



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

The 87th Annual Conference of the Agricultural Economics Society
(AES), Warwick University, 8 -10 April 2013

**Distributional Impacts of Food Price Changes on Romanian Households
following EU Accession**

Carmen Hubbard

Centre for Rural Economy, School of Agriculture, Food and Rural Development, Newcastle
University, UK

Email: carmen.hubbard@ncl.ac.uk

Abstract

This paper focuses on the estimation of changes in economic welfare (real income) on different Romanian socio-economic households due to changes in food prices, following the country's accession to the European Union (EU) in 2007. It updates and develops Hubbard and Thomson (2007) and identifies the winners and losers due to food price changes using the most recent, official, post accession data. The Slutsky Compensating Variation, based on construction of Laspeyres indexes, is employed for a food basket of 19 products. Given the importance of the share of self-consumption in total household consumption expenditure for almost all household types, the economic welfare impacts of food price changes (Slutsky CV) is estimated for both market (goods purchased) and non-market (goods produced and consumed within the household) components. Preliminary results show that real food prices have changed quite dramatically with some rising and others falling. The overall change in price for the 19 selected products, in real terms, is almost 20 per cent. This suggests high impacts on consumer welfare across the urban and rural households, particularly for low-income groups such as farmers, unemployed and pensioners.

Keywords: consumer welfare, food price changes, Slutsky Compensating Variation, cost of living, Romania

Introduction

This paper focuses on estimation of the welfare effects on different Romanian households following food price changes as a result of the country's accession to the European Union (EU) in 2007. It updates and develops Hubbard and Thomson (2007) and identifies the winners and losers due to food price changes using the most recent, official, post accession (2011) data. Accession to the EU had an impact on Romanian consumers' welfare as a result of integration into the Single Market and the adoption of EU policies such as the Common Agricultural Policy (CAP). The integration in the Single Market and the removal of trade barriers means that prices, at least for tradable goods and services, should converge towards EU levels. In the case of Romania, this has, in general, meant rises in food prices. Food expenditure accounts for a much higher share of total household consumption expenditure¹ as compared with most EU member states, e.g. 36% in 2011. However, this does not include (the imputed value of) self-consumption (goods produced and consumed within the household), a specific characteristic of most Romanian households, which adds another 14%.

Previous studies have demonstrated that EU accession entails higher food prices. Georgakopoulos (1990) showed that accession increased the price of food in Greece by 8.5 per cent. Renwick and Hubbard (1994) estimated the average increase in the cost of food for the UK as a result of EU membership between 2.4 per cent and 3.7 per cent of gross income. In the case of the Netherlands, Kol and Kuijpers (1996) estimated an increase in the total cost of food of about 7 per cent of average disposable income. Hubbard and Podruzsik (2006) estimated an overall increase in Hungarian food prices of 8.7 per cent, and the Office of the Committee for European Integration (2005) in Poland calculated a 7.8 per cent rise in total prices of food and non-alcoholic drinks, in the first year after accession. Nonetheless, the literature regarding distributional effects of food price changes (i.e. on different groups of consumers) following EU accession, either in established or new EU members, is sparse. Hubbard and Podruzsik (2006) estimated that the short-term impact of food price changes in Hungary varied between 0.5 per cent for the highest-deciles income group and 2 per cent for the lowest group. Hubbard and Thomson (2007) estimated the short-term economic welfare effects on a 12-fold breakdown of Romanian households, *i.e.* six socio-economic categories from urban

¹ Total household consumption expenditure includes expenditure for: food and drink, non-food products and services.

and rural areas, as a result of *assumed* food price changes. In their approach, relative Romanian food prices were aligned to relative food prices in neighbouring Hungary, who joined the EU in 2004. In addition, an 8% increase in the real level of food prices in Romania was assumed. Using Slutsky Compensating Variation, results showed that although on average the welfare loss was 2.6%, the impact was much higher for the most vulnerable groups, i.e. unemployed, pensioners and farmers, from both urban and rural areas. However, the high share of self-consumption diminished these impacts, in particular for rural households. Against this background, this paper estimates the distributional impact on the cost of living (welfare effects) on five socio-economic groups, *i.e.* employee, self-employed, farmer, unemployed and pensioner households from both urban and rural areas, following *actual* changes in food prices five years after Romania's EU accession. The paper is organised as follows. Section 2 gives a short description of data source and method. Results and some conclusions are presented in Section 3 and Section 4.

