Review on Some Main Directions of Macroeconomic Analysis of Electric Power

Guang Chen[1,a] *, Di Wang[1,b], Jinhu Li[2,c], Yangqi Yu [2,d] and Ziming Xu [2,e]

[1]State Grid Energy Research Institute Co. Ltd., Beijing 102209, China;

[2]State Grid Info-telecom Great Power Science and Technology Co.,Ltd., Fuzhou 350003, China

[a]chenguang@sgeri.sgcc.com.cn,[b]wangdi1@sgeri.sgcc.com.cn,[c]lijinhu@sgitg.sgcc.com.cn,[d]yuyangqi@sgitg.sgcc.com.cn,[e] xuziming@sgitg.sgcc.com.cn

*corresponding author

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Abstract: The main problem of the development of the power industry is whether it can accurately grasp the growth trend of power demand combined with the background of China's economic development, and provide a reliable basis for the rational development of the power industry.In recent years, economists and policy makers have increased their attention and research on the relationship between economic growth and the development of the power industry, and give a brief review in detail to provide a reference for the research of power and economic relations.

1. Research Background

The macroeconomic analysis is mainly to judge and predict the current macroeconomic situation and development trend through the comparative analysis of the main GDP. At present, the macroeconomic indicators mainly used by macro economists are the statistical data provided by the statistical departments, mainly including GDP-national economic overall indicators, CPI-consumer price indicators, PPI-producer price indicators, etc., and the power data can directly or indirectly respond to these important indicators.

Power data has many advantages, such as real-time, authenticity and accuracy. Carrying out macroeconomic prediction by relying on power data can give full play to the value of power data, make up for the shortcomings of traditional economic statistics in the publication time lag and other aspects, and effectively enhance the timeliness and accuracy of macroeconomic prediction.

The main problem of the development of the power industry is whether it can accurately grasp the growth trend of power demand combined with the background of China's economic development, and provide a reliable basis for the rational development of the power industry.In recent years, economists and policy makers have increased their attention and research on the relationship between economic growth and the development of the power industry, and give a brief review in detail to provide a reference for the research of power and economic relations.

2. Power Elasticity Coefficient Was Used To Study the Correlation between Electricity and Economic Growth

Power elasticity coefficient is the most direct embodiment of the correlation between power and economic development, and is one of the important factors considering the long-term development planning of power industry.

When all developed countries are in the development period, the power elasticity coefficient is greater than 1, that is to say, energy production is advanced development. However, the annual elasticity coefficient of power consumption in China fluctuates greatly. The lowest value since 1980 is 0.382 in 1998, while the highest value has reached 1.882 in the first half of 2003. Therefore, the change law of power elasticity coefficient has been a hot topic of domestic researchers.

Yang Minying [1] analyzed the impact of industrial structure changes, power consumption per unit output value and economic growth rate on the elasticity of power consumption, and on this

basis analyzed the change trend of central China and East China.

Hao Weiping [2] and other people analyzed the historical law of the change of power elasticity coefficient in China since the founding of the People's Republic of the Republic of China, analyzed the power elasticity coefficient of developed countries in China and abroad in different stages of economic development, and on this basis analyzed the change trend of power elasticity coefficient in China in the future.

Limberqiang [3] estimated the long-term elasticity coefficient of China's electric power on the basis of establishing the long-term power demand model, which showed that the elasticity coefficient was estimated at 0.78 between 1978 and 2001, slightly lower than 0.86 between 1952-2001, which is consistent with the promotion of energy conservation and economic structure optimization and adjustment after the reform and opening up.

Mao Jibing and Hua Ruxing [4] focused on the evolution process and change law of power consumption structure and power consumption elasticity coefficient in Beijing and Shanghai with high urbanization rate, and predicted that the elasticity coefficient of Chinese residents' life and tertiary industry will be greater than 1 in a quite long period.

Wu Jiang [5] from the analysis of 1998-2008 China's power consumption elasticity coefficient characteristics, analyzed the industrial structure, power use efficiency and terminal demand changes for long-term and short-term changes different impact mechanism, compared with our three economic cycles since 1978 and other countries in the world, pointed out that China's power consumption and GDP growth will continue to maintain a relatively strong correlation, power consumption elasticity coefficient "often high", "slow", "allergy" and other characteristics will continue for a certain period.

Si Zengchuo [6] analyzed the correlation between the process of industrialization process and the evolution of the elasticity coefficient of power consumption. His research found that because China is in the period of heavy industrialization, the elasticity coefficient of power consumption is significantly greater than 1, and the proportion of power energy consumption in the secondary industry continues to rise.

The Guo Ying [7] study confirmed that the positive correlation between industrial electricity consumption and economic growth in Zhejiang Province, and the elasticity coefficient of industrial electricity consumption to economic growth is 1.55.

By establishing a regression analysis model between electricity consumption and economic growth, He Yonggui [8] measured every 1% increase in China's electricity consumption, and the GDP also increased by 1%.

However, there are many disputes about the role of power elasticity coefficient and whether academia can truly reflect the relationship between economic development and power consumption.Power elastic coefficient is the comprehensive result of the mutual promotion and restriction of various social factors and economic factors, and the development of power elastic coefficient is a complex dynamic process.

3. Using Cointegration Analysis and Causality Test to Study the Long-Term Relationship between Power Consumption and Economic Development

Asafu-Adjaye[9] studied the correlation between power consumption and economic development based on the data from more than 100 countries, and concluded that there is a strong correlation between power consumption and economic development, and developed countries have a stronger correlation between power consumption and economic development than backward countries. Among them, the correlation between Chinese power consumption and economic development is very high, and explains this correlation as the role of industrialization. However, the strong correlation between power consumption and economic growth is not a "causal relationship". The relationship between power consumption and economic development may be that power consumption promotes economic growth, or that economic development drives power consumption, which needs to be further studied.

In the framework of production three-factor function, [10] studied the relationship between

power consumption and economic growth in 1952 by co-consolidation analysis and error correction model technology in 2001.The empirical results show that Chinese power consumption is endogenous with economic growth, and that the two variables are interrelated. In terms of time, power is ahead of the overall economy, electricity consumption is the Granger in of economic growth, but short-term economic growth is not the Granger in in of electricity consumption. The study believes that in the short term, China's "economy development, power first" development strategy is still effective while the market mechanism is still unsound. Proper "go" first can avoid economic losses from periodic power shortages.

Yuan Jiahai, Ding Wei, Hu Zhaoguang [11] using coconsolidation theory to study the relationship between 1978-2003 China's power consumption and economic growth, verify the long-term relationship between power consumption and GDP growth, in the short term there is a one-way ranger from power consumption to G D P growth, but there is no ranger from economic growth to power consumption, industrial output and coconsolidation relationship between industrial power inspection strongly supports the conclusion. We analyze the reasons of the above conclusions from a deep perspective, that is, China is experiencing the industrialization process of economic development. From 1978-2003, the proportion of industrial output value in GDP has been steadily rising, and industrial electricity consumption accounted for 70% -80% of the whole social electricity consumption. Industrial output accounts for a large proportion of the national economy, meaning that the growth of industrial electricity consumption leads to the growth of industrial output, thus leading to the growth of GDP. This shows that the growth of power consumption increases China's income level through the growth of industrial electricity consumption; otherwise, the insufficient power supply will affect the growth of industrial output, and thus inhibit the growth of income level.

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