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Consumption Gap Between Urban and Rural Migrants: A Study Based on the Quantile Regression and Decomposition

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***Abstract*—Based on the data of China Migrants Dynamic Survey in 2016, this paper uses the quantile regression and decomposition method to examine the consumption disparity between the urban and rural migrants. The empirical evidence finds that the consumption gap between the urban and rural migrants exists at each quantile of the distribution, and the effects of the characteristics covariates such as finance, demographics, mobility and employment on the consumption vary with the migrants' positions in the consumption distribution and also differ between the urban and rural migrants. The differences in the characteristics account for 88.2% of the total consumption gap between the two groups. The consumption gap between the urban and rural migrants is higher at the middle and the top of the consumption distribution, and smaller at the low end of the distribution. The endowment effect increases at higher quantiles, while the coefficient effect decreases at higher quantiles.**

Keywords—urban migrants; rural migrants; consumption gap; quantile regression and decomposition

I. INTRODUCTION

With the acceleration of urbanization in China, the quantity of migrants has increased from 21 million in the 1990s to 245 million by the end of 2016. Under the dual economic structure of China, the migrants can be divided into urban migrants and rural migrants. What's more, there are characteristics differences of the migrants in terms of finance, education, etc., which may affect the consumption expenditure. Then, what factors have led to the difference of the consumption between the urban and rural migrants? To what extent do they affect the consumption disparity of the two groups? These are the research content of this paper.

Several authors have studied the consumption of the migrants. Minh and Paul (2011) use the panel data of the Vietnamese Household Living Standard Survey to explore the relationship between the mobility and consumption patterns [1]. Based on the panel data from 26 EU countries, Raluca-Maria and Elena-Maria (2014) argue that migration would increase household consumption expenditure [2]. Giang (2018) points out that the consumption level of the migrant households is significantly lower than that of the urban households, and the consumption gap is mainly reflected in the non-food consumption [3]. Zhang and Liu (2015) prove that the unemployment risk can significantly reduce the consumption of the migrants [4]. Y. P. Song and Z. L. Song (2018) find that participating in medical insurance can increase the per capita non-medical consumption of the migrants [5]. Wen (2015) finds that the unemployment risk has a significant inhibitory effect on the consumption of the migrants [6]. Jin and Yang (2016) compare the consumption behaviors of the new generation of migrants and the urban youth [7].

The existing literature explore the consumption behaviors of the migrants. However, they have ignored the consumption disparities between the rural migrants and the urban migrants. Based on the data of China Migrants Dynamic Survey in 2016, this paper analyzes the consumption disparity between the urban and rural migrants with the Oaxaca-Blinder decomposition method.

The remainder of this paper is organized as follows: in Section II, we illustrate the model and the quantile regression and decomposition method. Section III describes the data of China Migrants Dynamic Survey in 2016 and the variables. Section IV presents the primary empirical results and the analyses. Section V concludes the paper and discusses the policy implications.

II. MODELS AND METHODS

A. Quantile Regression

The basic model is:

$$lnC = \alpha + \beta X + \varepsilon \quad (1)$$

where lnC represents the logarithm of per capita consumption expenditure ($ln\ PCE$). X represents the factors that affect the consumption, including the characteristic covariates of the finance, demographics, mobility and employment of the respondents. The characteristic variables of finance include the logarithm of per capita monthly income ($ln\ PCI$) and whether to take part in the social insurance ($insur$). The demographic characteristic variables include education

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(*edu*), marital status (*mar*), gender (*gen*) and generation (*gener*). The first generation of the migrants is the group born before 1980, while the second generation of the migrants refers to the group born after 1980.The variables of migration characteristics include local residence intention (*res*), migration scope *(mi-sco*), and migration duration (mi-*dur*). The migration scope includes three forms: trans-provincial migration (*trans-pro*), trans-city migration in the province (*trans-city*), and trans-town migration within the city (*trans-town*). The variables of employment characteristics include the sector type (*sector*), industry type (*ind*), and employment status (*sta*). And the industry type variables include the primary industry (*pri*), the secondary industry (*sec*) and the tertiary industry (*ter*). The employment status of the migrant includes the employees (*emee*), employers (*emer*), self-employed workers (*self-em*), and other identities (*oth-id*). α is a constant, and it represents the level of spontaneous consumption. β represents the regression coefficient of the explanatory variables.

We use the quantile regression method to study the consumption difference of the urban and rural migrants at different locations of the conditional distribution. The quantile regression model is:

$$Q_\theta(lnC \mid X) = \mu_\theta + \beta_\theta X \qquad (2)$$

where $Q_\theta (lnC \mid X)$ denotes the θth conditional quantile of lnC. The coefficients β_θ is the returns to the variables at the θth quantile.

