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Mergos G., Mizzi L.

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FOOD DEMAND UNDER TRANSITION: A REVIEW OF EVIDENCE AND METHODOLOGIES

George Mergos and Leonard Mizzi

ABSTRACT

This paper reviews the recent literature on food demand and welfare analysis in transition economies. Understanding the evolution of demand and obtaining estimates of food demand elasticities and of the effects on welfare of price and income changes are vital for policy makers. The purpose of the paper is to consider issues and methods available for the analysis of food consumption patterns in transition economies. A review of a number of studies reveals that economic analysis using conventional analytical methods produces meaningful results which conform with a priori expectations. However, more work is needed on data availability and reliability, mostly through the carrying out of household surveys, and on the method used for empirical analysis.

Keywords:

FOOD DEMAND ANALYSIS, TRANSITION ECONOMIES

1. Introduction

Price liberalisation has been, from the very beginning, the most difficult and painful element of change in the transition process in Central and Eastern European Countries (CEECs). As the CEECs liberalise their economies and move from a planned to a market-orientated environment, the emerging difficulties and uncertainties at macroeconomic level are substantial. However, their impact at micro-level is even stronger, affecting both welfare and people's attitudes towards reform. Since the early 1990s, relative food price changes have been very large, real incomes have declined and there has been a rise in the incidence of poverty, especially amongst wage earners and families with children. The realignment of severely distorted prices and changes in real income levels is having considerable impact, affecting the structure of food consumption and nutrition with significant implications for household welfare. Changes in food consumption patterns may also, to some extent, be attributable to the substantial increase in the range of products available and the change in the quality of the products sold. As food still constitutes a large proportion of total consumption expenditure, analysis of own-price and cross-price effects at micro-level becomes fundamental to the assessment of the impact of price policies on welfare.

Welfare comparisons between the periods before and after price liberalisation are difficult; real incomes prior to 1991/92 were overstated as money incomes were not freely convertible into goods and services and shortages did not uniformly affect the population. Food consumption declined at a considerably faster rate for the ultra-poor and, to a lesser extent, for the poor, than for those people with per capita incomes equal to the average. In Romania and Bulgaria, 20-29% of the population could be considered as ultra-poor in 1992 whilst an additional 20-39% were affected by less acute poverty (Cornia, 1994, p. 298). Slovenia constitutes a different case altogether as it is at a more advanced stage of economic development than Romania and Bulgaria and the impact of the structural adjustment process was different.

The structure of the paper is as follows; firstly, it presents a review of the studies which have analysed the impact of structural adjustment on food demand and welfare. The focus is on food demand analysis with emphasis on the estimation of demand elasticities, on poverty assessment and on considerations concerning food security. Then, alternative methodologies for the analysis and forecast of food demand, whether using a single equation framework or a systems analysis, are broadly considered and discussed; the most appropriate methodology for the transition economies is identified and described.

A consideration of the suitability of a particular methodology within the context of the macroeconomic adjustment process of the CEECs must take into account the severe data limitations and the prerequisites of flexibility and computational ease. Data availability constitutes a major constraint, since the use of time series is inappropriate. Economic time series are difficult to interpret when major structural breaks occur, unless refined techniques are introduced in order to take such instability into account. Whenever time series data are available, in the form of budget shares computed from National Accounts, their use is not recommended due to the radical change in the operation of the economy and the price system. Under the prevailing circumstances the most appropriate source for an analysis of food demand, nutrition and poverty is a *household expenditure/budgetary survey*. These surveys, which record food and non-food expenditure at the household level along with demographic composition, have been criticised as being affected by biases and reliability problems, especially in the case of Central and Eastern European countries (see Atkinson and Micklewright, 1992).

The problem of reliability can become a more severe one within the context of high own consumption and a flourishing underground economy. The next section reviews some studies that have analysed food demand under conditions of structural adjustment. Few studies have estimated price and income elasticities for food in Central and Eastern European countries. The main ones include those undertaken by Buckwell *et al.* (1993, 1994) for Bulgaria, Shaffer (1993), Banse (1993), Ratinger (1993), Safin (1993), Davis (1993, 1994a,b) for Bulgaria and Janda (1995). To our knowledge no demand elasticity estimates have been computed for either Slovenia or Romania.

