

Estimating of minimal living and the situation of income distribution in Semnan province during 1989-2009

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Abstract:

Decision for poverty and injustice campaign and allocation of credit for decreasing of it, is related to minimal living and the situation of income distribution. In this research, with the use of cost-income situation and in formations for rural and urban population of Semnan province, it's estimated that, the minimal living by linear cost system in urban zones is 45440056.82 and in rural zones is 44503518.11.

Therefore, the rate of minimal living in urban zones is more than rural zones. Also Jinni coefficient in 1389 in urban zones was 56, and in rural zones were 48. It shows that, the situation of income distribution in villages is better than cities.

Key Words: Minimal living, poverty, jinni coefficient, urban population, rural population

This article is extracted from a project entitled "Review and Comparison minimal living in urban and rural population in Semnan province during 1368-89." in Islamic Azad University of Semnan

Introduction

Quantitative studies on subsistence, poverty and inequality have been done since the beginning of the twentieth century. Poverty not only includes low income people but also people with low living standards and social values are nominated the poor. For decreasing poverty, development and economic programs and also poverty elimination law are done by the Iranian government. Nonetheless, all of these plans were not successful. Decisions for poverty and inequality reduction and also credit allocation related to the level of subsistence and income distribution. For measuring subsistence and income distribution, there are several indicators.

Study about subsistence and income distribution in the state level will be helpful to find the best solution for sustainable development and poverty alleviation in the regional level. Poverty related to the physical needs like nourishment, house, hygiene and education. The situation gets worse with inaccessibility to the job opportunities and prejudice. Poverty exists in all of the countries but this problem in the developing countries with low income in more than developed countries with higher level income.

Theoretical Study

a. Definitions and measurement of subsistence

Subsistence is the expenditure that a person needs in a certain place and time to reach a minimum level of welfare. People who don't access to the level are considered the poor. For determination and measurement of Poverty the criteria called subsistence is needed. The monetary unit and the minimum expenditure can be used to provide subsistence. But subsistence is not clear. Some researchers defined subsistence by the terms of energy and protein needed by the body. For example, in China the subsistence based on body needs is defined 2150 calories per day. Depending on absolute or relative poverty "poverty line" is defined as the boundary between the poor and other people in the society. Poverty line based on absolute or relative poverty needs different politics because each of these definitions has

different sensitivity against economic- social short term and long term changes and income inequality. According Abolfathi (1992) definition, the Absolute

poverty is defined as income amount according to the community cultural, social and economic context that sufficient for the minimum needs of individuals (e.g., food, clothing, housing, etc.). Poverty line that is determined by using this method called basic needs approach.

b- Subsistence according to the minimum welfare and utility

In the economic, welfare is defined by the utility function and utility function is defined by the consuming of goods and services. In fact utility function determines people preference to the different goods and services. Base on this way subsistence can be defined as a spot of consumer expenditure function that has a minimum cost regarded to the prices that provide a determined welfare for a household.

For subsistence and poverty line determination and calculation the preliminary utility level should be determined. It is not arbitrary because preliminary utility level considerably effect on subsistence and poverty line. There is a problem in recognize of poverty line. The standard method is that cost function parameters determined based on the consumer demand behavior. Fundamental problem is that household characteristics are different in size and structure and these characteristics effect on household welfare without apparent in the consumer demand behavior. Sen (1987 and 1985) stated that poverty should be defined based on a set of abilities and activities that a person able to do. From this viewpoint goods and services that can be provide these capabilities is varied, but functionalities is stable.

C. the income approach to poverty

Income poverty approaches are essentially "one-dimensional" and are evaluated based on income and consumption.

D. capability approach to poverty

The World Bank reports 2000-2001 that poverty concepts include material deprivation and non material deprivations like: education, health and vulnerability. Lack of education and health decreases the poor life quality. Amartiasen says that these deprivations decrease human capabilities. There does not exist an immaterial deprivation indicators and the necessary data for measurement these indicators.

E. combined approaches

United Nations Development Program (UNDP) introduced a combined index, called a composite index of human development indices (HDI) in 1990. It is based on three components: longevity is based on life expectancy, literacy levels, and living level (which is defined in terms of per capita purchasing power).

F. some of poverty reasons

Poor outcome of the interaction processes of economic, social and political process. Low income levels, limited employment opportunities, low rate of labor productivity, rapid population growth, unequal distribution of income due to lack of an efficient tax system, limited coverage of social security, and inflation are the most important reasons of poverty.

G. classical economists' theories of income distribution

In the viewpoint of classical economists ownership of production factors is the base of income distribution. Smith says that competitiveness in market make equilibrium. In other words, base on the supply and demand law national production values distribute between individuals as a wages, profits and rents. According to the Ricardo attributed national income distribute between people in three classes: renter classes, will be paid and profitable. In fact three factors, labor, land and capital should receive their wages.

