The difference of residents' consumption in different regions

1.Introduction

1.1 Research background

The consumption of residents plays an important role in the sustainable development of social economy. Reasonable consumption mode and appropriate consumption rules of residents are conducive to the sustained and healthy growth of economy. Moreover, this is also the concrete embodiment of the living standard of people's cattle since the reform and opening up, with the rapid development of China's economy, the living standard of people's cattle has been improving, The consumption level of residents is also increasing, but at the same time, we should also see that the economic development speed of different regions in the country is different, and the consumption level of residents is also significantly different. For example, in 2020, the average annual consumption expenditure of urban households in China is 21210 yuan, the lowest in Shanxi Province is only 20332 yuan per capita, the highest of Shanghai's dada is 44839 yuan, and Shanghai is 2.21 times of that of Shanxi Province.

1.2 Purpose requirements of the research

In order to study the consumption level and the reasons of the changes, there are many factors that influence the residents' consumption expenditure in different regions. For example, the income level, employment status, retail price index, interest rate, property and shopping environment of residents may have an impact on the consumption of residents. In order to analyze what is the most important factor that has significant difference in the consumption expenditure of residents in different regions, and to analyze the quantitative relationship between the influencing factors and consumption level, the corresponding econometric model can be established to study.

2.Model setting

2.1 Explained variable selection

The object of our study is that the difference of residents' consumption in different regions can be divided into urban consumption and rural consumption. Because of the large differences between urban and rural population proportion and economic structure in each region, the most direct comparison is urban consumption. Moreover, because of the different population and economic aggregate in different regions, only "average consumption expenditure per capita of urban residents" can be used to compare, which is the official statistics available and can be used as variables. Therefore, the explanatory variable Y of the model is selected as "Per capita consumption expenditure of urban residents in China's provinces".

2.2 Data selection

Because the purpose of the study is the difference of urban consumption in different regions, and not the change of urban consumption in different times, we should choose the consumption expenditure of urban residents in the same period to establish a model. Therefore, the cross-section data model of 2020 is established.

2.3 Explanatory variable selection

There are many factors that influence the per capita consumption expenditure of urban residents in different regions. However, from the theoretical and empirical analysis, the most important factors should be residents' income. Although other factors also have influence on the consumption of residents, some of them are not easy to obtain data, such as "residents' property" and "shopping environment"; Some may be highly related to residents' income, such as "employment status", "property of residents". There are also factors that do not vary between regions when using cross-section data, such as "retail price index", "interest rate". Therefore, these other factors can not be included in the model, even if they have some influence on the consumption of residents, they can be classified into the random disturbance items. In order to correspond with the "per capita consumption expenditure of urban residents", the "per capita disposable income of urban residents in China's provinces" available in official statistics is chosen as the explanatory variable X_1. The “average price of house prices in China's provinces” is taken as the explanatory variable X_2, and the “GDP per capita of China's province” is taken as the explanatory variable X_3.

The following data are collected from the 2020 official data

Province	**Per capita consumption expenditure of urban residents in different provincesY (Yuan)**	**Per capita disposable income of urban residents of different provinces X_1(Yuan)**	**Average price of house prices in different provinces X_2(Yuan)**	**Per capita GDP of residents in different provinces X_3(Yuan）**
Shanghai	44839	76437	56636	159385
Beijing	41726	75602	56962	167640
Zhejiang Province	36197	62699	29564	110450
Tianjin	30895	47659	19154	90176
Jiangsu Province	30882	53102	24551	127285
Guangdong Province	33511	50257	34232	96138
Fujian Province	30487	47160	24630	110506