2. A Review of Issues

The first two sub-sections provide a review of the literature on food demand analysis in some Central and Eastern European countries and others in which some form of structural adjustment programme is underway. Sub-section 2.3 describes some poverty and welfare issues.

2.1 Estimation of price and income elasticities in Central and Eastern European countries

The most critical issue in an analysis of the impact of price policies on demand and welfare is the estimation of price and income elasticities. Buckwell *et al.* (1993) analyse food consumption in Bulgaria, focusing on the period 1989-1992. The main source of information used is the household budget survey as it provides comparability over several years, including monthly data on income, expenditure and consumption. As no prices are collected in these surveys, unit values are estimated. Prior to the price liberalisation process, relative prices were fairly stable and unchanged. Until 1991 real prices of basic foods were falling but since then price relativities have changed. At the end of 1992, real incomes were about 30% of their value in May 1990. Most of the structural change took place during 1990-1992 (but the preliminary data analysis using data from 1990 and 1991constituted a better statistical fit). The full results of the study are reported in Davis (1993); Buckwell *et al.* (1993) only report results for four basic commodities.

Davis (1993) specifies an expenditure function of the PIGLOG form, allowing aggregation over households. A set of demand equations is derived by taking the first derivative of the expenditure function with respect to the price of each commodity. Each budget share equation can be estimated

individually or as a system.

The main objective of the study is to estimate price and income elasticities. All own-price elasticities are negative except for bread. Income elasticities are positive for all goods except bread. Cross price relationships indicate both complementary and substitution relationships. These are high between bread and meat (complementary) and cheese and meat (substitutes). Bread seems to be substituting meat in the Bulgarian diet. Buckwell *et al.* acknowledge that, whilst these estimates are the best available indicators of consumer behaviour in transition economies, they may not provide a sound basis for predicting the course of food consumption in the long run. In addition, the authors state that to predict the future course of consumption requires the forecasting of the development of prices, incomes and social variables. Whilst the price elasticities may still be relevant for the short-term, the case of incomes will be different as rapid developments in the services sector and the informal economy become more widespread. Furthermore as income distribution gaps are likely to widen, future analysis should consider differential responses amongst different social groups and across regions.

Davis (1994b) explores whether the Almost Ideal Demand System is still applicable in an economy undergoing structural change. Tests for co-integration are performed and the Augmented Dickey-Fuller (ADF) results show that both the series for logged prices and raw budget shares exhibit non-stationary behaviour. The results of applying the ADF test to the residuals of the regressions error term do not lead to the rejection of the hypothesis of non-stationarity. This does not necessarily mean that the possibility of a co-integrating vector should be rejected but rather that it is difficult to distinguish between serial correlation and a unit root (Davis, 1994b, p.8).

The model is estimated using monthly household budget survey data, monthly consumption data, expenditure and unit value data. The prices are undeflated unit values as no actual prices are collected in the survey[19]. Prices have not been deflated because the Almost Ideal Demand System price index (*Stone's index*) is used. Food is disaggregated into bread, milk, cheese, meat, other foods, including fats, sugar, vegetables, fruit and alcohol. The model also includes non-food expenditure data - clothes and shoes, home appliances, culture, hygiene, communications and transport. The composite commodity theorem assumes that if a group of prices moves in parallel, then the corresponding group of commodities can be treated as a single good.

This assumption is reasonable if relative prices are independent of the pattern of demand, at least in the long run. Davis assumes that consumers are unlikely to have detailed information or expectations about changes in relative prices when making inter-temporal choices. Thus, it may be assumed that in the future relative prices may remain unchanged, so that only variations in the expected absolute price level are accounted for.

