The Urban-Rural Consumption Inequality in Turkey: A Quantile Regression Approach

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Abstract

In this paper we examine the rural-urban consumption disparity in Turkey by using data from Household Consumption Expenditures surveys, conducted by Turkish Statistical Institute from the year 2010 to 2015 every year. Primary findings from quantile regression techniques suggest that the urban-rural consumption disparity is on rise in every quantile in Turkey, and the larger consumption discrepancies are associated with lower quantiles. The results also indicate that increasing the educational level of rural household head is helpful in reducing urban-rural consumption disparity.

JEL Classification:D04, D31, D63, C21

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1. Introduction

The Turkish economy is associated with a persistent and unequal income and consumption distributions. The income of individuals plays a fundamental role in social integration by meeting their vital and socio-cultural needs. In this context, inequality in income distribution worsens not only economical but also socio-cultural problems. The reasons of inequality in Turkey can be attributed to the negative trend of real wages, existing tax structure benefiting the rich, low public and private investments, insufficient redistributive tax policies, high real interest rates, unequal opportunity in access to education, and excessive migration to urban areas due to both economic and political pressures. Consumption can be a more appropriate indicator of economic and social well-being, because consumption is a better measure of households'welfare than income. However, the debate over inequality almost exclusively

relies on income inequality, though official income statistics may not accurately reflect the changes in well-being. The income data in general ignore taxes and transfers and rely on income badly reported in surveys. For these reasons, the consumption patterns of households may provide a better indicator of economic and social well-being.

Economic conditions and standards of living have always been considerable different between urban and rural areas in Turkey. However, the income and consumption disparities between urban and rural areas have widened since the 1990s due to speedy immigration to urban areas for security reasons related to on-going terror incidents and state of emergency in the eastern and south eastern regions of Turkey. The lack of employment opportunities, lower returns to human capital investments and low economic performance in rural areas result in increasing welfare inequalities between urban-rural parts of Turkey. Hence, the disparities in welfare between urban and rural areas have been one of the most debated social phenomenon since 1990s. Levels of inequality in consumption expenditure change depending on parental education, geographical location and demographic composition of the household members such as age, marital status and gender of the household head, etc.

Studying consumption inequality is not new. There have been several studies focused on consumption inequality at the country level (Huang 2015, Nguyen et al. 2007, Johnson and Shipp 1999, Qu and Zhao 2008, etc). Huang (2015) employs quantile regression to analyze the determinants of household electricity consumption in Taiwan over the period 1981-2011. The results show that the effects of demographic, socio-economic, and household dwelling characteristics on household electricity consumption may differ across quantiles and may change over time. The study reports that household income and household size are significant in all quantiles for each year. Nguyen et al., (2007) use the Vietnam Living Standards Surveys from 1993 and 1998 to examine inequality in welfare between urban and rural areas in Vietnam. Real per capita household consumption expenditure (RPCE) is used as the measure of welfare. The authors apply a quantile regression decomposition technique to analyze the difference between the urban and rural distributions of log RPCE. Qu and Zhao (2008) also apply quantile regression to examine the large urban-rural disparity in China. Chamarbagwala (2010) examines India's urban-rural inequality in welfare in 1993-1994 and 2004, a period which coincides with the country's economic liberalization reforms and rapid economic growth. Using real monthly per capita household consumption expenditure as the measure of welfare, the author estimates quantile regressions to analyze the urban–rural welfare gap across the entire welfare distribution. Koenker and Hallock(2018) present a classical

empirical application in economics, Engel's(1857) analysis of the relationship between household food expenditure and household income. Using data for 235 European working-class households, they plotted Engel's data with seven estimated quantile regression lines corresponding to the 0.05, 0.1, 0.25, 0.5, 0.75, 0.9, and 0.95 quantiles.

The purpose of this paper is to examinethe consumption inequality between urban and rural areas in Turkey, using data obtained from Household Consumption Expenditure survey, conducted by Turkish Statistical Institute (TURKSTAT)in every year between 2010 and 2015. In an attempt to explain how the urban-rural consumption inequality varies across different levels of income, we apply the quantile regression technique for decomposition of consumption disparities between urban and rural areas in Turkey.

The rest of the paper is developed as follows: Section 2 presents the data and variables used. Section 3explains the quantile regression. Section 4 introduces the empirical results. Finally, the last section attempts to come up with some policy prescriptions that may help reducing consumption inequality between urban-rural areas in Turkey.

