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.

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

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 $R^I_+$, 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” \[ \{(b^i, \leq^i) \}_{i \in G} \] of points in $R_+ \times P$.

Since we are mainly interested in large groups $G$ of households we shall describe the “cloud” of points in $R_+ \times P$ by its (empirical) joint distribution $\mu_G$, i.e.,

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

With this notation we have the identity

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

**Definition:** The mean (per capita) demand (or market demand) of a group of households (which is described by the joint distribution $\mu$ of expenditure and preferences) is defined by

\[ F(p, \mu) := \int_{R_+ \times P} f(p, b, \leq) d\mu. \]

This definition of mean demand can be extended to more general distributions $\mu$ than the empirical distributions of finite groups of households. This will be done in the sequel, in particular, we shall consider distributions $\mu$ 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 \( x \in R^d \),

\[
x = g(p, a), \quad p \in R^d_+, \quad a \in A.
\]

The group of households (population) is then described by a distribution \( \alpha \) 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, \( \leq_a \). 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 \( \mu \) of expenditures and preferences we define

\[
g(p, a) = \int_p f(p, b, \leq) d\mu | a,
\]

where \( \mu | a \) denotes the conditional distribution of preferences given the attribute

\[
a = (a_1 = b_1, a_2, \ldots)
\]

Thus

\[
F(p, \mu) = \int f(p, b, \leq) d\mu = \int_A (\int_p f(p, b, \leq) d\mu | \alpha) d\alpha = \int_A g(p, a) d\alpha.
\]

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

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

In this generality there is no substantial difference between the attribute-model $\int_A g(p, a) d\alpha$ and the preference-model $\int_{R^n \times P} f(p, b, \preceq) d\mu$. Yet, the two models differ substantially as soon as one specifies the functional form of $g$ (e.g. linear in $a \in R^n$) and the stochastic structure of the random terms $\epsilon_a$ (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

$$F(p, \mu) = \int_{\mathbb{R}_+ \times P} f(p, b, \leq) d\mu$$

is much too detailed. The full distribution $\mu$ of agents' characteristics on $\mathbb{R}_+ \times P$ 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 $\mu_t$ describe the distribution of agents' characteristics in period $t$ and consider a time series $(\mu_t)$, $t = 1, \ldots, T$ of joint distributions of agents' characteristics. Let $B_t$ denote the mean expenditure $t$ associated with the distribution $\mu_t$.

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

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

for every $t$ 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 $\mathbb{R}_+ \times P$ 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 $\mu$ of commodity $h$.

**Problem 2:** Given a solution to Problem 1, under which condition on the evolution $(\mu_t)$ 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 $\mu_t$ 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 $\nu_t$ denote the joint distribution of expenditure and demand, i.e., $\nu_t$ is the image measure of $\mu_t$ under the mapping

$$(b, \leq) \rightarrow (b, f(p, b \leq)).$$

Figure 2

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

1) the empirical distribution function of expenditure $V_t$

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

and
2) the Engel curve of the group for every commodity \( h \), i.e.,

\[
f^\mu_h(p,b) = \int f_h(p,b, \leq) d\mu \ | \ b = E(\nu \ | \ b),
\]

where \( \mu \ | \ b \) (resp. \( \nu \ | \ b \)) denotes the conditional distribution of \( \mu \) (resp. \( \nu \)) given \( b \), i.e., \( \mu \ | \ b \) (resp. \( \nu \ | \ b \)) 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 \( \mu \) is used then I shall write \( f \) instead of \( f^\mu \).

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 \( \nu_t \). 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 \( \nu_t \) are known. I think that this is a characteristic difference between economic theory and econometrics. The theorist uses full information, i.e., the distribution \( \nu_t \), while the econometrician explicitly takes into account that one can only observe a sample distribution of \( \nu_t \). To carry out then the statistical analysis one has, unfortunately, often to make strong and unjustifiable assumptions on the distribution \( \mu \), in particular, on its support.\(^3\)\(^3\)

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.,

\[
f^\mu_h(p,b) = f(p,b).
\]

\(^3\) 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.
Indeed, in this case one obtains

\[ F(p, \mu_e) = \int_{\mathbb{R}_+} f(p, b) dV_e(b) = \check{f}(p, B_t). \]

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. Note that homothetic, but not identical preferences do not imply that the Engel curve \( f(p, \cdot) \) is linear, nor does linearity of \( f(p, \cdot) \) imply that the individual demand functions \( f(p, b, \cdot) \) are linear in \( b \).

