

INDIRECT TAX REFORM AND POVERTY IN ALBANIA

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Abstract

This paper investigates the effects and effectiveness of indirect tax reforms on poverty in Albania by using normalized consumption dominance curves method; initiated and developed by Makdissi and Wodon (2002) and improved by Duclos, Makdissi and Wodon (2008); and applying the approach on Albanian Living Standard Measurement Surveys (LSMS) data (2002 – 2008); to explain poverty reduction and life standard improvements expected from increasing tax on non-food expenditures and putting subsidies on food expenditures in Republic of Albania. The results are in favor of suggested tax reform policies.

Keywords:

Normalized Consumption Dominance Curves, Poverty Indices, Indirect Tax Reform, Social Welfare Improvement.

Chapter 1 Introduction

1.1 Prelude

All countries around the world at any stage of development; developed, developing or underdeveloped are making serious efforts to improve their economic situation features such as stability, sustainability and growth by establishing strategically helping policies. One of the most important tools for governments to enact their economic policies is through tax system which enables them to redistribute resources along with transfers and subsidies for reducing poverty and improving social welfare of citizens. Therefore, making the correct adjustments to the tax system has been proven to be of critic value. Obviously the importance of measuring the effectiveness of such adjustments makes it well worthy of further research.

According to The World Fact Book (2012) Albania has been one of the poorest countries in Europe despite considerable economic growth in recent decades. Albania achieved independence from Ottoman Empire in 1912, captured by Italy in 1939, ruled by a communist regime after WWII, allied with Soviet Union till end of fifties and with China till 1978. Early 1990, Albania returned to the free world facing with major social and economic issues: unemployment, corruption, lack of infrastructure, organized crime and political turmoil. Democracy establishment began with 1991 election and despite of some electoral fraud claims that surfaced afterwards, political system survived the collapse of pyramid scheme in 1997. Albania joined NATO in 2009 and became a candidate for European Union. The milestones of Albania challenging transition path, are political system change in 1991, pyramid crisis in 1997 and Kosovo war in 1999.

It is a well-established fact; tax is an important source of income for most governments and Albanian government is not an exemption; therefore the tax system always deserves receiving careful attention in theory and practice. However taxation effect on prices may have negative impact on poor and adverse outcomes in social justice context. Economists have considered the effects and consequences of different taxation polices in their researches in the past centuries. We apply Makdissi and Wodon (2002) and Duclos, Makdissi and Wodon (2008) methodology to identify direction of the tax

reform in Albania. In simple words, taxing a certain commodity (or a group of goods) in favor of subsidizing another commodity (or group of goods) and measuring the effect of such policy on social welfare could be considered the basis of the research plan. The methodology uses normalized consumption curves to determine an indirect tax reform's impact on social welfare has been already in use by different academic researchers and applying it on a small developing European country undoubtedly would be useful. The paper is continued with taking a look at Albania history, statistical features and LSMS description, quick look over the related work in the field and reviewing literature of normalized consumption dominance curves, the theoretical basis and key formulations along with necessary assumptions and limitations, the influential factors, parameters and variables, experimental data structure and description, simulation and modeling explanations, utilizing computational methods and procedures and obtained results and adjourned with discussions on interpretation of outcome results and their descriptive details with conclusions, comments and suggestions.

Chapter 2 Albania

2.1 Albania in a Glance

Republic of Albania is a small country in the southwestern region of the Balkan Peninsula, predominantly mountainous but flat along its coastline with the Adriatic Sea. Based on information provided by US Department of State's Background Note, Albania's area is 28,748 sq. km, the capital is Tirana (600,000; 2005 est.) and others major cities are Durres (200,000; 2005 est.), Shkoder (81,000; 2005 est.), Vlore (72,000; 2005 est.). Albania's population is estimated as (2011 est.): 2,994,667 ethnically composed of (2004 est., Government of Albania) Albanian 98.6%, Greeks 1.17% and others 0.23% (Vlachs, Roma, Serbs, Montenegrins, Macedonians, Balkan Egyptians, and Bulgarians) with growth rate equal to 0.267%. Albanian Muslims (Sunni and Bektashi) are 70% of population while Albanian Orthodox are 20%, and the rest are Roman Catholic (10%). The official language is Albanian. The health (2011 est.) indices show life expectancy for males 74.82 years and females 80.3 years; infant mortality rate equal to 14.61 deaths per 1,000 live births. Albanian Government system is parliamentary democracy following a constitution adopted by popular referendum November 28, 1998 (Independence from the Ottoman Empire dated back to November 28th, 1912). The real GDP growth is 2.8% (2009 est., International Monetary Fund); 3.3% (2009 est., Ministry of Finance); 3.4% (2011 proj., International Monetary Fund); 4.1% (2011 proj., Ministry of Finance). Inflation rate (Albanian Institute of Statistics) is 2.3% (2009 annual average); 2.8% (as of November 2010). Unemployment rate (Albanian Institute of Statistics) is 13.75% (2009); 13.52% (as of September 2010). Albanian natural resources include oil, gas, coal, iron, copper and chrome ores. Albania shares a border with Greece to the south/southeast, Macedonia to the east, Kosovo to the northeast, and Montenegro to the northwest. Western Albania lies along the Adriatic and Ionian Sea coastlines. Albania's primary seaport is Durres, which handles 90% of its maritime cargo.

World Bank's Poverty Assessment Program preliminary data shows an improvement, from 25.4% of population living below poverty line in 2002 to 12.4% in 2008 (due mainly to higher per capita GDP). GDP compounded of services (including trade, hotels, and restaurants) 21%, transport 5.5%, and communication 4.5%; agriculture 19%;

construction 14%; industry 10%; and remittances 9%.The official unemployment rate is 13.52%, with almost 60% of the workforce employed in the agricultural.

2.2 Poverty in Albania

The following map provided by Center for International Earth Science Information Network (CIESIN) Columbia University (2005);

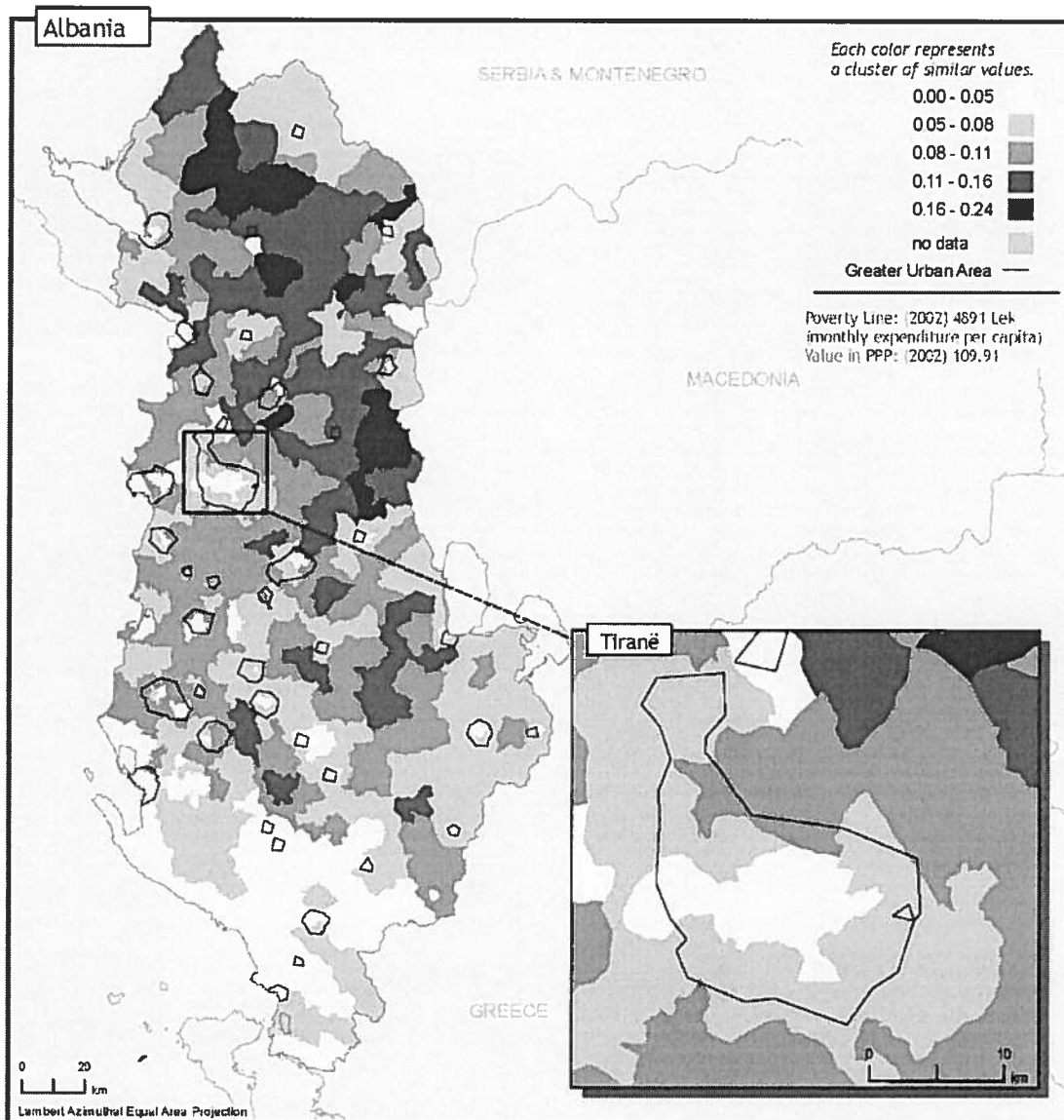


Figure 1 – Albania Measure of poverty
(© Columbia University, 2005)

In the map, Foster, Greer and Thorbecke (1984) index FGT(1) is used as per capita measure of the shortfall in the welfare of the poor from the poverty line, expressed as a ratio of the poverty line. World Bank's webpage for Albany (<http://www.worldbank.org.al>) marks spatial poverty especially in rural mountain areas. Poverty headcount in rural areas is 66 percent higher than in Tirana, and 50 percent higher than in other urban areas. Per capita consumption in rural areas, at 7,224 Leks, is about 80% of the consumption levels in urban areas.

The income data of 1996 and its poverty line shows that almost one third of the rural population is poor (in addition to accompanying features of lower than poverty line income such as limited access to infrastructure, education and health services) while the poverty in urban areas is half that level. World Bank poverty assessment for Albania (2007) states due to strong economic growth and large inflows of remittances, percentage of the population below the poverty line of US\$50 per person per month (4891 Lek in 2002 prices; US\$1 = 92.63Lek) fell from 25.4 to 18.5 percent between 2002 and 2005.

Initially, it was in a similar document of World Bank (Albania Poverty Assessment) dated November 2003, that an absolute poverty line based on nationally representative household level expenditure (consumption bundle of a sample reference population converted to a monetary measure using the cost-of-basic-needs methodology) data ever estimated for Albania is used for the first time. This resulted in the choice of an absolute poverty line of 4,891 Leks per capita per month.

Chapter 3 Theoretical Framework

3.1 Background

Martin Feldstein (1976) found optimal tax level non practical due to procedural slow pace. Ahmad and Stern (1984) worked on marginal tax reform on commodities to be revenue-neutral and welfare-improving. Yitzhaki and Slemrod (1991) initiated Daltonian reforms (2nd order stochastic dominance) to be improved later by Mayshar and Yitzhaki (1995) and form Dalton-Improving tax reforms. Atkinson (1970 and 1987) clearly pointed out the rich literature on measuring poverty, inequality and social welfare separately, but not together.

Makdissi and Wodon (2002) initiated comparison of consumption dominance curves and extended it to higher orders of stochastic dominance. Methodology of normalized consumption dominance curves then improved by Duclos, Makdissi and Wodon (2008) and applied to data of different countries around the world.

3.2 Brief Methodology Description

Two groups of food and non-food consumption dominance curves will be compared in whole and in part (such as housing, health, utilities and education) along with comparison between non-food group members while critical poverty lines are also considered and budget neutrality condition kept.

3.3 *Mathematical Foundation*

Refreshing definitions and mathematical formulations of the concept may begin with additive and classes of aggregated poverty indices;

Additive poverty index $P(z)$ and poverty line z

$$P(z) = \int_0^a p(y, z) dF(y) , \quad p(y, z) = 0 \quad \forall y > z$$

z : poverty line

y : consumer's real income

$p(y, z)$: consumer's contribution to total poverty (having the real income of y)

$F(y)$: cumulative distribution of real incomes ($0 < y < a$)

Aggregated poverty indices of class s and $P(z) \in \Pi^s$

$$\Pi^s(z) = \left\{ P(z) \left(\begin{array}{l} p(y, z) = 0 \quad y > z, p(y, z) \in C^s(z) \\ (-1)^i \frac{\partial^i p(y, z)}{\partial y^i} \geq 0 \quad i = 1, 2, 3, \dots, s \\ p^{(i)}(y, z) = 0 \quad i = 1, 2, 3, \dots, s-2 \vee s \geq 2 \end{array} \right) \right\}$$

$\hat{C}^s(z)$: s -times piecewise differentiable functions set. For Π^s at $s=1$ we have Paretian class of indices in which increasing income of one individual person without any changes for others improves poverty and symmetrically interchangeable without causing any difference in poverty or social welfare indices. The first order welfare improving tax reform is named after Jan Pen (1971). For $s=2$ there are Pigou – Dalton transfers (Pigou, 1912 and Dalton, 1920) or mean preserving transfer from income of a higher order person to lower order person's income that improves poverty and social welfare and Dalton-improving tax reforms (Mayshar and Yitzhaki, 1995). The third order ($s=3$) denotes the class of combinational transfers in favor of Pigou – Dalton transfers in lower parts of distribution along with reverse transfers in upper parts of distribution without any change in variance, resulting in Kolm improving tax reforms. For higher orders of s , Fishburn and Willig (1984) principle considers contributions made by more transfers in lower part of distribution.

