

Research on the Factors Affecting the Savings Status of National Residents Based on Experimental Analysis

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Abstract-Since the reform and opening up, China's economy has developed rapidly, and people's living standards have been greatly improved. In addition to meeting people's basic consumption needs, Chinese residents' deposits are also increasing year by year. The increase of deposits also represents that China's economic strength and consumption strength have been greatly increased. This paper aims to select the appropriate economic variables to study the impact of China's residents' savings^[1]. Through the basic goodness of fit test, t test, F test and Econometrics test, the model is tested and modified, and a more reliable and reliable model is obtained. Finally, the results show that every 1 yuan increase in per capita disposable income of urban residents in China will lead to China's Quasi goods The average increase of money supply and savings deposits is 890 million yuan. Every increase of 1 yuan in consumption level of Chinese residents will lead to an average increase of 1.74284 billion yuan in quasi money supply savings deposits. That is to say, the increase of per capita disposable income of urban residents and the increase of residents' consumption level will promote the growth of savings income in China. Based on this, the relevant policy suggestions are put forward.

Keywords-deposits from residents; regression analysis; parameter test; case analysis

1 Introduction

Household savings refers to the deposit activities in which urban and rural residents deposit temporarily unused or surplus currency income into banks or other financial institutions, also known as savings deposit. Savings deposits are an important source of funds for credit institutions. The development of savings business can, to a certain extent, promote the adjustment of the proportion and structure of the national economy, raise funds for economic construction, stabilize market prices^[2], regulate currency circulation, guide consumption and help people arrange their lives. Over the years, the bank has not only taken expanding sources of savings and increasing income from savings deposits as an important basic task, but also taken the steady growth of urban and rural residents' deposits as an important symbol of social stability and economic prosperity^[3]. China's reform and opening up has promoted the rapid development of national economy, people's income level has been greatly improved, and the savings deposit of urban and rural residents has grown rapidly, which has become one of the hot spots in China's economic life. Savings account for half of the gross national product, plays an important role in the national economy and is the reserve power and guarantee of funds^[4].

2 Data preparation and preliminary modeling

2.1 Parameter setting and significance of the model

This paper uses the numerical almost consistent with the money supply is savings as explained variable Y , choice X_1 (one hundred million yuan), gross domestic product per capita disposable income of urban households (yuan) X_2 , per capita net income of rural households (yuan) X_3 , tax revenue (one hundred million yuan), X_4 , residents' consumption level (one hundred million yuan) X_5 as explanatory variables, the following model:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \varepsilon \quad (1)$$

Where: ε represents the random error term, is a constant term, is a coefficient term, that is, the influence coefficient of each variable, indicating how many units the explained variable changes on average when other variables remain unchanged and the explanatory variable changes by 1 unit.

2.2 Variable selection and data sources

In order to select the factors that influence the savings income of Chinese residents, this paper selects the GDP, per capita disposable income of urban households, per capita net income of rural households, tax and consumption level as explanatory variables for research from the theoretical aspect and previous studies ^[5].

2.2.1 Introduction to variables

Gross Domestic Product (GDP): GDP is a relatively unified index that can typically represent China's economic growth. Generally speaking, the more the economy tends to rise, the higher the savings income of China's residents will be.

Per capita disposable income of urban households: the per capita disposable income of urban households represents the income level of urban residents in China ^[6]. Generally speaking, the higher the income is, the higher the savings will be, and the income level of urban residents generally has a positive impact on the initial estimate of savings.

Per capita disposable income of rural households: the per capita disposable income of rural households represents the income level of rural residents in China. In recent years, the income level of rural residents in China has significantly improved, which is also relatively able to affect savings, and the initial estimate is positive.

Tax: Tax is generally derived from income, etc. Generally speaking, the higher the tax is, the higher the basic income is. Even if the disposable income will be appropriately reduced, it can still positively affect the increase of savings income.

Resident consumption level: resident consumption level represents a consumption level of Chinese residents. The higher consumption, the higher the support of savings income, therefore, there is also a positive impact ^[8].