B. Decomposition of Consumption Difference

1) Oaxaca-Blinder Decomposition

The Oaxaca-Blinder decomposition method can be used to investigate the difference of the mean value of explained variables between the two groups. We apply this method to decompose the consumption difference between the urban and rural migrants:

$$lnC_u - lnC_r = (X_u - X_r) \beta_r + (\beta_u - \beta_r) X_u \qquad (3)$$

where u represents the urban migrants and r represents the rural migrants. Cu and Cr represent the consumption level of the urban and rural migrants respectively. β_u and β_r are the regression coefficients of the two groups respectively. The left side of the equality sign is the total difference of consumption between the two groups. The first term on the right-hand side is the endowment effect, which quantifies the contribution of the different covariate values to the consumption gap between the urban and rural migrants. The second term of the right-hand side is the coefficient effect, which quantifies the contribution of the difference in coefficients to the the consumption gap, reflecting the consumption differences caused by the different household registration.

2) Quantile Decomposition

We use the quantile decomposition method to investigate the consumption differences of urban and rural migrants at different quantiles. The difference between the θth quantile of the consumption distributions of the urban and rural migrants could be decomposed into the endowment effect and the coefficient effect:

$$Q_\theta(lnC_u) - Q_\theta(lnC_r) = [Q_\theta(lnC_u) - Q_\theta(lnC_{u\text{-}r})] + [Q_\theta(lnC_{u\text{-}r}) - Q_\theta(lnC_r)] \qquad (4)$$

where $Q_\theta(lnC_u)$ and $Q_\theta(lnC_r)$ represent the logarithmic consumption expenditure of the urban migrants and the rural migrants at the θth quantile respectively. $Q_\theta(lnC_{u\text{-}r})$ is the counterfactual distribution of of the logarithmic consumption expenditure of the rural migrants.

III. DATA

The data used in this paper come from the China Migrants Dynamic Survey (CMDS) in 2016. The survey included 169,000 individual data from all over the country. According to the research objective of this paper, 130,050 samples were selected, including 19,144 urban migrants and 110,906 rural migrants. In this paper, the logarithm of per capita monthly consumption expenditure is the dependent variable. The independent variables include the characteristic covariates of the finance, demographics, mobility and employment. Table I reports the descriptive statistics of the variables.

TABLE I. DESCRIPTIVE STATISTICS OF VARIABLES

Variables		Variable Description	Mean Value	
			Urban Migrants	*Rural Migrants*
Finance	*PCE*	personal monthly expenditure	2246	1669
	ln PCE	logarithm of personal monthly expenditure	7.366	7.096
	PCI	personal monthly income	4516	3352
	ln PCI	logarithm of personal monthly income	8.04	7.808
	insur	participation=1; non-participation=0	88.90%	93.50%
Demographics	*edu*	primary school dropout（0 year）	0.30%	1.60%
		primary school education（6 years）	2.50%	13.70%
		junior high school education（9 years）	20.80%	52.80%
		senior high school education（12years）	26.60%	21.60%
		junior college education（15years）	23.90%	7.30%
		bachelor degree（16years）	23.10%	2.90%
		postgraduate education（19years）	2.80%	0.10%
	mar	married=1, others=0	79.60%	80.90%
	gen	male=1, female=0	56.20%	57.80%
	gener	first generation=1, second generation=0	56.20%	53.70%
Migration	*res*	willing=1, unwilling=0	73.10%	58.50%
	mi-sco	trans-provincial migration (reference group)	48.40%	49.30%
		trans-city migration in the province =1, others=0	35.40%	33.60%
		trans-town within the city=1, others=0	16.20%	17.10%
	mi-dur	0-1 year	8.60%	9.20%
		1-2 years	17.90%	17.80%
		3-4 years	18.50%	17.60%
		5-9 years	30.40%	28.40%
		10-14 years	14.20%	14.30%
		15-19 years	7.10%	8.10%
		20-29 years	3.00%	4.40%
		30 years and more	0.40%	0.30%
Employment	*sector*	state sector=1, non-state sector=0	18.50%	5.30%
	ind	primary industry (reference group)	1.50%	2.70%
		secondary industry=1, others=0	20.40%	27.20%
		tertiary industry=1, others=0	78.10%	70.10%
	sta	employee (reference group)	68.40%	54.80%
		employer = 1, others = 0	9.40%	8.70%
		self-employed workers=1, others= 0	19.80%	34.80%
		other identities=1, others= 0	2.30%	1.80%

IV. EMPIRICAL ANALYSIS

A. Quantile Regression Result

To decompose the difference of consumption between the urban and rural migrants at the different quantiles of the consumption distribution, we use the quantile regression method first. Table II shows the regression results of (3).