In any case cross-section studies of family expenditures indicate clearly that Engel curves \( \check{f}(p, \cdot) \) 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 \( \check{f}(p, \cdot) \) 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 \( \check{f}(p, \cdot) \).
If we take it for granted that typically Engel curves \( f(p, \cdot) \) 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 \( (\mu_t) \). 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 \( (\mu_t) \) 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 \( (\mu_t) \). 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 \( f(p, b, \cdot) \) is on the relevant domain of the expenditure distribution, linear in \( b \) and has for all households the same slope \( S_h \), then

\[
F_h(p, \mu) = \int \int_{R^+ \times R} (f_h(p, B, \cdot) - (B - b)S_h) d\mu = \int f_h(p, B, \cdot) d\mu_{\leq},
\]

where \( \mu_{\leq} \) denotes the marginal distribution of preferences of the distribution \( \mu \). Thus, if in addition to the strong assumptions on the individual demand functions the marginal distribution \( \mu_{\leq} \) of preferences is fixed, then mean 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 \(\{b_i^t\}_{i \in G}\) is defined by

\[
V_t(b) = \frac{1}{\#G} \sum_{i \in G} \mathbb{1}(b_i^t \leq b)
\]

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:

\[
\begin{array}{c|cccccccc}
\text{mean} & 27215 & 31915 & 41262 & 57671 & 74691 & 99183 & 136550 \\
\text{median} & 24932 & 29067 & 37520 & 52985 & 68425 & 91126 & 121250 \\
\end{array}
\]

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

\[
V_t^*(b) = \frac{1}{\#G} \sum_{i \in G} \mathbb{1}(b_i^t / B_t \leq b).
\]

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:

\[
\begin{array}{cccccccc}
\text{Year} & 69 & 71 & 73 & 75 & 77 & 79 & 81 \\
\text{Gini} & 0.31 & 0.32 & 0.32 & 0.31 & 0.31 & 0.32 & 0.32 \\
\end{array}
\]

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 \(b_i^t\) 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 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. 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 \((\mu_t)\). 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

\[
\int f(p, b) dV_t(b) = \int f(p, B_t \cdot b) dV_t^*(b) \sim \int \tilde{f}(p, B_t \cdot b) dV^*(b).
\]

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.

---

Figure 7: Distribution functions for "Total Expenditure"
Figure 8: Lorenz curves for "Total Expenditure"
Figure 10: Lorenz curves for self-employed heads of household
If the distributions of expenditures of the group are given by densities \( \rho_t \), then our assumption can be expressed by

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

where \( \rho^* \) 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 unimodal. 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.

Calculated with non-parametric discrete maximum penalty likelihood estimator
3.3. The evolution ($\mu_t$) of the joint distributions of expenditures and preferences

Every assumption on the evolution of the joint distributions ($\mu_t$) 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 $\alpha_t$ 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 ($\mu_t$) 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 ($\mu_t$). 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 $\mu_t$ do not change along the evolution ($\mu_t$), i.e., there is a function $f(p, b)$ such that

$$f(p, b) = \int f(p, b, \leq) d\mu_t|b.$$ 

Assumption 2 is quite strong since in forming the average $\int f(p, b, \leq) d\mu_t|b$ we condition the distribution $\mu$ 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 $g(p, a) = \int f(p, b, \leq) d\mu_t|a$ 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., $\mu_t$ is a product measure $\mu_t = \mu_t^x \otimes \nu_t$) and if the marginal distributions $\mu_t^x$ of preferences do not change over time. Note, however, if the distributions $\mu_t$ are not product measures (i.e., the conditional distributions $\mu_t|b$ actually depend on $b$), then Assumptions 1 and 2 imply that the marginal distributions $\mu_t^x$ of preferences will change over time.
Proposition: Under Assumption 1 and 2 there exists a macro-demand function \( C(p, B) \) for the evolution \((\mu_t)\). The function \( C(\cdot, \cdot) \) is, in general, not homogeneous of degree zero in \((p, B)\).