H. neoclassical theory of income distribution

Neoclassical theory is based on use of utility rather than cost in the value topic. Principle of marginal productivity is the base of this theory. Income distribution in this theory is based on marginal productivity of production factors. Marshall and Hicks is the founder of this theory.

I. theories of Keynes and Keynesian economists about the income distribution

In the Keynes attitude effective demand, is the base of job volume determination and as a result it is basic for determination of production and income amount.

In fact, effective demand is a fundamental for income distribution between production factors.

G. Income Distributions in Islam

Islam economists only attention to the nature. Sadr is the founder of Islam economic and says that capital is a result of production and it is not a basic of production.

Literature Review

However, subsistence returns to thousands years ago but since the seventeenth century, but William Petty in political arithmetic book (which later published after his

death) has studied poverty alleviation (Block, 1996). Eden in 1797 gathered a lot of information about 100 households in church zones. Classical economists (Smith, Ricardo and Malthus) have commented about the poverty. Ricardo and Malthus, due to rapid population growth, decreasing in profits and returns on earth, were pessimistic about the living conditions and predicted that the poverty spread in the future. Economists optimistic believed that technology progress can help to decrease poverty.

Neoclassical economists (like Marshall) believe that with increasing productivity poverty reduces and the progress of society should be distributed among all society members, otherwise the poverty increases. Desousa, Smith, Claire (2001) by using OLS method to determine the factors affecting subsistence and income inequality were used. Adams (2006) with data collected in a large sample of households of Ghana country, studied influence of domestic assistance and international assistance (from African country and other countries) on the minimum standard of living in Ghana. Pazhuyan (1996) by method of calculating calories has done a comprehensive study about poverty line by use of calorie. Samadi (1999) by use of linear expenditure system (LES) poverty line, poverty population percentage and indexes like poverty gap and proportion of income gap is estimated.

Data and Method

In this study for estimating the livelihoods and poverty, the Semnan used urban and rural areas data and information are used during the years (1989 to 2009), which annually by the Statistical Center of Iran is reported. The data of the rural and urban household's consumption goods price.

Two basic methods are used for measurement of income distribution and inequality (Bakhtiari, 2003):

1. Nonparametric method: In this method, the index of income inequality and indicators of income distribution (share 40% of low income population and the proportion of 20% of the top income to the 20% of low income) using direct observations without particular model is calculated.

2. Parametric methods: Inequality of income distribution is calculated by use of distribution models (tile indices, Atkinson, Kakvany and Gini coefficient) and software. In this study parametric method (Gini coefficient) will be used.

Gini coefficient

In the 1902 based on Lorenz curve this index introduced. In fact this index shows the income inequality between community individuals.

The below formula is used for Gini coefficient calculation in the rural and urban areas between the 1989-2010 years.

Table(1)- Gini coefficient in urban and rural areas

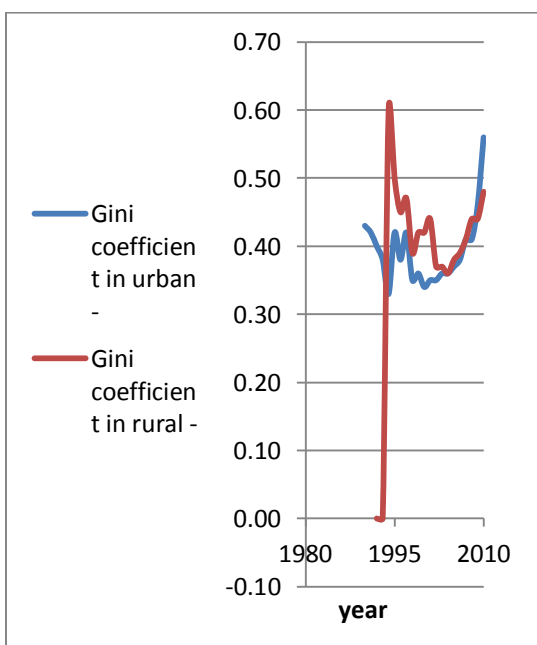
Gini coefficient in rural	Gini coefficient in urban	year
-	-	1989
-	0.43	1990
-	0.42	1991
-	0.4	1992
-	0.38	1993
0.6	0.33	1994
0.5	0.42	1995
0.45	0.38	1996
0.47	0.42	1997
0.39	0.35	1998
0.42	0.36	1999
0.42	0.34	2000
0.44	0.35	2001
0.37	0.35	2002
0.37	0.36	2003
0.36	0.36	2004
0.38	0.37	2005
0.39	0.38	2006
0.41	0.41	2007
0.44	0.41	2008
0.44	0.46	2009
0.48	0.56	2010

$$G = 1 - \sum_{i=1}^n (n_i - n_{i-1})(x_i + x_{i-1}) \quad (1) \text{ Where the}$$

G is Gini coefficient, X_i the individual cumulative income of i person or group. n_i Aggregated the individual (group) of i person or group.