The AIDS is consistent with the concept of long-run equilibrium because the data allows for co-integrating relationships, although tests for co-integration using a short-time frame may be inappropriate. The uncompensated demand elasticities show that milk and cheese are price elastic; cheese and meat are expenditure elastic. Compensated own-price elasticities of all the food categories are very similar to the uncompensated ones, the exception being in the case of meat. Davis acknowledges that the elasticity estimates may not provide a sound basis for predicting the course of food consumption in the long-run. However the results indicate that consumers are seeking to minimise the impact of the price rises through expenditure adjustments, consuming more traditional and cheaper foods. A major limitation of the study is that Bulgarian consumers still have

[19] In Central and Eastern European countries there is the problem of what has been termed as **suppressed inflation**. This means that prior to the price liberalisation process, inflationary pressures were contained due to queuing for products, forced substitution of demand and forced savings. Thus, in the case of Romania, for example, there was severe repressed inflation and forced savings during the period 1975-1990. Techniques have been designed to measure the extent to which the price level has been repressed due to the existence of price controls (see Feltenstein and Ha, 1993)

access to non-retail sources of supply for certain foods, which are not quantified in the survey. Other limitations of the survey relate to the assumptions of aggregation, price exogeneity and the choice of the functional form. The author states that in the absence of real income growth, the estimated price elasticities will continue to be relevant in the short to medium-term.

Shaffer (1993) analyses household expenditure patterns in Lithuania. The study employs standard econometric techniques to estimate Engel functions and the estimated parameters are used to obtain shifts expected in household expenditure in response to reforms initiated in 1990. The source of the data is a household budget survey and information at a household level is available. The use of Engel functions is appropriate as the data used is cross-sectional and price effects are absent. Income elasticities are calculated using the slope of the Engel curve. Some of the popular functions used are linear, quadratic, semi-log, double-log, log-inverse and inverse. Each functional form possesses some desirable characteristics, thus no single form has found general acceptance (Salathe, 1979). As previous studies by Prais and Houthakker (1955) indicate, the semi-log and double-log specifications are the most appropriate[20]. However, for all practical purposes and when elasticities are estimated at the sample means, estimates obtained using a double-log specification are generally sufficient (Mergos, 1991).

Nevertheless, it is acknowledged that there is a disadvantage of theoretical inconsistency when these specifications are assumed *a priori*, as neither is compatible with utility maximisation. Shaffer reports results based on the semi-log and double-log specifications. Two criticisms worth highlighting are that theoretical plausibility is compromised, and furthermore a Box-Cox transformation should have been estimated to identify the most appropriate form which best fits the data.

A multi-stage budgeting procedure is assumed and Engel functions are used to generate income elasticities calculated at different stages. The Lithuanian data set also provides the ability to partition the sample into urban and rural households. Engel functions are estimated for each expenditure group using ordinary least squares (OLS) methods. The slopes of the Engel curve for urban households are different from those of rural households. However, it cannot be concluded that the Engel curves for urban households have different slopes when compared to those of rural households in the case of **food** groups. Another weakness of the study is the lack of observations concerning the regression. Furthermore these are household group means, not individual household observations. Shaffer also calculates household size elasticities but the problem of the small data set leads to insignificant parameter estimates and unsatisfactory elasticities both for income and household size. Another method proposed for the incorporation of the size and characteristics of the household is to incorporate into the Engel function a commodity-specific adult-equivalent scale dependent upon the composition and size of each household. The main general criticism directed at this study is that it makes the very restrictive assumption that relative prices remain constant for all commodities. Thus, substitution effects are not analysed and the changes in food expenditure shown probably constiitute the lower bound of real changes..

Kazlaukas and Jensen (1994) describe the new household budgetary survey launched in Lithuania in 1992. The main objective of this survey is to monitor changes in household welfare and expenditure. The data can also be used to measure the impact of economic changes on the poorest households and evaluate different measures of poverty. The specific characteristics of households most in need of food and social assistance can be identified.

