THE MEASUREMENT AND ANALYSIS OF POVERTY TREND IN URBAN AND RURAL AREAS OF IRAN WITHIN 2001-2011

Sedighe Alizadeh[1], AliAkbar Khosravinejad[2]
[1,2]Islamic Azad University, Central Tehran Branch, Tehran, Iran
*Corresponding Author E-Mail: alizade.sedighe65@yahoo.com

ABSTRACT: *In this study, the relative poverty threshold has been calculated through linear expenditure system using Seemingly Unrelated Regression (SUR) and household budget report statistics in urban and rural areas during 2001-2011. The results obtained from this study show that the poverty threshold has been increased from 30787 thousand Rials in 2002 to 138381 thousand Rials in 2011 in urban areas and from 19232 thousand Rials in 2002 to 84887 thousand Rials in 2011 in rural areas. Poverty indices in the current study have been increased both in urban and rural areas which represent worsening the status and increasing the number of the poor.*

Keywords: Compared Census Indices, Poverty Gap, FGT, Linear Expenditure System

INTRODUCTION

In addition to those who suffer from persistent need, poverty includes the poor who have to live at lower level than acceptable standards in a period of life. Awareness of poverty level and identification of the poor can assist economic planners and policy makers in assessing the effects of development plans and selection of appropriate economic policies on the poverty of society.

Theoretical framework of the Study

This study seeks to provide an image of poverty by estimating poverty threshold and calculating its various indices in urban and rural areas of Iran.

Definition of Poverty

Poverty is a social, economic, and cultural phenomenon arising from the absence or inability to meet the minimum humanitarian needs. Also, poor refers to someone who lacks sufficient ability to meet the needs and demands of life

Definition of Poverty Threshold

The poverty threshold is defined in two ways of absolute and relative poverties like poverty. Absolute poverty threshold is "some income that according to the social, economic, etc. requirements of the studied society, is required for meeting the minimal needs of individuals such as food, clothing, etc.) or the minimal conditions (such as education, housing, etc.)". Relative poverty is defined as an income limit in which a certain percentage of the population is below it.

Indices to measure poverty

Compared Census Indexes (poverty rate)

It includes the ratio of the number of poor households (below poverty line) to total households in the community where q is the number of poor households and N is the total number of households.

$H= {}^{q}/_{N}$

This index shows how the ratio of the population lives below the poverty threshold.

Poverty Gap Index

Poverty gap has been shown as $g_i= (z-x_i)$ for i^{th} household and $g= \sum_{i=1}^{q} gi = \sum_{i=1}^{q}(z - xi)$ for poor households. The poverty gap ratio is obtained through dividing g_i by poverty household and summing it where N is the number of the population, q is the number of poor people, z is poverty threshold, and x_i is i^{th} income of poor individual.

$P_{gap} = \frac{1}{n}\sum_{i=1}^{q}\frac{(z-xi)}{z}$.

Foster, Greere, Thorbeke Poverty Index

This index is used for indicating the ratio of the poor to the depth of poverty in the studied community. This index shows that the poverty rate from investigating various subgroups of population can be summed with each other and the unit rate of poverty of whole population can be obtained. The original formula for calculating the Index is as follows:

$FGT_\alpha = P_\alpha = \frac{1}{n}\sum_{i=1}^{q}(\frac{gi}{z})^{\alpha}$ α>

In this index, poverty is considered as a function of poverty gap ratio that has been reached to α exponentiation. In fact, α shows the significance level to the poverty gap.

Linear Expenditure System

Klein, L.R. and Rubin (1948) presented a comprehensive set of demand relationships named Linear Expenditure System over time. Stone & Geary (1950) and Samuelson (1948) showed that this demand system has been obtained from the following utility function:

$U_t = \sum_{i=1}^{n} \alpha i \ln(q_{it} - \gamma_{it})$ $(q_{it} - \gamma_{it}) > 0$ $\Sigma\alpha_{it} =1$ (1)

Where U is total consumer utility, q excess consumption of good, γ minimal subsistence required for good, and α_i final share of beyond subsistence expenses. By maximizing the above utility function to the budget constraint of $I_t = \Sigma^{n}_{i=1}\ p_{it}\ q_{it}$ and derivation of Lagrange function, demand equations system can be extracted:

$y_{it} = p_{it}\ q_{it} = p_{it}\ \gamma_{it} + \alpha_i\ [\ I - \Sigma^{n}_{i=1}\ \gamma_{it}\ p_{it}\ ] + w_{it}$

This equations set is called linear expenditure system.