Data and Method

Data Source

The distributional analysis and estimation of the welfare effects is based on household level data provided by the 2003 and 2011 Family Budget Surveys (FBS). The FBS is a continuous official survey carried out by the Romanian National Institute of Statistics. The sample is representative at the national level, and the households are selected using a two-stage sampling method. Every year approximately 36,000 Romanian households are randomly chosen to participate in these surveys. Households are classified into seven groups according to the main occupational status declared by the head of the household (the main income contributor), *i.e.*, as employee, employer, self-employed in non-agricultural activities, farmer, unemployed, pensioner, and other categories (e.g., students, housewives). The primary information collected relates to living standards (e.g., household composition, income, expenditure structure, food consumption, imputed value of self-consumption and living conditions). Data are presented as monthly averages for all socio-economic categories of households. However, in recent years data related to 'employers' were not reported.

Slutsky's approximation

The most common method used in applied welfare economics for the estimation of gains or losses of a consumer (i.e. individual, household) due to price changes is the Marshallian consumer surplus. However, unless the income effect is negligible², this is not an exact measure of a change in consumer welfare (Hubbard and Thomson, 2007). Compensating Variation (CV) and Equivalent Variation (EV) are considered more correct theoretical measures of consumer surplus (Willig, 1976), and hence, typically viewed as alternative welfare measures of cost of living changes (Laidler, 1981). Hicks (1959:99) defined CV as “the amount of compensation, paid or received, that will leave the consumer in his initial welfare position following the change in price if he is free to buy any quantity of the commodity at the new price”. The analogous EV “is the amount of compensation, paid or received, that will leave the consumer in his subsequent welfare position in the absence of the price change if he is free to buy any quantity of the commodity at the old price”. However, Hicks's technique of analysing consumer surplus by computing CV or EV on the basis of ordinal indifference curves has been criticised for its lack of real world applicability, i.e. the deficiency of our knowledge to measure utility (indifference curves). An alternative approach to the Hicksian technique is the Slutsky approximation.

Slutsky approximated the consumer real income as the ability to buy the same bundle of goods as was bought before the price change (Laidler, 1980; Miller, 1978). This approximation does not involve reference to an indifference curve and, hence, eliminates the criticism of the Hicksian approach, making possible the empirical calculation of the amount of money (income) that keeps the consumer at a constant level of consumption (satisfaction). Consequently, Slutsky CV and EV assess to what extent the consumer's real income changes when the price of a good changes, *i.e.* the extent to which the consumer's standard of living changes when price varies. In practice, CV and EV can be easily computed by constructing index numbers (e.g. Laspeyres and Paache indexes) based on information about prices and quantities (Deaton and Muellbauer, 1980). Assuming that the relevant standard of living equates with the initial bundle of goods, the Slutsky CV is obtained by multiplying the initial

² A negligible income effect requires that the income elasticity of demand for the good in question be small or that the expenditure on the good represents a minor share of total expenditure.

money income by a ratio of the cost of obtaining a bundle of goods at the new set of price, to that of obtaining the same bundle of goods at the old set of prices (Laidler, 1981).

The model

Against this theoretical background and given that, in Romania, food expenditure still represents a large share of total household expenditure, the Slutsky CV based on Laspeyres indexes was considered as an appropriate measure for estimating the distributional welfare impacts and the identification of most vulnerable socio-economic groups to food price changes. Thus, to estimate the (minimum) amount of money that a household should pay or receive in order to remain as well off as before the food prices change (i.e. CV), a food consumption model based on Firici (2003) was constructed. For each type of household, 19 food products were selected: bread and pastries, wheat flour, rice, potatoes, sugar, vegetable oil, butter, margarine, eggs, milk, cheese, cream pork, poultry, beef, dry onion, carrots and other edible roots plants, apples and pears, and citrus fruits. These were considered as the main food intake and overall they account for more than half of total food expenditure. For each product and each household the model calculates food expenditure using 2003 quantities (consumed on average per month per person) and unit prices. These were then aggregated at the household level resulting in total food expenditure before accession. To compute total food expenditure after EU accession, real food prices were applied to the base year (2003) consumed quantities. Consumer Price Indexes (CPI) for Romania (2003 =100) were used to obtain the real prices for 2011. The following assumptions were made for each household: a) prices for all other goods (non-food and services) remain constant; and b) total income equals total expenditure (no net savings). To isolate the effect of food price changes, Laspeyres prices indexes (L) for each household (i), were calculated using total food and non-food expenditure before (2003) and after (2011) accession:

$$L_i = \frac{\sum_{1}^{19} q_{0i} P_{1i} + TNF_{0i}}{\sum_{1}^{19} q_{0i} P_{0i} + TNF_{0i}}$$

where:

- $i = 1, \dots, 10$ (type of household)
- q_0 = quantity consumed of each product before accession by the household
- p_0 and p_1 = prices before (0) and after (1) accession
- TNF_0 = total non-food expenditure before accession (assumed constant)

On the basis of these indexes and initial money income, the CV (as a measure of change in welfare) was computed as follows:

$$CV_i = Y_i \times L_i$$

where Y_i represents the disposable income (after tax) earned by household type i .