2. Data Used and Variables

Data used in this study include six independent household budget survey, conducted by the TurkStat in every year for the period 2010-2015and cover a total of 52419 households. The household budget surveys are conducted as random sampling each year. This data provides information about income, expenditure and consumption as well as a wide range of demographic and socio-economic characteristics of Turkish household members and household head. Household monthly expenditure is used as dependent variable while household total income is added as an independent variable. Recent literature suggests that consumption maybe a more appropriate indicator of economic well-being than income because consumption is a better measure of permanent household well-being than income, which may better reflect the changes in well-being (Slesnick 1993, Cutler and Kats 1991, Johnson and Shipp 1999). If consumers smooth their spending over their lifetimes, then consumption inequality might behave differently than income inequality over time (Johnson and Shipp 1999). Quantile regression also incorporates the following independent variables: gender, age and marital status of household head, the education level of household head (as year), household size and square of household size and dummy variables indicating the six

years (2010, 2011, 2012, 2013, 2014 and 2015). However, the household budget survey for 2015 do not explicitly distinguish between rural and urban areas. Therefore, in the 2015 survey, if a household head is working in the agricultural, forestry and fisheries sectors, we assume that house hold is located in rural area. Household size obtained from household budget survey conducted by TURKSTAT and is adjusted according to the OECD scale for taking into account the economies of scale in consumption. Accordingly, OECD measure of 1 for the reference person of the household, 0.5 for household members aged 14 and over, 0.3 for household members less than age 14 are used (Turkstat, 2015). The reference person is household head in this study. Table 1 shows the definition of variables used in the econometric model.

Table 1. The Definition of Variables

Dependent Variable	**Definition**
Lneexp	Logarithm of monthly household total expenditure
Independent Variables	
Lnincome	log of monthly household total income
Hsize	Household size
Hsizesqr	Household size squared
Gender	Equals 1 if household head is male zero otherwise
Marital	Equals 1 if household head is married, zero otherwise
Education	The education of household head (year)
year2010	Equals 1 if the year is 2010, zero otherwise (reference)
year2011	Equals 1 if the year is 2011, zero otherwise
year2012	Equals 1 if the year is 2012, zero otherwise
year2013	Equals 1 if the year is 2013, zero otherwise
year2014	Equals 1 if the year is 2014, zero otherwise
year2015	Equals 1 if the year is 2015, zero otherwise

3. Econometric Model

The quantile regression approach allows different consumption patterns between urban and rural areas. Hence,we use the quantile Regression (QR) technique developed by Koenker and Bassett (1978) for the analysis. QR shows the differences in the relationships between the dependent and the explanatory variables at diverse points of the conditional distribution of the dependent variable. The QR approach assume that the conditional quantile of a random variable Y is a linear in the vector of regressors $\boldsymbol{X}$**.** The ordinary least squares estimators are obtained by minimizing the sum of squared residuals. The quantile regression estimators for the vector of coefficients $\boldsymbol{\beta}$, on the other hand minimize the following expression (Bassett and

Chen 2001, Huang 2015, Koenker and Hallock 2018, Çağlayan and Astar, 2012, Karaoğlan and Tansıt 2017, Valenzuale et all. 2014):

$$\min_{\beta}\left[\sum_{i^*}\theta\left|y_i - x_i'\beta\right| + (1-\theta)\left|y_i - x_i'\right|\beta\right]$$

Where $i^* = i\left|y_i \geq x_i'\beta\right.$ and $i^* = i\left|y_i < x_i'\beta\right.$

4. The Consumption Gap in Turkey

The shares of consumption expenditures by quantiles vary considerable in Turkey (Table 2). While the share of food and non-alcoholic beverages in the total consumption expenditure is 19.9% in Turkey, it is 28.8% for the first 20% quantile and drops to 14.6% for the fifth 20% quantile in 2013. The expenditure share of clothing and footwear ratio is 5.3% in overall the country, the shares are 3.9% and 6.0% for the first and fifth quintiles respectively. Similarly the shares of transportation, communication, entertainment and education in total consumption expenditure are higher than country's average for the fifth quantile, while the shares of the same groups are lower than the country average for the first quantile (Table 2).