This coefficient has a value between zero and one and if it is closer to the 1, income distribution is more unfair.

Table (1) shows Gini coefficient for urban and rural areas of the province over the years (1989-2010) and the graph (1) shows the comparison between rural and urban Gini coefficient rate.



Graph (1)- urban and rural Gini coefficient

In the 1990 Gini coefficient in urban areas was 0.43 and in the 2010 this coefficient increases to the 0.56. In fact the income distribution inequality is increased. Besides In the rural areas income distribution is worse than urban areas.

Minimum standard of living calculation

In this study Based on linear expenditure system method and by use of estimated parameters in the demand function and household consumption data, subsistence is obtained. Poverty line extraction way is showed in the bellow:

1. Choice of the utility function:

Respect to the basic assumptions of consumer behavior utility function should be selected based on the aim. Stone-Gary utility function is the best way for extraction of demand function and poverty line determination.

2. Demand function determination:

In experimental studies a method for estimation of demand is systematic estimation. Systematic demand Functions, related to the allocation of total cost between goods. It is related simultaneously to the demand and price of each good, price of other goods, and income.

3. Estimation of the demand function parameters:

In this phase the parameters (γ_i, β_i) based on demand, prices and income are estimated.

Linear expenditure system

Linear expenditure system extract from Klein and Rubin (1948) utility function .this function for two goods defined as below:

$$U = [q_1 - \gamma_1]^{\beta_1} [q_2 - \gamma_2]^{\beta_2} \quad (2)$$

The constraints of this function include, $\beta_1 + \beta_2 = 1$, $0 < \beta_i < 1$, $(q_i - \gamma_i) > 0$

In fact demand for good i should not be bellow than subsistence. In this function U is utility level, q_i is consumption of goods, β_i is the relative share of goods after considering the minimum consumption level at utility function, and γ_i is the minimum consumption of goods level. $[\gamma_1, \gamma_2]$ Respectively is the subsistence or minimum consumption of q_1, q_2 goods. Lagrange should be done on the top function.

$$U = \beta_1 \ln[q_1 - \gamma_1] + \beta_2 \ln[q_2 - \gamma_2] \quad (3)$$

For extraction of demand equations related to this utility, top function should be maximized with the budget constraint.

$$\begin{aligned} \text{Max} U &= \beta_1 \ln[q_1 - \gamma_1] + \beta_2 \ln[q_2 - \gamma_2] \\ \text{s.t.} \quad M &= p_1 q_1 + p_2 q_2 \end{aligned} \quad (4)$$

Where, M is total household expenditure, q_1, q_2 consumer demand for two goods, P_1, P_2 price of q_1, q_2 and β_1, β_2 ultimate share of q_1, q_2 expenditure. Lagrange function is:

$$L = \beta_1 \ln[q_1 - \gamma_1] + \beta_2 \ln[q_2 - \gamma_2] + \lambda [M - p_1 q_1 - p_2 q_2] \quad (5)$$

The first order conditions for utility maximization are defined as bellow:

If the first order conditions for q_1, q_2 is solved, we have:

$$q_1 = \gamma_1 + \frac{\beta_1}{p_1} [M - p_1 q_1 - p_2 q_2]$$

$$q_2 = \gamma_2 + \frac{\beta_2}{p_2} [M - p_1 q_1 - p_2 q_2] \tag{6}$$

Equations (6) are the demand function for q_1, q_2 goods.

With multiply of top equations in p_i , demand function for each good based on monetary values are obtained as a function of its price, other commodities price, and total expenditure of consumer. This relationship can be extended to n goods:

$$\begin{aligned} E_1 = q_1 p_1 &= \gamma_1 p_1 + \beta_1 [M - p_1 \gamma_1 - p_2 \gamma_2] \\ E_2 = q_2 p_2 &= \gamma_2 p_2 + \beta_2 [M - p_1 \gamma_1 - p_2 \gamma_2] \end{aligned} \tag{7}$$

These equations are called linear expenditure system. Seemingly unrelated regressions method (SUR) is used for estimation of the parameters. Table (2) showed the linear expenditure system of urban households in Semnan province.

Table (2)-the linear expenditure system of urban households in Semnan province

γ_i	β_i	product group parameters
1517	0.17639	Tobacco and food
372.52	-0.00946	Clothing
564.32	0.36442	housing
235.04	0.04836	miscellaneous goods and services
175.76	0.06323	Transportation and communications
280.37	0.15377	health
83.67	0.04272	Fun and education
257.04	0.14165	other goods and services

Coefficients of β_i show that the highest marginal cost of the urban households of Semnan Province is related to the housing costs with the share of 0.36. Tobacco and food with the marginal cost share of 0.176, health with the marginal cost share of 0.15, foods and services with the marginal cost share of 0.14, respectively are in other ranks. In fact with income increases, house demand is increased.