An increase, for example, in food prices, *ceteris paribus*, means that the initial bundle of goods is obtained at a higher cost, and so according to the Laspeyres index a positive CV is required because the consumer's cost of living has risen. Given the importance of self-consumption for all types of households, the CV was decomposed into demand components: market (goods purchased) and non-market (goods produced within the households). These components were estimated as following. For each product and each type of household, the model calculates market expenditure using purchased quantity for 2003 and 2011, which when deduced from total expenditures provides non-market expenditure.

Results

Estimates of food price changes per household are presented in Table 1 and Table 2. Table 1 shows, in the form of Laspeyres indexes, the changes in the cost of living for each household as a result of food price changes following accession to the European Union. Table 2 estimates the minimum amount of money that a household should receive or is willing to accept/pay, on average per month, in order to remain as well off as it was before the food price changes. The figures highlight clearly an increase in the cost of living, and thus a consumer's welfare loss, for all households.

Table 1. Change in Cost of Living based on Laspeyres Price Indexes (%), Romania

Household	Urban			Rural			Average		
	Total	Market	Non-market	Total	Market	Non-market	Total	Market	Non-market
Employees	4.2	4.5	-0.3	6.6	4.7	1.9	5.0	4.5	0.5
Self-employed	5.0	5.0	0.0	8.5	5.5	3.0	6.5	5.1	1.4
Farmers	10.2	7.1	3.1	12.1	6.3	5.8	10.4	5.9	4.3
Unemployed	7.2	7.0	0.2	9.7	6.6	3.1	8.3	6.6	1.7
Pensioners	5.9	5.9	0.0	8.6	5.7	2.9	7.1	5.7	1.4
All	5.6	5.2	0.4	7.7	4.9	2.8	6.3	5.1	1.2

Source: author's estimates

Table 2. Slutsky Compensating Variation, Romania (RON/household/month)

	Urban			Rural			All		
	Total	Market	Non-market	Total	Market	Non-market	Total	Market	Non-market
Employees	39	41	-2	50	36	14	42	37	5
Self-employed	33	33	0	46	30	16	39	31	8
Farmers	42	29	13	41	21	20	39	22	17
Unemployed	40	37	3	42	29	13	40	32	8
Pensioners	28	28	0	34	23	11	31	25	6
All	35	33	2	41	26	15	37	29	8

Source: author's estimates

On average, a Romanian household will have to increase its total disposable (net) income by 6.3% (Table 1) or RON 37 per month (Table 2) in order to be able to consume the same bundle of goods as before the food price changes. However, the change in the cost of living varies between 5% for an employee household and 10.4% for a farmer household. Clearly, farmer, unemployed and pensioner households experience a higher impact on their welfare. Their net income will need to be increased by 10.4%, 8.3% and 7.1%, respectively. The differences between urban and rural households are significant, i.e. rural households require a 7.7% increase, as compared to 5.6% for urban households. Within the socio-economic categories (Table 3), rural farmer households are the most affected; they need a 12% increase of their total net income to maintain their initial standard of living, followed by urban farmer households (10%), the rural unemployed (9.7%), and rural pensioners (8.6%). In terms of the minimum amount of money by which households would have to be compensated, the households with a higher initial share of food expenditure in total income require more.

Table 3. Romanian Consumer Households Ranked by Cost of Living Increase

	Type of households	Laspeyres index (%)	CV (RON/month)
1	Rural farmer	12.1	41
2	Urban farmer	10.2	41
3	Rural unemployed	9.7	42
4	Rural pensioner	8.6	34
5	Rural self-employed	8.5	46
6	Urban unemployed	7.2	40
7	Rural employee	6.6	50
8	Urban pensioner	5.9	28
9	Urban self-employed	5.5	33
10	Urban employee	4.2	39

Source: Table 1 and Table 2

Due to the important role played by self-consumption in total food consumption for most Romanian households, and because consumption from own-resources is less-price responsive than market demand for the same products, the ‘total’ results were disaggregated into ‘market’ and ‘non-market³’ components (Tables 1 and 2). Such a disaggregation implies that part of the change in consumer surplus remains with the ‘producers’ (Quaim, 2001). Hence, the minimum amount of money which the household requires for the effect of food price changes on real income is diminished by the amount of non-market compensating variation.

This is particularly the case for those households for which self-consumption represents a significant proportion of total consumption, e.g. urban and rural farmer households and all other rural households. The effect is captured by the share of the non-market component in the increase in the cost of living, which varies between 29% for rural employee households to 48% for rural farmer households. This is not, however, the case for urban households. With one exception (urban farmer households), the effect of the non-market component is negligible for all urban households. Moreover, urban employee households seem to benefit from a fall in prices for some products such as poultry, eggs, pork and dry onion (a Laspeyres index for non-market component of less than 1). The decomposition of the CV and Laspeyres indexes changes the household ranking presented in Table 3 as follows (Table 4).