The marginal propensity to consume commodity \( h \) is given by

\[
MPC(p, B) = \frac{1}{B} \int_{\mathbb{R}_+} \left( \frac{\partial}{\partial b} \tilde{f}(p, b) \right) \cdot b \cdot \rho_B(b) \, db.
\]

Proof. Given \( p^* \) and \( f \) we obtain

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

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

\[
\frac{\partial}{\partial B} C(p, B) = \int \frac{\partial}{\partial B} \tilde{f}(p, B \cdot b) \rho^*(b) \, db = \int \frac{\partial}{\partial B} f(p, B \cdot b) \cdot b \cdot \rho^*(b) \, db = \frac{1}{B} \int \frac{\partial}{\partial b} \tilde{f}(p, b) \cdot b \cdot \rho_B(b) \, db.
\]

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

\[
\frac{1}{B_t} \int \frac{\partial}{\partial b} f^\mu h(p, b) b \cdot \rho_{B_t}(db)
\]

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 \( B_t \), thus \( f(p, b, B_t) = f^\mu(p, b) \). Then there exists a macro-demand function \( C(p, b) \). But if one computes the derivative one obtains

\[
\frac{\partial}{\partial B} C(p, B) = \frac{1}{B} \int \left( \frac{\partial}{\partial b} \tilde{f}(p, b, B) \right) b \cdot \rho_B(b) \, db + \int \frac{\partial}{\partial B} \tilde{f}(b, B) \rho_B(b) \, db.
\]

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 \((\mu_t)\) 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 \((\mu_t)\) 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 \((\mu_t)\) by the mean expenditure \(B_t\) is to strenghten Assumption 1. (Compare E. Malinvaud 1981, Chap. 2.2, p. 75).

Let \(V_t \parallel b\) denote the conditional distribution function of expenditure given \(\leq\), i.e., the distribution function of expenditure of all households with preference relation \(\leq\). Of course, \(\leq\) can be replaced by attribute \(a\).

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

\[
V_t \parallel b = V_{\leq}^*\left(\frac{1}{B_t} \cdot b\right)
\]

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

\[
\frac{\partial}{\partial B} C(p, B) = \frac{1}{B} \int_{R^+ \times R^+} \frac{\partial}{\partial b} f(p, b, \leq) \cdot b d\mu = \frac{1}{B} \int_{R^+} b \left( \int_{R^+} \frac{\partial}{\partial b} f(p, b, \leq) d\mu | b \right) \rho_B(b) dB
\]

If the conditional distributions \(\mu | b\) 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

\[
\int_{R^+} \frac{\partial}{\partial b} f(p, b, \leq) d\mu | b \neq \frac{\partial}{\partial b} \int_{R^+} f(p, b, \leq) d\mu | b = \frac{\partial}{\partial b} f(p, b)
\]

From cross-section data we can, in principal, estimate the statistical Engel curve \(f\), hence \(\frac{\partial}{\partial b} f(p, b)\), but we cannot estimate the individual marginal propensities to consume, \(\frac{\partial}{\partial b} f(p, b, \leq)\).
or $\frac{\partial g}{\partial a_1}(p, a_1 = b, a_2 \ldots)$ 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


Stoker, T.M. (1984): Completeness, Distribution Restrictions, and the Form of Aggregate Func-