FGT poverty indices (Foster, Greer and Thorbecke, 1984)

$$FGT^\alpha(z) = \int_0^z \left(\frac{z-y}{z} \right)^\alpha dF(y), \alpha \geq 0 \text{ and } FGT^\alpha(z) \subset \Pi^s(z), \forall \alpha \geq s-1$$

Social welfare functions $U = \int_0^a u(y) dF(y)$ and class s social welfare indices

$$\Omega^s = \{U \mid u(y) \in C^s(\infty), (-1)^{i+1} u^{(i)}(y) \geq 0, \forall i = 1, 2, 3, \dots, s \}$$

3.4 Model Development

Having $dp(y, z) = p_i^{(1)}(y, z) \frac{\partial y}{\partial t_i} + p_j^{(1)}(y, z) \frac{\partial y}{\partial t_j}$ and assuming the price of each

good is producer price while considering the changes in price of any good k merely caused by changes in taxes over it i.e. $dq_k = dt_k$; during a tax reform for a consumer with real income equal to $y^R = \rho(y, \alpha, q, q^R)$ and consumption of good k as $x_k = \rho(y, \alpha, q)$, Roy's identity shows (Besley and Kanbur, 1988) the effect of marginal change of tax rate on consumer's welfare:

$$\left. \frac{\partial \rho(y, \alpha, q, q^R)}{\partial t_k} \right|_{q=q^R} = -x_k(y, \alpha, q^R), \text{ and}$$

α : consumer's preference parameter

q^R : vector of prices before tax reform

q : vector of prices after tax reform

y^R : consumer's real income before tax reform

y : consumer's real income after tax reform

Government's revenue from tax is $R(q) = \sum_{k=1}^K t_k x_k(q)$ and budget neutrality

$$\text{suggests } dR(q) = \left(X_i(q) + \sum_{k=1}^K \frac{\partial X_k(q)}{\partial q_i} \right) dq_i + \left(X_j(q) + \sum_{k=1}^K \frac{\partial X_k(q)}{\partial q_j} \right) dq_j = 0$$

Consequently $dq_j = \left[- \left(X_i(q) + \sum_{k=1}^K \frac{\partial X_k(q)}{\partial q_i} \right) / \left(X_j(q) + \sum_{k=1}^K \frac{\partial X_k(q)}{\partial q_j} \right) \right] dq_i$, that

leads to the idea of γ ; the economic efficiency cost of taxing good j relative to taxing

good i ; derived from $dq_j = -\gamma \left(\frac{X_i}{X_j} \right) dq_i$ and defined as

$$\gamma = \frac{X_i(q) + \sum_{k=1}^K \frac{\partial X_k(q)}{\partial q_i}}{X_i} \bigg/ \frac{X_j(q) + \sum_{k=1}^K \frac{\partial X_k(q)}{\partial q_j}}{X_j}, \text{ while higher values of } \gamma \text{ show less}$$

efficiency.

Yitzhaki and Thirsk (1990) as well as Yitzhaki and Slemrod (1991) are suggesting for $\gamma \geq 1$ the second order dominance may not be held due to the high deadweight loss just in case.

Since the income distribution F is continuous, non-decreasing in additive poverty indices $p_F(z) = \int_0^a p(y, z) dF(y)$, we have $\begin{cases} p(y, z) \geq 0, \forall y \leq z \\ p(y, z) = 0, \forall y > z \end{cases}$

The sets of stochastic dominance curves considered by Duclos, Makdissi and Wodon (2008) for two different income distribution functions of $F(y)$ and $G(y)$ to compare poverty and social welfare are:

$$D_F^1(y) = F(y) \text{ and } D_F^s(y) = \int_0^y D_F^{s-1}(u) du, \forall s \geq 2$$

$$D_G^1(y) = G(y) \text{ and } D_G^s(y) = \int_0^y D_G^{s-1}(u) du, \forall s \geq 2$$

They made a proposition that the necessary and sufficient condition for no increase in poverty, going from income distribution F to G is having the difference in additive poverty indices to be negative or none. In other words the ΔP_{FG} has to be

$$\Delta P_{FG} = \int_0^a p(y, z) dG(y) - \int_0^a p(y, z) dF(y) \leq 0 \text{ in order to have no increase in poverty. Their}$$

necessary and sufficient condition to keep the above inequality true is $D_F^s(y) - D_G^s \geq 0, \forall y \leq z^+$ when $z \in [0, z^+]$ and $\forall p \in \Pi^s$

They suggest with a similar analogy for the social welfare which is measured by

$$U_F = \int_0^a u(y) dF(y) \text{ in } \Omega^s = \{U \mid u(y) \in C^s(\infty), (-1)^{i+1} u^{(i)}(y) \geq 0, \forall i = 1, 2, 3, \dots, s\} \text{ that going}$$

from income distribution F to G won't decrease social welfare if ΔU_{FG} remain positive

$$\Delta U_{FG} = \int_0^a u(y) dG(y) - \int_0^a u(y) dF(y) \geq 0 \text{ for } \forall U \in \Omega.$$

Their proposed sufficient condition for non-decreasing social welfare is

$$\begin{cases} D_F^s(y) - D_G^s(y) \geq 0, \forall y \in [0, a], s < 3 \\ D_F^s(y) - D_G^s(y) \geq 0, \forall i \in \{2, \dots, s-1\}, s \geq 3 \end{cases}$$

If $z = a$ when $s = 1, 2$ the conditions for reducing poverty and social welfare improvement are identical. Based on Fishburn (1980) notation, Duclos, Makdissi and Wodon (2008) considered dominance curves as sum of powers of poverty gaps

$$D^s(z) = \frac{1}{(s-1)!} \int_0^z (z-y)^{(s-1)} dF(y) \text{ and measuring the effect of tax over good } k$$

$$\left. \frac{\partial D^s(z)}{\partial t_k} \right|_{q=q^R} = \begin{cases} x_k(z, q^R f(z)) \wedge s = 1 \\ \frac{1}{(s-2)!} \int_0^z x_k(y, q^R) (z-y)^{(s-2)} dF(y) \wedge s = 2, 3, K \end{cases}$$

where $f(y)$ is income density function and the consumption dominance curves as

$$CD_k^s(z) = \frac{\partial D^s(z)}{\partial t_k}, s = 1, 2, K \text{ with normalized form over average consumption of good } k$$

$$\overline{CD}_k^s(z) = \frac{CD_k^s(z)}{X_k(q)}.$$

Duclos, Makdissi and Wodon (2008) based on their theorems set the necessary condition for a marginal tax reform to be weakly poverty improving of s -order as $\overline{CD}_i^s(y) - \gamma \overline{CD}_j^s(y) \geq 0, \forall y, z \in [0, z^*]$ for $s = 1, 2, K$ and to be weakly social welfare improving of s -order as $\overline{CD}_i^s(y) - \gamma \overline{CD}_j^s(y) \geq 0, \forall y \in [0, \infty)$ for $s = 1, 2, \dots$

To utilize consumption dominance curves for evaluating the effects of indirect tax reforms, Duclos, Makdissi and Wodon (2008) indicated the changes in vector of goods prices into consideration and set the pre-reform vector as the reference and introduced two theorems.

Theorem 1: For a marginal tax reform $dq_j = -\gamma \left(\frac{X_i}{X_j} \right) dq_i > 0$, a necessary and sufficient condition to improve poverty of order s is to weakly decrease poverty for $\forall P(z) \in \Pi^s(z), \forall z \in [0, z^+], s \in \{1, 2, 3, \dots\}$ and for a given $s \in \{1, 2, 3, \dots\}$ is $\overline{CD}_i^s(y) - \gamma \overline{CD}_j^s(y) \geq 0, \forall y \in [0, z^+]$

Theorem 2: For a marginal tax reform $dq_j = -\gamma \left(\frac{X_i}{X_j} \right) dq_i > 0$, a sufficient condition to improve social welfare of order s is to weakly increase social welfare for $\forall U \in \Omega^s$ where $\Omega^s = \{U \mid u(y) \in C^s(\infty), (-1)^{i+1} u^{(i)}(y) \geq 0, \forall i = 1, 2, 3, \dots, s\}$ and for a given $s \in \{1, 2, 3, \dots\}$ is $\overline{CD}_i^s(y) - \gamma \overline{CD}_j^s(y) \geq 0, \forall y \in [0, +\infty)$.

Chapter 4 Analysis and Discussions

4.1 *Data Description*

Indications of growth and improving public welfare show considerable progress in Albania. The government Growth and Poverty Reduction Strategy (GPRS) was not possible without accurate information and data that makes design, implementation and evaluation of economic and social programs in Albania possible. Major household level surveys contributed to this purpose began with Living Conditions Survey (LCS - 1998) and the Household Budget Survey (HBS - 2000) both carried out by the Albanian Institute of Statistics (INSTAT). Furthermore Albanian government established its own monitoring system (2001-2006) including the following data collection instruments: Population and Housing Census; Living Standards Measurement Surveys every 3 years, and annual panel surveys. Living Standard Measurement Surveys (LSMS) in Albania (2002 – 2008) is the data set used for analysis. After few conversion and adjustments the raw data is ready for simulation.

4.2 *Empirical Data Set*

Grosh and Glewwe (1995) have explained in detail how World Bank established the Living Standards Measurement Study (LSMS) in 1980 to develop improvements in collecting methods and using household data in policy making decisions; evaluation of life standard levels and effects of government policies as well an integrated platform to facilitate collaboration of survey statisticians, analysts, and policymakers. LSMS has two distinctive features in comparison with other surveys:

- Multi-dimensional questionnaires covering multiple aspects of household welfare and behavior (consumption, income, savings, employment, health, education, fertility, nutrition, housing and migration...)
- Extensive quality control features (screening questions in questionnaire format, organized of fieldwork, limited sample size of maximum 5000 households...)

Both features significantly raise the quality of the data in addition to short turnaround times. Albania LSMS modules include metadata, household roster, dwelling and utilities, education, health, employment, transfers and social assistance, other income sources, and

consumption. The data structure is explained in Albania LSMS Basic Information Document provide by The World Bank and Albania Institute of Statistics (INSTAT) Besides The following documents form the complete documentation available on the Albania LSMS.

1. Questionnaires

- Household Questionnaire
- Food diary (booklet) (Albanian and English)
- Community and price questionnaire
- Agriculture questionnaire

2. Training manuals

- Enumerator and supervisor manual (Albanian only)
- Community Questionnaire Supervisor Instructions (Albanian Only)
- Agricultural Manual (Albanian only)

3. Other documents

- Basic information document (English only)
- Sampling design and implementation reports [Annex 5 to the above document] (English only)

Albania has 12 Prefectures (Prefekturat), each contains Districts (Rrethet) which include Cities (Qyteti) and Communes (Komunat). The rural villages and small cities are all parts of Communes and several enumeration areas (EA) are considered for census purposes on household units (HU). The LSMS sample size is 450 EA each covering 8 HU to make a total sample of 3600 HU. Sampling frame has three regions (strata):

- Coastal Area
- Central Area
- Mountain Area

A separate stratum is considered for Tirana region.

The structure is summarized in a table as follows:

Domain	Total Enumeration Areas in the Frame	Total Enumeration Areas in the Sample	Total Household Units in the Sample
Coastal Area	2704	125	1000
Major Cities	715	30	240
Other Urban	510	30	240
Rural	1479	65	520
Central Area	3858	125	1000
Major Cities	800	30	320
Other Urban	573	20	160
Rural	2485	65	520
Mountain Area	830	125	1000
Other Urban	172	50	400
Rural	658	75	600
Tirana (urban and other)	1075	75	600
Total	8467 EAs	450 EAs	3600 HUs

Table 1 – Distribution of Enumeration Areas and Sample Size

4.2.1 Brief Results

Features of poverty in Albania are reflected in the results as expected; FGT

poverty indices are suitable measures to consider: $FGT^\alpha = \sum_{i=1}^q \left(\frac{z-y}{z} \right)^\alpha$.

Poverty index	α	Estimate	Std. Err	95% Confidence Interval	
				Lower Bound	Upper Bound
FGT^α	0	0.137988	0.005719	0.126776	0.1492
	1	0.027921	0.001478	0.025023	0.030819
	2	0.008725	0.000616	0.007518	0.009932
	3	0.003345	0.000305	0.002746	0.003943

Table 2 – Estimates of FGT Poverty Indices with Official Poverty Line $z=4891$ Leks

At $\alpha = 0$ we have simple headcount that shows around 14% of entire population is living below official poverty line, while for $\alpha > 0$ in addition to existence of poverty its depth also has been taken into account as poverty gap and for $\alpha > 1$ the indices are sensitive to inequalities too.

A short look at income distribution among different types of families and their budgeting schedule for consumption various groups of goods and services would help to depict a better image.