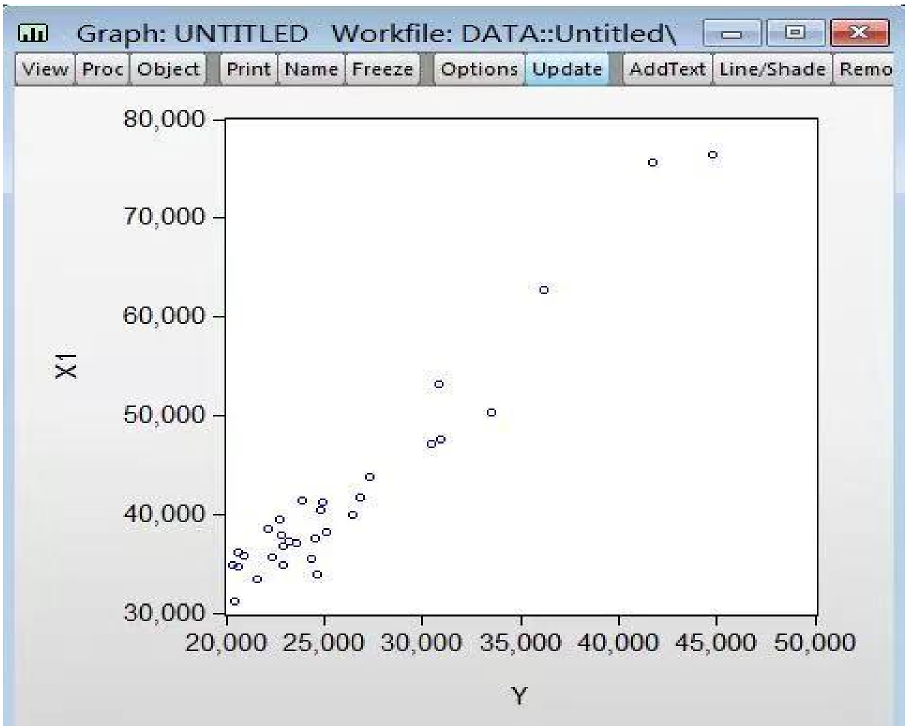
Liaoning Province	27291	43726	16427	72619
Shandong Province	24849	40376	11611	57713
Inner Mongolia Autonomous Region	23888	41353	11564	68357
Chongqing City	26464	40006	12272	80027
Hubei province	26796	41698	10788	60391
Hunan Province	22683	39442	17076	60763
Hainan	22134	38556	14572	55061
Jiangxi Province	23560	37097	19084	58557
Anhui Province	22885	36706	17568	73297
Hebei Province	23167	37286	15211	47691
Jilin Province	25133	38253	15354	58029
Heilongjiang Province	22866	37868	14346	67545
Shaanxi Province	21623	33396	10753	45753
Sichuan Province	22379	35720	7848	56445
Ningxia Hui Autonomous Region	20332	34793	12835	47334
Shanxi Province	20397	31115	12647	36518
Henan Province	20645	34750	17505	57051
Xinjiang Uygur Autonomous Region	20907	35859	12074	44671
Guangxi Zhuang Autonomous Region	24315	35506	9865	49455
Qinghai Province	22952	34838	9476	54684
Yunnan Province	24569	37500	14858	50474
Guizhou Province	20587	36096	10906	49206
Gansu Province	24927	41156	11000	54285

Tibet Autonomous Region	24615	33822	12596	34059

2.4 Data availability analysis

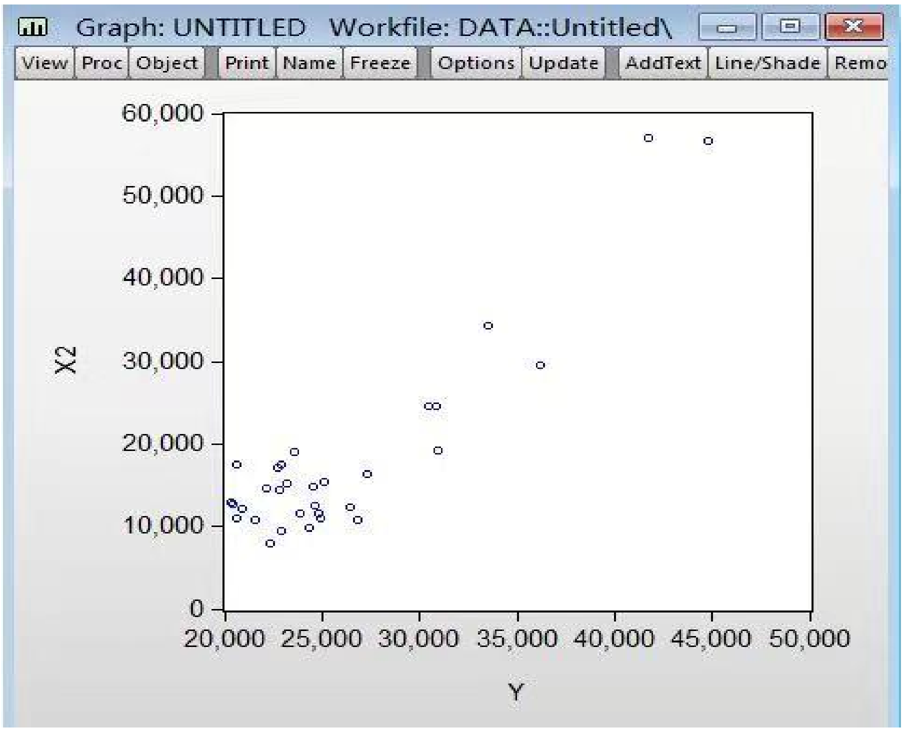
Use Eviews software to get:

Scatter plot of Y with respect to X_1



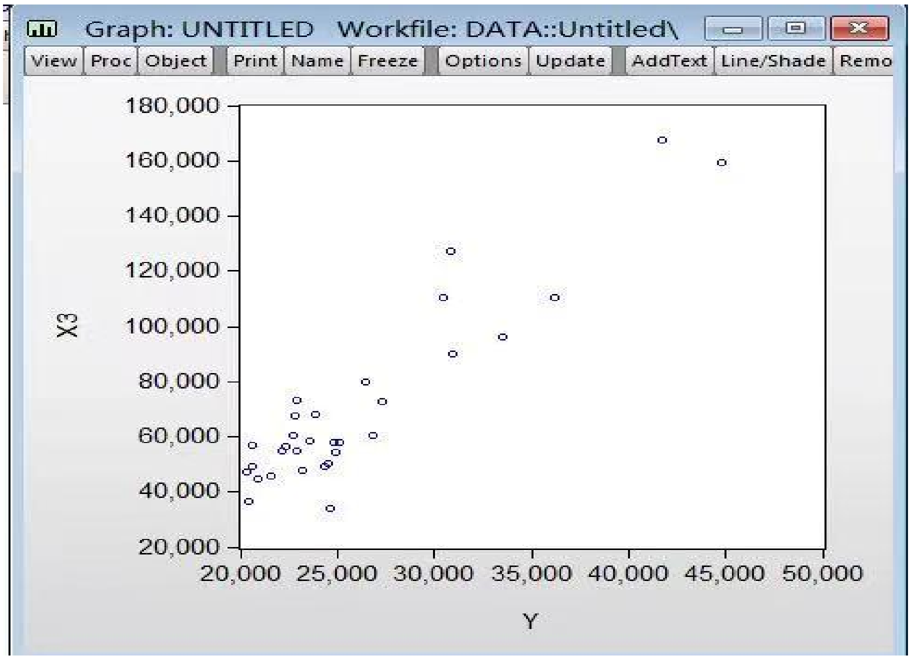
It can be seen that Y and X_1 are linearly related.

Scatter plot of Y with respect to X2



It can be seen that Y and X2 are linearly related.

Scatter plot of Y with respect to X3



It can be seen that Y and X3 are linearly related.

2.5 Research model setting

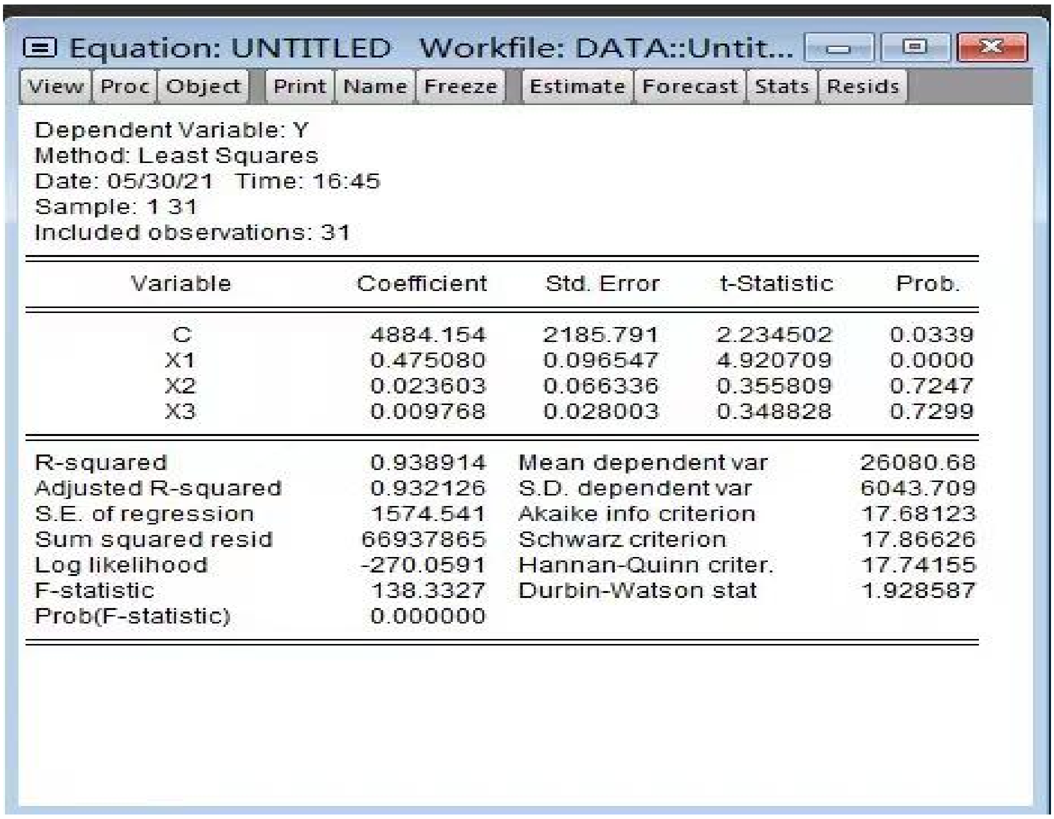
Accordig to the scatter diagram analysis, there is a linear relationship between the explained variable and the explanatory variable, so the linear regression model is set as:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$$

3.Parameter estimation

3.1 Parameter results

It is assumed that the model and random disturbance μ satisfy the classical assumption. The parameters of the system are estimated by OLS. Input data to get the regression results as shown in the figure, as follow:


Equation: UNTITLED Workfile: DATA::Untit...