Table 2. The Consumption Expenditure Quantiles Ordered by Income in Turkey (2013)

Main groups of consumption expenditures	Total	**1. %20**	**2. %20**	**3. %20**	**4. %20**	**5. %20**
Total consumption expenditure	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Food and non-alcoholic beverages	**19.9**	28.8	25.6	22.1	20.0	14.6
Alcoholic beverages, cigarette and tobacco	**4.2**	5.3	4.8	4.9	4.7	3.2
Clothing and footwear	**5.3**	3.9	4.5	4.9	5.4	6.0
Housing and rent	**25.0**	33.3	29.6	26.3	24.1	21.2
Furniture, houses appliances and home care services	**6.6**	5.6	5.9	6.4	7.0	6.8
Health	**2.1**	2.1	2.2	2.0	2.1	2.0
Transportation	**17.4**	8.1	12.2	16.3	17.4	22.1
Communication	**4.0**	3.0	3.6	4.0	4.3	4.2
Entertainment and culture	**3.1**	1.6	2.2	2.6	2.9	4.1
Educational services	**2.4**	0.7	1.1	1.4	1.8	4.0

Restaurant and hotels	**5.9**	4.0	4.8	5.4	6.1	6.9
Various good and services	**4.3**	3.5	3.7	3.7	4.3	5.0

Sources: http://www.tuik.gov.tr/PreTablo.do?alt_id=1012.

Table 3 outlines the consumption expenditure quantiles ordered by income in urban area for 2013. The share of food and non-alcoholic beverages in total urban household consumption is 17.8%. But this ratio changes according to quantiles. Food and non-alcoholic beverages turns out to be 25.9% and 12.5% for the first and fifth quintiles respectively, consistently decreasing from the first to fifth quintile. The shares of the order of the main groups' expenditures also change between quantiles in urban area. The shares of transportation, communication, entertainment and education in total consumption expenditure are higher than country's and urban's average for the fifth quantile in urban area, while the shares of the same groups are lower than country's and urban's average for the first quantile in urban area (Table 3).

Table 3. The Consumption Expenditure Quantiles Ordered by Income in Urban Area (2013)

Main groups of consumption expenditures	**Total**	**1. 20%**	**2. 20%**	**3. 20 %**	**4. 20 %**	**5. 20 %**
Total consumption expenditure	100.0	100.0	100.0	100.0	100.0	100.0
Food and non-alcoholic beverages	17.8	25.9	23.4	22.2	19.0	12.5
Alcoholic beverages, cigarette and tobacco	4.0	5.0	5.3	5.2	4.7	2.7
Clothing and footwear	5.3	3.2	4.3	4.8	5.8	6.0
Housing and rent	25.7	40.7	34.0	30.4	26.2	18.6
Furniture, houses appliances and home care services	6.7	4.3	5.8	6.2	7.3	7.2
Health	2.1	1.9	1.7	2.1	2.4	2.0
Transportation	17.7	6.1	8.7	10.7	14.5	26.7
Communication	4.1	3.3	4.2	4.3	4.2	4.0
Entertainment and culture	3.3	1.5	2.2	2.7	3.0	4.4

Educational services	2.7	0.5	1.1	1.5	2.0	4.4
Restaurant and hotels	6.3	5.0	6.3	6.4	6.6	6.3
Various good and services	4.4	2.7	3.1	3.6	4.4	5.3

Source: http://www.tuik.gov.tr/PreTablo.do?alt_id=1012

Table 4 also presents the consumption expenditure quantiles ordered by income in rural area of Turkey. In particular, in all quantiles of rural area the shares of food and non-alcoholic beverages are higher compared with all quantiles of urban area and overall Turkey. The shares of housing and rent, on the other hand, are lower compared with all quantiles of urban area and overall Turkey with the exception of the first quintile which represents a slightly higher percentage of expenditure than overall Turkey. The shares of the other commodity groups' expenditures vary across quantiles in rural area as in Turkey and urban area. However, the share of food and non-alcoholic the consumption expenditure in rural area is considerable higher than in urban area and overall Turkey in general, except the first quintile whose share is lower than that of urban area. The shares of transportation, communication, entertainment, education and various goods increases in higher quintiles in rural area but in general lower than those of urban area and overall Turkey.

Table 4. The Consumption Expenditure Quantiles Ordered by Income in Rural Area (2013)

Main groups of consumption expenditures	**Total**	**1. % 20**	**2. %20**	**3. % 20**	**4. % 20**	**5. % 20**
Total consumption expenditure	100.0	100.0	100.0	100.0	100.0	100.0
Food and non-alcoholic beverages	27.2	33.2	31.8	30.3	26.0	22.8
Alcoholic beverages, cigarette and tobacco	5.1	4.7	5.0	5.5	5.2	4.9
Clothing and footwear	5.1	3.2	4.5	5.4	5.1	5.7
Housing and rent	22.3	33.6	26.8	23.3	20.7	17.9
Furniture, houses appliances and home care services	6.1	4.7	6.1	6.2	6.7	6.1
Health	2.1	2.2	2.3	1.9	1.8	2.2
Transportation	16.6	8.0	10.5	13.2	18.6	21.8
Communication	3.7	2.5	3.1	3.6	3.5	4.5
Entertainment and culture	2.2	1.5	1.8	1.9	2.6	2.4

