Analysis and Forecast of Consumer Price Index

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Abstract: consumer price index (CPI) has become a hot term that has been paid attention to by the public. It is a macroeconomic index which reflects the price level of consumer goods and service items that households generally buy. An economic model is established to analyze this model to understand and understand the influencing factors of consumer price index. In this paper, the change of consumer price index is analyzed by linear regression method.

Keywords: Consumer Price Index; Linear Regression Analysis: Eviews; Forecast

I. INTRODUCTION

Price is a barometer of the development of national economy, and its fluctuation range reflects the scarcity of resources in the course of economic operation. Price problem is a monetary problem, which is essentially the allocation of physical resources. The consumer price index (Consumer Price Index,) is a relative number that reflects the trend and range of change in the price of consumer goods and service items purchased by urban and rural residents in a certain period of time. The consumer price index is generally regarded as an important indicator of the degree of inflation (or deflation) in the world. Price policy is used to analyze and formulate monetary policy. Policy, household consumption policy, wage policy and national economic accounting to provide scientific basis. Therefore, it is of great significance to monitor CPI in real time.

II. ANALYSIS OF INFLUENCING FACTORS OF CONSUMER PRICE INDEX

CPI comes from real life and also reflects real life. People have a personal feeling about the rise and fall of CPI. It is closely related to people's life. Secondly, it can not only reflect inflation, Moreover, it can reflect the change of purchasing power of money and its influence on people's real wages; third, it is of great significance to national economic accounting. There are many influencing factors, such as the level of macroeconomic development, medium- and long-term economic development strategy and current economic policy. The following are two specific aspects of analysis:

(1.) The level of per capita income is an important factor in the consumer price index. On the one hand, the per capita income of residents is affected by the macroeconomic situation, on the other hand, it is affected by the gross domestic product (GDP). Higher incomes will boost consumption, but not necessarily consumer price indices.

Revised Version Manuscript Received on 09 June 2018.

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(2). Reflecting the trend and range of changes in the ex-factory and purchase prices of all industrial producers. Through the change of producer's ex-factory price index to observe the change of industrial output value, on the other hand, we can see the influence of the industrial producer's ex-factory price index on the consumer price index.

III. EMPIRICAL STUDY

(I) Data Collection

Through the data collected by the National Bureau of Statistics, the following data tables have been obtained:

Year	Per capita income of residents (yuan)	Factory Price Indices for Industrial producers (last year / 100)	consumer price index (last year / 100)
2011	14551	106	105.4
2012	16510	98.3	102.6
2013	18311	98.1	102.6
2014	20167	98.1	102
2015	21966	94.8	101.4
2016	23821	98.6	102
2017	25974	106.3	103.6

Source: national Bureau of Statistics of the people's Republic of China

(II) Modeling

The model expression is: $CPI = \beta_0 + \beta_1 X + \beta_2 Y + \mu$

Among them, the CPI is the consumer price index, and the coefficient is the per capita income of the residents and the factory price index for the industrial producers, and the random interference term.

(III) Data Handling

Using Eviews software to analyze the model, figure I, figure II:

OBS	Y	X	CPI
2011	106	14551	105.4
2012	98.3	16510	102.6
2013	98.1	18311	102.6
2014	98.1	20167	102
2015	94.8	21966	101.4
2016	98.6	23821	102
2017	106.3	25974	101.6

Figure 1. Data Entry

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication Pvt. Ltd.

