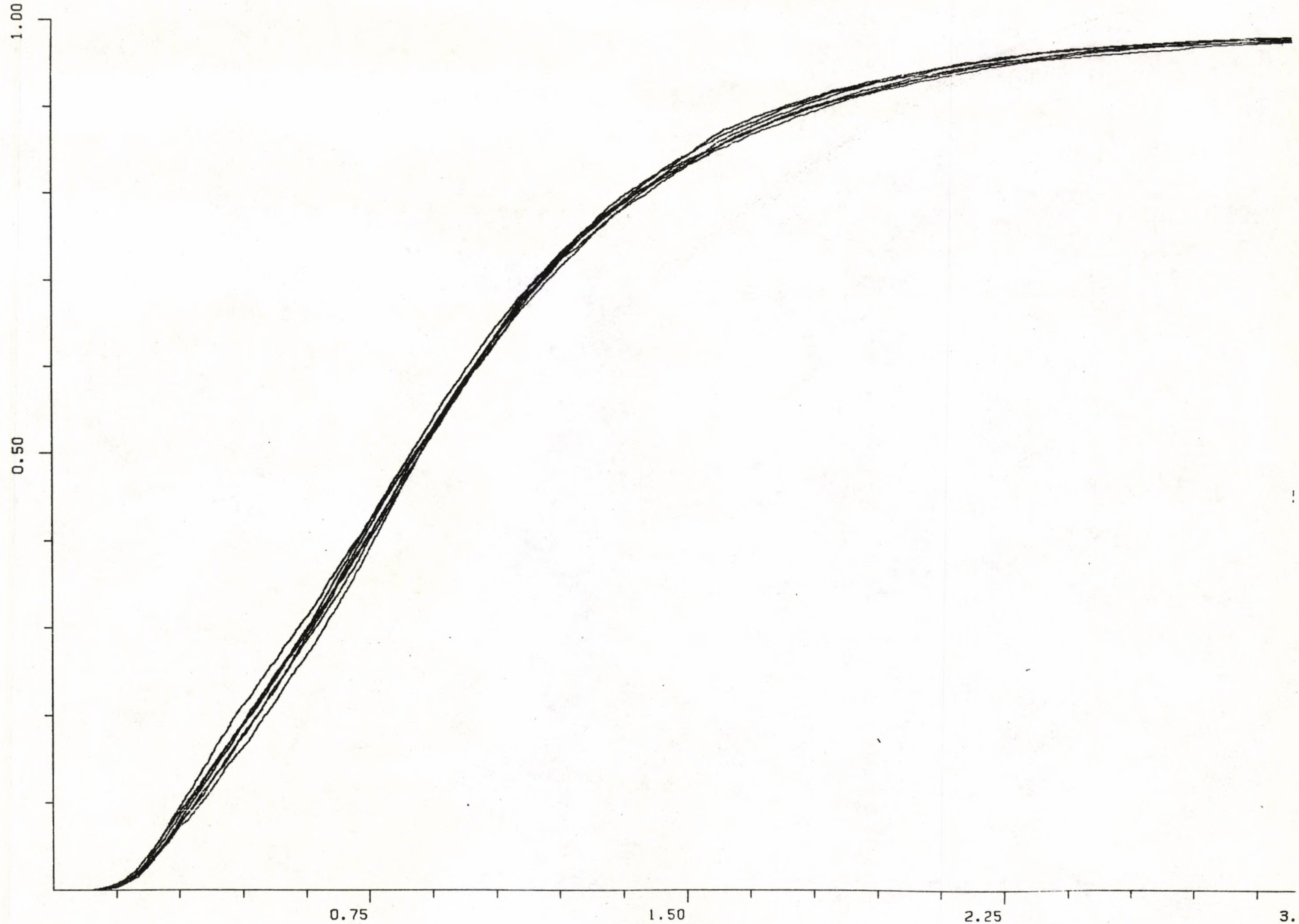

Figure 7: Distribution functions for "Total Expenditure"

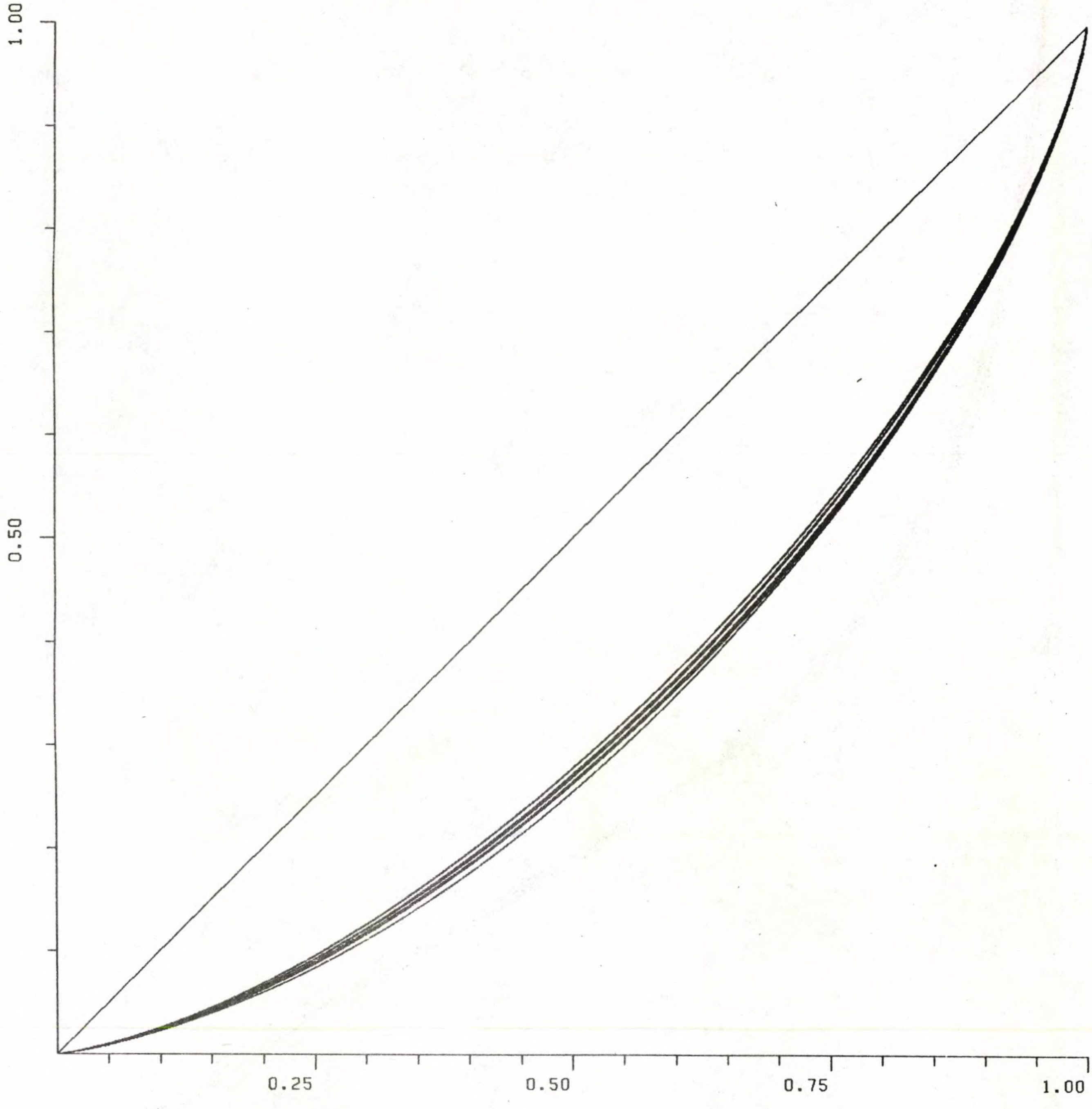

Figure 8: Lorenz curves for "Total Expenditure"