2.2.2 Sample selection

According to the availability of data, this paper obtained the macroeconomic data from the

National Bureau of Statistics from 2000 to 2019 for research, and used the latest time series data from 2000 to 2019 to study the influencing factors of China's household savings income, so as to make the research results more consistent with the current national conditions of China and get more effective conclusions [7]. The obtained data is as follows:

Table 1 2000-2019 time series data

Index	Deposits	X1	X2	X3	X4	X5
2000	64332.4	100280.1	6280	2253.42	12581.51	3698
2001	73762.4	110863.1	6859.6	2366.4	15301.38	3954
2002	86910.7	121717.4	7702.8	2475.63	17636.45	4256
2003	103617.7	137422	8472.2	2622.24	20017.31	4542
2004	119555.4	161840.2	9421.6	2936.4	24165.68	5056
2005	141050.99	187318.9	10493	3254.9	28778.54	5671
2006	161587.3	219438.5	11759.45	3587.04	34804.35	6302
2007	172534.19	270092.3	13785.79	4140.36	45621.97	7434
2008	217885.35	319244.6	15780.76	4760.62	54223.79	8483
2009	260752.7	348517.7	17174.65	5153.17	59521.59	9226
2010	303302.5	412119.3	19109.44	5919.01	73210.79	10550
2011	352797.5	487940.2	21809.78	6977.29	89738.39	12646
2012	411362.6	538580	24564.72	7916.58	100614.28	14075
2013	467031.12	592963.2	26467	9429.6	110530.7	15615
2014	508878.12	643563.1	28843.9	10488.9	119175.31	17271
2015	552073.48	688858.2	31194.8	11421.7	124922.2	18929
2016	603504.2	746395.1	33616.2	12363.4	130360.73	20877
2017	649341.5	832035.9	36396.2	13432.4	144369.87	23070
2018	721688.6	919281.1	39251	14617	156402.86	25378
2019	821400	990865.1	42359	16021	157992	27563

Next, the model estimation and testing are carried out. Before the model estimation, the scatter diagram of the data is drawn to preliminarily understand the quantitative relationship between the data:

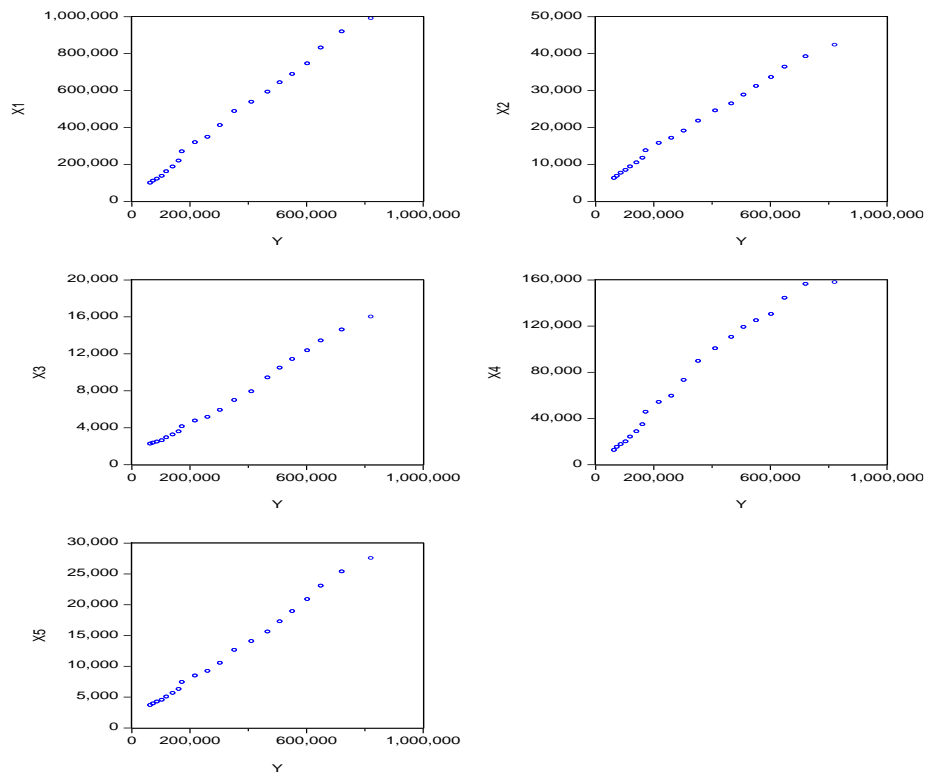


Figure 1 scatter diagram

It can be seen that all explanatory variables have an obvious positive relationship with the explained variable household savings, and the specific quantitative relationship will be verified in the subsequent regression.