Household Type	Households	Persons	Total Annual Income		Annual Income in Leks	
			In thousand Leks	In %	Household	Per capita
Single person	44293.81	44293.81	7898049.12	2.293451	178310.5	178310.5
Couple without children	111401.1	222802.1	37630085.3	10.9271	337789.3	168894.7
Couple with one child	68930.17	206790.5	34949871	10.14881	507033	169011
Couple with two children	139468.4	557873.8	72540777.3	21.06453	520123.2	130030.8
Couple with 3+ children	105751.4	569982.4	43139218.8	12.52685	407930.7	77559.3
One parent family	89565.13	291995.7	38873421.2	11.28814	434024.1	138420.5
Other family	193006.5	1061114	109342590	31.75112	566522.8	109705.1
Total	752416.5	2954852	344374012	100	457690.7	130608.1

Table 3 – Income Distribution among Household Types

The proportions of income assigned to different consumption groups based on income quintiles are also interesting enough to review; the following table captured the featured budgeting of different quintiles. Very expectedly, about one half of the expenditure is assigned to food by every quintile; highest percentage by poorest and lowest percentage by richest quintile. Housing takes the second place in budgets for all quintiles except for richest, that the place is taken by clothing. The third highest budget line of households however changes over quintiles from furnishing for the poorest to clothing for the middles and housing for the richest quintile. The rise of the share of miscellaneous goods and services from poorest to richest quintiles shows a steady and continuous trend.

Expenditure groups	Income Quintiles				
	Poorest	II	III	IV	Richest
Food and non-alcoholic beverages	61.07	55.96	53.21	48.77	40.12
Alcoholic beverages, Tobacco and narcotics	4.11	4.98	4.57	4.59	3.98
Clothing and footwear	4.62	5.67	6.09	6.41	6.53
Housing excluded imputed rents	9.12	8.27	8.18	7.52	6.42
Furnishing, equipment and routine maintenance of the house	5.29	5.36	5.89	5.72	6.21
Health	3.68	4.46	4.04	4.05	4.13
Transport	2.86	3.76	4.69	5.90	8.29
Communication	2.58	2.76	2.82	3.09	3.03
Recreation and culture	1.69	2.01	2.37	3.00	4.01
Education	0.18	0.51	0.78	1.13	2.99
Restaurants and hotels	1.29	1.91	2.65	4.52	7.69
Miscellaneous goods and services	3.52	4.36	4.71	5.31	6.59
Total	100	100	100	100	100

Table 4 – Shares of Total Expenditure by Income Quintiles (in percent)

Following are the graphical results of comparison between normalized consumption dominance curves for food and non-food in years 2005 and 2002:

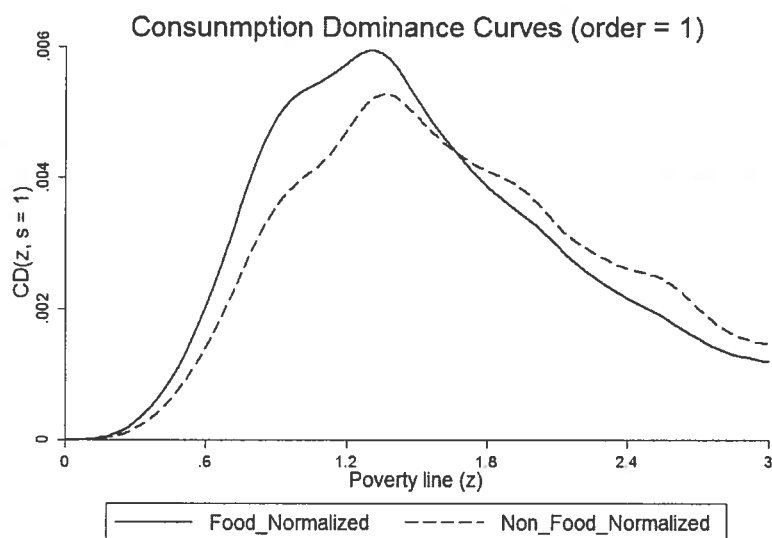


Figure 2 – Normalized Consumption Curves for food and non-food s=1 (2002)

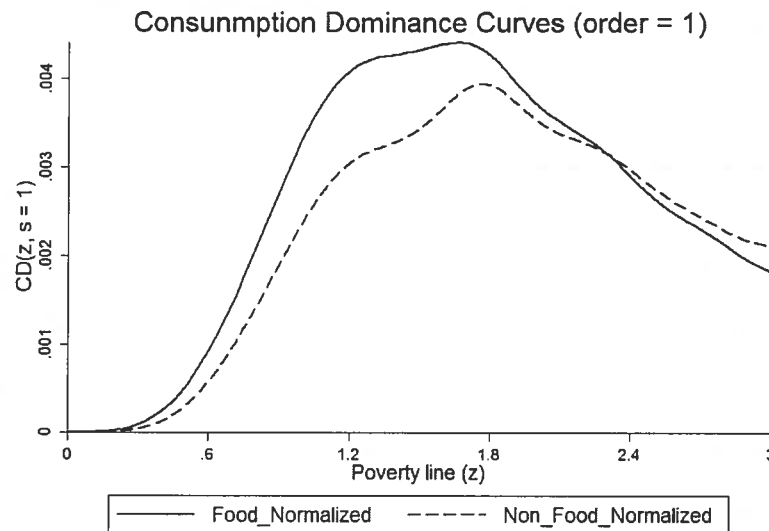


Figure 3 – Normalized Consumption Curves for food and non-food s=1 (2005)

In comparison the critical value of $z^1(\gamma = 1)$ raised from 1.67 to 2.3 times poverty line while the food CD curve stays above non-food CD curve for all z values smaller than or equal to poverty line. This improvement is observable in other compared groups.

4.2.2 Complete Results

Complete graphical results as well as critical values tables and their standard errors and 95% confidence intervals are completely offered in last chapter, while their important features are discussed in the next chapter.

4.3 Discussions

The LSMS data set of 2002 has covered 3600 households that very slightly increased to 3640 for 2005. The poverty line has remained unchanged at level of 4,891 Leks per capita per month and all values are normalized based on it, so focus has been on the $z \in [1,3]$, meanwhile to find critical values, investigation is extended up to a range of $[0,55)$ to raise robustness. Although the time period between the two surveys is not long due to ongoing reforms in Albania the results show considerable changes which make the analysis more interesting. The attention is paid to comparison between consumption dominance curves of food and non-food, durables, education clothing, alcohol and

utilities for three orders of dominance ($s = 1, 2, 3$) and economic efficiency cost ($\gamma = 0.5, 1, 2$).

4.3.1 Food and Non-Food Consumption Dominance Curves 2002

The first order ($s = 1$) consumption dominance curve of food stays over non-food for all the values of $z \leq 1.6655$ when $\gamma = 1$ (Figure 4). For 95% confidence interval, z stays between $(1.6655 - 1.98 \times 0.0728346)$ and $(1.6655 + 1.98 \times 0.0728346)$ or within the range of $[1.522744, 1.808256]$. Therefore increasing the tax over non-food in favor of food will be first order poverty improving up to the level of 1.6655 times of current official poverty line $z \in [0, 1.6655]$ and for all poverty indices belonging to Π^1 ; while due to the curves intersection, it is not first order social welfare improving according to Pen (1971). The consumption dominance curves intersecting each other for economic efficiency cost of $\gamma = 0.5$ and $\gamma = 1.5$ at critical values of z equal to $z = 5.4658$ and $z = 0.3719$ respectively (Table 5).

In higher orders of dominance ($s = 2, 3$) the consumption dominance curves of food and non-food do not intersect for economic efficiency cost of $\gamma = 0.5, 1$ (Figures 5 – 6); which makes the tax reform poverty improving of second and third order for all the poverty lines $z \in [0, \infty)$, and social welfare improving of Dalton (1920) and Kolm (1976) types respectively for all welfare indices belonging to Ω^2, Ω^3 .

However if the economic efficiency cost raise to $\gamma = 1.5$, the curves intersect at $z = 0.4019$ for $s = 2$ and at $z = 0.6601$ for $s = 3$ in a similar fashion described for $\gamma = 1$. Therefore all poverty indices of Π^2 are reducing for $z \in [0, 0.4019]$ and all the indices of Π^3 are poverty improving for $z \in [0, 0.6601]$ without expecting social welfare improvement necessarily.

4.3.2 Food and Alcohol Consumption Dominance Curves 2002

The tax reform by taxing alcohol in favor of food is always poverty improving for $z \in [0, \infty)$ and any poverty index belonging to Π^1, Π^2, Π^3 (order of dominance $s = 1, 2, 3$) if economic cost efficiency remains low as $\gamma = 0.5$; the tax reform would be also Pen,

Dalton and Kolm social welfare improving for all the indices belonging to $\Omega^1, \Omega^2, \Omega^3$. However, at $\gamma = 1$; having no intersection between the consumption dominance curves; the tax reform is second and third order poverty improving for all indices belonging to Π^2, Π^3 and social welfare improving for orders $s = 2, 3$ (Figures 8 – 9). There is curve intersection for $\gamma = 1$ and $s = 1$ at $z = 1.2789$ (Figure 7) so all poverty indices belonging to Π^1 are reducing for $z \in [0, 1.2789]$. The curves intersection and lack of throughout poverty improvement and social welfare improvement certainty is the situation for $\gamma = 1.5$ (Table 6). All the poverty indices belonging to Π^1 are reducing for $z \in [0, 0.3536]$, any the poverty index belonging to Π^2 is reducing for $z \in [0, 0.5572]$ and all every poverty indices belonging to Π^3 are reducing for $z \in [0, 0.6611]$, while no social welfare improvement is necessarily expected.

4.3.3 Food and Durables Consumption Dominance Curves 2002

Taxing durables in favor of food could be described pretty similar to the tax reform for food and non-food; i.e. curves intersection for $s = 1$ and $\gamma = 0.5, 1, 1.5$ (Table 7) while in higher orders of dominance ($s = 2, 3$) the intersection happens only if economic efficiency cost raise to $\gamma = 1.5$ (Figures 13 – 15). Therefore at $\gamma = 1.5$ all the poverty indices belonging to Π^1, Π^2, Π^3 are reducing for $z \in [0, 0.89242]$, $z \in [0, 1.2815]$ and $z \in [0, 1.6479]$ respectively without sufficient evidence of social improvement. The poverty indices belonging to Π^1 are reducing for $\gamma = 0.5$ and $z \in [0, 5.8505]$ as well as $\gamma = 1$ and $z \in [0, 1.7655]$, without proven social welfare improvement. At $\gamma = 0.5, 1$ all the poverty indices belonging to Π^2, Π^3 are reducing for $z \in [0, \infty)$ and social welfare improving for all the indices belonging to Ω^2, Ω^3 .

4.3.4 Food and Education Consumption Dominance Curves 2002

The consumption dominance curve of education always stays above food for order of dominances $s = 2, 3$, $\gamma = 0.5, 1.5$, therefore all the poverty indices belonging to Π^2, Π^3 are reducing for $z \in [0, \infty)$ and all social welfare indices belonging to Ω^2, Ω^3 are Dalton and Kolm improving respectively (Figures 16 – 18). However, at $\gamma = 1$ no social

welfare improving for any order of dominance $s = 1,2,3$ is proven and poverty improving for all the indices belonging to Π^1, Π^2, Π^3 would be possible for $z \in [0,0.5883]$, $z \in [0,0.7582]$ and $z \in [0,0.4231]$ respectively (Table 8). Meanwhile, for $\gamma = 0.5$ all the poverty indices belonging to Π^1 are reducing for $z \in [0,3.6311]$ and with economic efficiency cost $\gamma = 1.5$ every poverty index belonging to Π^1 is reducing for $z \in [0,4.4593]$. At economic efficiency costs of $\gamma = 0.5$ and $\gamma = 1.5$ social welfare improvement for indices belonging to Ω^1 are not proven.

4.3.5 Food and Clothing Consumption Dominance Curves 2002

The food and clothing tax reform in favor of food has no social welfare improvement at economic efficiency cost of $\gamma = 1$ (Figures 10 – 12) for any social welfare index belonging to $\Omega^1, \Omega^2, \Omega^3$ and orders $s = 1,2,3$; while all the poverty indices belonging to Π^1, Π^2, Π^3 are reducing for $z \in [0,1.5123]$, $z \in [0,4.2427]$ and $z \in [0,0.5965]$ respectively (Table 9). It is poverty improving and social welfare improving of second and third order at economic efficiency costs of $\gamma = 0.5$ and $\gamma = 1.5$, for all poverty indices belonging to Π^1, Π^2, Π^3 and every social welfare index belonging to $\Omega^1, \Omega^2, \Omega^3$. At the same economic efficiency costs of $\gamma = 0.5$ and $\gamma = 1.5$, and for $s = 1$, all poverty indices belonging to Π^1 are reducing for $z \in [0,6.4965]$ and $z \in [0,4.5383]$ respectively.

4.3.6 Food and Non-Food Consumption Dominance Curves 2005

In comparison with the tax reform in favor of food vs. non-food in 2002, there exist resemblance to 2002 curves (Figures 19 – 21); the curves have made an additional intersection for $s = 2$ and $\gamma = 1$ at $z = 14.5707$. Besides, the other intersections are at higher critical values of z as shown in Table 10. Therefore the only throughout poverty and social welfare improving reforms are happening for $s = 2$ at $\gamma = 0.5$ and for $s = 3$ at $\gamma = 0.5, 1$, so at economic cost efficiency of $\gamma = 0.5$ all the poverty indices belonging to Π^2, Π^3 are reducing and every social welfare index belonging to Ω^2, Ω^3 show improvement for $z \in [0, \infty)$. Also at economic cost efficiency of $\gamma = 1$ all

the poverty indices belonging to Π^3 are reducing and every social welfare index belonging to Ω^3 show improvement for $z \in [0, \infty)$. The social welfare improvement is not proven for other values of γ and orders of s in current situation of tax reform.