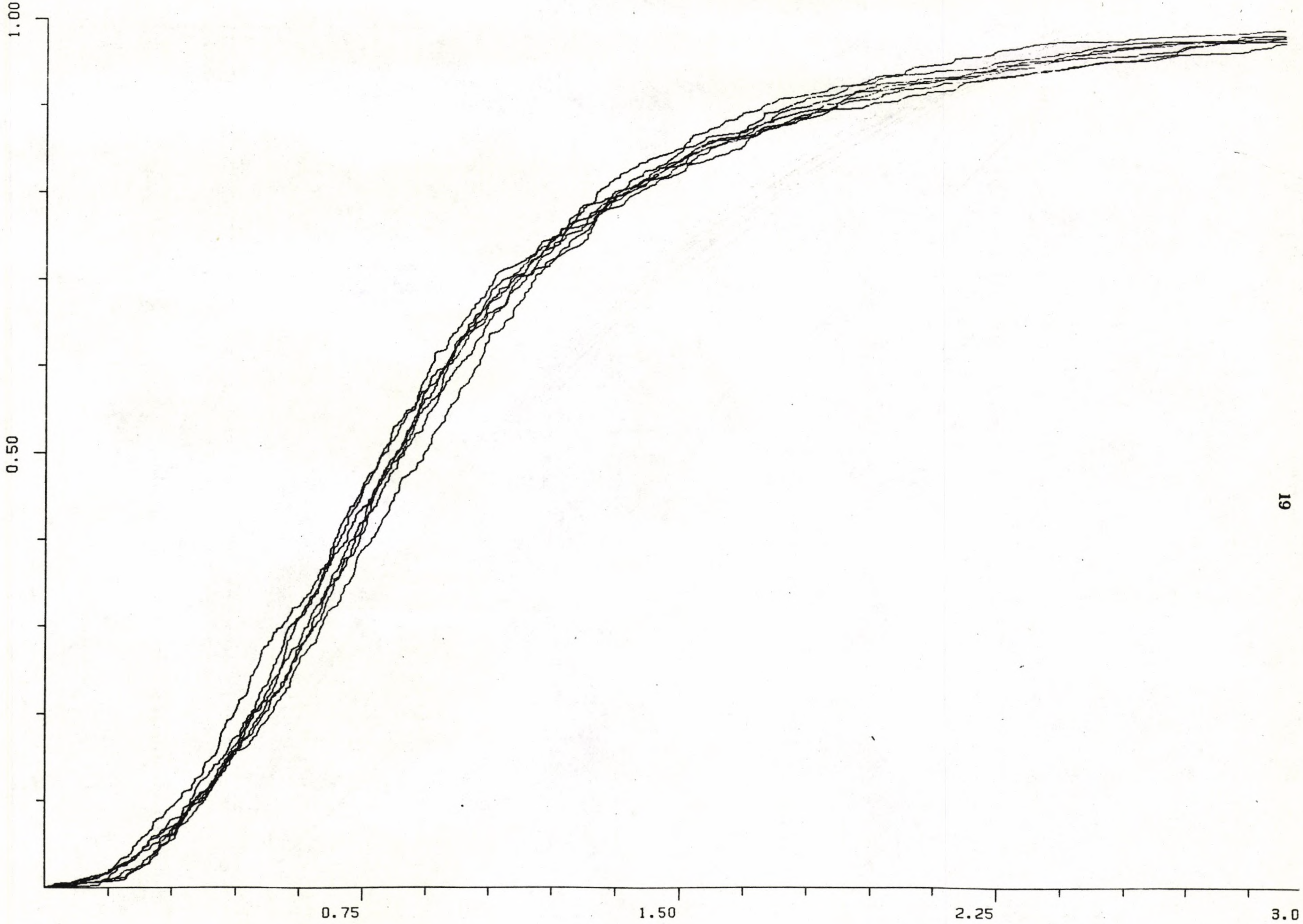

Figure 9: Distribution functions of 'net income' for self-employed heads of household

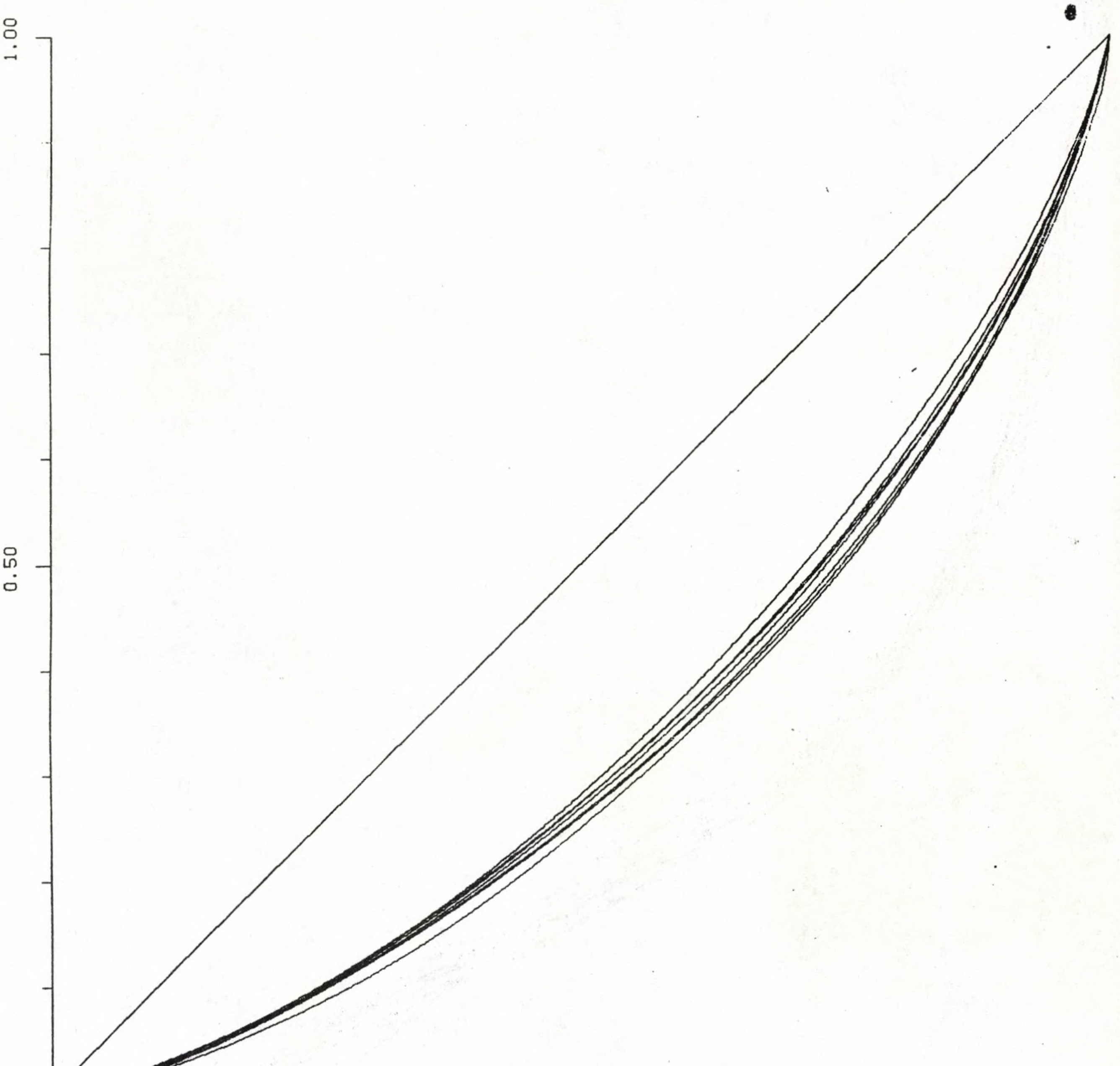

Figure 10: Lorenz curves for self-employed heads of household

If the distributions of expenditures of the group are given by densities ρ_t, then our assumption can be expressed by

$$\rho_t(b) = \frac{1}{B_t}\rho^*(\frac{1}{B_t} \cdot b)$$

where ρ^* is a density with mean equal to one.