<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The European Community and the Newly Industrialized Countries</td>
<td>Jacques Pelkmans</td>
</tr>
<tr>
<td>3</td>
<td>Seasonality in Eurodollar Interest Rates</td>
<td>Aldo Rustichini</td>
</tr>
<tr>
<td>9</td>
<td>Information Processing in Futures Markets. An Essay on the Adequacy</td>
<td>Manfred E. Streit</td>
</tr>
<tr>
<td>10</td>
<td>When Workers Save and Invest: Some Kaldorian Dynamics</td>
<td>Kumaraswamy Velupillai</td>
</tr>
<tr>
<td>11</td>
<td>A Neo-Cambridge Model of Income Distribution and Unemployment</td>
<td>Kumaraswamy Velupillai</td>
</tr>
<tr>
<td>12</td>
<td>On Lindahl's Theory of Distribution</td>
<td>Guglielmo Chiodi</td>
</tr>
<tr>
<td>22</td>
<td>Paul A. Samuelson on Monetary Theory</td>
<td>Don Patinkin</td>
</tr>
<tr>
<td>23</td>
<td>Inflation and Structural Change in the Euro-Dollar Market</td>
<td>Marcello De Cecco</td>
</tr>
<tr>
<td>24</td>
<td>The Vicious/Virtuous Circle Debate in the '20s and the '70s</td>
<td>Marcello De Cecco</td>
</tr>
<tr>
<td>25</td>
<td>Modelling, Managing and Monitoring Futures Trading: Frontiers of</td>
<td>Manfred E. Streit</td>
</tr>
<tr>
<td>26</td>
<td>Economic Crisis in Eastern Europe: Prospects and Repercussions</td>
<td>Domenico Mario Nuti</td>
</tr>
<tr>
<td>34</td>
<td>Modern Macroeconomic Theory: An Overview</td>
<td>Jean-Paul Fitoussi</td>
</tr>
<tr>
<td>35</td>
<td>Economic Systems and their Regulation</td>
<td>Richard M. Goodwin</td>
</tr>
<tr>
<td>46</td>
<td>Is the Bargaining Theory Still an Effective Framework of Analysis</td>
<td>Alessandra Venturini</td>
</tr>
<tr>
<td>47</td>
<td>Schumpeter: The Man I Knew</td>
<td>Richard M. Goodwin</td>
</tr>
<tr>
<td>48</td>
<td>Politique de l'Emploi et Réduction de la Durée du Travail</td>
<td>Jean-Paul Fitoussi</td>
</tr>
<tr>
<td>56</td>
<td>Preferences in Policy Optimization and Optimal Economic Policy</td>
<td>Berc Rustem</td>
</tr>
</tbody>
</table>
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
The Effects of Worker Participation upon Productivity in French Producer Cooperatives

No. 69: Berc RUSTEM
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

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
Inter-Industry and Inter-Temporal Variations in the Effect of Trade on Industry Performance

Paul A. GEROSKI
Alexis JACQUEMIN

The International Debt Problem in the Interwar Period

84/103: Marcello DE CECCO
The Economic Performance of Producer Cooperatives within Command Economies: Evidence for the Case of Poland

84/105: Derek C. JONES
A Non-Linear Model of Fluctuations in Output in a Mixed Economy

84/111: Jean-Paul FITOUSSI
Mergers and Disequilibrium in Labour-Managed Economies