Besides, all poverty indices belonging to Π^1 are reducing for $z \in [0, 7.0127]$, $z \in [0, 2.294]$ and $z \in [0, 0.7437]$ at $\gamma = 0.5$, $\gamma = 1$ and $\gamma = 1.5$ respectively, also every poverty index belonging to Π^2 is reducing for $z \in [0, 14.5707]$ and $z \in [0, 0.99339]$ at $\gamma = 1$ and $\gamma = 1.5$. All poverty indices belonging to Π^3 are reducing for $z \in [0, 1.2906]$, at $\gamma = 1.5$.

4.3.7 Food and Durables Consumption Dominance Curves 2005

The tax reform in favor of food by taxing durables fully resembles 2002 situation (Figures 22 – 24); poverty improving and social welfare improving of second and third order for $\gamma = 0.5$ and $\gamma = 1$; and limited poverty improving and no certain social welfare improving elsewhere. Moreover the limits of z is higher everywhere comparing with 2002 situation (Table 11). All poverty indices belonging to Π^1 are reducing at economic efficiency cost of $\gamma = 0.5$, $\gamma = 1$ and $\gamma = 1.5$, for $z \in [0, 7.7589]$, $z \in [0, 3.23945]$ and $z \in [0, 2.19213]$ respectively without necessarily improvement in social welfare indices belonging to Ω^1 . At economic efficiency cost of $\gamma = 1.5$ every poverty index belonging to Π^2, Π^3 is reducing for $z \in [0, 4.23014]$ and $z \in [0, 8.4295]$, also no social welfare index belonging to Ω^2, Ω^3 shows improvement necessarily at this economic efficiency cost.

4.3.8 Food and Education Consumption Dominance Curves 2005

Tax reform in favor of food by taxing education is substantially different from 2002 (Figures 25 – 27). Social welfare improvement is not proven in any order of dominance at economic efficiency cost of $\gamma = 1.5$ for any social welfare index belonging to $\Omega^1, \Omega^2, \Omega^3$. It is second and third order social welfare improving and poverty improving for all values of z at $\gamma = 0.5$ and all the poverty indices belonging to Π^2, Π^3 and all the indices of social welfare belonging to Ω^2, Ω^3 . Also third order poverty and

social welfare improving exist for all the poverty indices belonging to Π^3 and every index of social welfare improvement belonging to Ω^3 at $\gamma = 1$ for $z \in [0, \infty)$ (Table 12).

All the poverty indices belonging to Π^1, Π^2, Π^3 are reducing for $z \in [0, 4.89718]$, $z \in [0, 1.895065]$ and $z \in [0, 1.2587]$ at $\gamma = 0.5, 1, 1.5$ respectively, also every poverty index belonging to Π^2, Π^3 is reducing at economic efficiency cost of $\gamma = 1, 1.5$ for $z \in [0, 14.5707]$ and $z \in [0, 1.8187]$. At economic efficiency cost of $\gamma = 1.5$ all poverty indices belonging to Π^3 are reducing for $z \in [0, 2.5143]$ too. No Social welfare improvement is necessarily expected for limited poverty improvement cases mentioned above.

4.3.9 Food and Utility Consumption Dominance Curves 2005

Taxing utilities in favor of food at economic efficiency cost $\gamma = 1$ is always limited poverty improving and not certain social welfare improving (Figures 28 -30). It is the case for first order of dominance $s = 1$ at all economic efficiency costs as well (Table 13). At economic efficiency cost of $\gamma = 0.5$ and $\gamma = 1.5$, all poverty indices belonging to Π^1, Π^3 are reducing and every social welfare index belonging to Ω^1, Ω^3 is improving for $z \in [0, \infty)$. At economic efficiency cost of $\gamma = 1$ all poverty indices belonging to Π^1, Π^2, Π^3 are reducing for $z \in [0, 0.6306]$, $z \in [0, 0.8297]$ and $z \in [0, 1.1707]$ without necessarily expecting any social welfare improvement. Also every poverty index belonging to Π^1 is reducing for $z \in [0, 10.2028]$ and $z \in [0, 8.8337]$ at economic efficiency cost of $\gamma = 0.5$ and $\gamma = 1.5$ respectively.

4.4 Final Conclusions

The analysis covered an indirect tax reform in favor of food versus other groups of consumptions and resulted in being poverty reducing of different orders respectively, either limited or throughout the range of poverty lines and social improving of different orders in some cases; the only exception was food versus education in 2002. One of the reasons for such observation could be numerous eliminations of food consumption observations (almost half) due to shortcomings of education data series.

The higher critical values of z for similar components in 2005 analysis in comparison with 2002 results could be considered as an indication of fruitful improving reforms in Albania in the past decade.

4.5 Acknowledgement

Grateful thanks are offered to Araar and Duclos (2009) for providing the free tool set DASP (Distributive Analysis STATA Package), a very useful package developed for STATA to empower it for specific purposes of estimating poverty indices, decomposing indices, drawing poverty curves, especially consumption dominance curves, and difference between them with determined confidence intervals.

Chapter 5 References

5.1 References (in an alphabetic order)

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Chapter 6 Appendices

6.1 Appendix 1: Complete Detailed Results – Figures

The resulted consumption dominance curves are offered in order of dominance and compared components for LSMS2002.

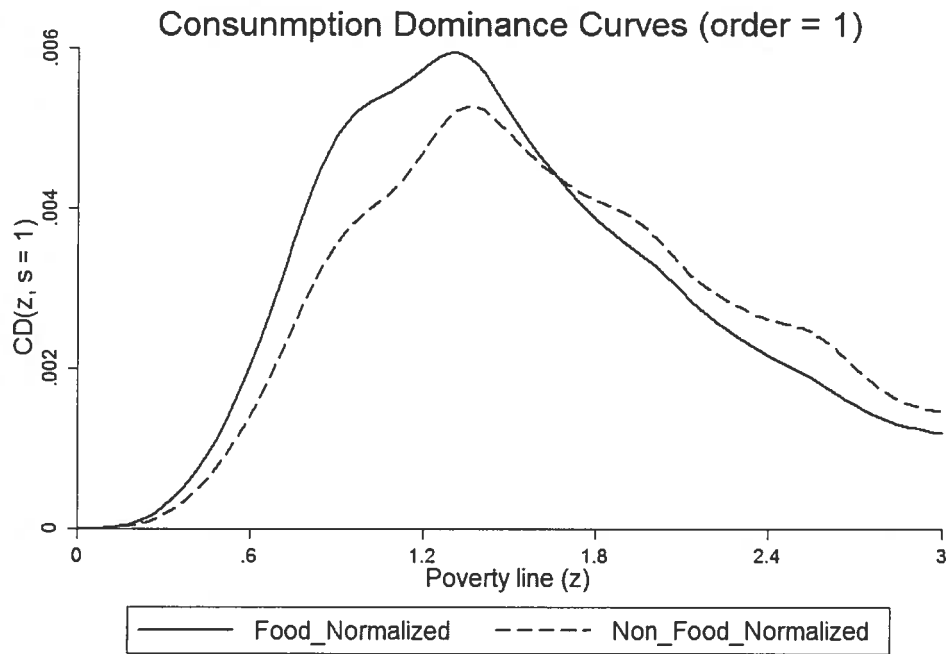


Figure 4 – Normalized Consumption Curves for Food and Non-Food, s=1 (2002)

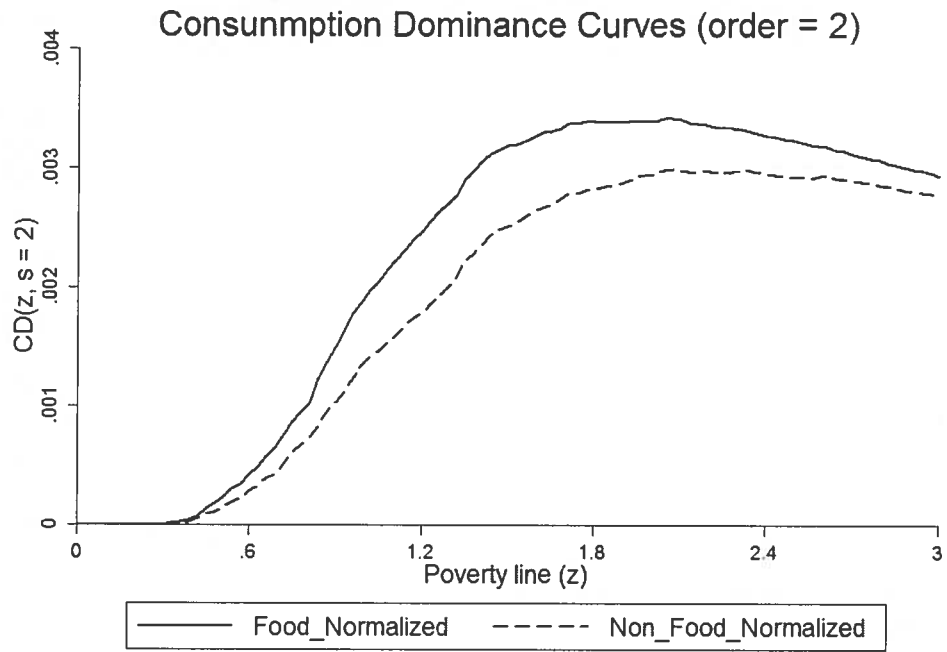


Figure 5 – Normalized Consumption Curves for Food and Non-Food, $s=2$ (2002)

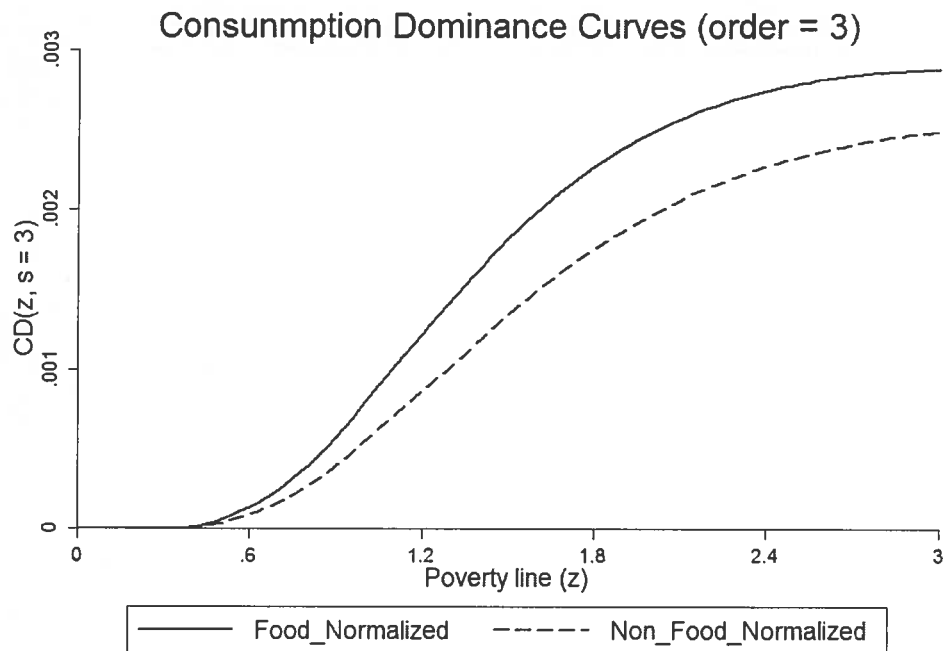


Figure 6 – Normalized Consumption Curves for Food and Non-Food, $s=3$ (2002)

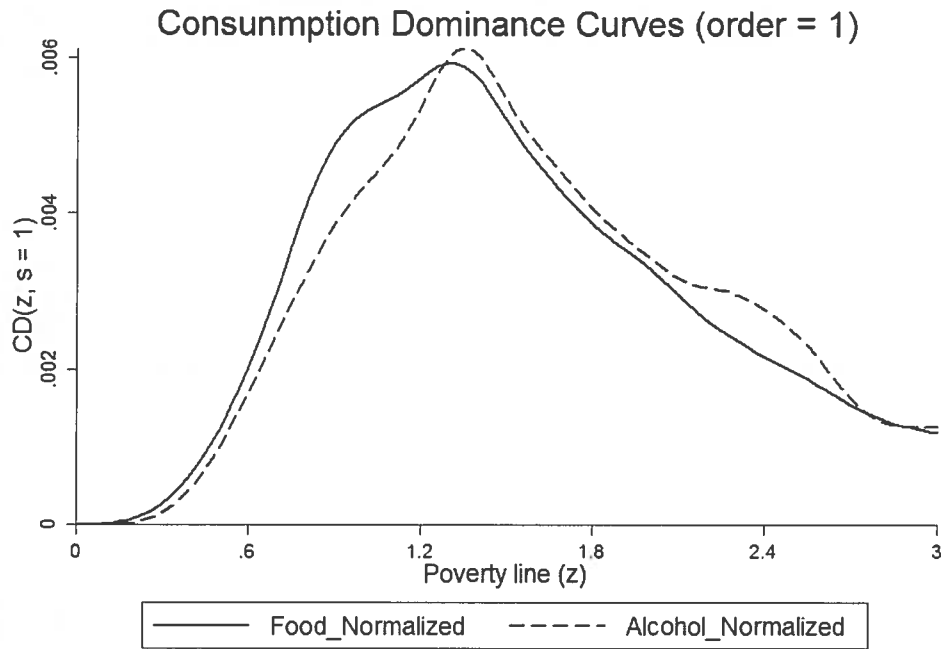


Figure 7 – Normalized Consumption Curves for Food and Alcohol, s=1 (2002)