We emphasize that Assumption 1 does not imply an implicit assumption on the functional form of the expenditure distributions. Empirical studies in the literature typically assume that the expenditure distributions can be well described by log–normal, Beta or Gamma distributions. These functional specifications, however, are not well supported by the data that we used in Figure 5 and 6. A non–parametric estimation of the densities suggest clearly that the density of the expenditure distributions for the group of all households is not unimodale. of expenditure have bi–modal densities. Figure 11 shows a non–parameter as well as some parametric estimations of the expenditure distribution for the U.K. Data in the year 1973. The figures are similar for other years.

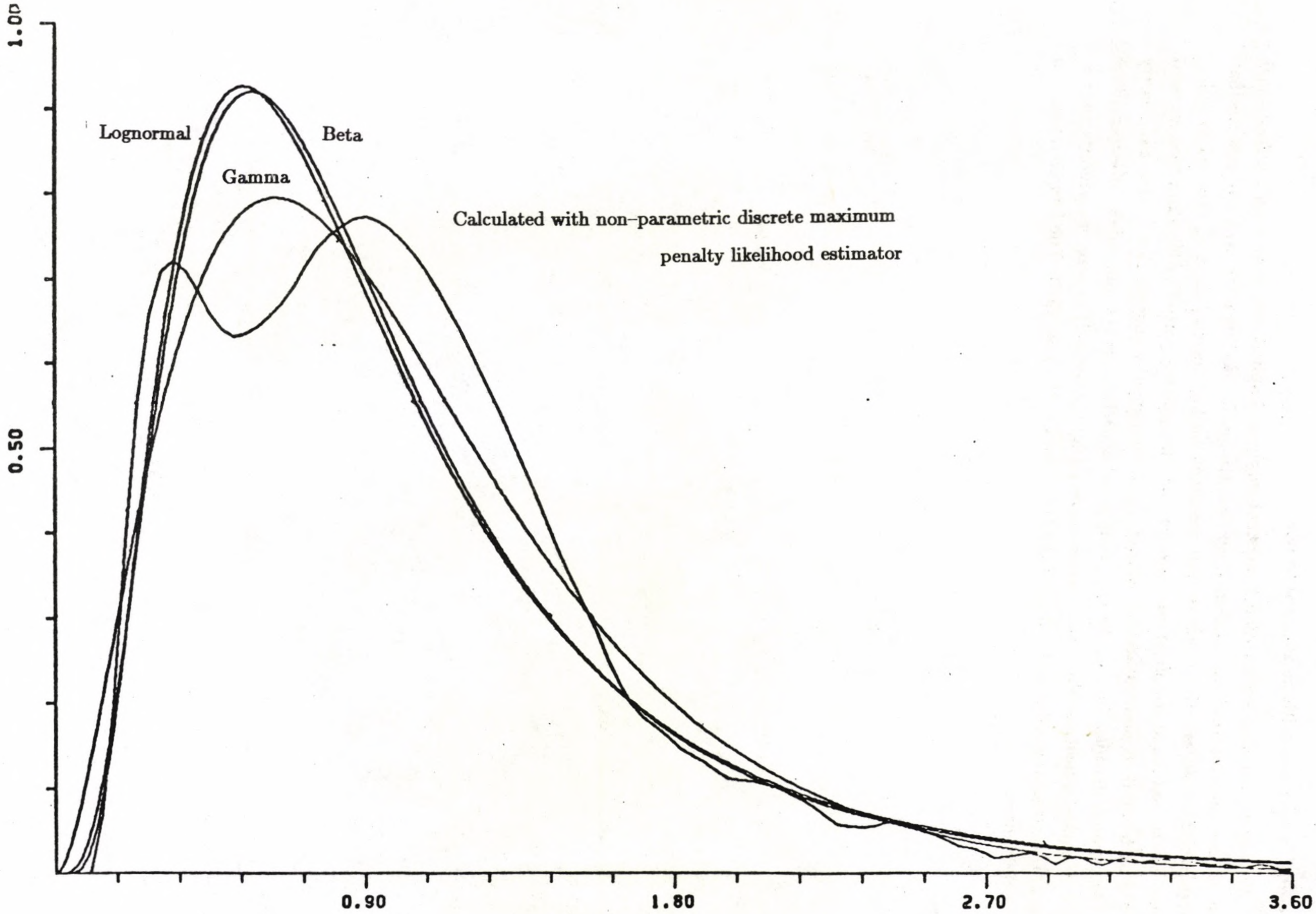

Figure 11: Different densities for British income distribution (1973). Mean income is equal to one.
Gamma and Beta are also known as Pearson type III and VI respectively.

3.3. The evolution (μ_t) of the joint distributions of expenditures and preferences

Every assumption on the evolution of the joint distributions (μ_t) of expenditures and preferences is highly speculative. If one cannot observe individual preference relations then one cannot observe distributions over preference relations. If we replace preferences by observable "attributes" as mentioned in the Remark in Section 2, we need an a priori given functional relationship between prices, observable attributes and demand. The distributions α_t of attributes are then, in principle, observable if we have a time series of cross–section data.

Thus, in order to specify the evolution of (μ_t) we have to make assumptions on the evolution of the *conditional* distributions of preferences where we condition on expenditure and possibly other observable attributes. Since in the preference–model we did not explicitly consider other observable attributes than expenditure, we have to make assumptions on the evolution of the conditional distribution $\mu_t \,|\, b$, i.e., the distribution of preferences in period t of those households whose expenditure is equal to b.

It seems likely that these conditional distributions $\mu_t \,|\, b$ of preferences will change over time. For example, if we believe that preferences depend on age (or sex) and if the age (sex) distribution of those households with budget b changes over time which typically is observed, then $\mu_t \,|\, b$ will actually change over time. But how do they change? Since I have no reasonable answer I am tempted to consider the hypothetical case where the conditional distributions of preferences do not change. The reader will immediately object that it is not very sound to assume that distributions of preferences do not change if I claim at the same time that preferences cannot be observed. The assumption, however, would imply that the Engel curves do not change along the evolution (μ_t). Since Engel curves seem to be more "real" than distributions of preferences we formulate our assumption in terms of Engel curves.

Assumption 2: The Engel curves for the distribution μ_t do not change along the evolution (μ_t), i.e., there is a function $\bar{f}(p,b)$ such that

$$\bar{f}(p,b) = \int_P f(p,b,\preceq) d\mu_t \,|\, b.$$

Assumption 2 is quite strong since in forming the average $\int f(p,b,\preceq) d\mu_t \,|\, b$ we condition the distribution μ exclusively on expenditure b. Recall, in the attribute–model we conditioned on the vector of attributes $a = (a_1 = b,\ a_2, \ldots)$ and assumed merely that $g(p,a) = \int f(p,b,\preceq) d\mu_t \,|\, a$ does not change. Assumption 2 is a strengthening of the assumption that the function g does not change. Clearly Assumption 2 is satisfied if individual expenditures and preferences are *statistically independent* (i.e., μ_t is a product measure $\mu_t = \mu_t^{\preceq} \otimes \nu_t$) and if the marginal distributions $\mu_t^{\preceq}$ of preferences do not change over time. Note, however, if the distributions μ_t are not product measures (i.e., the conditional distributions $\mu_t \mid b$ actually depend on b), then Assumptions 1 and 2 imply that the marginal distributions $\mu_t^{\preceq}$ of preferences will change over time.