Review of the Related Literature:

- In a case study entitled Poverty, Growth and Redistribution", Assadzadeh and Satya [1] examined changes in poverty in Iran during 1983-1993 years. They concluded that within the study period, rural poverty has been declined in a small amount while there was an increase in poverty indices in urban areas.
- Aref Navid and TanWeer-ul-Islam, [2] examined the estimation of multi-dimensional poverty and its influential factors in Pakistan. The results obtained from drawing poverty threshold indicated the significant impact of households' consumption in extending the poverty and the disproportion of poverty among households.
- In a study entitled "Chronic and Transient Poverty", Duclos and Giles [3] measured and estimated poverty in China. They estimated poverty in China using panel data method in which the results indicated a significant difference between chronic and transient poverties.

- In a study, Arshadi, Hosseinzade, and Mostashari [4]evaluated minimum subsistence of urban households in Kermanshah and concluded that during the period, total minimum annual subsistence increases in urban areas in Kermanshah.
- In a study entitled "estimation of poverty and poverty indices in urban and rural areas", Khosravinejad [5] estimated the poverty threshold and concluded that poverty indices have almost had a descending trend in the first half of his study period (2001-2007) and an ascending trend at the second half of the study period.

The Model Estimation

Parameters of linear expenditure system model were estimated by the budget of urban and rural households during 2001-2011 and results have been given in Table 1.

Table 1: Estimation of parameters of expenditure system of urban and rural households

	Food and tobacco	Clothing	Housing	Goods and services at home	Transportation and communication	Health and treatment	Other goods
Urban areas							
β	0.136	0.072	0.129	0.021	0.276	0.136	0.23
T-statistics	10.57	11.27	4.18	2.14	12.76	9.33	-
α	0.93	0.94	0.96	0.98	0.97	0.96	0.9
T-statistics	121.64	57.83	106.96	65.2	54.76	50.35	43.7
R^2	0.99	0.99	0.99	0.97	0.99	0.98	-
D-w	1.93	1.98	2.33	2.44	2.28	1.88	-
Rural areas							
β	0.381	0.018	0.019	0.074	0.181	0.119	0.208
T-statistics	27.4	2.2	2.3	8.8	11.3	9.0	-
α	0.863	0.977	0.989	0.930	0.964	0.937	0.855
T-statistics	64.68	101.35	145.37	64.07	68.17	48.35	45.51
R^2	0.998	0.992	0.996	0.990	0.992	0.979	-
D-w	1.867	2.113	1.958	2.009	1.709	1.516	-

Source: Findings of the study

For goods group of "other goods", coefficient of beyond subsistence expenses is obtained as follows:

$$\beta_8 = 1 - \sum_{i=1}^{7} \beta_i$$

To achieve the Rial value of minimum subsistence for each year, both parties of the equation of relative habits model $\gamma_{it} = \alpha_i q_{it-1}$ are multiplied by P_{it}:

$$\gamma_{it} P_{it} = \alpha_i (q_{it-1} P_{it})$$

Where $\gamma_{it} P_{it}$ is the estimation of Rial value of minimum subsistence?

The minimum subsistence was calculated based on estimations (in Table 1) for rural and urban households in years 2001 -2011 and presented in Tables 2 and 3.

In urban areas, the highest rate of minimum subsistence is related to housing group, while the lowest rate is related to the goods and services at home except for the years 2007, 2008, and 2009 that the lowest rate of minimum subsistence has been allocated to clothing group

In rural areas, the highest rate of minimum subsistence is related to food group while the lowest rate is related to the goods and services at home except for years of 2002, 2003, and 2004 that the lowest rate of minimum subsistence has been allocated to health and treatment group.

Table 2: **Estimation of the minimum subsistence for urban households in different goods groups in 2001 -2011 years (Thousand Rials)**

Goods group / Year	Food and tobacco	Clothing	Housing	Goods and services at home	Transportation and communication	Health and treatment	Other goods
2002	7815	1819	9927	1725	4033	2080	3387
2003	9228	2193	12127	2055	4814	2622	4090
2004	11240	2547	14343	2502	6183	2978	5151
2005	13306	3193	15994	3101	8536	4146	6559
2006	14489	3417	18131	3380	10564	5012	7868
2007	16200	3740	22081	3826	11619	5254	8871
2008	21351	4462	26254	4621	13283	6768	10647
2009	22555	5170	32437	4565	14991	8347	12698
2010	25801	5103	32409	5276	16435	9241	16092
2011	32395	5894	45292	5611	18309	11239	19641
Average annual growth	0.17	0.14	0.18	0.14	0.18	0.21	0.22