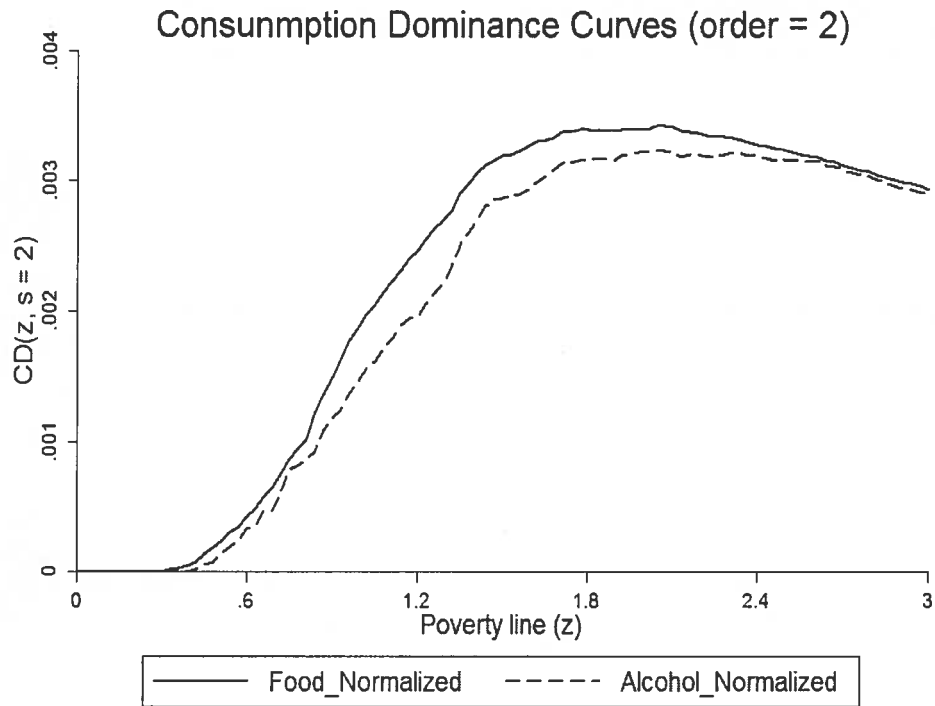


Figure 8 – Normalized Consumption Curves for Food and Alcohol, s=2 (2002)

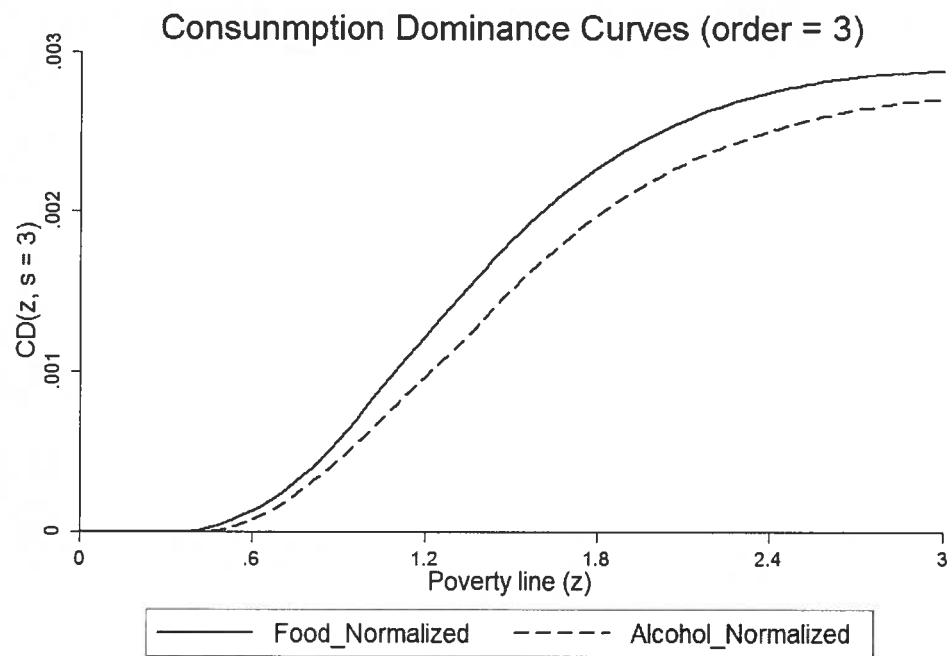


Figure 9 – Normalized Consumption Curves for Food and Alcohol, s=3 (2002)

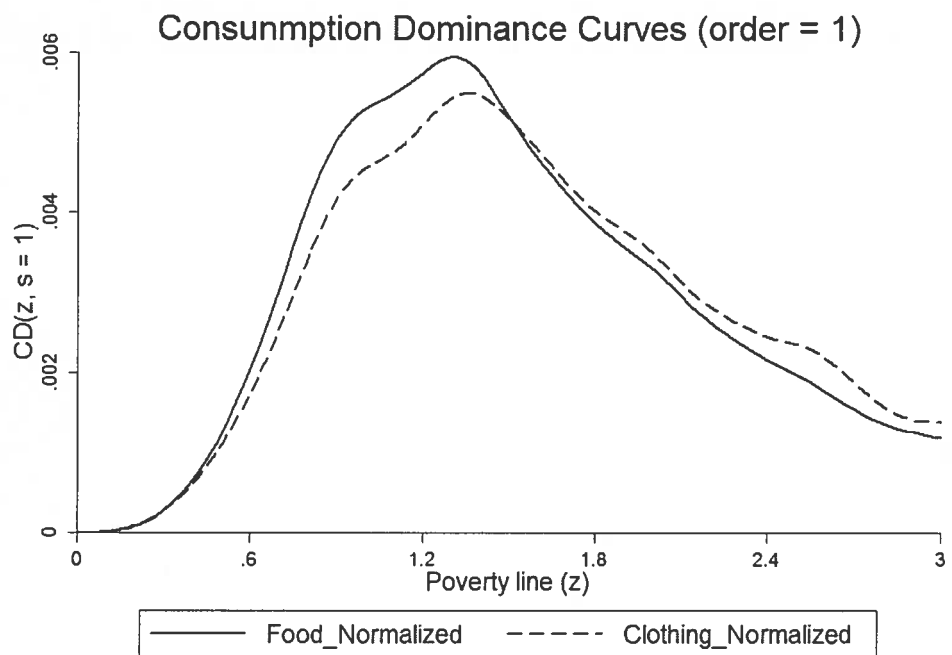


Figure 10 – Normalized Consumption Curves for Food and Clothing, s=1 (2002)

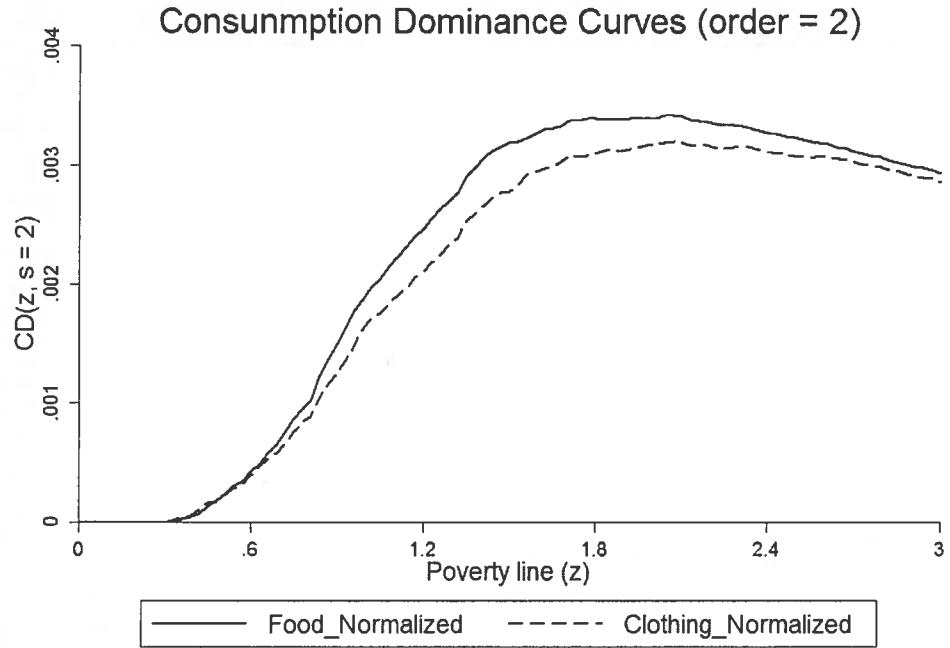


Figure 11 – Normalized Consumption Curves for Food and Clothing, s=2 (2002)

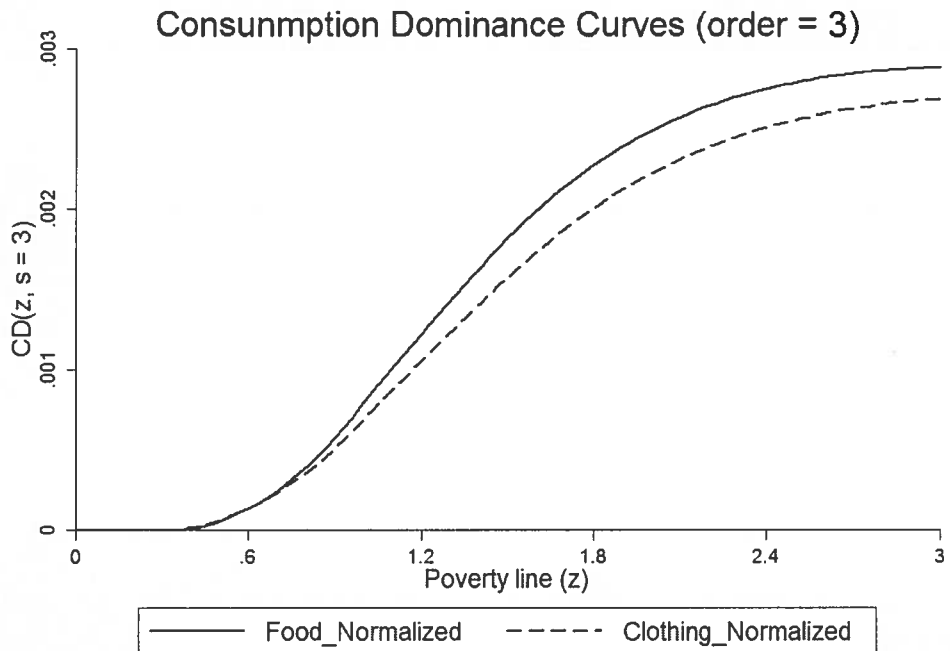


Figure 12 – Normalized Consumption Curves for Food and Clothing, s=3 (2002)

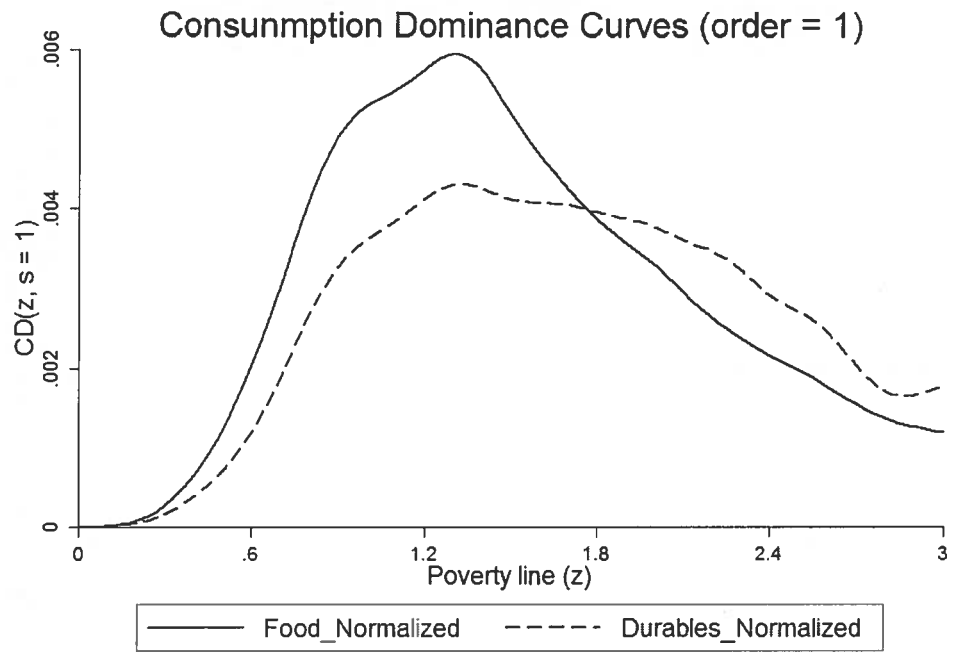


Figure 13 – Normalized Consumption Curves for Food and Durables, s=1 (2002)