Proposition: *Under Assumption 1 and 2 there exists a macro–demand function $C(p,B)$ for the evolution (μ_t). The function $C(\cdot,\cdot)$ is, in general, not homogeneous of degreè zero in (p,B). The margina' propensity to consume commodity h is given by*

$$MPC(p,B) = \frac{1}{B}\int_{R_+} (\frac{\partial}{\partial b}\bar{f}(p,b)) \cdot b \cdot \rho_B(b)db.$$

Proof. Given ρ^* and $\bar{f}$ we obtain

$$C(p,B) = \int \bar{f}(p,b)\rho_B(b) = \int \bar{f}(p,b)\frac{1}{B}\rho^*(\frac{b}{B})db$$
$$= \int \bar{f}(p,B\cdot b)\rho^*(b)db,$$

which is a function in p and B. If μ is not a product measure then $\bar{f}(p,b)$, and hence $C(p,B)$, are not necessarily homogeneous of degree zero. Finally we obtain

$$\frac{\partial}{\partial B}C(p,B) = \int \frac{\partial}{\partial B}\bar{f}(p,B\cdot b)\rho^*(b)db$$
$$= \int \partial_2\bar{f}(p,B\cdot b)\cdot b\cdot \rho^*(b)db$$
$$= \frac{1}{B}\int \frac{\partial}{\partial b}\bar{f}(p,b)\cdot b\cdot \rho_B(b)db. \qquad \text{Q.E.D.}$$

Remark: The above result is based on two assumptions. The first one we claim to be satisfied approximately in reality. The second one is purely hypothetical. I do not claim that in reality Engel curves remain constant over time (actually I have no knowledge at all about the evolution of Engel curves over time.) However, I do claim that a micro–model of a household population for which the concept of MPC or EE is well defined and, moreover, can be computed from cross–section data must satisfy Assumption 2. Or in different words: If one computes a number from cross–section data according to the formula

$$\frac{1}{B_t}\int \frac{\partial}{\partial b}f^{\mu_t}h(p,b)b\cdot \rho_{B_t}(db)$$

then this number can be interpreted as the marginal propensity to consume of the population provided we introduce the ceteris paribus clause as given by Assumption 2.

Indeed, consider the simplest case, where the evolution of the Engel curves can be parametrized by the mean expenditure B, thus $\bar{f}(p,b,B_t) = f^{\mu_t}(p,b)$. Then there exists a macro–demand function $C(p,b)$. But if one computes the derivative one obtains

$$\frac{\partial}{\partial B}C(p,B) = \frac{1}{B}\int (\frac{\partial}{\partial b}\bar{f}(p,b,B))b\cdot \rho_B(b)db + \int \frac{\partial}{\partial B}\bar{f}(b,B)\rho_B(b)db.$$

Obviously from cross-section data we cannot compute the second integral on the right hand side. In order to compute this integral we have to know how the Engel curves shift with increasing per capita expenditure.

We emphasize that Assumption 2 does not imply that individual preferences (or attributes) do not change. If individual expenditures and preferences (or attributes) are not statistically independent then Assumption 1 and 2 on the evolution (μ_t) are not compatible with the hypothesis that the preference relation (or attributes) of every individual household remains fixed and only their expenditures vary. If we would know how individual expenditure varies as a function of per capita expenditure then, of course, we would know the evolution of (μ_t) provided one assumes that every household keeps his preferences. An example is given by the well known fixed individual budget share model, i.e., $b_t^i/_{B_t}$ is independent of t. Assumption 1, which refers to the marginal distribution of expenditures, however, says nothing on the evolution of individual expenditures.

Consequently, an alternative way to parametrize the evolution (μ_t) by the mean expenditure B_t is to strenghten Assumption 1. (Compare E. Malinvaud 1981, Chap. 2.2, p. 75).

Let $V_t \mid\preceq$ denote the conditional distribution function of expenditure given $\preceq$, i.e., the distribution function of expenditure of all households with preference relation $\preceq$. Of course, $\preceq$ can be replaced by attribute a.

If we assume now that (i) for every preference relation the conditional distribution function $V_t \mid\preceq$ can be parametrized by the mean expenditure B_t of V_t (not by the mean of $V_t \mid\preceq$) i.e., there is a distribution function $V^*_{\preceq}$ such that

$$V_t \mid\preceq (b) = V^*_{\preceq}(\frac{1}{B_t} \cdot b)$$

and (ii) the marginal distribution $\mu_t^{\preceq}$ of preferences do not change along the evolution, then we have again parametrized the evolution (μ_t) by the mean B_t. Consequently, there exists a macro–demand function $C(p, B)$, i.e.,

$$F(p, \mu_t) = C(p, B_t).$$

The macro–demand function $C(p, B)$ is homogeneous of degree zero in p and B. If we compute the MPC we obtain

$$\begin{aligned}\frac{\partial}{\partial B}C(p,B) &= \frac{1}{B}\int_{R_+\times P}\frac{\partial}{\partial b}f(p,b,\preceq)\cdot b d\mu \\ &= \frac{1}{B}\int_{R_+} b(\int_P \frac{\partial}{\partial b}f(p,b,\preceq)d\mu\,|\,b)\rho_B(b)db\end{aligned}$$

If the conditional distributions $\mu \mid b$ of preferences depend on b, i.e., if expenditures and preferences are not statistically independent, then Assumption 2 is not satisfied and we have in general

$$\int_P \frac{\partial}{\partial b}f(p,b,\preceq)d\mu \mid b \neq \frac{\partial}{\partial b}\int_P f(p,b,\preceq)d\mu|b = \frac{\partial}{\partial b}\bar{f}(p,b)$$

From cross–section data we can, in principal, estimate the statistical Engel curve $\bar{f}$, hence $\frac{\partial}{\partial b}\bar{f}(p,b)$, but we cannot estimate the individual marginal propensities to consume, $\frac{\partial}{\partial b}f(p,b,\preceq)$

or $\frac{\partial}{\partial b} g(p, a_1 = b, a_2 \ldots)$ in the attribute–model. Thus, we conclude, that the above assumptions lead to a well defined macro–demand function but for this macro–demand function we cannot estimate the MPC from cross–section data.

References

Banderier, G. (1970): Repartition et èvolution des revenus fiscaux des ménages. *Economie et Statistique*, No. 16.

Blinder, A.S. (1980): The Level and Distribution of Economic Well Being, in: *The American Economy in Transition* (ed. M. Feldstein), University of Chicago Press.

Brown, J.A.C. and Deaton, A.S. (1972): Models of Consumer Behavior: A Survey. *Economic Journal*, 1145–1236.

Deaton, A.S. and Muellbauer, J. (1980): *Economics and Consumer Behavior*. Cambridge University Press, Cambridge.

Gösecke, G. and Bedau, K.D. (1974): *Verteilung und Schichtung der Einkommen der privaten Haushalte in der Bundesrepublik Deutschland 1950–1975*. Deutsches Institut für Wirtschaftsforschung, Heft 31, Duncker und Humblot, Berlin.

Gorman, W.M. (1953): Community Preference Fields. *Econometrica*, 63–80.

Grandmont, J.M. (1983): *Money and Value*. Cambridge University Press, Cambridge.