3 Econometric test

3.1 Least square estimation model

OLS estimation of the model can obtain the results as shown in the figure below:

Dependent Variable: Y
Method: Least Squares
Date: 06/05/21 Time: 20:29
Sample: 2000 2019
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-38096.53	19257.72	-1.978247	0.0679
X1	0.934548	0.407471	2.293532	0.0378
X2	5.224589	6.639506	0.786894	0.4445
X3	41.83549	14.74177	2.837887	0.0132
X4	-1.762056	0.818370	-2.153129	0.0492
X5	-24.99359	15.18299	-1.646157	0.1220
R-squared	0.998702	Mean dependent var		339668.4
Adjusted R-squared	0.998239	S.D. dependent var		237845.8
S.E. of regression	9981.685	Akaike info criterion		21.49822
Sum squared resid	1.39E+09	Schwarz criterion		21.79694
Log likelihood	-208.9822	Hannan-Quinn criter.		21.55653
F-statistic	2154.780	Durbin-Watson stat		1.316749
Prob(F-statistic)	0.000000			

Figure 2 Model initial estimation results

The regression model is established as follows:

$$Y = -38096.53 + 0.9345X_1 + 5.2246X_2 + 41.8355X_3 - 1.7621X_4 - 24.9936X_5 \quad (2)$$

$$T = (-1.9782) \quad (2.2935) \quad (0.7869) \quad (2.8379) \quad (-2.1531) \quad (-1.6462) \quad (3)$$

$$R^2 = 0.9987 \quad \text{Adj } R^2 = 0.9982 \quad \text{DW} = 1.3167 \quad \text{F} = 2154.780 \quad (4)$$

In the above formula, the values in brackets are t-test values. It can be seen from the data of the regression equation that the regression equation has a strong ability to explain the saving behavior of urban residents in China, that is, 99.8% of residents' savings can be explained from the regression equation. The significance level is 0.1, that is, the confidence interval is 90%. Since the F-test value of the model is greater than the statistical critical value of F, it is considered that the significance of the regression equation is established and the goodness of fit is good. By analyzing t test values, it can be concluded that, at a given significance level, $\ln X_1$ and X_2 have a significant impact on household savings, while X_3 and X_4 have no significant impact on household savings.

3.2 Statistical test

Goodness of fit test: can be obtained from the data in Figure 2, and adjusted R square is 0.9982. The goodness of fit of the model is 99.82%, indicating that the model has a good goodness of fit.

Model significance test F test: At the significance level of 0.05, the critical value with 5 and 14 degrees of freedom was investigated in the F distribution table. It can be seen from Figure 2 that $F = 2154.780 < 2.9582$, so the null hypothesis that coefficients of all explanatory variables are 0 is rejected, and the model is significant.

T-test for significance of variables: At the significance level of 0.05, the critical value 2.1448 of 14 is found in the T-distribution table. As can be seen from the data in Figure 2, X1, X3 and X4 explanatory variables have a significant impact on the explained variables, while X2 and X5 variables are significant.

4 Final model and its economic significance

4.1 Final model

There is only multicollinearity in the model. After modifying the multicollinearity of the model, there is neither heteroscedasticity nor sequence correlation in the result after step-up regression. Therefore, the result after step-up regression is the final regression result of this paper.

Dependent Variable: Y
Method: Least Squares
Date: 06/05/21 Time: 20:59
Sample: 2000 2019
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-56523.94	8151.696	-6.934010	0.0000
X2	8.899983	3.005088	2.961639	0.0087
X5	17.42838	4.534250	3.843718	0.0013

R-squared	0.997916	Mean dependent var	339668.4
Adjusted R-squared	0.997671	S.D. dependent var	237845.8
S.E. of regression	11479.37	Akaike info criterion	21.67197
Sum squared resid	2.24E+09	Schwarz criterion	21.82133
Log likelihood	-213.7197	Hannan-Quinn criter.	21.70113
F-statistic	4069.791	Durbin-Watson stat	1.390663
Prob(F-statistic)	0.000000		

Figure 3 Final regression result

The final model is as follows:

$$Y = -56523.94 + 8.9000 * X_2 + 17.4284 * X_5 \quad (5)$$

$$T = (-6.9340) \quad (2.9616) \quad (3.8437) \quad (6)$$

$$R^2=0.9980 \quad \text{Adj } R^2=0.9977 \quad \text{DW}=1.3907 \quad \text{F}=4069.791 \quad (7)$$

The estimation results of the model show that, assuming that other variables remain unchanged, on average, every unit increase in the per capita disposable income of urban residents will increase by 8.9000 units on average. For every 1 unit increase in resident consumption level, China's resident savings income will increase by 17.4284 units.

4.2 Analysis of statistical test results

Goodness of fit test: can be obtained from the data in Fig.3, and the revised coefficient of determination is. The goodness of fit of the model is close to 1, indicating a high goodness of

fit.

