

The Impact of Poverty Alleviation Policy on Urban Household Demand

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Abstract

Many policies and measures for poverty alleviation have been undertaken by the Chinese government, but few researchers have explored its experience and lessons. This research focuses on household needs like food, clothing, housing, household equipment and supplies, transportation and communication, education and entertainment, healthcare; and also focuses on food items such as grains, meat, eggs, milk, vegetables, fruits and others in urban China. In poor households, the average disposable income per capita is less than or near per capita expenditure; and the Engels coefficient is often over 40%. The data from 1997-2012 in this research is in the provincial level from the Information Website of Development Research Center of the State Council (or “DRCnet”). The authors used the two stage ELES-AIDS (Almost Ideal Demand System) to estimate the price elasticity and expenditure elasticity of the household’s expenditures. According to the results, it is recommended that the government should follow economic law and improves policy efficiency, especially its food policy to alleviate the poverty of low income residents.

Keywords

Poverty Alleviation, Urban Household, Two Stage ELES-AIDS, China

1. Introduction

After economic reform since 1980s in China, more and more people choose to work and live in city, especially for rural, off-farm job providing opportunity for a great number of the surplus rural labor force; in the meantime, which maybe make poverty transfer from rural to urban.

Up till now, more authors focus on rural poverty, but pay less attention to the low-income group in urban. Thought many researchers focus on household consumption, they just focus on the food security, rarely considering about the policy implication [1].

This paper will use the two stage ELES-AIDS (Almost Ideal Demand System) to estimate the price elasticity and expenditure elasticity including food, clothing, housing, family equipment, communication and transformation, education, health care, and others etc. According to the results, it is recommended that the government should follow economic law and improve policy efficiency, especially its food policy to alleviate the poverty of low income residents.

The frame of the paper is arranged in the following: except for the introduction, the next part is Data and its expression, A Two-Stage ELES-AIDS Model, results, conclusions and policy implication.

2. Data and Its Expression

All data in this research is from the Information Website of Development Research Center of the State Council (or “DRCnet”, <http://www.drcnet.com.cn>).

The urban household data is collected from 1997 to 2012 grouped by disposable income, including the lowest (among which, also separated half for the difficult group), the lower, the middle-lower, the middle, the middle-higher, the higher and the highest; their proportion of the group accounts for 10% (including 5% of difficult group), 10%, 20%, 20%, 20%, 10% and 10%, respectively. And these groups denotes Lowest, difficult, lower, mid-lower, middle, mid-higher, higher, highest in the table in the following.

3. Two-Stage ELES-AIDS Model

Due to weakly separable utility over broad groups of goods, usually we allocate broad group of goods over total expenditure at first; then allocate group expenditure over individual commodities.

3.1. ELES Model

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

Due to weakly separable utility over broad groups of goods, usually we allocate broad group of goods over total expenditure at first; then allocate group expenditure over individual commodities. The extended linear expenditure system (ELES) is based on the basis of the linear expenditure system [2].

The ELES model expression is as follows:

$$V_i = a_i + b_i Y \quad (1)$$

Here, V_i is the annual expenditure of a household spending on goods or services of i -th; and Y is the income of household. According to the model, the

b_i could be calculated, is the marginal propensity to consume (MPC).

In economics, the marginal propensity to consume (MPC) is the concept that the increase in personal consumer spending (consumption) occurs with an increase in disposable income. The proportion of disposable income which individuals spend on consumption is called as propensity to consume.

Mathematically, the definition of MPC function is expressed in the following: $MPC = \Delta C/\Delta Y$, ΔC -the change in consumption; ΔY -the change in disposable income that produced the consumption. Usually, we use the OLS to estimate the MPC like b in function (1).

3.2. AIDS Model

Deaton and Muellbauer [3] have developed the linear approximate almost ideal demand system (LA/AIDS), which was used to estimate price and income elasticities. The AIDS model only illustrates the axioms of choice, but does not reflect preferences and other social and economic factors.

The AIDS demand function used in this study is in the following: where the w_i is the expenditure share of the i th food or food group, X is living expenditure and Z_s are social and demographic variables (preference, household size, coefficient of family burden, income source, region, and so on.), x is the total expenditure, P_j are prices of food group items, and $\ln P^*$ is a Stone price index. $\alpha_p, \beta_p, \gamma_{ij}, \alpha$ are parameters to be estimated.

Stone Price Index, that is:

$$\ln P = \sum_k w_k \ln P \tag{2}$$

The model must meet the following restrictions:

$$\sum_i \alpha_i = 1, \sum_i \beta_i = 0, \sum_i r_{ij} = 0, \sum_j r_{ij} = 0, r_{ij} = r_{ji}$$

In practice, the LA-AIDS model is used more frequently than the non-linear AIDS model [4]. The estimates from an LA-AIDS model would approach the estimates for AIDS except for an intercept term.