Haavelmo, T. (1947): Family Expenditures and the Marginal Propensity to Consume. *Econometrica*, 335–341.

Hartog, J. and Veenbergen, J.G. (1978): Dutch Treat, Long–run Changes in Personal Income Distribution. *De Economist* 126, Nr. 4 .

HMSO, Her Majesty's Stationary Office: *Family Expenditure Survey, Annual report*. London.

Hildenbrand, W. (1974): *Core and Equilibria of a Large Economy*. Princeton University Press, Princeton.

Jorgenson, D.W., L.J. Lau and T.M. Stoker (1982)0: The Transcendental Logarithmic Model of Aggregate Consumer Behavior, in: *Advances in Econometrics*, Vol. 1, pp. 97–238, JAI Press.

Malinvaud, E. (1981): *Théorie macro-économique*. Dunod, Paris.

Marschak, J. (1939): On Combining Market and Budget Data in Demand Studies: A Suggestion. *Econometrica*, 332–335.

Marschak, J. (1939): Personal and Collective Budget Functions. *The Review of Economic Statistics*, 161–170.

Nataf, A. (1953): Sur des questions d'agrégation en économétrie. *Publication de l'Institut de Statistique de l'Université de Paris*, 2:5–61.

Shafer, W. and Sonnenschein, H. (1982): Market Demand and Excess Demand Functions,in: *Handbook of Mathematical Economics*, Vol.II, K.J. Arrow and M.D. Intriligator (ed), North–Holland, Amsterdam, 671–693.

Stoker, T.M. (1984): Completeness, Distribution Restrictions, and the Form of Aggregate Functions. *Econometrica*, 887–907.

Vangrevelinghe, G. (1969): Les niveaux de vie en France – 1956 et 1966. *Economie et Statistique*, No. 1.

Wolff, P. de (1941): Income Elasticity of Demand, a Micro-economic and Macro-economic Interpretation. *Economic Journal*, 140–145.

WORKING PAPERS ECONOMICS DEPARTMENT

No. 1:	Jacques PELKMANS	The European Community and the Newly Industrialized Countries
No. 3:	Aldo RUSTICHINI	Seasonality in Eurodollar Interest Rates
No. 9:	Manfred E. STREIT	Information Processing in Futures Markets. An Essay on the Adequacy of an Abstraction
No. 10:	Kumaraswamy VELUPILLAI	When Workers Save and Invest: Some Kaldorian Dynamics
No. 11:	Kumaraswamy VELUPILLAI	A Neo-Cambridge Model of Income Distribution and Unemployment
No. 12:	Guglielmo CHIODI Kumaraswamy VELUPILLAI	On Lindahl's Theory of Distribution
No. 22:	Don PATINKIN	Paul A. Samuelson on Monetary Theory
No. 23:	Marcello DE CECCO	Inflation and Structural Change in the Euro-Dollar Market
No. 24:	Marcello DE CECCO	The Vicious/Virtuous Circle Debate in the '20s and the '70s
No. 25:	Manfred E. STREIT	Modelling, Managing and Monitoring Futures Trading: Frontiers of Analytical Inquiry
No. 26:	Domenico Mario NUTI	Economic Crisis in Eastern Europe: Prospects and Repercussions
No. 34:	Jean-Paul FITOUSSI	Modern Macroeconomic Theory: An Overview
No. 35:	Richard M. GOODWIN Kumaraswamy VELUPILLAI	Economic Systems and their Regulation
No. 46:	Alessandra Venturini	Is the Bargaining Theory Still an Effective Framework of Analysis for Strike Patterns in Europe?
No. 47:	Richard M. GOODWIN	Schumpeter: The Man I Knew
No. 48:	Jean-Paul FITOUSSI Daniel SZPIRO	Politique de l'Emploi et Réduction de la Durée du Travail
No. 56:	Berc RUSTEM Kumaraswamy VELUPILLAI	Preferences in Policy Optimization and Optimal Economic Policy

No. 60: Jean-Paul FITOUSSI	Adjusting to Competitive Depression. The Case of the Reduction in Working Time
No. 64: Marcello DE CECCO	Italian Monetary Policy in the 1980s
No. 65: Gianpaolo ROSSINI	Intra-Industry Trade in Two Areas: Some Aspects of Trade Within and Outside a Custom Union
No. 66: Wolfgang GEBAUER	Euromarkets and Monetary Control: The Deutschmark Case
No. 67: Gerd WEINRICH	On the Theory of Effective Demand Under Stochastic Rationing
No. 68: Saul ESTRIN Derek C. JONES	The Effects of Worker Participation upon Productivity in French Producer Cooperatives
No. 69: Berc RUSTEM Kumaraswamy VELUPILLAI	On the Formalization of Political Preferences: A Contribution to the Frischian Scheme
No. 72: Wolfgang GEBAUER	Inflation and Interest: the Fisher Theorem Revisited
No. 75: Sheila A. CHAPMAN	Eastern Hard Currency Debt 1970-1983. An Overview
No. 90: Will BARTLETT	Unemployment, Migration and Industrialization in Yugoslavia, 1958-1982
No. 91: Wolfgang GEBAUER	Kondratieff's Long Waves
No. 92: Elizabeth DE GHELLINCK Paul A. GEROSKI Alexis JACQUEMIN	Inter-Industry and Inter-Temporal Variations in the Effect of Trade on Industry Performance
84/103: Marcello DE CECCO	The International Debt Problem in the Interwar Period
84/105: Derek C. JONES	The Economic Performance of Producer Cooperatives within Command Economies: Evidence for the Case of Poland
84/111: Jean-Paul FITOUSSI Kumaraswamy VELUPILLAI	A Non-Linear Model of Fluctuations in Output in a Mixed Economy
84/113: Domenico Mario NUTI	Mergers and Disequilibrium in Labour-Managed Economies

84/114:	Saul ESTRIN Jan SVEJNAR	Explanations of Earnings in Yugoslavia: the Capital and Labor Schools Compared
84/116:	Reinhard JOHN	On the Weak Axiom of Revealed Preference without Demand Continuity Assumptions
84/118:	Pierre DEHEZ	Monopolistic Equilibrium and Involuntary Unemployment
84/119:	Domenico Mario NUTI	Economic and Financial Evaluation of Investment Projects: General Principles and E.C. Procedures
84/120:	Marcello DE CECCO	Monetary Theory and Roman History
84/121:	Marcello DE CECCO	International and Transnational Financial Relations
84/122:	Marcello DE CECCO	Modes of Financial Development: American Banking Dynamics and World Financial Crises
84/123:	Lionello PUNZO Kumaraswamy VELUPILLAI	Multisectoral Models and Joint Production
84/126:	John CABLE	Employee Participation and Firm Performance: a Prisoners' Dilemma Framework
84/127:	Jesper JESPERSEN	Financial Model Building and Financial Multipliers of the Danish Economy
84/128:	Ugo PAGANO	Welfare, Productivity and Self-Management
85/155:	François DUCHENE	Beyond the First C.A.P.
85/156:	Domenico Mario NUTI	Political and Economic Fluctuations in the Socialist System
85/157:	Christophe DEISSENBERG	On the Determination of Macroeconomic Policies with Robust Outcome
85/161:	Domenico Mario NUTI	A Critique of Orwell's Oligarchic Collectivism as an Economic System
85/162:	Will BARTLETT	Optimal Employment and Investment Policies in Self-Financed Producer Cooperatives
85/169:	Jean JASKOLD GABSZEWICZ Paolo GARELLA	Asymmetric International Trade