F test: at the significance level of 0.05, the critical value with 2 and 17 degrees of freedom was investigated in the F distribution table. According to Figure 3, $F=4069.791 > 3.5915$ can be obtained, so the null hypothesis is rejected, indicating that the regression equation is significant.

T test: At the significance level of 0.05, the critical value 2.1098 of 17 is found in the T-distribution table. As can be seen from the data in Fig.3, the corresponding T values of X2 and X5 explanatory variables are both greater than 2.1098, which has a significant impact on the explained variables.

4.3 Economic significance of model parameters

The estimation results of the model show that, assuming that other variables remain unchanged, on average, every unit of GDP growth will reduce the household savings income by 0.9345 units on average. For every unit increase of per capita disposable income of urban residents, savings income of Chinese residents will increase by 5.2246 units; When the per capita disposable income of rural residents increases by 1 unit, the savings income of Chinese residents increases by 41.8355 units on average. When tax increases by 1 unit, savings income of Chinese residents will decrease by 1.7621 units on average, and when consumption level increases by 1 unit, savings income of Chinese residents will decrease by 24.9936 units on average.

The above tests show that the model can pass the preliminary economic tests and the symbols of the coefficients conform to the economic theory.

4.4 Comparison diagram of prediction sequence and variable sequence

For the prediction of the model, if the prediction accuracy of the model is high and the relative error percentage of the prediction is low, it indicates that the variables selected in this paper are relatively accurate in predicting the stock price.

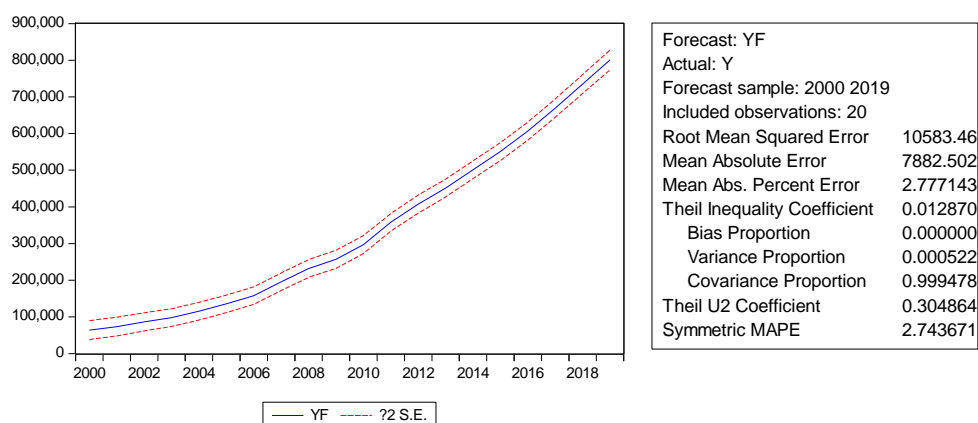


Figure 4 prediction

It can be seen that the relative error percentage of prediction is 2.7771%, less than 5%. Therefore, the prediction of the model is relatively accurate, indicating that the selected variables can predict China's savings income. Therefore, the model is reasonable.

5 Conclusions and prospects

5.1 Conclusions

The regression results show that, assuming that other variables remain unchanged, on average, every unit increase in the per capita disposable income of urban residents will increase by 8.9000 units on average.1 whenever the residents' consumption level increases, China's household savings income increased 17.4284 units, urban per capita disposable income is higher, is the higher savings, it also verifies the hypothesis, this paper is consistent with economic background, the higher the income, savings is the higher, the increase of residents' consumption level can cause our country residents savings income increases, This shows that the increase in consumption level will also lead to the increase in savings income, which is also quite realistic.

5.2 Prospects

(1) We should attach importance to the adjustment of the distribution field, increase transfer payments to low-income people, reform the taxation field based on the actual situation, narrow the gap between the rich and the poor, increase residents' income, improve residents' living standards, adhere to and improve the distribution system, the first distribution attaches importance to efficiency, the second distribution attaches importance to fairness.

(2) Increase the share of labor remuneration in primary distribution, establish a mechanism for regular increases in workers' wages, and take measures such as reducing production costs to increase production and supply. At the same time, the market mechanism can be expected to play a role in attracting more social funds to invest in the production of products in short supply through the rise of market prices. In addition, policies can guide capital injection into these areas to play a more important role. Other regions will standardize and strengthen government oversight.

(3) From the regression model, we can see that the savings deposit of residents is the result of multiple explanatory variables. In practice, we cannot separate these explanatory variables from each other. However, the influence of one variable on savings deposit can be studied by assuming that other conditions remain unchanged.

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