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: Y
Method: Least Squares
Date: 05/30/21 Time: 16:45
Sample: 1 31
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4884.154	2185.791	2.234502	0.0339
X1	0.475080	0.096547	4.920709	0.0000
X2	0.023603	0.066336	0.355809	0.7247
X3	0.009768	0.028003	0.348828	0.7299

R-squared	0.938914	Mean dependent var	26080.68
Adjusted R-squared	0.932126	S.D. dependent var	6043.709
S.E. of regression	1574.541	Akaike info criterion	17.68123
Sum squared resid	66937865	Schwarz criterion	17.86626
Log likelihood	-270.0591	Hannan-Quinn criter.	17.74155
F-statistic	138.3327	Durbin-Watson stat	1.928587
Prob(F-statistic)	0.000000		

3.2 research model

The coefficient of each variable and its accuracy can be seen from the figure, and the obtained data can be substituted into the linear regression model.

The model estimation result is:

$$\hat{Y}_i = 4884.154 + 0.475080X_1 + 0.023603X_2 + 0.009768X_3$$

	(2185.791)	(0.096547)	(0.066336)	(0.028003)
t=	(2.234502)	(4.920709)	(0.355809)	(0.348828)
p=	(0.0339)	(0.0000)	(0.7247)	(0.7299)

$R^2=0.938914$, F=138.3327, df=27

4. Model checking

4.1 Goodness of fit and statistical test

When Eviews is used to get the estimation results of regression model parameters, the measure of goodness of fit of relevant data for model test has been given: in this case, the coefficient of determination is 0.938914， the results show that the model is better fit for sample data, which means that three explanatory variables explain the majority of the differences of one explanatory variable.

4.2 T-test

T-test: Respectively for $H_0:\beta_0=\beta_1=0$ and $H_0:\beta_2=\beta_3=0$,It can also be seen from results that the standard error and t-value of the estimated regression coefficient are SE (β_0) = 2185.791 and t (β_0) = 2.234502; SE (β_1) = 0.096547and t (β_1) = 4.920709; SE (β_2) = 0.066336 and t (β_2) = 0.355809;SE (β_3) = 0.348828 and t (β_3) = 0.028003. Take α = 0.05, look up t distribution table, the critical value of degree of freedom n-k=27 is $t_{0.025}(27)=2.052$. Because t (β_0) = 2.234502> $t_{0.025}(27)=2.052$ and t (β_1) = 4.920709> $t_{0.025}(27)=2.052$, which mean that β_0 and β_1 can reject H_0. Similarly, t (β_2) = 0.355809< $t_{0.025}(27)=2.052$ and t (β_3) = 0.028003< $t_{0.025}(27)=2.052$,which mean that β_2 and β_3 can not reject H_0.This shows that the per capita disposable income of urban residents has a significant impact on the per capita consumption expenditure.The other two variables X_2, X_3 are not as significant as X_1.

4.3 Economic significance test

The estimated parameter β_1=0.475080, It shows that the difference of per capita disposable income of urban residents is 1 yuan, which leads to the difference of per capita consumption expenditure of urban residents is 0.475080 yuan. This is consistent with the meaning of marginal propensity to consume in economics.

5.Conclusion

Residents' consumption is the specific performance of living standard and economic development, but regional economic development levels are different. Therefore, we can use regression analysis to select the data of 31 provinces in 2020 for processing. In the collection of reliable information, per capita disposable income, housing price and per capita GDP are selected as the consideration factors. The regression model is used to analyze the overall trend of the country and determine the relationship between the variables.

The regression model is established by using Eviews, and the relationship between explanatory variables and explained variables is obtained in the T test. It can be seen that people's consumption is in direct proportion to disposable income, and the correlation is strong. However, housing price and per capita GDP are not so important. Therefore, it can be inferred that housing price is not significant for the following reasons: housing is not a consumer product in residents' life, but more of an investment and asset, so it is not universal for data analysis. For per capita GDP, it is more of a standard to measure the living standard of the whole country. In order to be more objective, it is often combined with purchasing power parity. As an indicator to measure economic development in development economics, it is one of the most important macroeconomic indicators. Since it is considered at the overall level, it cannot well reflect the relationship between individuals.

The conclusion is that per capita consumption expenditure changes with the change of per capita disposable income.