Houssain and Jensen (1994) use the 1991 Latvian household budgetary survey to examine the importance of income and household composition in food expenditure. As in the Shaffer study, Engel functions are estimated. In the case of Latvia eight different food groups - grain, fruit and vegetables,

[20] Deaton and Case (1988) recommend the following form: $w_i = a_i + \beta_i \ln PCE + u_i$ where PCE is per capita expenditure. This form, estimated at the household level, meets the most obvious requirement of an allocation model - that if applied to all goods in the budget, its predicted budget shares add up to unity.

meat and meat products, dairy products, eggs, fish, vegetable fats and confectionery items - are analysed. In addition, six age categories are included (demographics). The estimated forms of the Engel functions incorporating household composition are: (1) linear; (2) semi-log, and (3) double-log. The identification problem is resolved by making the assumption that the income scale is equal to the size of the household, N. Income elasticity estimates and adult equivalence scales are given.

2.2 Estimation of demand elasticities under structural adjustment

This sub-section reviews some studies analysing food demand in Africa and Latin America which may be useful in the estimation of demand elasticities within the context of severe structural changes in the economy. Teklu (1994) provides a very concise review of the methodologies applied in food demand analysis in sub-Saharan Africa. The author maintains that consumption from own-production tends to be high in areas where the cost of access to the food markets and production risks are high. There is an important analogy here with the situation prevailing in most Central and Eastern European countries.

Byerlee and Sain (1991) examine how structural adjustment programmes and policy reforms of the 1980s in selected Latin American countries have affected relative food prices. Prices were deflated using the National Consumer Price Index (CPI) and the rate of change in real prices over time is computed through a log-linear regression. The authors note that the way that changes in relative prices of staple foods affect the welfare of poor consumers will depend, amongst other things, on the price elasticity of substitution between staple foods. The poor tend to have a relatively high price elasticity for food staples and readily substitute between different food products. There is little doubt that the structural adjustment programmes of the 1980s have adversely affected the welfare and food security of the poor, whose real incomes have declined.

Hassan and Babu (1991) estimate a logit model and Engel curves to study the determinants of food poverty and the composition of household consumption amongst tenant farmers of the Rahad Scheme in Sudan. Data was collected from a sample of 100 households by means of survey visits. The results imply that the there is a diversity in food consumption behaviour between households at different positions on the social ladder. To measure the extent of relative poverty amongst the tenants, Gini concentration ratios are calculated. An index of absolute food poverty is measured for the same population of farmers. The logit parameters are family size, dependency ratio, source of income, wealth and farming experience.

Lorge Rogers and Lowdermilk (1991) investigate food consumption patterns of different income classes in urban areas of Mali. A household income and expenditure survey covering seven regional capitals and the capital city was undertaken between 1985-1986, and collected data on household composition, assets, and all household expenditure. Prices were calculated by estimating the price per kilo for each food purchase and computing an average price per household and per city. In order to estimate price and expenditure elasticities of demand it was necessary to group data from several cities, since the whole price variation measured was due to regional and seasonal differences.

A double-log specification is chosen, the dependent variable being the log of average per capita monthly quantity purchased of a given commodity and the independent variables being the log of average per capita monthly household expenditure, the log of price per kilo of the commodity in the dependent variable, the log of price per kilo of a related commodity and the log of members in the household. In addition, the equation includes the percentage of household members who are between 1 and 15 years of age, and a dummy variable for own consumption or otherwise. Due to data limitations it was not possible to estimate a more complex matrix of own and cross-price elasticities of demand in order to analyse patterns of substitution amongst foods.

2.3 Poverty, welfare and food security considerations

The need to measure poverty profiles becomes fundamental within transition economies. A poverty

profile shows how a measure of poverty varies across population sub-groups, such as those defined by region of residence or sector of employment (Ravaillon and Bidani, 1994). The various population groups are affected by price liberalisation in different ways, thus strong inequalities are observed when we consider the cost of transition. On-going studies for Romania and Bulgaria indicate that some of the most vulnerable groups are farmers with little or no land in the rural areas, pensioners in the urban areas and wage earners with children. The instance of poverty in the rural areas plays an extremely important role in the design and implementation of agricultural price policies because of the differential impact it has on population groups depending upon their access to land. Within this context it is important to determine the incidence, number, and features of the rural and urban poor. The main confusion lies in whether the incidence of rural poverty is declining faster than the incidence of urban poverty in middle-income countries, and whether the incidence of urban poverty is higher than that of rural poverty (Naylor and Falcon, 1995).