³ This represents goods produced within the household or received/supplied from/by relatives or friends usually located in rural areas.

Table 4. Romanian Consumer Households Ranked by Increase in Market Component of Cost of Living

	Type of households	Laspeyres index (%)	CV (RON/month)
1	Urban farmer	7.1	29
2	Urban unemployed	7.0	37
3	Rural unemployed	6.6	29
4	Rural farmer	6.3	21
5	Urban pensioner	5.9	28
6	Rural pensioner	5.7	23
7	Rural self-employed	5.5	30
8	Urban self-employed	5.0	33
9	Rural employee	4.7	36
10	Urban employee	4.5	39

Source: Table 1 and Table 2

Concluding remarks

This paper focused on the estimation of changes in economic welfare (real income) on different socio-economic types of households from both urban and rural Romania, following changes in real food prices as a result of EU membership. Using the Slutsky approximation, based on construction of Laspeyres indexes, the Compensating Variation in income corresponding to real food price changes was calculated for 10 types of Romanian household, and disaggregated into market and non-market demand components. The findings show that overall food prices in Romania have increased in real terms by almost 20%, two and half times higher than assumed by Hubbard and Thomson (2007). An increase of food prices in real terms has affected welfare differently for different categories of household. A higher impact is estimated for low-income groups, in particular those groups for which food expenditure represents an important share of total income, e.g. unemployed, pensioner and farmers households. The high share of self-consumption diminishes the impacts for rural households, due to the lower price response of non-market demand, and somewhat less money compensation is required. However, the opportunity cost of the non-market component matters, and thus cannot be ignored. Hence, the decomposition of Slutsky CV reinforces the importance of self-consumption, particularly for those households in rural Romania. It can be argued that for rural households, particularly farmers, welfare loss due to food price changes may be offset by agricultural subsidies received as a result of the adoption of the CAP. This is indeed the case for less than a third of total Romanian farmers. The majority (two millions) of farmers (operating on less than 1 ha) are not actually eligible for any kind of subsidies, including direct payments. Subsistence and semi-subsistence farming

remain a major characteristic of rural Romania. The negative impacts calculated in this paper maybe counteracted by increased economic growth following accession, and thus on household income, and on demographic and social changes, aspects which are not analysed here.

References:

- Deaton, A. and Muellbauer, J. (1980). *Economics and Consumer Behaviour*. Cambridge University Press, Cambridge.
- Firici, M.C (2003) Distributional Impacts of CAP Adoption on Romania, PhD thesis, University of Aberdeen
- Georgakopoulos, T.A. (1990). The impact of accession on food prices, inflation and food consumption in Greece, *European Review of Agricultural Economics*, **17**, 485-495.
- Hicks, J.R. (1956). *A Revision of Demand Theory*. Oxford University Press, Oxford.
- Hubbard, C. and Thomson, K.J. (2007). Romania's accession to the EU: short-term welfare effects on food consumers, *Food Policy*, **32**, 128-14
- Hubbard, C. and Podruzsik, S. (2006) Distributional impacts of EU accession on Hungarian food consumers, *Studies of Agricultural Economics*, **104**, 33-43
- Institutul National de Statistica (2012) Coordonate ale nivelului de trai în România. Veniturile și consumul populației în anul 2011, Bucuresti, ISSN:2066-0383, ISSN-L:1583-2392
- Kol, J. and Kuijpers, B. (1996). The Costs of Consumers and Taxpayers of the Common Agricultural Policy of the European Union: The case of the Netherlands, Erasmus University, Rotterdam.
- Laidler, D. (1981). *Introduction to Microeconomics* (2nd edition), Camelot, Southampton.
- Miller, R.L. (1978). *Intermediate Microeconomics. Theory, Issues and Applications*, McGraw-Hill.
- Office of the Committee for European Integration (2005). *Poland in the European Union – Experiences of the First Year of Membership*, Department of Analyses and Strategies, P.P.G.K. SA, Zakład Poligrafii – Drukarnia “KART” Warsaw.
- National Institute of Statistics (2004). Co-ordinates of Living Standards in Romania: Population Income and Consumption in 2003, Bucharest.
- Renwick, A.W. and Hubbard, L.J. (1994). Distributional Aspects of the UK Costs of the Common Agricultural Policy, *Food Policy*, **19** (5), 459-468.
- Willig, R.D. (1976). Consumer's Surplus Without Apology, *American Economic Review*, **66** (4), 589-597