The income has an statistically significant positive impact on the consumption at each quantile of the consumption distribution of the urban and rural migrants. The income elasticity of consumption increases at higher quantiles. This shows that the consumption expenditure is more sensitive to the change of the income with the increase of the consumption level. The income elasticity of the rural migrants is higher than that of the urban migrants for quantiles 0.1, 0.25, 0.5 and 0.75. While at the 90th percentile, the income elasticity of the urban migrants is higher. Participation in the social insurance has a

statistically significant inhibitory effect on the consumption of both the urban and rural migrants across all quantiles. Participation in the social insurance will increase the expenses of the migrants and they have to balance the budget by reducing the consumption expenditure. The impact of participation in the social insurance on the consumption of the urban migrants is higher than that of the rural migrants for quantiles 0.1, 0.25, and 0.9.

TABLE II. QUANTILE REGRESSION RESULT

Variable	Quantiles									
	0.10		*0.25*		*0.50*		*0.75*		*0.90*	
	Rural	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*	*Rural*	*Urban*
ln PCI	0.837*** (218.5)	0.800*** (97.8)	0.865*** (335.6)	0.856*** (147.5)	0.889*** (433.9)	0.884*** (210.1)	0.905*** (483.6)	0.903*** (215.4)	0.919*** (448.0)	0.926*** (202.1)
insur	-0.028** (-2.53)	-0.065*** (-3.32)	-0.029*** (-3.95)	-0.054*** (-3.90)	-0.035*** (-5.91)	-0.035*** (-3.44)	-0.03*** (-6.14)	-0.019* (-1.88)	-0.026*** (-4.32)	-0.031*** (-2.81)
edu	0.014*** (13.20)	0.010*** (4.48)	0.009*** (12.13)	0.008*** (4.92)	0.005*** (9.41)	0.005*** (4.05)	0.003*** (5.13)	0.003*** (2.83)	0.002*** (3.46)	0.001 (0.95)
mar	0.135*** (17.52)	0.093*** (5.65)	0.115*** (22.11)	0.056*** (4.82)	0.078*** (18.90)	0.032*** (3.73)	0.050*** (13.19)	0.012 (1.43)	0.040*** (9.64)	0.015 (1.62)
gen	-0.019*** (-3.32)	-0.008 (-0.63)	-0.005 (-1.22)	-0.016* (-1.81)	-0.001 (-0.17)	-0.009 (-1.39)	0.008*** (2.88)	0.003 (0.50)	0.003 (1.07)	0.006 (0.81)
gener	0.037*** (5.86)	0.000 (0.03)	0.016*** (3.62)	-0.014 (-1.42)	0.007** (1.99)	-0.006 (-0.89)	0.000 (0.03)	-0.005 (-0.68)	-0.001 (-0.20)	0.009 (1.17)
res	0.119*** (20.65)	0.152*** (10.70)	0.098*** (25.14)	0.097*** (9.60)	0.078*** (25.15)	0.073*** (9.98)	0.058*** (20.42)	0.049*** (6.76)	0.041*** (13.12)	0.028*** (3.52)
mi-dur	0.005*** (11.23)	0.002** (2.05)	0.004*** (13.03)	0.002** (1.97)	0.004*** (15.23)	0.003*** (4.86)	0.003*** (14.09)	0.003*** (5.30)	0.003*** (11.33)	0.003*** (4.44)
trans-city	0.123*** (19.89)	0.077*** (5.65)	0.104*** (24.89)	0.052*** (5.40)	0.084*** (25.19)	0.044*** (6.22)	0.070*** (23.07)	0.040*** (5.76)	0.050*** (15.18)	0.034*** (4.40)
trans-town	0.140*** (18.07)	0.063*** (3.52)	0.120*** (22.96)	0.064*** (5.07)	0.101*** (24.23)	0.060*** (6.49)	0.091*** (24.01)	0.054*** (5.91)	0.074*** (17.68)	0.055*** (5.50)
sector	0.055*** (4.36)	-0.005 (-0.29)	0.050*** (5.82)	-0.005 (-0.43)	0.049*** (7.17)	0.015* (1.72)	0.054*** (8.78)	0.034*** (3.90)	0.040*** (5.90)	0.028*** (2.96)
sec	-0.005 (-0.25)	-0.051 (-0.99)	-0.034*** (-2.81)	-0.061* (-1.67)	-0.055*** (-5.73)	-0.064** (-2.42)	-0.06*** (-6.83)	-0.025 (-0.96)	-0.046*** (-4.83)	-0.006 (-0.20)
ter	0.092*** (5.32)	0.045 (0.89)	0.060*** (5.18)	0.029 (0.81)	0.029*** (3.10)	0.000 (0.01)	0.008 (0.96)	0.007 (0.27)	-0.002 (-0.23)	0.014 (0.51)
emer	0.007 (0.71)	-0.062*** (-2.83)	0.032*** (4.59)	-0.025 (-1.58)	0.045*** (8.09)	-0.008 (-0.71)	0.037*** (7.23)	-0.020* (-1.77)	0.037*** (6.67)	-0.007 (-0.55)
self-em	0.120*** (17.73)	0.027 (1.60)	0.089*** (19.51)	0.024** (2.00)	0.070*** (19.44)	0.038*** (4.35)	0.053*** (16.12)	0.034*** (3.85)	0.041*** (11.28)	0.008 (0.85)
oth-id	0.083*** (3.99)	0.026 (0.64)	0.066*** (4.69)	0.014 (0.50)	0.062*** (5.59)	0.014 (0.67)	0.053*** (5.20)	-0.021 (-1.00)	0.043*** (3.83)	-0.001 (-0.04)
constants	-0.483*** (-14.3)	0.100 (1.23)	-0.26*** (-11.5)	0.059 (1.02)	-0.043** (-2.37)	0.161*** (3.84)	0.159*** (9.66)	0.245*** (5.88)	0.278*** (15.36)	0.282*** (6.20)