Kumaraswamy VELUPILLAI
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 Kumarswamy 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
85/187: Jesper JESPERSEN  Some Reflections 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 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.
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:
..................................................................
<table>
<thead>
<tr>
<th>No.</th>
<th>Author(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jacques Pelkmans</td>
<td>The European Community and the Newly Industrialized Countries *</td>
</tr>
<tr>
<td>2</td>
<td>Joseph H.H. Weiler</td>
<td>Supranationalism Revisited - Retrospective and Prospective. The European Communities After Thirty Years *</td>
</tr>
<tr>
<td>3</td>
<td>Aldo Rustichini</td>
<td>Seasonality in Eurodollar Interest Rates</td>
</tr>
<tr>
<td>4</td>
<td>Mauro Cappelletti/ David Golay</td>
<td>Judicial Review, Transnational and Federal: Impact on Integration</td>
</tr>
<tr>
<td>5</td>
<td>Leonard Gleske</td>
<td>The European Monetary System: Present Situation and Future Prospects *</td>
</tr>
<tr>
<td>6</td>
<td>Manfred Hinz</td>
<td>Massenkult und Todessymbolik in der national-sozialistischen Architektur *</td>
</tr>
<tr>
<td>7</td>
<td>Wilhelm Burklin</td>
<td>The &quot;Greens&quot; and the &quot;New Politics&quot;: Goodbye to the Three-Party System? *</td>
</tr>
<tr>
<td>8</td>
<td>Athanasios Moulakis</td>
<td>Unilateralism or the Shadow of Confusion *</td>
</tr>
<tr>
<td>9</td>
<td>Manfred E. Streit</td>
<td>Information Processing in Futures Markets. An Essay on the Adequacy of an Abstraction *</td>
</tr>
<tr>
<td>10</td>
<td>Kumaraswamy Vellupillai</td>
<td>When Workers Save and Invest: Some Kaldorian Dynamics *</td>
</tr>
<tr>
<td>11</td>
<td>Kumaraswamy Vellupillai</td>
<td>A Neo-Cambridge Model of Income Distribution and Unemployment *</td>
</tr>
<tr>
<td>12</td>
<td>Kumaraswamy Vellupillai/Guglielmo Chiodi</td>
<td>On Lindahl's Theory of Distribution *</td>
</tr>
<tr>
<td>13</td>
<td>Gunther Teubner</td>
<td>Reflexive Rationalitaet des Rechts *</td>
</tr>
<tr>
<td>14</td>
<td>Gunther Teubner</td>
<td>Substantive and Reflexive Elements in Modern Law *</td>
</tr>
<tr>
<td>15</td>
<td>Jens Alber</td>
<td>Some Causes and Consequences of Social Security Expenditure Development in Western Europe, 1949-1977 *</td>
</tr>
<tr>
<td>Number</td>
<td>Author(s)</td>
<td>Title</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>16</td>
<td>Ian BUDGE</td>
<td>Democratic Party Government: Formation and Functioning in Twenty-One Countries *</td>
</tr>
<tr>
<td>17</td>
<td>Hans DAALDER</td>
<td>Parties and Political Mobilization: An Initial Mapping *</td>
</tr>
<tr>
<td>18</td>
<td>Giuseppe DI PALMA</td>
<td>Party Government and Democratic Reproducibility: The Dilemma of New Democracies *</td>
</tr>
<tr>
<td>19</td>
<td>Richard S. KATZ</td>
<td>Party Government: A Rationalistic Conception *</td>
</tr>
<tr>
<td>20</td>
<td>Juerg STEINER</td>
<td>Decision Process and Policy Outcome: An Attempt to Conceptualize the Problem at the Cross-National Level *</td>
</tr>
<tr>
<td>21</td>
<td>Jens ALBER</td>
<td>The Emergence of Welfare Classes in West Germany: Theoretical Perspectives and Empirical Evidence *</td>
</tr>
<tr>
<td>22</td>
<td>Don PATINKIN</td>
<td>Paul A. Samuelson and Monetary Theory</td>
</tr>
<tr>
<td>23</td>
<td>Marcello DE CECCO</td>
<td>Inflation and Structural Change in the Euro-Dollar Market *</td>
</tr>
<tr>
<td>24</td>
<td>Marcello DE CECCO</td>
<td>The Vicious/Virtuous Circle Debate in the '20s and the '70s *</td>
</tr>
<tr>
<td>25</td>
<td>Manfred E. STREIT</td>
<td>Modelling, Managing and Monitoring Futures Trading: Frontiers of Analytical Inquiry *</td>
</tr>
<tr>
<td>26</td>
<td>Domenico Mario NUTI</td>
<td>Economic Crisis in Eastern Europe - Prospects and Repercussions</td>
</tr>
<tr>
<td>27</td>
<td>Terence C. DAINTITH</td>
<td>Legal Analysis of Economic Policy *</td>
</tr>
<tr>
<td>28</td>
<td>Frank C. CASTLES / Peter MAIR</td>
<td>Left-Right Political Scales: Some Expert Judgements *</td>
</tr>
<tr>
<td>29</td>
<td>Karl HOHMANN</td>
<td>The Ability of German Political Parties to Resolve the Given Problems: the Situation in 1982 *</td>
</tr>
<tr>
<td>30</td>
<td>Max KAASE</td>
<td>The Concept of Political Culture: Its Meaning for Comparative Political Research *</td>
</tr>
</tbody>
</table>

* : Working Paper out of print
<table>
<thead>
<tr>
<th>No.</th>
<th>Author(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>Klaus TOEPFER</td>
<td>Possibilities and Limitations of a Regional Economic Development Policy in the Federal Republic of Germany</td>
</tr>
<tr>
<td>32</td>
<td>Ronald INGLEHART</td>
<td>The Changing Structure of Political Cleavages Among West European Elites and Publics</td>
</tr>
<tr>
<td>33</td>
<td>Moshe LISSAK</td>
<td>Boundaries and Institutional Linkages Between Elites: Some Illustrations from Civil-Military Elites in Israel</td>
</tr>
<tr>
<td>34</td>
<td>Jean-Paul FITOUSSI</td>
<td>Modern Macroeconomic Theory: An Overview</td>
</tr>
<tr>
<td>35</td>
<td>Richard M. GOODWIN/</td>
<td>Economic Systems and their Regulation*</td>
</tr>
<tr>
<td></td>
<td>Kumaraswamy VELUPILLAI</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Maria MAGUIRE</td>
<td>The Growth of Income Maintenance Expenditure in Ireland, 1951-1979</td>
</tr>
<tr>
<td></td>
<td>John HIGLEY</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Dietrich HERZOG</td>
<td>New Protest Elites in the Political System of West Berlin: The Eclipse of Consensus?</td>
</tr>
<tr>
<td>39</td>
<td>Edward O. LAUMANN/</td>
<td>A Framework for Concatenated Event Analysis</td>
</tr>
<tr>
<td></td>
<td>David KNOKE</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Gwen MOOR/</td>
<td>Class and Prestige Origins in the American Elite</td>
</tr>
<tr>
<td></td>
<td>Richard D. ALBA</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Joseph H.H. WEILER</td>
<td>Israel and the Creation of a Palestine State. The Art of the Impossible and the Possible</td>
</tr>
<tr>
<td>43</td>
<td>Franz Urban PAPPI</td>
<td>Boundary Specification and Structural Models of Elite Systems: Social Circles Revisited</td>
</tr>
<tr>
<td></td>
<td>Ralf ROGOWSKI</td>
<td></td>
</tr>
</tbody>
</table>