Educational services	1.0	0.4	0.7	0.6	1.3	1.4
Restaurant and hotels	4.5	2.7	3.9	4.2	4.7	5.3
Various good and services	4.2	3.4	3.5	3.9	3.9	5.1

Sources: http://www.tuik.gov.tr/PreTablodo?alt_id=1012

The distribution of annual equivalised household disposable income by quantiles are given in Table 5. The share of total income received by the poorest and richest 20% of the population are 6.1%, and 46.6% respectively. These figures show that the income inequality is a serious problem in Turkey. The mean of annual equvalised household disposable income per capita is 13,250 Turkish liras, while the median of annual equvalised household disposable income per capita is 10,024 Turkish liras. These ratios and values tend to be the same in urban and rural areas. However, the mean and median income are higher in urban area compared to Turkey and rural area while they are lower in rural area with respect to overall Turkey and urban area

Table 5. Distribution of annual equivalised household disposable income by quantiles, 2013

Turkey	**Total**	**1. 20 %**	**2. 20 %**	**3. 20 %**	**4. 20 %**	**5. 20 %**
Percentage (%)	100	6.1	10.7	15.2	21.4	46.6
Mean (TL)	13250	4016	7076	10080	14193	30889
Median (TL)	10024	4188	7080	10024	14000	24726
Urban						
Percentage (%)	100	6.4	10.9	15.2	21.1	46.4
Mean (TL)	15046	4811	8213	114378	15888	34900
Median (TL)	11387	5051	8163	11387	15596	28103
Rural						
Percentage (%)	100	6.7	11.4	16.1	22.6	43.3
Mean (TL)	9 374	3128	5331	7522	10609	20293
Median (TL)	7451	3300	5328	7451	10443	16755

Sources: http://www.tuik.gov.tr/MicroVeri/GYKA_2014/turkce/downloads/tablo1.xlsx

4. Results

Table 6 and Table 7 shows QR estimation results for urban and rural areas respectively. All variables of income and expenditure are in natural logarithm. Most of the estimated coefficients are statistically significant. The effect of the logarithm of household income is positive and significant on the logarithm of household expenditure in all quantiles. In general, our results show that households with higher income levels have higher consumption elasticities in both urban and rural areas, though 95% confidence intervals for log income coefficients overlaps within urban and rural areas. The effect of income in urban area for all of quantiles have a higher magnitude than rural area, indicating expenditure on total consumption tend to be is more sensitive to changes in income in urban areas than in rural areas.

Table 6. Quantile regression results for urban area

	Q.25		Q.50		Q.75	
Coefficient	Coefficient	t stat	Coefficient	t stat	Coefficient	t stat
Log of household income (TL)	0.705	7.90	0.78	7.76	0.844	8.72
Household size	0.33	4.83	0.28	3.61	0.17	1.98
Square of household size	-0.0001	-4.32	-0.0001	-0.42	-0.00008	-0.88
Age of household heads	0.06	4.20	0.04	3.41	0.02	2.23
Gender of household head	-0.092	-8.18	-0.052	-10.08	-0.045	-8.98
Marital status of household head	-0.25	-3.42	-0.42	-4.27	-0.51	-3.98
Education of household head	0.53	5.71	-0.33	4.30	-0.19	1.52
Year2011	0.71	3.91	0.48	1.96	0.27	4.33
Year2012	0.78	4.01	0.53	2.28	0.22	4.27

Year2013	0.81	3.49	0.39	1.19	0.21	3.15
Year2014	0.83	4.25	0.57	5.11	0.30	2.41
Year2015	0.86	4.28	0.57	5.42	0.31	2.28
constant	1.41	30.62	1.08	11.01	0.793	7.25