One of the most commonly-used methods to construct poverty lines is the caloric method which is defined as the expenditure level at which the minimum required caloric intake is typically attained by the population. Another approach is that proposed by Ravaillon (1994). Food expenditure that produces the minimum required caloric intake is obtained by scaling up the food expenditure of the representative basket by the ratio of the minimum required caloric intake to the actual caloric intake. This approach is applied by Rashid (1994). Two poverty lines are estimated for Romania - a lower and an upper one. Nearly 65% of the new poor in Romania are members of wage-earner households whilst 23% of the new poor are pensioners, with the proportion of poor increasing over the period 1989-1992. The main contributory factor has been a fall in economic activity rather than the redistribution of consumption.

Kakwani (1995) assesses income inequality in the Ukraine and attempts to measure the aggregate level of poverty and the extent to which it is affected by economic growth and income redistribution. Income distribution is analysed using the Lorenz curve and the generalized Lorenz curve and a concentration index, which is broadly similar to the Gini index. Data is obtained from Family Budget Surveys although the sampling procedure clearly leads to the bias of results where economic welfare and inequality are concerned. The results for the Ukraine show that inequality declined monotonically from 1980 to 1991 but rose between 1991 and 1992. Whilst poverty declined over the period 1980-1991, in 1992 it increased to a massive figure of 29.8% of the population. This was largely attributed to a decrease in per capita real income.

Protection of the vulnerable is an important concern when food prices are raised. Although price reforms imply the raising of prices to provide incentives to producers, the elimination of subsidies has important distributional implications and price reform adversely affects the welfare of poor urban groups. This state of affairs cannot be overlooked. An assessment of changes in living standards over time and between groups can be achieved with a simple, yet theoretically solid, methodology proposed by Sarris (1993).

Closely linked to poverty is food security at household level. Sen (1976) in a seminal paper has shown that income entitlement is the major determinant of access to food, hence food security should be examined at the household rather than the national level. Governments are always concerned with the security of supply of basic foodstuffs for the population and an important consideration in the design of agricultural price policy is the level of food prices for the population, especially under conditions of inflation. Although this is sometimes considered a supply and stock policy problem, in most cases it is household level food security which is important.

The next section reviews the most diffuse estimation techniques used in food demand analysis in economies undergoing some form of structural change.

3. Alternative Methodologies for the Analysis and Forecast of Food Demand

The alternative methodologies used to analyse food demand are described in detail in Thomas (1987), Edgerton (1991) and Laurila (1994). The main approaches are: (i) the use of simple Engel curves, and (ii) the use of a demand system.

3.1 Use of Engel curves

Thomas provides a concise review of Engel curves. He notes that in budget surveys, prices can be considered as constant, apart from variations due to social and regional factors. Hence the main emphasis is on total expenditure or income but as income is often under-reported in cross-sectional studies, total expenditure elasticities are normally estimated. The main difficulty arises with the incorporation of demographics. Estimated elasticities reflect variations in expenditure and household size and composition. Equivalent adult scales were traditionally applied but this approach is rather a crude one. Other approaches have been suggested by Pollak and Wales (1981); demographic scaling and demographic translating are the most widely used. Engel curves are generally estimated for relatively heterogeneous commodities and thus the problem of variations in the quality of commodities arises. Thomas highlights the fact that the effect of quality changes is largely eliminated by the deflation process. This issue of quality will be raised when the Deaton methodology is explained. Another issue is the choice of the functional form.