Expenditure elasticities and Marshallian (compensated) elasticities were computed from the estimated parameters of the LA-AIDS model using the close approximation of the exact formulas are given in Equations (3)–(4).

Expenditure elasticities:

$$\eta_i = 1 + \frac{\beta_i}{w_i} \tag{3}$$

Marshallian (uncompensated) price elasticities:

$$\epsilon_{ij} = \frac{\partial q_i}{\partial p_j} \frac{p_j}{q_i} = -\delta_{ij} + \frac{\gamma_{ij}}{w_i} - \frac{\beta_i w_j}{w_i} \tag{4}$$

while $i = j$, $\delta = 1$, or $\delta = 0$.

4. Results

From the two stage functions, the results of marginal propensity to consume and

estimation of demand elasticities show in the following:

4.1. Marginal Propensity to Consume

There are eight commodity groups for the stage of the demand system: food, clothing, housing, family equipment, transportation, education, health care, and other commodities.

From ELES model, the results for the first-stage commodity groups are presented in **Table 1**. All parameters are significant at the 1% level. Here we just focus on marginal propensity to consume, neglecting the expenditure elasticities and price elastic.

Food: In the urban household, averagely 22% of income is used for food consumption, but for difficult group, the proportion reaches 43%; while the highest income group the proportion is only 15%; from absolute value, the difficult group has less expenditure for food.

Clothing: about 10% of income is used for clothing, and in the lowest group, its proportion is 10%, the proportion for other groups ranges from 6% - 8%.

Housing: comparing with the average level, the difficult group spends 12% income for housing, as is the double times to average level; except the lowest group, its housing proportion is 10%, and the others range 5% to 7%.

Health: the average proportion of health care expenditure is 4%, but difficult group account for 9% from income share.

There is no more different in the consumption tendency of family equipment, transportation, education, and others between different income groups.

Generally, for the lowest group, especially difficult group, lower group have higher share in food, clothing, health and housing expenditure.

4.2. Estimation of Demand Elasticities

The diagonal number in each group of **Table 2** indicates the own-price elasticities. The own-price elasticities are negative sign, as show that food demand structure is related to the market price; and the group for low income is more sensitive than other groups, for almost all own-price elasticities are higher than other two groups.

From the cross-price elasticities within the food group have positive signs, implying that major food items have substitute relationship; and the negative cross-price elasticities means the complement relationship.

The second stage consists of six commodities within the food group: grain, meat (pork, lamb, beef, chicken, etc.), egg, aquatic, milk and other food items.

Considering the sample number in the model, the samples are separated into 3 kinds: low group, middle group and high group.

The estimates of expenditure elasticities for commodities in the food group indicate that most of commodities are necessary goods. Grains have the lowest expenditure elasticities, but they are still in the normal good range. The expenditure elasticities for meat is the luxury good to low group, but aquatic, milk and others are luxury goods for all groups.

Table 1. The Estimation of Elasticities from ELES model.

(a)

Income group	Food		Clothing		housing	
	a_i	b_i	a_i	b_i	a_i	b_i
average	0.22 (58.32)	615.10 (12.17)	0.07 (49.38)	58.18 (3.01)	0.06 (23.95)	145.35 (4.40)
lowest	0.37 (40.69)	313.90 (7.95)	0.09 (44.48)	-37.33 (-4.19)	0.10 (27.66)	33.54 (2.11)
difficult	0.43 (42.84)	206.25 (5.89)	0.10 (48.60)	-52.88 (-7.48)	0.12 (24.78)	17.44 (1.05)
lower	0.30 (41.31)	479.55 (10.08)	0.09 (50.01)	-7.52 (-0.67)	0.07 (20.77)	97.89 (4.29)
midlower	0.27 (52.93)	529.98 (11.66)	0.08 51.69	11.66 0.81	0.07 25.18	101.20 4.29
middle	0.25 60.43	561.49 11.50	0.08 50.33	71.51 3.91	0.06 20.45	133.86 3.80
midhigher	0.22 65.67	656.72 12.26	0.07 55.10	118.63 5.76	0.06 23.63	152.72 3.95
higher	0.20 64.98	729.14 11.17	0.07 46.81	130.86 4.28	0.06 21.82	195.87 3.62
highest	0.15 54.60	1057.24 11.11	0.06 39.83	108.20 2.09	0.05 16.21	363.89 3.34

(b)