Note: The value of t is shown in parentheses.
***, **, * respectively indicate that the estimated coefficients are significant at 1%, 5% and 10% levels.

Education has a statistically significant positive impact on the consumption of the rural migrants and its influence on the consumption decreases at higher quantiles. For urban migrants, the education affects the consumption positively for quantiles 0.1, 0.25, 0.50 and 0.75, and it has no significant impacts on the consumption for quantile 0.90. The impact of the education is stronger for the rural migrants for most of the quantiles. With the increase of the years of schooling, the human capital gradually increases, and the returns of human capital increases, which leads to the growth of consumption. As the quantile rises and the education level increases, the return rate of the human capital gradually declines, which reduces the effects of education on the consumption. Therefore, improving the education level of the low-consumption group is more conducive to enlarge the consumption. The improvement of the human capital of the rural migrants could narrow the consumption gap between the urban migrants and the rural migrants.

Among the migrants, the consumption expenditure of the married groups is significantly higher than that of the unmarried groups, indicating that marriage contributes to the consumption expenditure. The impact of marriage on the consumption of the rural migrants decreases at higher quantiles, while the marriage has no significant influence on the consumption of the urban migrants for quantiles 0.75 and 0.9. The gender has no significant effects on the consumption of the urban and rural migrants for most of the quantiles. There are intergenerational consumption differences among the rural migrants for quantiles 0.10, 0.25 and 0.50. The consumption level of the first generation of the rural migrants is significantly higher than that of the second generation, while there is no significant intergenerational consumption difference among the urban migrants.

Those migrants who prefer to stay locally for a long time have higher propensity to consume across the quantiles. In each quantile, the consumption expenditure of the urban and rural

migrants who work in the province is higher than those who migrate outside the province at each quantile. The consumption expenditure of the rural migrants working in the state sector is significantly higher than those in the non-state sector across all quantiles.

The type of industry can affect the consumption of the rural migrants, while has little effect on that of the urban migrants for most quantiles. The employer status can significantly affect the consumption of rural migrants while it has no significant effect on the consumption of urban migrants for most quantiles. The identity of self-employed workers has a significant positive impact on the consumption of both the urban migrants and the rural migrants.

B. Decomposition of Consumption Difference

1) Oaxaca-Blinder Decomposition

According to Table III, the total difference of logarithmic average consumption of the urban and rural migrants is 0.271. The endowment effect is 0.239, accounting for 88.2% of the total difference. The coefficient effect is 0.032, accounting for only 11.8% of the total disparity. Most of the consumption gap is caused by difference in the characteristics of the finance, demographics, mobility and employment.