Source: calculations in Table 1

Table 3: Estimation of the minimum subsistence rural households in different goods groups in 2001 -2011 years (Thousand Rials)

Good group / Year	Food and tobacco	Clothing	Housing	Goods and services at home	Transportation and communication	Health and treatment	Other goods
2002	7459	1780	3548	1452	1731	1237	2025
2003	8679	2185	4258	1687	2260	1656	2368
2004	9799	2502	4958	1950	3090	1856	2933
2005	12317	3159	5824	2570	4617	2763	3611
2006	14133	3361	5983	2964	5280	3016	4326
2007	16092	3518	6903	3082	6327	3744	4738
2008	20475	4042	8645	3977	7480	4151	5665
2009	20122	4046	9384	3636	7822	4859	5730
2010	23940	4259	10941	4099	8911	5824	7708
2011	32983	4903	15036	4648	10757	6712	9847
Average annual growth	0.18	0.12	0.17	0.14	0.23	0.21	0.19

Source: Table 1

Estimation of poverty threshold and poverty indices

The sum of the mentioned minimum subsistence is obtained as minimum poverty threshold. The poverty threshold has been calculated for urban and rural areas and given in Table 4.

Based on the obtained results, the average annual growth rate of poverty threshold has been significantly decreased in urban and rural areas in 2006. According to the average annual growth rate, it can be said that poverty threshold had the highest growth in both urban and rural areas in 2011 while there has been the lowest growth in 2010 in urban areas and 2009 in rural areas.

Poverty indices in urban households

To calculate poverty indices, the raw data of total gross expenditure of households and calculation of poverty threshold have been used in the previous section. Poverty indices have been presented in urban areas in Table 5

Table 4: **Estimation of annual poverty threshold in urban and rural areas during the period 2002-2011 (Thousand Rials)**

Year	poverty threshold in urban area	Annual growth rate	poverty threshold in rural area	Annual growth rate
2002	30787	-	19232	-
2003	37128	0.20	23093	0.20
2004	44944	0.21	27116	0.17
2005	54836	0.22	34861	0.28
2006	62861	0.15	39065	0.12
2007	71591	0.14	44408	0.14
2008	87387	0.22	54436	0.22
2009	100763	0.15	55599	0.02
2010	110357	0.09	65683	0.18
2011	138381	0.25	84887	0.29

Source: findings of the study

.**Table 5**: **Poverty indices in urban areas during 2002-2011 (Thousand Rials)**

Year	Census poverty index	Poverty gap index (%)	Squared poverty gap index (FGT)
2002	23.48	5.59	4.17
2003	24.26	5.56	4.15
2004	23.89	5.38	4.04
2005	23.13	5.84	4.32
2006	30.75	8.16	5.71
2007	23.12	5.76	4.28
2008	24.6	5.58	4.17
2009	24.48	6.15	4.51
2010	24.64	5.92	4.37
2011	26.29	6.41	4.68

Source: Findings and calculations of the Tables

Table 6: Poverty indices in rural areas during 2002-2011 (Thousand)

Year	Census poverty index	Poverty gap index (%)	Squared poverty gap index (FGT)
2002	32.74	8.01	6.92
2003	33.244	7.77	6.73
2004	24.78	5.38	4.78
2005	31.50	8.07	6.97
2006	30.98	8.28	7.14
2007	31.64	8.19	7.07
2008	32.24	8.70	7.47
2009	31.56	8.08	6.98
2010	32.24	8.36	7.21
2011	34.86	8.66	7.44

Source: Findings of the study

The ratio of households below the poverty threshold in urban areas has experienced rising rate up to 2006 and in subsequent years, the results suggest the decrease in the percentage of the poor in urban areas.

Poverty indices in rural areas

The ratio of households below poverty threshold in rural areas had no regular trend until 2006, while it increased after 2006.

CONCLUSIONS

1- The poverty threshold has raised with a gentle slope in urban areas over time and such trend is further in rural areas compared to that in urban areas and this has had more growth in 2011.

2- Poverty gap index and Foster, Greere, Thorbeke poverty index have not been regularly increased or decreased in both urban and rural areas which indicates irregular worsening or improving the status of the poor in the studied period.

3- The poverty index of compared census has grown haphazardly; however, this index has a relatively the same ascending growth in rural areas.

According to this interpretation, it can be said that the number of the poor has been rising in urban areas over time which has been continuous in rural areas from 2007 onwards.

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