* *Working Paper out of print
45: Alexis PAULY/
René DIEDEBERICH
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
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>Adjusting to Competitive Depression. The Case of the Reduction in Working Time</td>
<td>Jean-Paul FITOUSSI</td>
</tr>
<tr>
<td>61</td>
<td>Idéologie et Morale Bourgeoise de la Famille dans le Ménager de Paris et le Second Libro di Famiglia, de L.B. Alberti</td>
<td>Philippe LEFORT</td>
</tr>
<tr>
<td>62</td>
<td>Die Dichter und das Kritisieren</td>
<td>Peter BROCKMEIER</td>
</tr>
<tr>
<td>63</td>
<td>Law and Social Conflict</td>
<td>Hans-Martin PAWLOWSKI</td>
</tr>
<tr>
<td>64</td>
<td>Italian Monetary Policy in the 1980s</td>
<td>Marcello DE CECCO</td>
</tr>
<tr>
<td>65</td>
<td>Intraindustry Trade in Two Areas: Some Aspects of Trade Within and Outside a Custom Union</td>
<td>Gianpaolo ROSSINI</td>
</tr>
<tr>
<td>66</td>
<td>Euromarkets and Monetary Control: The Deutschemark Case</td>
<td>Wolfgang GEBAUER</td>
</tr>
<tr>
<td>67</td>
<td>On the Theory of Effective Demand under Stochastic Rationing</td>
<td>Gerd WEINRICH</td>
</tr>
<tr>
<td>68</td>
<td>The Effects of Worker Participation upon Productivity in French Producer Cooperatives</td>
<td>Saul ESTRIN/ Derek C. JONES</td>
</tr>
<tr>
<td>69</td>
<td>On the Formalization of Political Preferences: A Contribution to the Frischian Scheme</td>
<td>Berc RUSTEM Kumaraswamy VELUPILLAI</td>
</tr>
<tr>
<td>70</td>
<td>Politique et Morale</td>
<td>Werner MAIHOFER</td>
</tr>
<tr>
<td>71</td>
<td>Five Centuries of Dying in Siena: Comparison with Southern France</td>
<td>Samuel COHN</td>
</tr>
<tr>
<td>72</td>
<td>Inflation and Interest: the Fisher Theorem Revisited</td>
<td>Wolfgang GEBAUER</td>
</tr>
<tr>
<td>73</td>
<td>Rationalism and the Modern State</td>
<td>Patrick NERHOT</td>
</tr>
<tr>
<td>74</td>
<td>Democratic Theory and Neo-Corporatist Practice</td>
<td>Philippe SCHMITTER</td>
</tr>
</tbody>
</table>