85/170:	Jean JASKOLD GABSZEWICZ Paolo GARELLA	Subjective Price Search and Price Competition
85/173:	Berc RUSTEM Kumaraswamy VELUPILLAI	On Rationalizing Expectations
85/178:	Dwight M. JAFFEE	Term Structure Intermediation by Depository Institutions
85/179:	Gerd WEINRICH	Price and Wage Dynamics in a Simple Macroeconomic Model with Stochastic Rationing
85/180:	Domenico Mario NUTI	Economic Planning in Market Economies: Scope, Instruments, Institutions
85/181:	Will BARTLETT	Enterprise Investment and Public Consumption in a Self-Managed Economy
85/186:	Will BARTLETT Gerd WEINRICH	Instability and Indexation in a Labour-Managed Economy - A General Equilibrium Quantity Rationing Approach
85/187:	Jesper JESPERSEN	Some Reflexions on the Longer Term Consequences of a Mounting Public Debt
85/188:	Jean JASKOLD GABSZEWICZ Paolo GARELLA	Scattered Sellers and Ill-Informed Buyers: A Model of Price Dispersion
85/194:	Domenico Mario NUTI	The Share Economy: Plausibility and Viability of Weitzman's Model
85/195:	Pierre DEHEZ Jean-Paul FITOUSSI	Wage Indexation and Macroeconomic Fluctuations
85/196:	Werner HILDENBRAND	A Problem in Demand Aggregation: Per Capita Demand as a Function of Per Capita Expenditure

Spare copies of these Working Papers can be obtained from:

Secretariat Economics Department
European University Institute
Badia Fiesolana
50016 SAN DOMENICO DI FIESOLE (Fi)
Italy.

EUI WORKING PAPERS

EUI Working Papers are published and distributed by the European University Institute, Florence.

Copies can be obtained free of charge -- depending on the availability of stocks -- from:

The Publications Officer

European University Institute

Badia Fiesolana

I-50016 San Domenico di Fiesole(FI)

Italy

Please use order form overleaf.

PUBLICATIONS OF THE EUROPEAN UNIVERSITY INSTITUTE

To : The Publications Officer
European University Institute
Badia Fiesolana
I-50016 San Domenico di Fiesole(FI)
Italy

From : Name..............................
Address..............................
....
....
....
....

Please send me the following EUI Working Paper(s):

No.:................
Author, title:..............................
....
....
....
....

Date:..................

Signature:
....

PUBLICATIONS OF THE EUROPEAN UNIVERSITY INSTITUTE

EUI WORKING PAPERS

1: Jacques PELKMANS	The European Community and the Newly Industrialized Countries *
2: Joseph H.H. WEILER	Supranationalism Revisited - Retrospective and Prospective. The European Communities After Thirty Years *
3: Aldo RUSTICHINI	Seasonality in Eurodollar Interest Rates
4: Mauro CAPPELLETTI/ David GOLAY	Judicial Review, Transnational and Federal: Impact on Integration
5: Leonard GLESKE	The European Monetary System: Present Situation and Future Prospects *
6: Manfred HINZ	Massenkult und Todessymbolik in der national-sozialistischen Architektur *
7: Wilhelm BURKLIN	The "Greens" and the "New Politics": Goodbye to the Three-Party System? *
8: Athanasios MOULAKIS	Unilateralism or the Shadow of Confusion *
9: Manfred E. STREIT	Information Processing in Futures Markets. An Essay on the Adequacy of an Abstraction *
10:Kumaraswamy VELUPILLAI	When Workers Save and Invest: Some Kaldorian Dynamics *
11:Kumaraswamy VELUPILLAI	A Neo-Cambridge Model of Income Distribution and Unemployment *
12:Kumaraswamy VELUPILLAI/ Guglielmo CHIODI	On Lindahl's Theory of Distribution *
13:Gunther TEUBNER	Reflexive Rationalitaet des Rechts *
14:Gunther TEUBNER	Substantive and Reflexive Elements in Modern Law *
15:Jens ALBER	Some Causes and Consequences of Social Security Expenditure Development in Western Europe, 1949-1977 *

16:Ian BUDGE	Democratic Party Government: Formation and Functioning in Twenty-One Countries *
17:Hans DAALDER	Parties and Political Mobilization: An Initial Mapping *
18:Giuseppe DI PALMA	Party Government and Democratic Reproducibility: The Dilemma of New Democracies *
19:Richard S. KATZ	Party Government: A Rationalistic Conception *
20:Juerg STEINER	Decision Process and Policy Outcome: An Attempt to Conceptualize the Problem at the Cross-National Level *
21:Jens ALBER	The Emergence of Welfare Classes in West Germany: Theoretical Perspectives and Empirical Evidence *
22:Don PATINKIN	Paul A. Samuelson and Monetary Theory
23:Marcello DE CECCO	Inflation and Structural Change in the Euro-Dollar Market *
24:Marcello DE CECCO	The Vicious/Virtuous Circle Debate in the '20s and the '70s *
25:Manfred E. STREIT	Modelling, Managing and Monitoring Futures Trading: Frontiers of Analytical Inquiry *
26:Domenico Mario NUTI	Economic Crisis in Eastern Europe - Prospects and Repercussions
27:Terence C. DAINTITH	Legal Analysis of Economic Policy *
28:Frank C. CASTLES/ Peter MAIR	Left-Right Political Scales: Some Expert Judgements *
29:Karl HOHMANN	The Ability of German Political Parties to Resolve the Given Problems: the Situation in 1982 *
30:Max KAASE	The Concept of Political Culture: Its Meaning for Comparative Political Research *

* :Working Paper out of print

31:Klaus TOEPFER	Possibilities and Limitations of a Regional Economic Development Policy in the Federal Republic of Germany *
32:Ronald INGLEHART	The Changing Structure of Political Cleavages Among West European Elites and Publics *
33:Moshe LISSAK	Boundaries and Institutional Linkages Between Elites: Some Illustrations from Civil-Military Elites in Israel *
34:Jean-Paul FITOUSSI	Modern Macroeconomic Theory: An Overview *
35:Richard M. GOODWIN/ Kumaraswamy VELUPILLAI	Economic Systems and their Regulation*
36:Maria MAGUIRE	The Growth of Income Maintenance Expenditure in Ireland, 1951-1979 *
37:G. LOWELL FIELD/ John HIGLEY	The States of National Elites and the Stability of Political Institutions in 81 Nations, 1950-1982
38:Dietrich HERZOG	New Protest Elites in the Political System of West Berlin: The Eclipse of Consensus? *
39:Edward O. LAUMANN/ David KNOKE	A Framework for Concatenated Event Analysis
40:Gwen MOOR/ Richard D.ALBA	Class and Prestige Origins in the American Elite
41:Peter MAIR	Issue-Dimensions and Party Strategies in the Irish republic 1948-1981:The Evidence of Manifestos
42:Joseph H.H. WEILER	Israel and the Creation of a Palestine State. The Art of the Impossible and the Possible *
43:Franz Urban PAPPI	Boundary Specification and Structural Models of Elite Systems: Social Circles Revisited
44:Thomas GAWRON/ Ralf ROGOWSKI	Zur Implementation von Gerichtsurteilen. Hypothesen zu den Wirkungsbedingungen von Entscheidungen des Bundesverfassungsgerichts *