Although the Box-Cox transformation can provide some solution to this problem, in most cases and for elasticity estimates around the sample mean a double log specification is sufficient. However, when the focus is on estimating elasticities at low income levels the use of the Box-Cox transformation provides better elasticity estimates.

3.2 Use of demand systems

The LES describes expenditure on the 1^{th} commodity as a linear function of prices and total expenditure. Laraki (1990 p. 399) notes that traditionally, researchers used Linear Expenditure Systems (LESS) to compute own and cross-price elasticities (see Betancourt, 1971; Lluch, Powell and Williams, 1977). However, this system imposes the effects of substitution and assumes that all goods are normal, hence it is very restrictive. The system is also not flexible as estimated own price elasticities are always approximately proportional to total expenditure elasticities. In recent years, this model has been replaced by more flexible functional forms.

The three most common functional forms used in food and beverages are the Rotterdam model, the translog and the LA/AIDS. It is beyond the scope of this paper to discuss in detail each of these flexible functional forms (FFF). The LA/AIDS appears to be the most popular demand system, mainly due to its computational ease, but recently there has also been a resurgence in Rotterdam applications. Laurila (1994 p. 345) outlines the theoretical and practical reasons in the choice of a particular functional form. The AIDS is derived from a utility function which assumes weak separability, a less restrictive assumption than that underlying LES which assumes additivity of preferences. The AIDS is easier to estimate than the translog, especially when demographics need to be incorporated. Recent studies have compared the superiority of the LA/AIDS over the Rotterdam model; most results are not conclusive although one study rejected the LA/AIDS (Alston and Chalfant, 1993).

Edgerton (1991) outlines some empirical difficulties in demand and welfare analysis - the high degree of multicollinearity between many of the demographic variables, loss of information concerning price variation when cross-sectional studies are used (except in the case of panel data), aggregation, separability and dynamics. On the basis of the criteria laid down by Lau (1986), one of the proposed methodologies is the AIDS, or more specifically a modified version of the Deaton-Muellbauer methodology.

A description of this methodology and the data requirements follows. In Deaton (1986) the methodology used to estimate the own-price elasticity for a single good by comparing its demand to its price is described; Deaton (1987) extends the methodology to cover systems of demand functions so that cross-price elasticities are estimated and substitution patterns studied. The study by Deaton and Grimard (1992) shows how important it is to take into account substitution between different foods when considering the effect of a policy change on the welfare of the population. To estimate the model, data is required on household expenditure on a range of goods as well as on physical quantities purchased. In addition households must be geographically "clustered" within the sample. Two equations for each good are assumed.

The first is a budget share equation which is assumed to be a linear function of the logarithm of total expenditure, of the logarithms of prices of all the N goods, of a vector of household characteristics, a cluster-fixed effect and a residual. The second equation relates to the unit value of a good which is a function of the same variables that appear in the share equation with the exception of the cluster-fixed effect. The logarithm of unit value is the logarithm of quality plus the logarithm of price.

The main differences of this model to an AIDS specification are: (i) equations should not be regarded as a direct representation of preferences but simply as regression functions of budget shares and unit values conditional of the right hand side variables, (ii) zero expenditures are also included, and (iii) consumers choose both quantity and quality, that is, expenditure is a product of quantity, quality and price, and thus income and quality elasticities are estimated (see Laraki, 1990 p. 400). Deaton shows that quality effects in cross-sectional price variation result from commodity aggregation.

This approach has been widely applied by Deaton and others in the Living Standards Measurement Study (LSMS) of the World Bank (Pakistan, Indonesia, Cote d' Ivoire). Laraki (1990) discusses the methodological issues concerned with an estimation of the effects of price and tax reform in Morocco. The three criteria used to evaluate the price reform are its effects on real income across income groups, on calorie consumption, and on the government. Laraki suggests that whilst the calculation of income elasticities is generally straightforward, calculating price elasticities is not, because of the lack of reliable time series data. In the Moroccan study, Laraki uses total food consumption[21] rather than total food expenditure in order to take into account the importance of own consumption in the rural sector and the phenomenon of food transfers from the rich to the poor. The conclusion is that any food price increases provoke negative welfare effects and substantial nutrition losses for poor households, a pattern which is in accordance with the findings for Brazil, Columbia, Mexico, Sri Lanka and Uganda (see Pinstrup-Andersen, 1988). These implications can be relevant in an analysis of the emerging situation in most Central and Eastern European countries.