*: Working Paper out of print
<table>
<thead>
<tr>
<th>No.</th>
<th>Author</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td>Richard Griffiths</td>
<td>Economic Reconstruction Policy in the Netherlands and its International Consequences, May 1945 – March 1951 *</td>
</tr>
<tr>
<td>77</td>
<td>Scott Newton</td>
<td>The 1949 Sterling Crisis and British Policy towards European Integration *</td>
</tr>
<tr>
<td>78</td>
<td>Giorgio Fodor</td>
<td>Why did Europe need a Marshall Plan in 1947? *</td>
</tr>
<tr>
<td>79</td>
<td>Philippe Mioche</td>
<td>The Origins of the Monnet Plan: How a Transitory Experiment answered to Deep-Rooted Needs</td>
</tr>
<tr>
<td>80</td>
<td>Werner Abelshauser</td>
<td>The Economic Policy of Ludwig Erhard *</td>
</tr>
<tr>
<td>81</td>
<td>Helge Pharo</td>
<td>The Domestic and International Implications of Norwegian Reconstruction *</td>
</tr>
<tr>
<td>82</td>
<td>Heiner R. Adamsen</td>
<td>Investitionspolitik in der Bundesrepublik Deutschland 1949-1951 *</td>
</tr>
<tr>
<td>83</td>
<td>Jean Bouvier</td>
<td>Le Plan Monnet et l’Economie Française 1947-1952 *</td>
</tr>
<tr>
<td>84</td>
<td>Mariuccia Salvati</td>
<td>Industrial and Economic Policy in the Italian Reconstruction *</td>
</tr>
<tr>
<td>85</td>
<td>William Diebold, Jr.</td>
<td>Trade and Payments in Western Europe in Historical Perspective: A Personal View By an Interested Party</td>
</tr>
<tr>
<td>86</td>
<td>Frances Lynch</td>
<td>French Reconstruction in a European Context</td>
</tr>
<tr>
<td>87</td>
<td>Gunther Teubner</td>
<td>Verrechtlichung. Begriffe, Merkmale, Grenzen, Auswege *</td>
</tr>
<tr>
<td>88</td>
<td>Maria Spinelli</td>
<td>Les Crimes Internationaux de l'Etat dans les Travaux de Codification de la Responsabilité des États Entrepris par les Nations Unies *</td>
</tr>
<tr>
<td>89</td>
<td>Jelle Visser</td>
<td>Dimensions of Union Growth in Postwar Western Europe</td>
</tr>
<tr>
<td>90</td>
<td>Will Bartlett</td>
<td>Unemployment, Migration and Industrialization in Yugoslavia, 1958-1982</td>
</tr>
</tbody>
</table>

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

* : Working Paper out of print
<table>
<thead>
<tr>
<th>Number</th>
<th>Author(s)</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>85/149</td>
<td>Joseph J. M. Van der Ven</td>
<td>Les droits de l'Homme: leur universalité en face de la diversité des civilisations.</td>
</tr>
<tr>
<td>85/150</td>
<td>Ralf Rogowski</td>
<td>Meso-Corporatism and Labour Conflict Resolution *</td>
</tr>
<tr>
<td>85/151</td>
<td>Jacques Genton</td>
<td>Problemes Constituionnels et Politiques poses en France par une eventuelle ratification et mise en oeuvre du projet de Traite d'Union Europeenne *</td>
</tr>
<tr>
<td>85/152</td>
<td>Marjanne de Kwasteniet</td>
<td>Education as a verzuilung phenomenon Public and independent education in the Nederlands</td>
</tr>
<tr>
<td>85/153</td>
<td>Gianfranco Pasquino and Luciano Bardi</td>
<td>The Institutions and the Process of Decision-Making in the Draft Treaty *</td>
</tr>
<tr>
<td>85/154</td>
<td>Joseph Weiler and James Modrall</td>
<td>The Creation of the Union and Its Relation to the EC Treaties *</td>
</tr>
<tr>
<td>85/155</td>
<td>François Duchene</td>
<td>Beyond the first C.A.P.</td>
</tr>
<tr>
<td>85/156</td>
<td>Domenico Mario Nuti</td>
<td>Political and Economic Fluctuations in the Socialist System</td>
</tr>
<tr>
<td>85/157</td>
<td>Gianfranco Poggi</td>
<td>Niklas Luhmann on the Welfare State and its Law *</td>
</tr>
<tr>
<td>85/158</td>
<td>Christophe Deissenberg</td>
<td>On the Determination of Macroeconomic Policies with Robust Outcome</td>
</tr>
<tr>
<td>85/159</td>
<td>Pier Paolo D'Attorre</td>
<td>ERP Aid and the Problems of Productivity in Italy during the 1950s</td>
</tr>
<tr>
<td>85/160</td>
<td>Hans-Georg Deggau</td>
<td>Ueber einige Voraussetzungen und Folgen der Verrechtlichung</td>
</tr>
<tr>
<td>85/161</td>
<td>Domenico Mario Nuti</td>
<td>Orwell's Oligarchic Collectivism as an Economic System</td>
</tr>
</tbody>
</table>

* : 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 Performance 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 Europäischen 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
Assymmetric 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