Table 7. Quantile regression results for rural area

Variables	Q.25		Q.50		Q.75	
	Coefficient	t stat	Coefficient	t stat	Coefficient	t stat
Log of household income (TL)	0.541	9.17	0.56	9.17	0.57	5.10
Household size	0.71	3.05	0.68	4.19	0.54	3.05
Square of household size	-0.0017	-3.49	-0.0001	-4.92	-0.001	-2.57
Age of household heads	0.15	3.36	0.20	4.70	0.14	2.75
Gender of household head	-0.06	-1.92	-0.07	-3.36	-0.052	-1.69
Marital status of household head	-0.12	4.87	-0.09	-8.12	-0.23	-6.17
Education of household head	0.15	0.714	0.08	0.91	-0.10	-2.83
Year2011	0.51	2.27	0.12	2.15	0.28	4.23
Year2012	0.48	3.28	0.16	3.42	0.23	1.28
Year2013	0.53	5.15	0.24	3.01	0.36	5.97
Year2014	0.57	7.13	0.32	1.99	0.38	8.16
Year2015	0.60	6.48	0.37	2.28	0.41	7.48
constant	1.02	4.97	1.02	7.62	1.03	4.97

When we look at the results of urban areas estimates, we can see that the effect of household size on consumption expenditures is decreasing in the upper quantiles both in urban and rural areas of Turkey. The effect of household size on consumption expenditure decreases in higher quintiles both in urban and rural areas and higher in rural area than in urban area in all quintiles though the confidence intervals overlap both within and between urban and rural areas. Household size and household expenditure have an inverted U-shape relationship implying that households expenditure increases in household size at a decreasing rate both in rural and urban areas. Age of household head is found to be significantly and positively affecting consumption expenditures both in urban area and rural areas, but the magnitude in rural area is higher than that of urban area for all quintiles. The impact of household head's age on consumption expenditure increases in the middle quintile in urban area and decreases in higher quintiles in urban are. Gender of household head is negative in all quintiles but significant only in urban area, implying households with a male household head in urban area

tend to consume less than the households with a female household head and the households in rural areas.

Regarding the marital status, consumption is significantly lower relative to the widowed/divorced/single household heads, if household head is married both in urban and rural areas and magnitude is considerable larger in urban areas. The effect on being married is negatively and statistically significant on household expenditure in urban area with the value of 0.25 in the 25% quantile and the value of 0.51 in the 75 quantile in urban area. The effect of being married on consumption also raises monotonically from the 25% to 75% quantile in rural area. It should be noted that the confidence intervals across all quintiles for the effect of marital status overlap within each region. The other important finding of the study is that the impact of the education level on household consumption is positive and significant only in the first quantile in urban area, while the effect of education level is negative and significant only in the middle quintile in urban area and the third quintile of urban area.

Finally, year dummies are positive and significant across all quantiles in urban and rural areas, except the dummies for 2013 for urban and 2012 for rural areas which turn out to be insignificant. Overall the results from year dummies indicate increase in consumption over time both in urban and rural areas, and the effect seems to be larger in lower quintiles and overall in urban area, except the highest quintile.

Conclusion

In this paper we examine the disparities of consumption in urban and rural areas in Turkey. We use quantile regression technique in order to investigate the impact of income, marital status, age, gender and education level of household head and household size on consumption at different quantiles in urban and rural areas in Turkey.

Turkey is a developing country, and poverty in both rural and urban areas is a substantial problem in Turkey. For folks living in poverty, consumption, especially the food consumption is definitely the most important item, representing the largest share in total expenditure. The results in this study suggest that there exist significant consumption disparities across the income quantiles both in urban and rural areas. But the disparity is significantly larger in rural area than in urban area. The household consumption both in urban and rural areas are responsive to income in all quantiles.

The impact of household income on household consumption seems to be higher in urban areas than in rural areas. The relationship between household size and household consumption is concave across quantiles in urban and rural areas. This impact on household size on household consumption is higher in lower quantiles in rural area. The effect of education is positive and statistically significant in the lowest quantile in urban area, negative and significant in the middle quantile and insignificant in the highest quintile and in all quintiles of the rural area. Households with a female household head tend to consume more than those with a male household head in urban area but there is no significant difference in consumption with respect to the gender of household head in rural area. Moreover, the gender effect on consumption tend to be larger in magnitude in the lowest quantile and decreases in higher quintiles in urban area. The impact of household head being married has a negative and significant effect on consumption in both areas and in all three quintiles but the magnitude is larger in urban area.

The results from year dummies indicate increase in consumption over time both in urban and rural areas, and the effect seems to be larger in lower quintiles and overall in urban area, except the highest quintile. Finally, we should note that, one of the potential cause of consumption disparities in urban area across the quintiles may be the internal migration from rural to urban areas which is not included in the analysis. Improvement of educational level for the lowest quintile in urban area seems to be helpful in reducing consumption disparities in urban area, indicated by the fairly large positive and significant coefficient of education for the lowest quintile in urban area.

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