3.3 Projections of food demand

Estimation of price and expenditure elasticities provides the basis upon which to forecast future food demand. Knowledge of this demand is essential for both improved development planning and policy decision-making (Gougentas *et al.*, 1993). Food demand projections are often obtained by multiplying estimates of population size by estimates of per capita consumption of food commodities. Estimates of per capita consumption of food commodities are usually obtained either as future values of base-year levels using current real income growth rates and income elasticities, or as functions of own-prices and total per capita expenditure. In either case the effects of changes in the prices of substitute and complementary commodities are assumed to be zero or to cancel each other out (Gougentas *et al.*, 1993). The approach proposed by Gougentas *et al.* simulates a large number of alternative policy scenarios for Indonesia. The projections are made by combining the estimated demand response parameters from the structural model with population projections and assumptions

[21] This is defined as food expenditure plus the value of own consumption plus the net value of food gifts given and received.

about the future course of commodity prices and real total expenditure.

Projections are made at *representative household level* for budget shares, total expenditure, and growth rate in total consumption, and at a *regional level* for growth rate in both total expenditure and total consumption. The most difficult assumption is that for the expected inflation rate. For Indonesia, a constant-real prices scenario is assumed. Although such an assumption is very restrictive, little is known about the future course of commodity prices. The next section briefly reviews the main approaches used to model food demand and proposes a methodology to be applied in order to analyse demand and poverty in an economy under transition.

4. Conclusions and Recommendations

The three alternative approaches which are most suited to an analysis of food demand and welfare issues in Central and Eastern European countries are: (i) simple Engel curve analysis, (ii) the use of a demand system, such as the one applied by Davis (1994b) or Balcome and Davis (1994), and (iii) the use of the Deaton methodology, incorporating spatial variation in prices.

The basic sources of data are *Household Budgetary Surveys* and/or *Income and Expenditure Surveys*. Bouis *et al.* (1992) note that household expenditure surveys are the foundation of a large majority of food demand, nutrition and poverty studies in economic literature. It is first important to analyse the information compiled in these surveys in each of the three countries. The preliminary data tabulation/analysis should follow the approach taken by the Centre for Agricultural and Rural Development (CARD) at Iowa State University, USA, for the Baltic Reports series. Particular attention needs to be given to the CPI deflators, the magnitude of own-consumption and price differences between cities and state-owned and collective farm markets (see Gardner and Brooks, 1994). Poverty incidence should be assessed for various income groups and efforts should be made to identify the rural poor and the causes of rural poverty.

The methodology adopted by the Wye College team (Buckwell-Davis-Balcombe-Davidova) is extremely interesting although own-price and cross-price elasticities have been estimated using undeflated unit values. Within this context, the Deaton methodology is superior although a combined methodology which takes into account unit root testing **and** spatial variation of prices is too complex given constraints of time, financial and human resources. Either approach (2) or (3) is recommended.

Buckwell *et al.* (1993) infer that the development of a market economy will widen income inequality in Central and Eastern European countries. Relative food prices will be subject to further alignment as food markets establish some form of working equilibrium (Henson and Sekula, 1994). Has the equilibrium been reached? Probably not, as the food system in most of these countries is still in a state of flux. A demand systems approach is a better methodology for the monitoring of income, real purchasing power and relative price changes. A subsistence minimum needs to be established, either in terms of calorie and protein intake or real income so that it will be possible to target welfare schemes towards those groups which are most vulnerable to the economic changes. Finally, Gini coefficients should be computed and the methodology of Gougentas *et al.* applied for any food demand projections. The estimation of Engel functions could still be used as a preliminary methodology to predict how food demand may change in the foreseeable future.

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