TABLE III. OAXACA-BLINDER DECOMPOSITION RESULT

	Total difference		**Endowment effect**		**Coefficient effect**	
	Value	***%***	***Value***	***%***	***Value***	***%***
ln PCI	0.128	47.2	0.201	74.2	-0.073	-26.9
insur	-0.010	-3.7	0.002	0.7	-0.012	-4.4
edu	0.012	4.5	0.024	8.9	-0.012	-4.4
mar	-0.034	-12.5	-0.001	-0.4	-0.033	-12.2
gen	-0.002	-0.7	0.000	0.0	-0.002	-0.7
gener	-0.009	-3.2	0.000	0.1	-0.009	-3.3
res	0.010	3.7	0.012	4.4	-0.002	-0.7
mi-sco	-0.013	-4.8	-0.001	-0.4	-0.012	-4.4
mi-dur	-0.023	-8.5	0.001	0.4	-0.024	-8.9
sector	0.001	0.4	0.005	1.8	-0.004	-1.5
ind	-0.005	-1.8	0.006	2.2	-0.011	-4.0
sta	-0.026	-9.8	-0.010	-3.9	-0.016	-5.9
constants	0.242	89.3	0.000	0.0	0.242	89.3
total	0.271	100	0.239	88.2	0.032	11.8

From the decomposition of the consumption gap, the income difference between urban and rural migrants can explain 47.2% of the difference in consumption. According to the Absolute Income Hypothesis of Keynes, the absolute income level of the consumer determines his consumption expenditure, so that the income gap will lead to the consumption gap. According to the law of diminishing marginal propensity to consume, the marginal consumption propensity of the rural migrants is higher than that of the urban migrants. Raising the income of the rural migrants can effectively improve the overall consumption level of the migrants and narrow the consumption gap. The consumption gap caused by education accounts for 4.5% of the total difference.

2) Quantile Decomposition

Table IV presents the result of the quantile decomposition of the consumption gap between the rural and urban migrants. In the whole consumption expenditure interval, the consumption gap shows a "U" distribution, which is larger at the low and high-end locations. The total difference is 0.251 at quantile 0.1. It decreases to 0.238 at quantile 0.3. And the total difference increases to 0.31 at quantile 0.9. Generally speaking, the consumption gap between the high-end and mid-to-high end positions is more significant than that between the low-end and mid-low-end locations. That means, as the consumption level rises, the consumption gap expands. The reasons may be that, at the low consumption level, the main component of consumption expenditure of the rural and urban migrants is the necessities, so there is no significant difference in the consumption expenditure. When consumption is at high level, the corresponding income gap is larger. The per capita income of the urban migrants is 1.6 times that of rural migrants for quantile 0.9, and the widening income gap leads to an increase in the consumption gap. The endowment effect is larger at higher quantiles. And it could account for more than 73% of the total difference at each quantile. On the contrary, the coefficient effect is larger at lower quantiles.

V. CONCLUSIONS

Using the data of China Migrants Dynamic Survey in 2016, we apply the quantile regression and decomposition method to investigate the consumption disparity between the urban and rural migrants. Our study shows that the consumption of rural and urban migrants is different in each quantile of the distribution. The effects of the covariates such as finance, demographics, mobility, and employment on the consumption vary with the migrants' positions in the consumption distribution and also differ between the urban and rural migrants.

The result also shows that the differences in the characteristics account for 88.2 of the total consumption difference between the urban and rural migrants, which implies the consumption gap of the two groups is mainly due to the differences in the finance, demographics, mobility and employment.

TABLE IV. QUANTILE DECOMPOSITION RESULT

Quantile	Total difference	Endowment Effect		Coefficient Effect	
		Value	*%*	*Value*	*%*
0.1	0.251	0.184	73.3	0.067	26.7
0.2	0.240	0.190	79.2	0.050	20.8
0.3	0.238	0.199	83.3	0.040	16.7
0.4	0.242	0.209	86.3	0.033	13.7
0.5	0.249	0.220	88.6	0.028	11.4
0.6	0.259	0.234	90.6	0.024	9.4
0.7	0.273	0.252	92.4	0.021	7.6
0.8	0.289	0.272	93.9	0.018	6.1
0.9	0.310	0.296	95.5	0.014	4.5

What's more, we find the consumption gap between the urban and rural migrants is higher at the middle and the top of the consumption distribution, and smaller at the low end of the distribution. As the consumption level increases, the consumption gap enlarges. The endowment effect increases at higher quantiles, while the coefficient effect decreases at higher quantiles. This indicates that with the improvement of the consumption level, the influences of the difference in the characteristics on the consumption gap increase, while the influence of the household registration system on the consumption gap weakens.

There is an objective consumption gap between the rural and urban migrants. The reasons are not only the differences in characteristics such as finance, demographics, mobility and employment, but also the institutional discrepancies brought about by the household registration. In order to attenuate the consumption gap of the two groups, the government should increase the expenditure in the rural education, strengthen the reform of the household registration system and further improve the social security system.

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