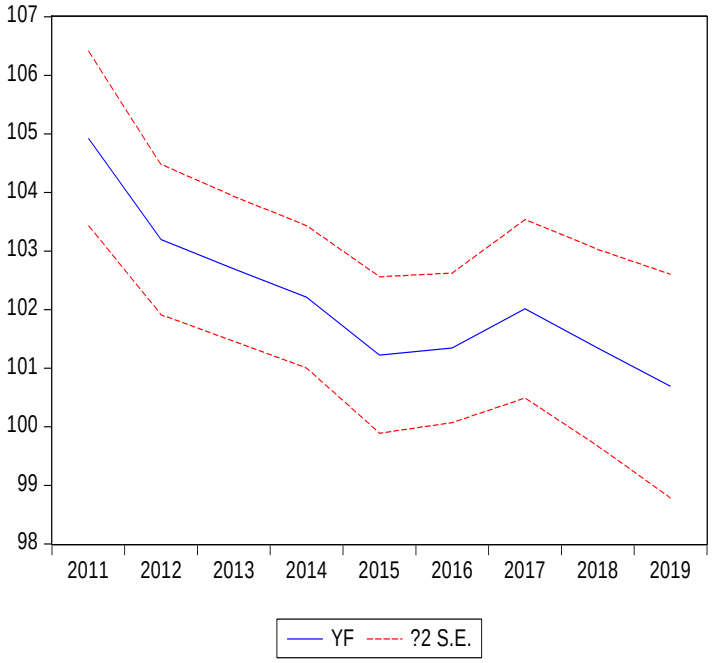
Dependent Variable: CPI
Method: Least Squares
Date: 05/31/18 Time: 10:55
Sample: 2011 2017
Included observations: 7

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	91.83665	5.38892	17.04175	0.0001
X	-0.000259	5.65E-05	-4.585697	0.0101
Y	0.159062	0.052412	3.034837	0.0386

R-squared	0.884826	Mean dependent var	102.5143
Adjusted R-squared	0.827239	S.D. dependent var	1.350837
S.E. of regression	0.56147	Akaike info criterion	1.981009
Sum squared resid	1.260993	Schwarz criterion	1.957828
Log likelihood	-3.933531	Hannan-Quinn criter.	1.694492
F-statistic	15.365	Durbin-Watson stat	2.31555
Prob (F-statistic)	0.013265		

Figure II Regression Results

It is concluded that: $CPI = 91.83665 - 0.000259X + 0.159062Y$
R-squared=0.884826、Adjusted R-squared=0.827239、F-statistic=15.36500、Durbin-Watson stat=2.315550
According to the Eviews software test, there is a linear correlation between the per capita income of the residents, the producer price index of industrial producers and the consumption level index of residents. The model estimates show that the CPI index will be reduced by 0.000140 per per percentage point of per capita income assuming that other variables are constant, and the other variables are assumed to be variable. In the same case, the industrial producer price index increases by one percentage point, and the CPI index will increase 0.270243., which is consistent with the theoretical analysis. The following figure is a change in the growth trend of each variable.



Forecast: YF
Actual: CPI
Forecast sample: 2011 2019
Included observations: 7

Root Mean Squared Error	0.424431
Mean Absolute Error	0.374115
Mean Abs. Percent Error	0.364446
Theil Inequality Coefficient	0.002070
Bias Proportion	0.000000
Variance Proportion	0.030582
Covariance Proportion	0.969418

Figure III Variable Growth Trend Map

(IV) Forecast Analysis

According to the model, we will forecast the consumer price index for the next two years (2018 and 2019), and we will calculate the forecast value of the variable per capita income X and the industrial producer price index Y using the method of average growth rate. The industrial producer's factory price index is estimated at 106.4107, and the per capita income is estimated at 28608 / 31509. The data estimates are substituted into the model and the following table is obtained:

Time	2016	2017	2018	2019
CPI Actual Value	102	103.6		
CPI Predicted Value	101.34	102.0.1	101.34	100.6876
Predictive Encoding	0.65%	1.45%		

IV. CONCLUSIONS AND RELATED RECOMMENDATIONS

This paper makes a time series analysis on the consumer price index and forecasts the consumer price index in the next two years. Through the forecast results can be seen in the next two years CPI will come back. Based on the prediction of consumer price index in this paper, the following suggestions are given:

(I) improve the CPI system through the adjustment of national policy.

(II) adjust the state's macro-control efforts in a timely manner, continue to adjust its structural policies, encourage consumption, grasp and respond to all kinds of new situations in time, ensure that the economy is running within a reasonable range, and strive to avoid a hard landing of the Chinese economy. Keep China steady and fast in economic development.

(III) State departments should strengthen the detection and early warning of the national economy, intervene in time to adjust the price instability in the market, and pay close attention to the price trend of the international market.

(IV) the consumption concept of Chinese residents should also be adjusted, the consumption structure of residents should be adjusted properly, and rational consumption should be guided to establish a reasonable consumption concept.

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