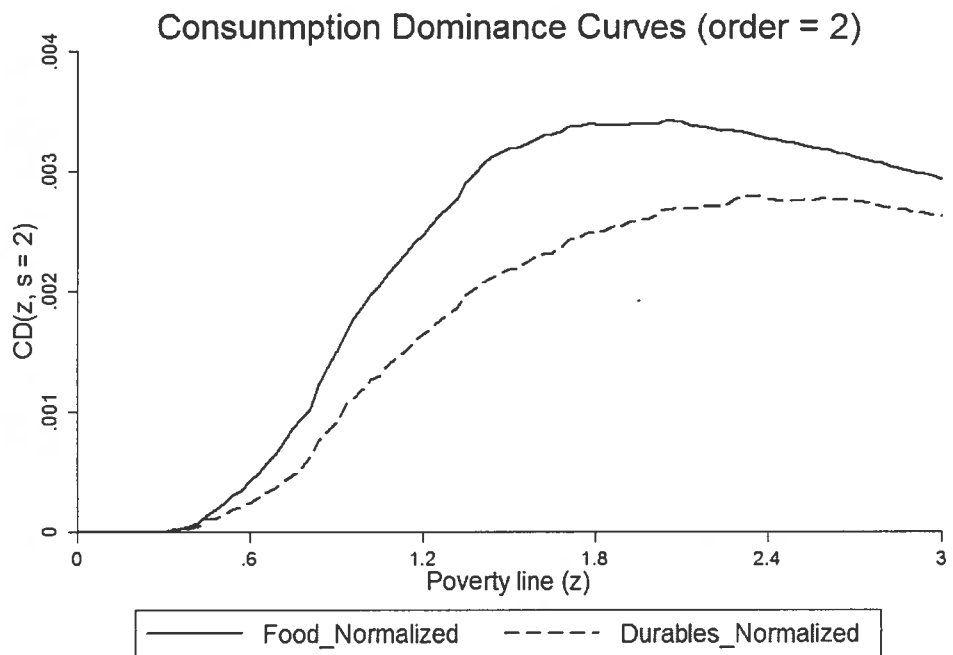


Figure 14 – Normalized Consumption Curves for Food and Durables, s=2 (2002)

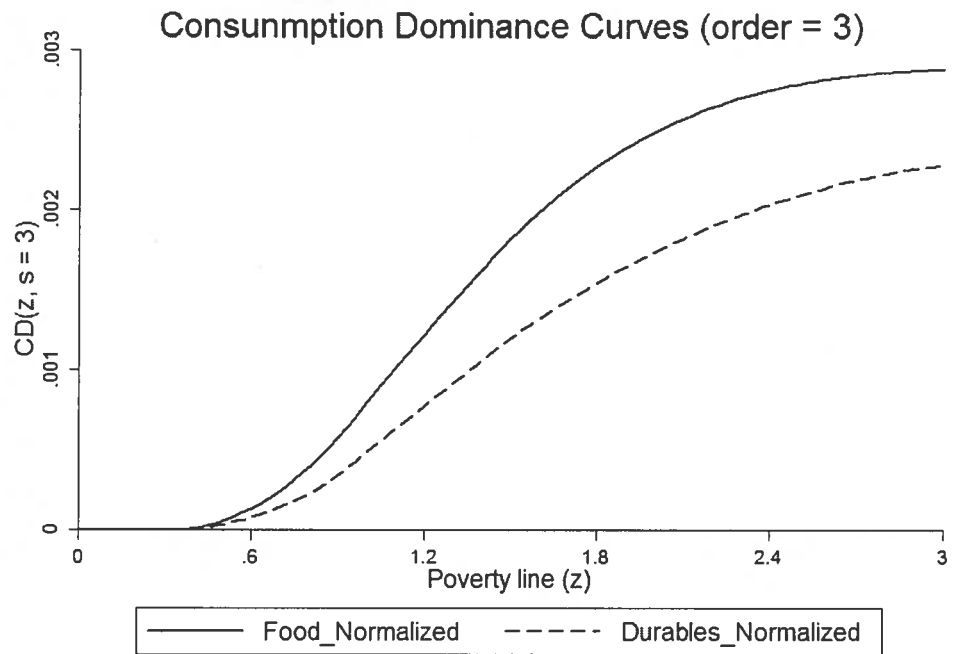


Figure 15 – Normalized Consumption Curves for Food and Durables, s=3 (2002)

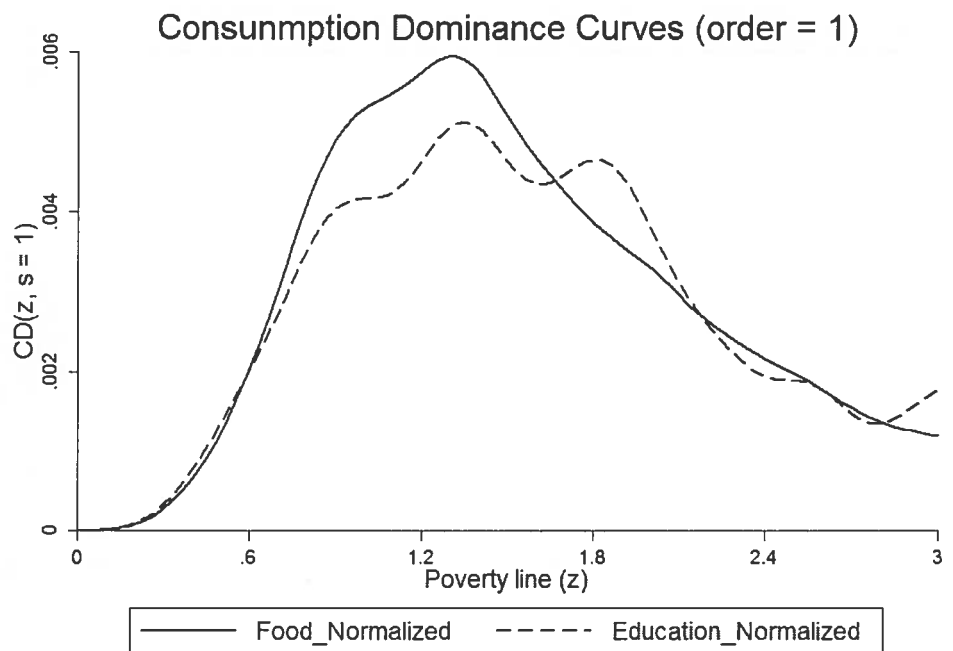


Figure 16 – Normalized Consumption Curves for Food and Education, s=1 (2002)

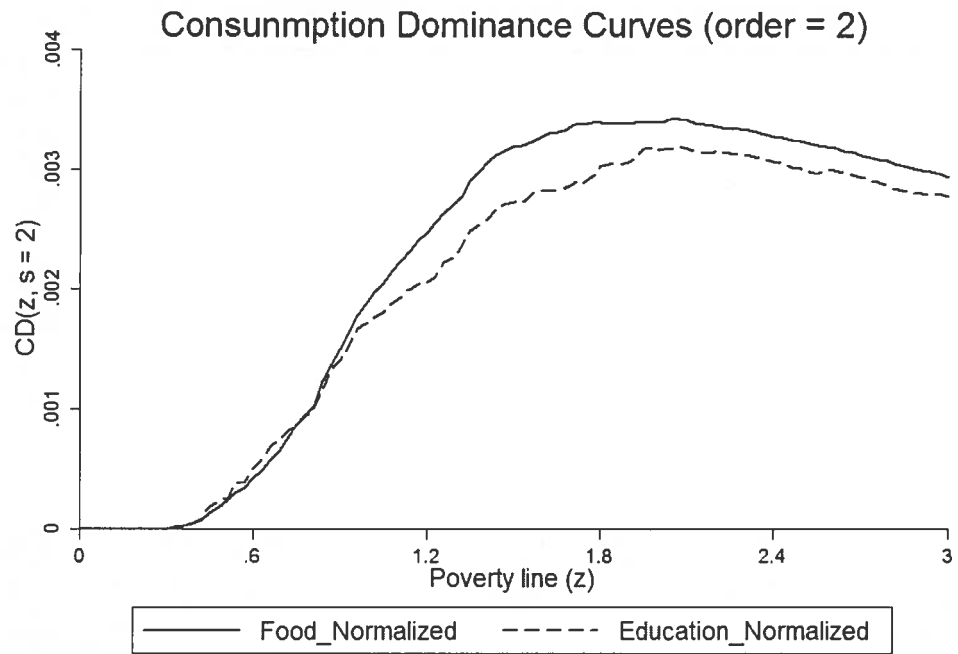


Figure 17 – Normalized Consumption Curves for Food and Education, $s=2$ (2002)

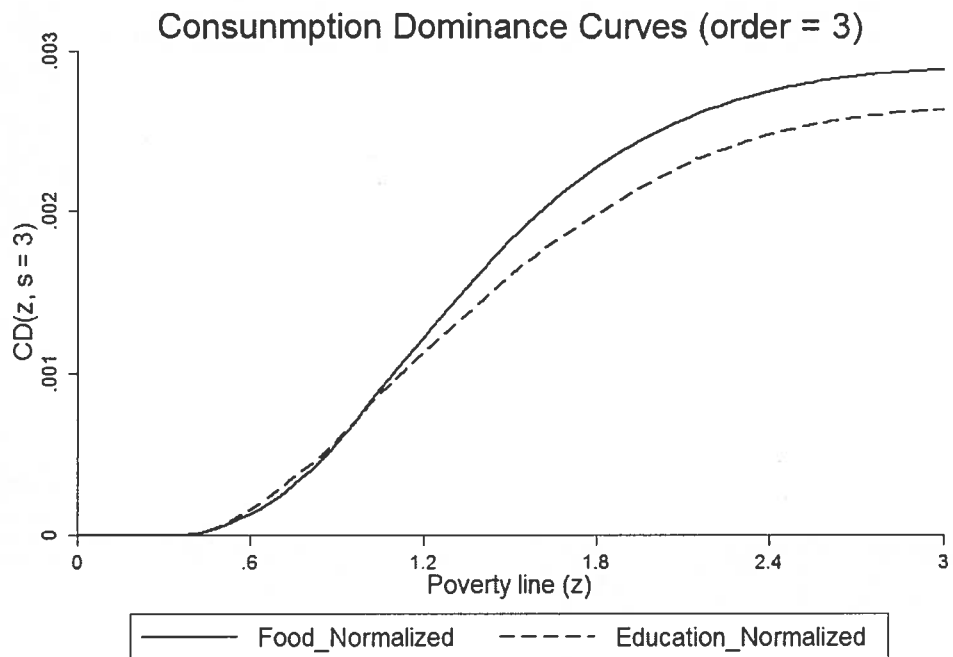


Figure 18 – Normalized Consumption Curves for Food and Education, $s=3$ (2002)

Resulted consumption dominance curves in order of dominance and compared components for LSMS2005:

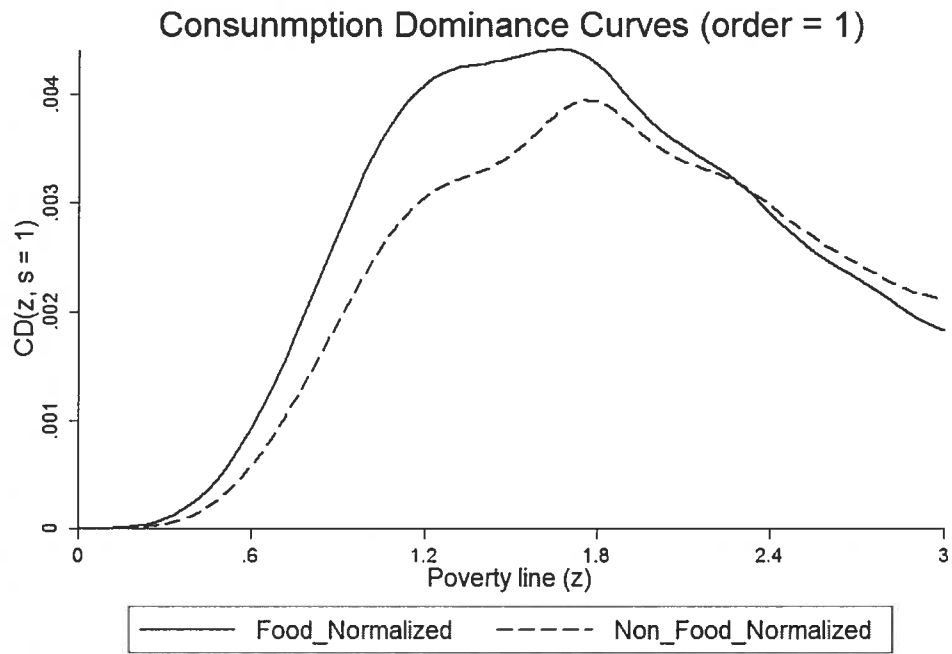


Figure 19 – Normalized Consumption Curves for Food and Non-Food, $s=1$ (2005)

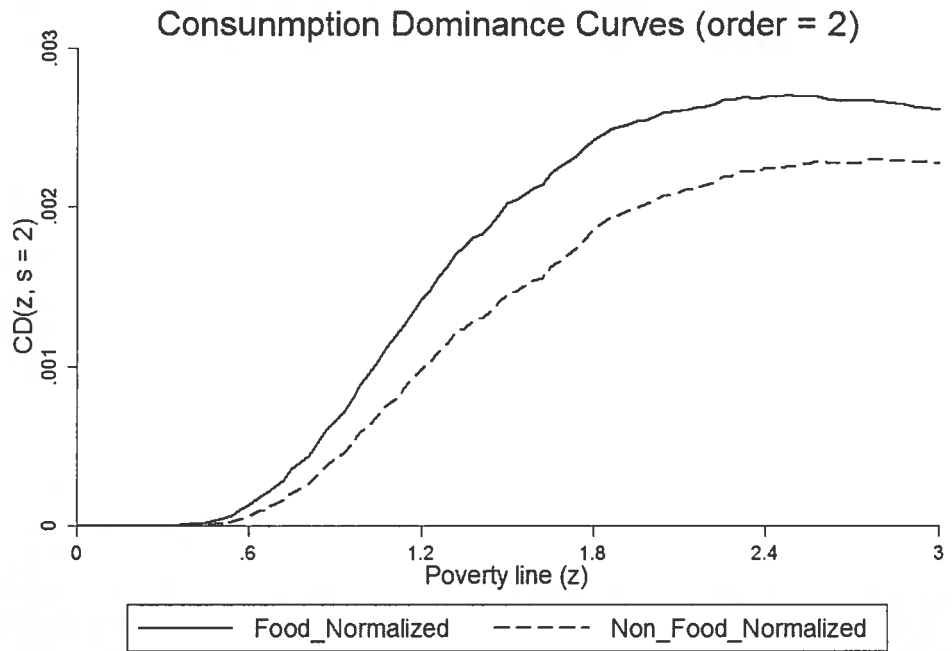


Figure 20 – Normalized Consumption Curves for Food and Non-Food, $s=2$ (2005)