* :Working Paper out of print

45:Alexis PAULY/ René DIEDERICH	Migrant Workers and Civil Liberties *
46:Alessandra VENTURINI	Is the Bargaining Theory Still an Effective Framework of Analysis for Strike Patterns in Europe? *
47:Richard A. GOODWIN	Schumpeter: The Man I Knew
48:J.P. FITOUSSI/ Daniel SZPIRO	Politique de l'Emploi et Réduction de la Durée du Travail
49:Bruno DE WITTE	Retour à Costa. La Primauté du Droit Communautaire à la Lumière du Droit International
50:Massimo A. BENEDETTELLI	Eguaglianza e Libera Circolazione dei Lavoratori: Principio di Eguaglianza e Divieti di Discriminazione nella Giurisprudenza Comunitaria in Materia di Diritti di Mobilità Territoriale e Professionale dei Lavoratori
51:Gunther TEUBNER	Corporate Responsability as a Problem of Company Constitution *
52:Erich SCHANZE	Potentials and Limits of Economic Analysis: The Constitution of the Firm
53:Maurizio COTTA	Career and Recruitment Patterns of Italian Legislators. A Contribution of the Understanding of a Polarized System *
54:Mattei DOGAN	How to become a Cabinet Minister in Italy: Unwritten Rules of the Political Game *
55:Mariano BAENA DEL ALCAZAR/ Narciso PIZARRO	The Structure of the Spanish Power Elite 1939-1979 *
56:Berc RUSTEM/ Kumaraswamy VELUPILLAI	Preferences in Policy Optimization and Optimal Economic Policy *
57:Giorgio FREDDI	Bureaucratic Rationalities and the Prospect for Party Government *
59:Christopher Hill/ James MAYALL	The Sanctions Problem: International and European Perspectives

* :Working Paper out of print

60:Jean-Paul FITOUSSI	Adjusting to Competitive Depression. The Case of the Reduction in Working Time
61:Philippe LEFORT	Idéologie et Morale Bourgeoise de la Famille dans le Ménager de Paris et le Second Libro di Famiglia, de L.B. Alberti *
62:Peter BROCKMEIER	Die Dichter und das Kritisieren
63:Hans-Martin PAWLOWSKI	Law and Social Conflict
64:Marcello DE CECCO	Italian Monetary Policy in the 1980s *
65:Gianpaolo ROSSINI	Intraindustry Trade in Two Areas: Some Aspects of Trade Within and Outside a Custom Union
66:Wolfgang GEBAUER	Euromarkets and Monetary Control: The Deutschemark Case
67:Gerd WEINRICH	On the Theory of Effective Demand under Stochastic Rationing
68:Saul ESTRIN/ Derek C. JONES	The Effects of Worker Participation upon Productivity in French Producer Cooperatives *
69:Berc RUSTEM Kumaraswamy VELUPILLAI	On the Formalization of Political Preferences: A Contribution to the Frischian Scheme *
70:Werner MAIHOFER	Politique et Morale *
71:Samuel COHN	Five Centuries of Dying in Siena: Comparison with Southern France *
72:Wolfgang GEBAUER	Inflation and Interest: the Fisher Theorem Revisited
73:Patrick NERHOT	Rationalism and the Modern State *
74:Philippe SCHMITTER	Democratic Theory and Neo-Corporatist Practice *
75:Sheila A. CHAPMAN	Eastern Hard Currency Debt 1970-83. An Overview

* :Working Paper out of print

PUBLICATIONS OF THE EUROPEAN UNIVERSITY INSTITUTE September 1985

76:Richard GRIFFITHS	Economic Reconstruction Policy in the Netherlands and its International Consequences, May 1945 - March 1951 *
77:Scott NEWTON	The 1949 Sterling Crisis and British Policy towards European Integration *
78:Giorgio FODOR	Why did Europe need a Marshall Plan in 1947? *
79:Philippe MIOCHE	The Origins of the Monnet Plan: How a Transistory Experiment answered to Deep-Rooted Needs
80:Werner ABELTSHAUSER	The Economic Policy of Ludwig Erhard *
81:Helge PHARO	The Domestic and International Implications of Norwegian Reconstruction *
82:Heiner R. ADAMSEN	Investitionspolitik in der Bundesrepublik Deutschland 1949-1951 *
83:Jean BOUVIER	Le Plan Monnet et l'Economie Française 1947-1952 *
84:Mariuccia SALVATI	Industrial and Economic Policy in the Italian Reconstruction *
85:William DIEBOLD, Jr.	Trade and Payments in Western Europe in Historical Perspective: A Personal View By an Interested Party
86:Frances LYNCH	French Reconstruction in a European Context
87:Gunther TEUBNER	Verrechtlichung. Begriffe, Merkmale, Grenzen, Auswege *
88:Maria SPINEDI	Les Crimes Internationaux de l'Etat dans les Travaux de Codification de la Responsabilité des Etats Entrepris par les Nations Unies *
89:Jelle VISSER	Dimensions of Union Growth in Postwar Western Europe
90:Will BARTLETT	Unemployment, Migration and Industrialization in Yugoslavia, 1958-1982

* :Working Paper out of print

91:Wolfgang GEBAUER	Kondratieff's Long Waves
92:Elisabeth DE GHELLINCK/ Paul A. GEROSKI/ Alexis JACQUEMIN	Inter-Industry and Inter-Temporal Variations in the Effect of Trade on Industry Performance
93:Gunther TEUBNER/ Helmut WILLKE	Kontext und Autonomie. Gesellschaftliche Selbststeuerung durch Reflexives Recht *
94:Wolfgang STREECK/ Philippe C. SCHMITTER	Community, Market, State- and Associations. The Prospective Contribution of Interest Governance to Social Order *
95:Nigel GRIFFIN	"Virtue Versus Letters": The Society of Jesus 1550-1580 and the Export of an Idea
96:Andreas KUNZ	Arbeitsbeziehungen und Arbeitskonflikte im oeffentlichen Sektor. Deutschland und Grossbritannien im Vergleich 1914-1924 *
97:Wolfgang STREECK	Neo-Corporatist Industrial Relations and the Economic Crisis in West Germany *
98:Simon A. HORNER	The Isle of Man and the Channel Islands - A Study of their Status under Constitutional, International and European Law
99:Daniel ROCHE	Le Monde des Ombres *
84/100:Gunther TEUBNER	After Legal Instrumentalism? *
84/101:Patrick NERHOT	Contribution aux Débats sur le Droit Subjectif et le Droit Objectif comme Sources du Droit *
84/102:Jelle VISSER	The Position of Central Confederations in the National Union Movements *
84/103:Marcello DE CECCO	The International Debt Problem in the Inter-War Period
84/104:M. Rainer LEPSIUS	Sociology in Germany and Austria 1918-1945. The Emigration of the Social Sciences and its Consequences. The

* :Working Paper out of print

	Development of Sociology in Germany after the Second World War, 1945-1967
84/105:Derek JONES	The Economic Performances of Producer Cooperations within Command Economies: Evidence for the Case of Poland *
84/106:Philippe C. SCHMITTER	Neo-Corporatism and the State *
84/107:Marcos BUSER	Der Einfluss der Wirtschaftsverbaende auf Gesetzgebungsprozesse und das Vollzugswesen im Bereich des Umweltschutzes
84/108:Frans van WAARDEN	Bureaucracy around the State:Varieties of Collective Self-Regulation in the Dutch Dairy Industry *
84/109:Ruggero RANIERI	The Italian Iron and Steel Industry and European Integration
84/110:Peter FARAGO	Nachfragemacht und die kollektiven Reaktionen der Nahrungsmittelindustrie
84/111:Jean-Paul FITOUSSI/ Kumuraswamy VELUPILLAI	A Non-Linear Model of Fluctuations in Output in a Mixed Economy *
84/112:Anna Elisabetta GALEOTTI	Individualism and Political Theory
84/113:Domenico Mario NUTI	Mergers and Disequilibrium in Labour-Managed Economies *
84/114:Saul ESTRIN/Jan SVEJNAR	Explanations of Earnings in Yugoslavia: The Capital and Labor Schools Compared
84/115:Alan CAWSON/John BALLARD	A Bibliography of Corporatism
84/116:Reinhard JOHN	On the Weak Axiom of Revealed Preference Without Demand Continuity Assumptions
84/117:Richard T.GRIFFITHS/ Frances F.B.LYNCH	The FRITALUX/FINEBEL Negotiations 1949/1950
84/118:Pierre DEHEZ	Monopolistic Equilibrium and Involuntary Unemployment *
84/119:Domenico Mario NUTI	Economic and Financial Evaluation of Investment Projects; General Principles and E.C. Procedures