According to the γ_i coefficient highest level of subsistence respectively related to the Tobacco and food, house, and clothes. Lowest level of subsistence related to the education and entertainment. After this transportation and communication, miscellaneous goods and services, other goods and services, and health included.

Table (3) shows the parameters estimation of linear system expenditure for rural areas.

Table (3)-the linear expenditure system of rural households in Semnan province

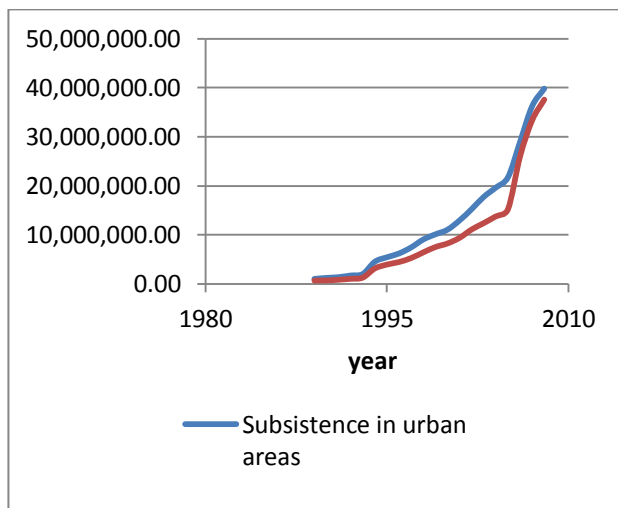
γ_i	β_i	product group parameters
1158.27	0.48712	Tobacco and food
258.41	0.16516	Clothing
403.22	0.06756	housing
223.53	0.10909	miscellaneous goods and services
131.47	0.03221	Transportation and communications
332.04	0.04853	health
99	0.03717	Fun and education
402.27	0.05316	other goods and services

Coefficients of β_i show that the highest marginal cost of the rural households of Semnan Province is related to the Tobacco and food costs with the share of 0.48. Clothes with the marginal cost share of 0.16, miscellaneous goods and services with the marginal cost share of 0.109, house with the marginal cost share of 0.067, respectively are in other ranks.

According to the γ_i coefficient highest level of subsistence respectively related to the Tobacco and food, house, and other goods and services. Lowest level of subsistence related to the education and entertainment. After this transportation and communication, miscellaneous goods and services, clothes, and health included. The $\sum P_i \gamma_i$ formula shows the minimum commitment expenditure for each good. In the table (4) subsistence in rural and urban areas of Semnan province from 1989 to 2009 is calculated.

Table(4): annual minimum subsistence livelihoods in rural and in urban areas

Subsistence in rural areas (Rials)	Subsistence in urban areas (Rials)	year
691930.6	1042791.5	1989
727772.3	1242571	1990
861021.8	1391300.6	1991
1053769.5	1734858.3	1992
1297456.8	2039016.2	1993
3165743.9	4538037.2	1994
3959554.4	5453770.8	1995
4479364	6223010.8	1996
5285951.2	7460939.7	1997
6441628.9	9068300.7	1998
7527900.8	10121722.8	1999
8261295.8	11065533.3	2000
9404936.4	12951243.9	2001
11109600.6	15255978.3	2002
12409611.4	17761513	2003
13787653.8	19656435.5	2004
15216812.4	21744041.2	2005
25997051.42	28963099.18	2006
33372562.08	36248497.03	2007
37586502.11	39824232.58	2008
44503518.11	45440056.82	2009



Graph (2): comprehension of subsistence in rural and urban areas

Annual urban subsistence for each person in the year (1989) was 1042791.5 rials and in the year (2009) is increased to the 45,440,056.82 rials. Annual Rural subsistence per person in the year (1989) was 691,930.6 rials and it is increased to the 44,503,518.11 rials in 1389.

Conclusion:

In the Urban areas the highest marginal cost related to the housing and the lowest share of household cost related to the clothes. Also highest subsistence in urban areas related to the food and Tobacco and the lowest subsistence dedicated to recreation and education. But in rural areas, highest share of marginal expenditure related to the food and Tobacco group and the lowest marginal cost related to the recreation and education.

It can be seen that subsistence in urban areas is higher than rural areas and the investigating year's subsistence

in the rural and urban areas is rising. In 1990 Gini coefficient in urban areas was 0.43 percent and at the end of 2009 year to 0.56 percent has increased. In early 1994, the Gini coefficient in rural areas was 0.6 and in 2009 has declined to 0.48 percent. It also shows that in the 2009 income distribution in rural areas is better than urban areas of the province.

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