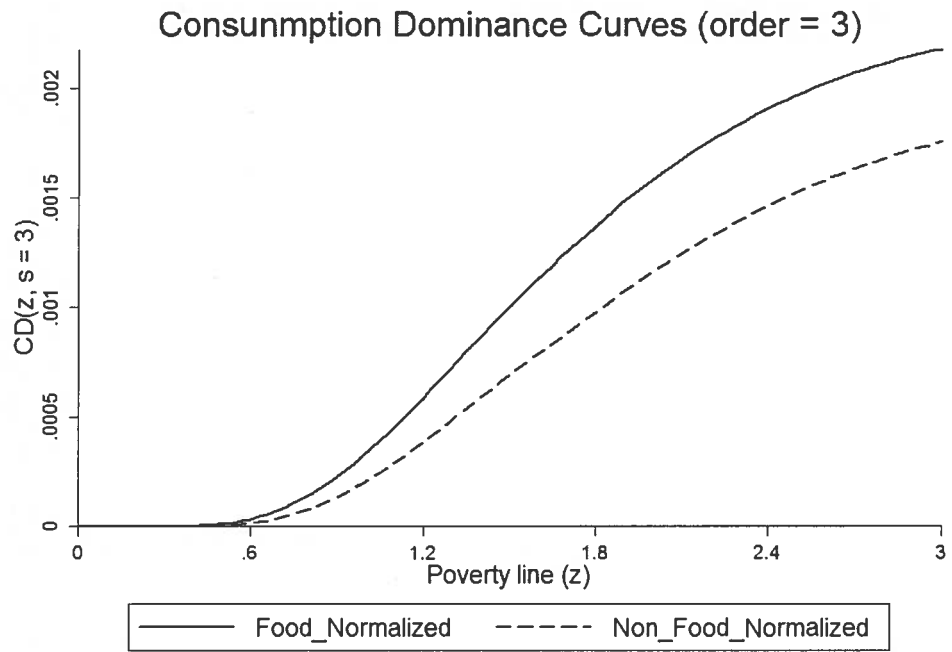


Figure 21 – Normalized Consumption Curves for Food and Non-Food, $s=3$ (2005)

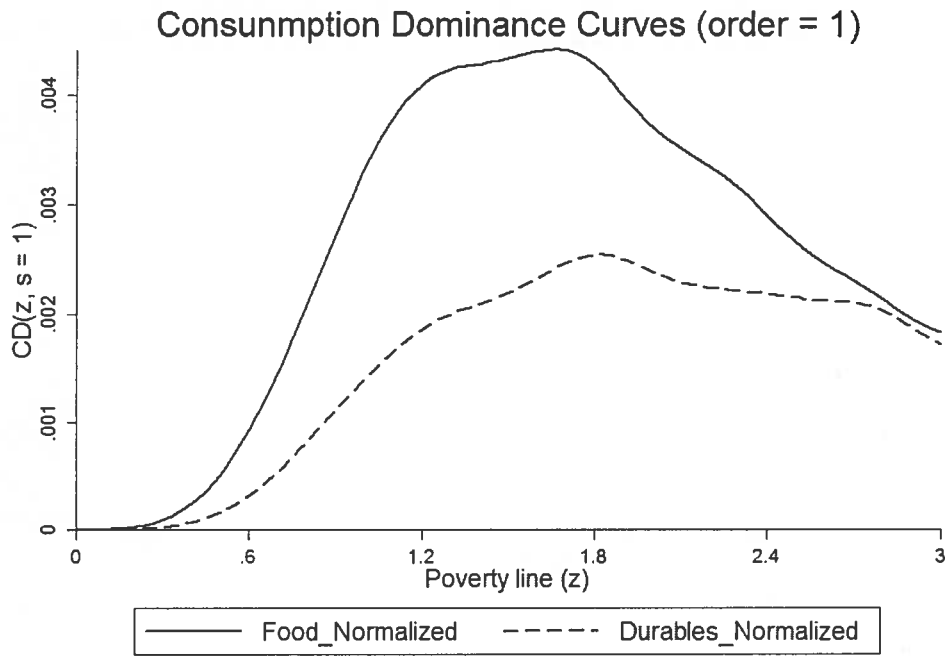


Figure 22 – Normalized Consumption Curves for Food and Durables, $s=1$ (2005)

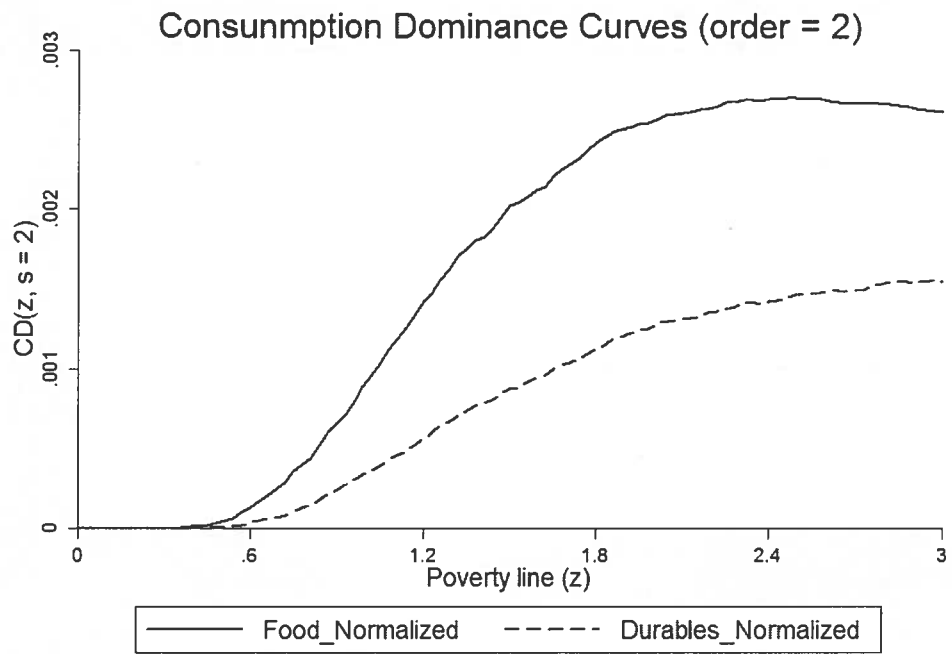


Figure 23 – Normalized Consumption Curves for Food and Durables, s=2 (2005)

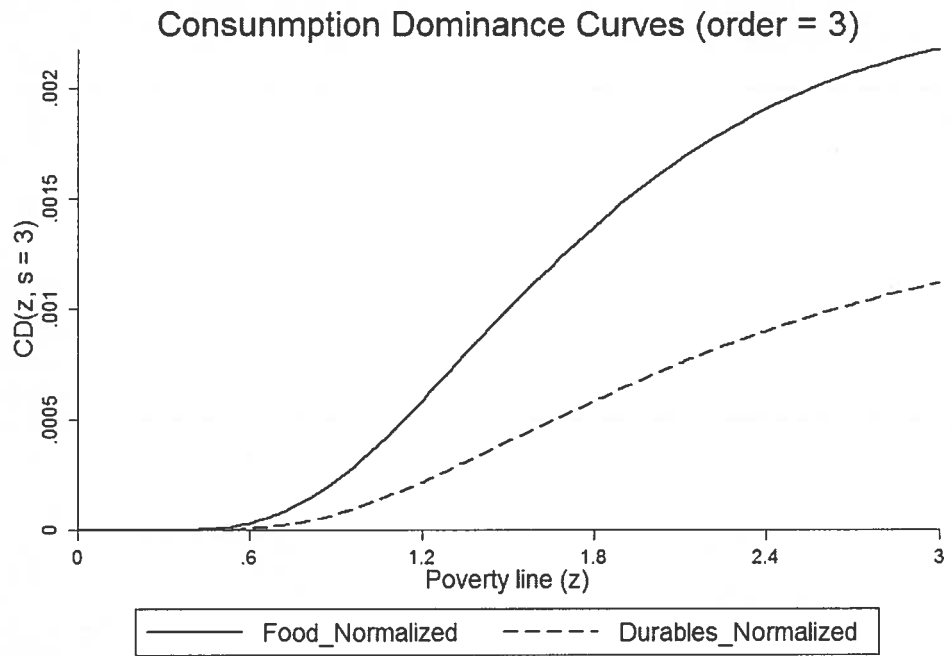


Figure 24 – Normalized Consumption Curves for Food and Durables, s=3 (2005)

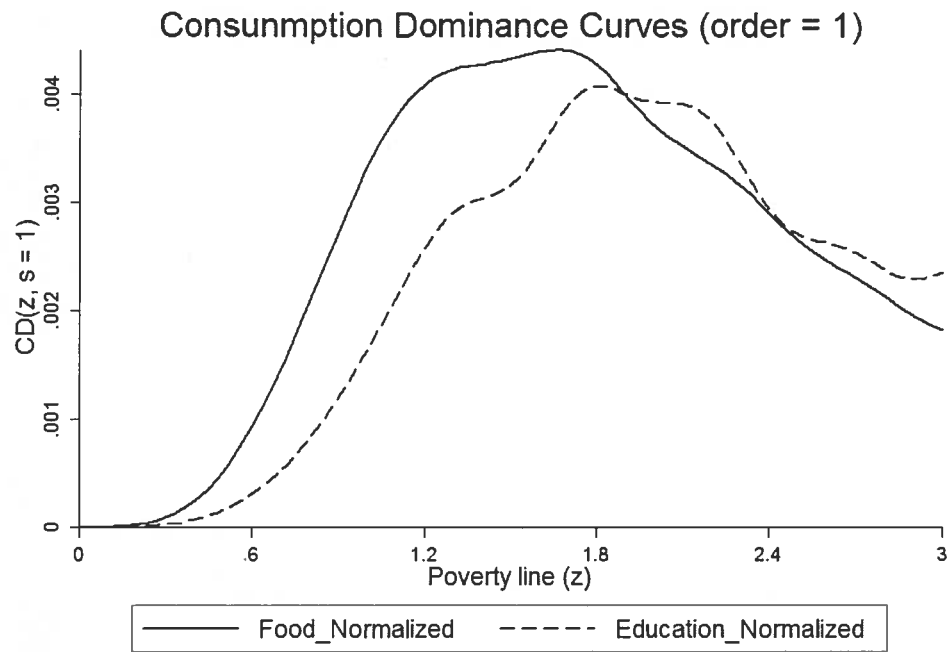


Figure 25 – Normalized Consumption Curves for Food and Education, $s=1$ (2005)

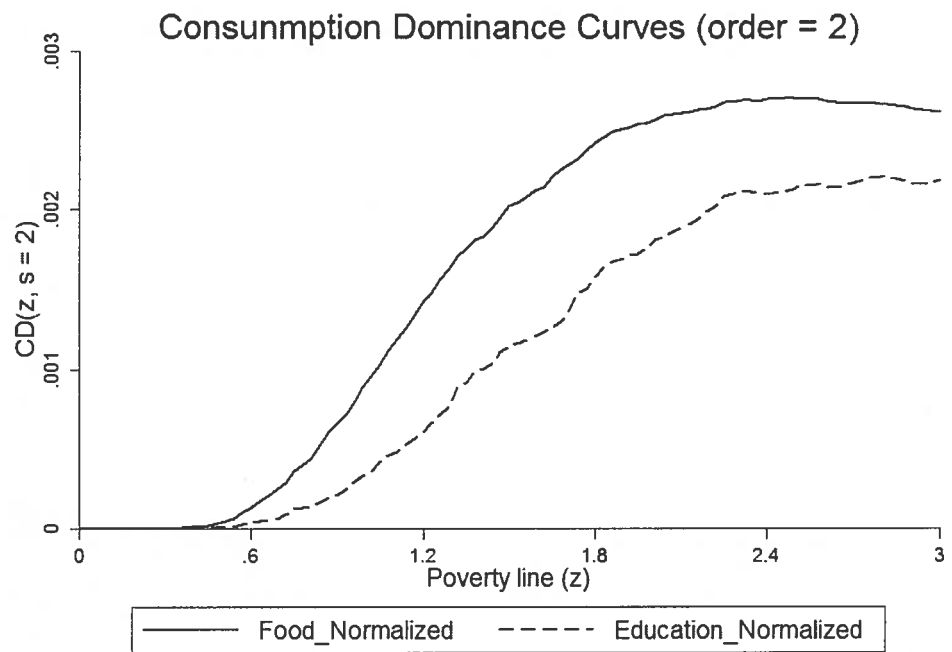


Figure 26 – Normalized Consumption Curves for Food and Education, $s=2$ (2005)