Income group	equipment		transportation		education		health	
	a_i	b_i	a_i	b_i	a_i	b_i	a_i	b_i
average	0.04 (17.18)	103.72 (3.36)	0.11 (39.31)	-295.96 (-7.63)	0.08 (20.74)	193.01 (3.92)	0.04 (17.37)	50.21 (1.48)
lowest	0.05 (23.96)	-40.47 (-4.24)	0.08 (20.78)	-69.05 (-3.93)	0.07 (13.92)	103.46 (4.52)	0.07 (21.42)	-38.93 (-2.61)
difficult	0.05 (21.63)	-36.04 (-4.15)	0.09 (18.35)	-69.58 (-4.18)	0.08 (13.24)	88.61 (4.31)	0.09 (14.78)	-48.78 (-2.41)
lower	0.05 (24.28)	-19.72 (-1.57)	0.08 (21.84)	-80.37 (-3.17)	0.07 (16.22)	140.85 (5.03)	0.06 (16.93)	-1.44 (-0.07)
midlower	0.04 24.03	9.17 0.56	0.09 29.36	-123.67 -4.53	0.07 17.09	180.99 5.03	0.05 19.74	10.93 0.47
middle	0.04 22.49	56.82 2.51	0.10 34.82	-222.66 -6.39	0.07 18.38	215.63 4.61	0.05 18.54	18.09 0.57
midhigher	0.04 16.90	119.39 3.11	0.11 45.30	-354.13 -8.90	0.08 21.36	240.50 4.20	0.04 13.74	85.62 1.71
higher	0.04 15.03	225.45 4.03	0.13 44.84	-583.06 -9.50	0.08 25.98	220.93 3.25	0.04 14.55	114.15 1.89
highest	0.03 13.88	547.80 6.51	0.14 27.70	-870.36 -4.84	0.08 26.89	229.69 2.08	0.03 13.84	227.68 2.90

Source: the authors calculate through models.

Table 2. Estimated price and expenditure elasticities within the food group.

group	item	Price Elasticities						Expenditure Elasticities
		grain	meat	egg	aquatic	milks	others	
low	grain	-0.543	-0.218	0.046	-0.088	-0.145	-0.101	0.384
	meat	-0.408	-0.996	-0.044	-0.061	0.098	0.014	1.457
	egg	0.124	-0.069	-0.723	-0.116	0.029	-0.066	0.796
	aquatic	-0.279	-0.068	-0.075	-0.620	-0.056	0.011	1.100
	milks	-0.739	0.232	-0.012	-0.150	-1.362	0.345	2.014
	others	-0.110	0.042	-0.013	0.003	0.042	-1.034	0.996
middle	grain	-0.473	0.042	0.012	-0.066	-0.100	-0.119	0.659
	meat	0.043	-0.556	0.028	-0.054	-0.110	-0.115	0.728
	egg	0.034	0.078	-0.614	-0.112	-0.061	-0.107	0.750
	aquatic	-0.125	-0.087	-0.053	-0.770	-0.040	0.017	1.067
	milks	-0.296	-0.266	-0.060	-0.097	-0.868	0.147	1.507
	others	-0.054	-0.040	-0.013	0.004	0.030	-1.082	1.059
high	grain	-0.283	-0.103	0.004	0.033	0.011	0.172	0.040
	meat	-0.153	-0.623	0.017	-0.065	0.130	0.332	0.268
	egg	-0.025	0.037	-0.691	0.086	-0.214	0.316	0.415
	aquatic	-0.076	-0.174	0.015	-0.739	-0.217	-0.029	1.252
	milks	-0.139	0.182	-0.205	-0.392	-1.065	0.075	1.624
	others	-0.074	-0.014	-0.001	0.010	0.027	-1.063	1.268

Source: the authors calculate through models.

5. Conclusions and Policy Implication

From the MPC results, local government should pay more attention to food, clothing, and health care and housing for lowest group, because these expenditures take more money from their limited disposable income.

From expenditure elasticities, aquatic and milk at more than 1, urban demand for aquatic and milk will increase, and meat will also rise, because the low groups (accounting for 20% in total group) have strong demand if they have higher income. So a better policy for poor residents is to increase their chance to earn money, so as to raise their payment power.

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References

- [1] Li, Z.Q., Wang, D.J., Yu, W., Wu, J.Z. and Zhang, Y.M. (2013) The Consumption among Households of Different Income Level—Empirical Analysis of Rural Household Survey Data. *Journal of System Science & Mathematics*, **33**, 2-10.

- [2] Chen, J. and Wu, L.P. (2009) An Analysis on Change of Consumer Demand and Consumer Structure of Chinese Urban Residents—Based on ELES Model. *Journal of Shihezi University (Philosophy and Social Sciences)*, **23**, 49-53.
- [3] Deaton, A. and Muellbauer, J. (1980) An Almost Ideal Demand System. *The American Economic Review*, **70**, 312-326.
- [4] Fan, S., Eric, J.W. and Cramer, G.L. (1995) Household Demand in Rural China: A Two-Stage LES-AIDS Model. *American Journal of Agricultural Economics*, **77**, 847-858. <https://doi.org/10.2307/1243888>



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