* :Working Paper out of print

84/120:Marcello DE CECCO	Monetary Theory and Roman History
84/121:Marcello DE CECCO	International and Transnational Financial Relations *
84/122:Marcello DE CECCO	Modes of Financial Development: American Banking Dynamics and World Financial Crises
84/123:Lionello F. PUNZO/ Kumuraswamy VELUPILLAI	Multisectoral Models and Joint Production
84/124:John FARQUHARSON	The Management of Agriculture and Food Supplies in Germany, 1944-47
84/125:Ian HARDEN/Norman LEWIS	De-Legalisation in Britain in the 1980s *
84/126:John CABLE	Employee Participation and Firm Performance. A Prisoners' Dilemma Framework
84/127:Jesper JESPERSEN	Financial Model Building and Financial Multipliers of the Danish Economy
84/128:Ugo PAGANO	Welfare, Productivity and Self-Management
84/129:Maureen CAIN	Beyond Informal Justice *
85/130:Otfried HOEFFE	Political Justice - Outline of a Philosophical Theory
85/131:Stuart J. WOOLF	Charity and Family Subsistence: Florence in the Early Nineteenth Century
85/132:Massimo MARCOLIN	The Casa d'Industria in Bologna during the Napoleonic Period: Public Relief and Subsistence Strategies
85/133:Osvaldo RAGGIO	Strutture di parentela e controllo delle risorse in un'area di transito: la Val Fontanabuona tra Cinque e Seicento
85/134:Renzo SABBATINI	Work and Family in a Lucchese Paper-Making Village at the Beginning of the Nineteenth Century

* :Working Paper out of print

85/135:Sabine JURATIC	Solitude féminine et travail des femmes à Paris à la fin du XVIIIème siècle
85/136:Laurence FONTAINE	Les effets déséquilibrants du colportage sur les structures de famille et les pratiques économiques dans la vallée de l'Oisans, 18e-19e siècles
85/137:Christopher JOHNSON	Artisans vs. Fabricants: Urban Protoindustrialisation and the Evolution of Work Culture in Lodève and Bédarieux, 1740-1830
85/138:Daniela LOMBARDI	La demande d'assistance et les réponses des autorités urbaines face à une crise conjoncturelle: Florence 1619-1622
85/139:Orstrom MOLLER	Financing European Integration: The European Communities and the Proposed European Union.
85/140:John PINDER	Economic and Social Powers of the European Union and the Member States: Subordinate or Coordinate Relationship
85/141:Vlad CONSTANTINESCO	La Repartition des Competences Entre l'Union et les Etats Membres dans le Projet de Traite' Instituant l'Union Europeenne.
85/142:Peter BRUECKNER	Foreign Affairs Power and Policy in the Draft Treaty Establishing the European Union.
85/143:Jan DE MEYER	Belgium and the Draft Treaty Establishing the European Union.
85/144:Per LACHMANN	The Draft Treaty Establishing the European Union: Constitutional and Political Implications in Denmark.
85/145:Thijmen KOOPMANS	The Judicial System Envisaged in the Draft Treaty.
85/146:John TEMPLE-LANG	The Draft Treaty Establishing the European Union and the Member

* :Working Paper out of print

	States: Ireland
85/147:Carl Otto LENZ	The Draft Treaty Establishing the European Union: Report on the Federal Republic of Germany
85/148:David EDWARD/ Richard MCALLISTER/ Robert LANE	The Draft Treaty establishing the European Union: Report on the United Kingdom *
85/149:Joseph J. M. VAN DER VEN	Les droits de l'Homme: leur universalite' en face de la diversite' des civilisations.
85/150:Ralf ROGOWSKI	Meso-Corporatism and Labour Conflict Resolution *
85/151:Jacques GENTON	Problemes Constituionnels et Politiques poses en France par une eventuelle ratification et mise en oeuvre du projet de Traite d'Union Europeenne *
85/152:Marjanne de KWAASTENIET	Education as a verzuiling phenomenon Public and independent education in the Nederlands
85/153:Gianfranco PASQUINO and Luciano BARDI	The Institutions and the Process of Decision-Making in the Draft Treaty *
85/154:Joseph WEILER and James MODRALL	The Creation of the Union and Its Relation to the EC Treaties *
85/155:François DUCHENE	Beyond the first C.A.P.
85/156:Domenico Mario NUTI	Political and Economic Fluctuations in the Socialist System
85/157:Gianfranco POGGI	Niklas Luhmann on the Welfare State and its Law *
85/158:Christophe DEISSENBERG	On the Determination of Macroeconomic Policies with Robust Outcome
85/159:Pier Paolo D'ATTORRE	ERP Aid and the Problems of Productivity in Italy during the 1950s
85/160:Hans-Georg DEGGAU	Ueber einige Voraussetzungen und Folgen der Verrechtlichung
85/161:Domenico Mario NUTI	Orwell's Oligarchic Collectivism as an Economic System

* :Working Paper out of print

85/162:Will BARTLETT	Optimal Employment and Investment Policies in Self-Financed Produce Cooperatives
85/163:Terence DAINTITH	The Design and Performànce of Long-term Contracts *
85/164:Roland BIEBER	The Institutions and Decision-Making Process in the Draft Treaty Establishing the European Union
85/165:Philippe C. SCHMITTER	Speculations about the Prospective Demise of Authoritarian Regimes and its possible Consequences
85/166:Bruno P. F. WANROOIJ	The American 'Model' in the Moral Education of Fascist Italy *
85/167:Th. E. ABELTSHAUSER/ Joern PIPKORN	Zur Entwicklung des Europaeischen Gesellschafts- und Unternehmensrechts *
85/168:Philippe MIOCHE	Les difficultés de la modernisation dans le cas de l'industrie française de la machine outil, 1941-1953 *
85/169:Jean GABSZEWICZ Paolo Garella	Assymetric international trade
85/170:Jean GABSZEWICZ Paolo Garella	Subjective Price Search and Price Competition
85/171:Hans-Ulrich THAMER	Work Practices of French Joiners and Cabinet-Makers in the Eighteenth Century *
85/172:Elfriede REGELSBERGER Philippe DE SCHOUTHEETE Simon NUTFALL, Geoffrey EDWARDS	The External Relations of European Political Cooperation and the Future of EPC
85/173:Kumaraswany VELUPILLAI Berc RUSTEM	On rationalizing expectations
85/174:Leonardo PARRI	Political Exchange in the Italian Debate
85/175:Michela NACCI	Tra America e Russia: Viaggiatori francesi degli anni trenta

* :Working Paper out of print

85/192:Lucia FERRANTE	La Sessualita come Ricorsa. Donne Davanti al Foro Arcivescovile di Bologna (sec. XVII)
85/193:Federico ROMERO	Postwar Reconversion Strategies of American and Western European Labor
85/194:Domenico Mario NUTI	The Share Economy:Plausibility and Viability of Weitzman's Model
85/195:Pierre DEHEZ and Jean-Paul FITOUSSI	Wage Indexation and Macroeconomic Fluctuations
85/196:Werner HILDENBRAND	A Problem in Demand Aggregation: Per Capita Demand as a Function of Per Capita expenditure

* :Working Paper out of print