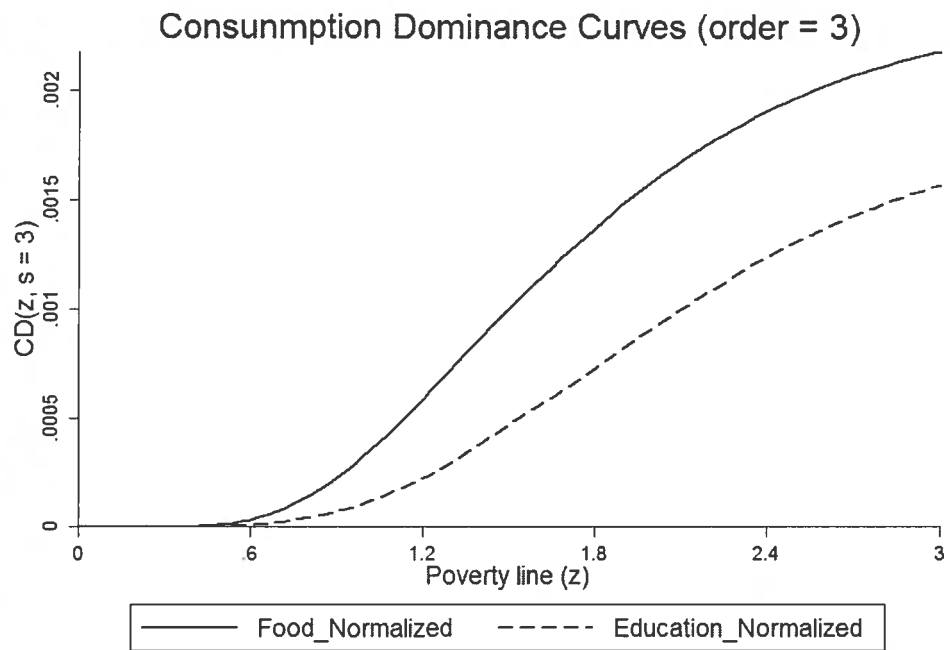


Figure 27 – Normalized Consumption Curves for Food and Education, $s=3$ (2005)

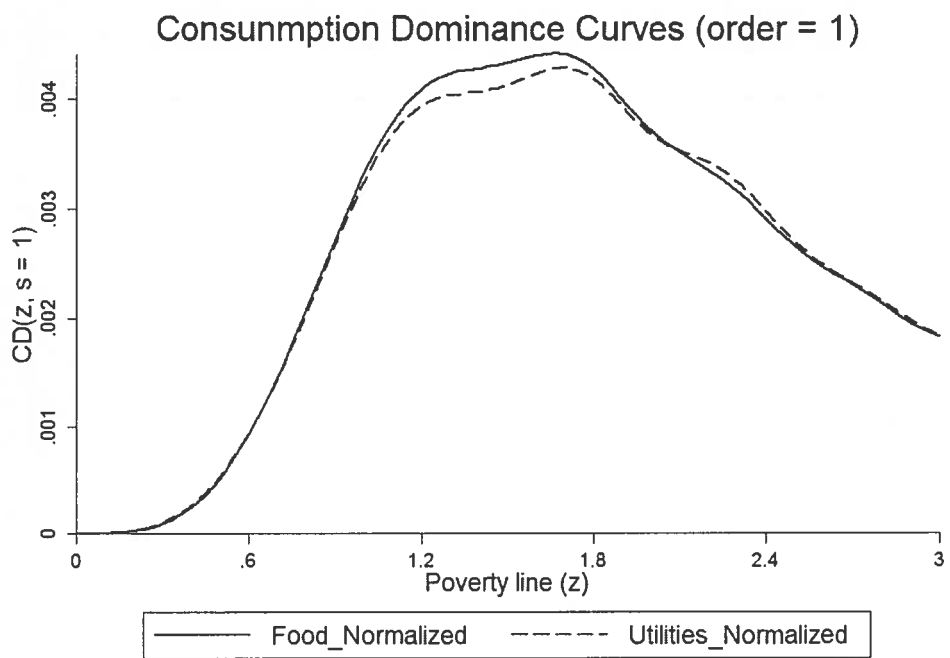


Figure 28 – Normalized Consumption Curves for Food and Utilities, $s=1$ (2005)

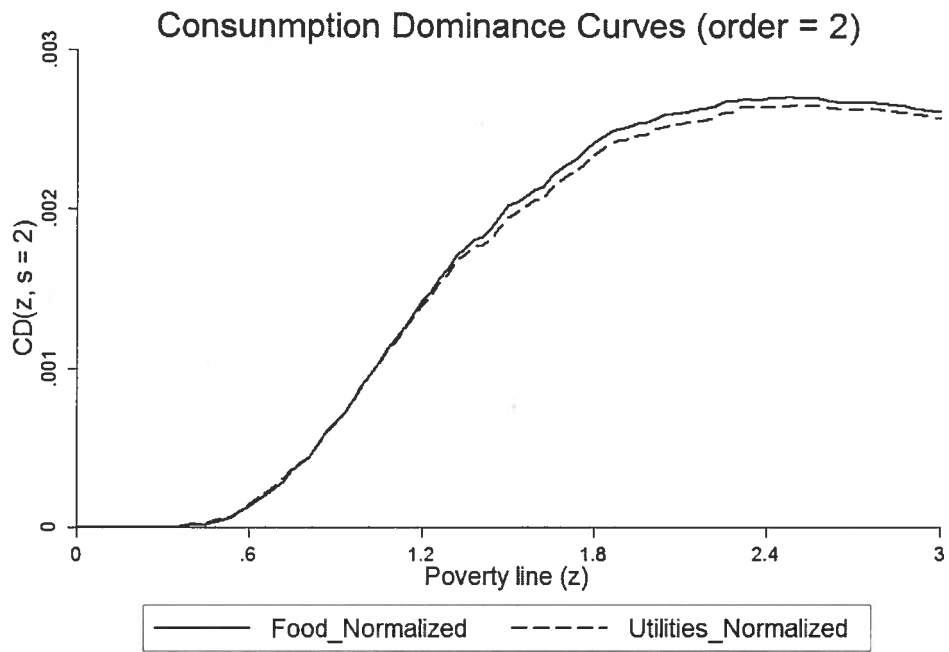


Figure 29 – Normalized Consumption Curves for Food and Utilities, $s=2$ (2005)

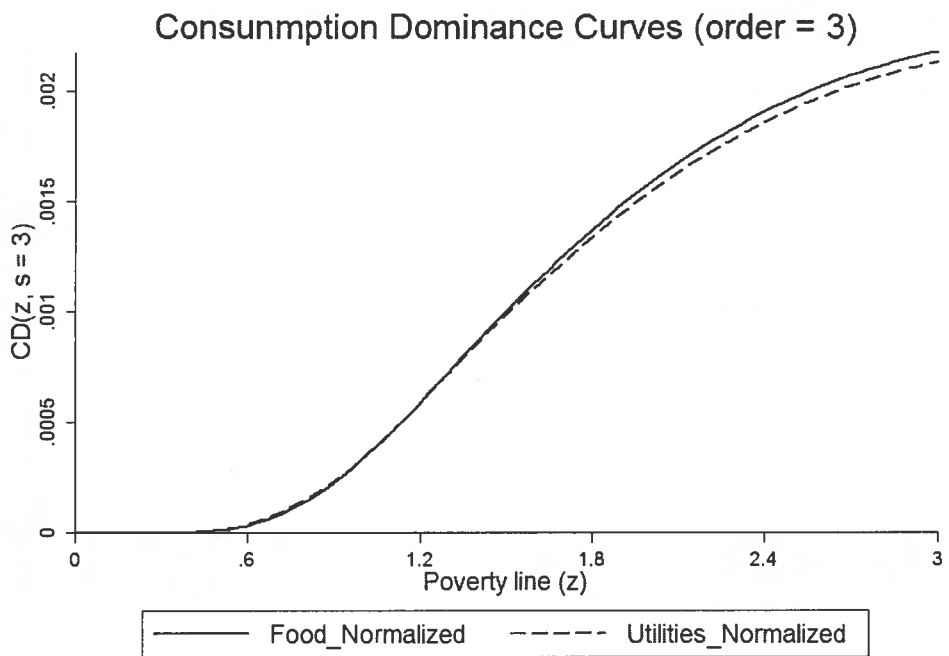


Figure 30 – Normalized Consumption Curves for Food and Utilities, $s=3$ (2005)

6.2 Appendix 2: Complete Detailed Results – Tables

Critical Values LSMS 2002 normalized; the numbers in parentheses present standard errors and in brackets represent 95% confidence intervals.

Food vs. Non-Food	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	5.4658 (0.227307) [5.020278, 5.911322]	1.6655 (0.0728346) [1.522744, 1.808256]	0.3719 (0.0401828) [0.293142, 0.450658]
S = 2	–	–	0.4019 (0.126459) [0.154040, 0.64976]
S = 3	–	–	0.6601 (0.076859) [0.509456, 0.810744]

Table 5 – Critical values – Food and Non-Food CD Curves (2002)

Food vs. Alcohol	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	–	1.2789 (0.045816) [1.189101, 1.368699]	0.3536 (0.040264) [0.274683, 0.432517]
S = 2	–	–	0.5572 (0.074484) [0.411211, 0.703189]
S = 3	–	–	0.6611 (0.076719) [0.510731, 0.811469]

Table 6 – Critical values – Food and Alcohol CD Curves (2002)

Food vs. Durables	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	5.8505 (0.231035) [5.397671, 6.303329]	1.7655 (0.079028) [1.610605, 1.920395]	0.89242 (0.036667) [0.820553, 0.964287]
S = 2	–	–	1.2815 (0.037154) [1.208678, 1.354322]
S = 3	–	–	1.6479 (0.041259) [1.567032, 1.728768]

Table 7 – Critical values – Food and Durables CD Curves (2002)

Food vs. Education	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	3.6311 (0.562541) [2.528520, 4.73368]	0.5883 (0.033585) [0.522473, 0.654127]	4.4593 (0.174463) [4.117353, 4.801248]
S = 2	–	0.7582 (0.052089) [0.656106, 0.860294]	–
S = 3	–	0.4231 (0.14899) [0.131080, 0.71512]	– –

Table 8 – Critical values – Food and Education CD Curves (2002)

Food vs. Clothing	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	6.4965 (0.492321) [5.531551, 7.461449]	1.5123 (0.058295) [1.398042, 1.626558]	4.5383 (0.21925) [4.10857, 4.96803]
S = 2	–	4.2427 (0.036404) [4.171348, 4.314052]	–
S = 3	–	0.5965 (0.086114) [0.427717, 0.765283]	–

Table 9 – Critical values – Food and Clothing CD Curves (2002)

Critical Values LSMS 2005

Food vs. Non-Food	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	7.0127 (0.248766) [6.525119, 7.500281]	2.294 (0.097774) [2.102363, 2.485637]	0.7437 (0.034579) [0.675925, 0.811475]
S = 2	–	14.5707 (0.042218) [14.48795, 14.65345]	0.99339 (0.047248) [0.900784, 1.085996]
S = 3	–	–	1.2906 (0.047070) [1.198343, 1.382857]

Table 10 – Critical values – Food and Non-Food CD Curves (2005)

Food vs. Durables	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	7.7589 (0.330089) [7.111926, 8.405874]	3.23945 (0.227203) [2.794132, 3.684768]	2.19213 (0.088970) [2.017749, 2.366511]
S = 2	–	–	4.23014 (0.030737) [4.169896, 4.290385]
S = 3	–	–	8.4295 (0.041459) [8.34824, 8.51076]

Table 11 – Critical values – Food and Durables CD Curves (2005)

Food vs. Education	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	4.89718 (0.845851) [3.239312, 6.555048]	1.895065 (0.067455) [1.762853, 2.027277]	1.2587 (0.041164) [1.178019, 1.339381]
S = 2	–	14.5707 (0.042219) [14.48795, 14.65345]	1.8187 (0.036736) [1.746697, 1.890703]
S = 3	–	–	2.5143 (0.042306) [2.43138, 2.59722]

Table 12 – Critical values – Food and Education CD Curves (2005)

Food vs. Utilities	$\gamma = 0.5$	$\gamma = 1$	$\gamma = 1.5$
S = 1	10.2028 (0.758499) [8.716142, 11.68946]	0.6306 (0.034969) [0.562061, 0.699139]	8.8337 (0.615658) [7.62701, 10.04039]
S = 2	–	0.8297 (0.0565043) [0.718952, 0.940448]	–
S = 3	–	1.1707 (0.049395) [1.073886, 1.267514]	–

Table 13 – Critical values – Food and Utilities CD Curves (2005)

6.3 Appendix 3: Computational System and Programming

STATA is a program of choice for statistical data analysis; it is used extensively in academic applications for data preparation and process. It is featuring numerous data

management modules which are significantly efficient for analysis of different sizes of datasets. The great flexibility of STATA originated in its ability to use specially tailored programmes in form of “.ado” routines for any specific purpose of the researcher.

In addition to STATA commands set, DASP, a very useful package developed by Araar and Duclos (2009), is installed in STATA to empower it for specific purposes of estimating poverty indices, decomposing indices, drawing poverty curves, especially consumption dominance curves, and difference between them with determined confidence intervals. According to its developers, “DASP, (Distributive Analysis STATA Package), is mainly designed to assist researchers and policy analysts interested in conducting distributive analysis with Stata”.