

# *Is the Stock Market a Reliable Indicator of the National Economy?*

## **-Empirical Analysis According to Chinese Data**

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**Abstract:** Based on China's economic data from 1992 to 2021, this essay employs the unitary linear regression model to investigate the effect of the Shanghai Composite Index on per capita GDP and carries out heterogeneity analysis from the perspective of different bank types. This paper concludes that the stock market in China has the function of a barometer. Based on different industries, the Chinese stock market's capacity as a barometer is effective in different industries, but China's stock market has the greatest effect on the tertiary industry, the second industry, and the least effect on the primary industry. Based on the expenditure approach, Chinese stock market's use as a barometer is effective for different components of GDP, but the effect of China's stock market on net exports of products and services is the largest, followed by government consumption and input-output ratio, and the effect on household consumption is the least. Based on the consideration of timing, the Chinese stock market's ability to serve as a barometer only took effect before the outbreak of the substandard goods crisis in 2008 and failed after the outbreak of the crisis.

**Keywords:** Shanghai composite index, gross regional product per capita, regression, heterogeneity, conservatism

## **1. Introduction**

The stock market serves as a good indicator of the state of the economy, which means that the changes in stock returns can quickly and directly reflect the economic fluctuations of a country over a certain period. Then one can also predict changes in the economic market by looking at the direction of the stock market. Thus, stock market barometers can not only help professionals predict roughly the future trend of stock prices and prepare for some serious financial disasters in advance, but the rise in the stock market can also reflect the influence of a country in the financial market and its economic position in the international market. Even if the stock price may deviate from reality in the short term, it is an extremely important ability to predict the possibility of economic recovery and development prospects in the short term by using the changes in the stock market in advance. However, in some countries, the function of the stock market barometer may not be fully realized due to the imperfect delisting system and other factors.

Therefore, the question that this paper plans to discuss is whether the stock market serves as a gauge of the country's economy. In view of this, this paper plans to carry out the following work: Based on an empirical analysis of the connection between China's per capita GDP and the Shanghai Composite Index from 1992 to 2021, this paper employs the unary linear regression model and combines multiple heterogeneity analyses to provide case studies and experience for related research on the function of barometers.

## 2. Literature Review

In the study that informed this essay, the first type of literature examined focuses on whether the barometer's capability of the Chinese stock market exists. Zheng Guihuan et al [1]. took the data of firms with A-shares from 1995 to 2019 as samples, referred to the historical dimension and comparative analysis of international stock markets, discussed the correlation between stock index and real economy from the perspective of both the long and short terms, stock and increment, and discussed the characteristics and problems regarding the barometer effect of China's share market. The research results of Zhang Zhimin et al [2]. show that the stock index cycle has a strong correlation with economic growth. The magnitude of the share market as well as its liquidity both contribute favorably to the expansion of the economy. However, there is little evidence of a dynamic connection between stock market growth and economic expansion. Meng Qingbin et al [3], investigated how changes affect people in China's macroeconomic factors on the stock market by applying the variable vector autoregressive model in the Ma Shi domain. Xu Xin draws the following conclusions through research [4]: China's stock market has not played an effective role in predicting the macro-economy, and it cannot fully show that China's share market has had a macroeconomic barometer effect. Chao Liu et al [5]. used detrended cross correlation analysis (DCCA), multifractal detrended cross correlation analysis (MF-ADCCA), and the DCCA algorithm with time delay to select data from the CSI 300 index and the Purchasing Managers' index from April 2005 to June 2017. They investigated the interdependence, asymmetry, and direction of China's share market and economy, and introduced the DCCA cross correlation coefficient for comparative analysis at home and abroad. The empirical results of Jin Fang show that the results of China's share market volatility on macroeconomic development is not obvious [6]; the fluctuation of the share market deviates from the trend of the macroeconomy in some cases, indicating that the stock market is volatile. There is no good reason why China's stock market has become an effective economic indicator. Li Qian [7], through the correlation data analysis of China's economic data indicators and stock data indicators, supplemented by an information inquiry into China's stock development and economic system, came to the conclusion that the performance of China's stock market can be viewed as a general indicator of the country's economy. Chen Weizhong used the data of 21 countries from 2003 to 2012 to compare and examine the connections between the returns of the securities market and the first- and second-order changes of the national economy [8]. Zhang Shikun analyzed the impact of stock market volatility on economic growth with the data from 2001 to 2018 by using a VAR model [9]. Lu Shichao adopted the Shanghai Shanghai Enterprise Index to represent the operation of the stock market [10], adopted total consumer products sold at retail in Shanghai, the aggregate volume of imports and exports, the resident confidence index, the inflation index, the power generation, and the investment in fixed assets, and embraced the co-integration idea and approach to represent the macroeconomic operation of Shanghai.

The second kind of literature is to explore the reasons behind the failure of the Chinese stock market barometer. Li Teng said that only by ensuring that stock prices reflect the value of listed companies can the stock market's role as an economic gauge be strengthened [11]. Wang Hongwei investigated the connection between stock price indexes and economic expansion in China and the United States and conducted empirical analysis on the rationality of the argument that the national

economy can be measured through the share market [12]. This paper discusses the causes of divergence between the trend of the Chinese stock market and economic growth by analyzing the industry structure and performance growth of the top ten weighted stocks on the Shanghai Stock Exchange. XieBaisan and Tong Xinlaiproposed that the divergence is due to the particularities of the share market formed in the growth of China's share market and financial industry [13], such as improper positioning of the stock market and excessive emphasis on the financing function. excessive issuance of new shares at high prices; there are policy risks in the stock market. Zheng Zhenzhen first demonstrated the link between the stock market and the entity economy in the context of a healthy securities market [14]. Then combined with the reality of China, this paper demonstrates distinction between China's share market and the real economy and analyzes the factors that restrict the growth of the Chinese securities market. Gu Baoguostated explicitly that the poor performance of China's share market [15], as an economic indicator of China's macroeconomy, was caused by the mispositioning of functions, the coexistence of speculation and gambling, and the absence of a legal framework.

On the basis of the aforementioned previous research, four different additions could be made to this study. First, most literary works concentrate on the research of the stock market, while few concentrate on exploring the impact of China's share market on economic growth. This essay discusses the function of China's barometer. Secondly, this paper uses rich heterogeneity analysis to carry out research from three perspectives: tertiary industry, expenditure approach, and time. Third, this paper is based on the National Bureau of Statistics of China's most recent and comprehensive statistical information. This data is more realistic and helps to draw more accurate statistical conclusions. Fourthly, given that the Chinese economy is the second largest in the world, and it is the greatest of all the emerging nations, studying the Chinese stock market barometer's effectiveness is especially crucial. The findings of this work have significant theoretical relevance and practical usefulness, and they can provide examples and cases from China for research in comparable fields in other nations.

### **3. Research Design**

#### **3.1. Variables**

The variable in this essay that is described is the national economy. Considering the available research, this paper uses GDP per capita as the proxy variable. This paper uses the Shanghai Composite Index as the primary explanatory factor to assess the development level of China's stock market. An index used in statistics that depicts the general direction of equities listed on the Shanghai Stock Exchange is called the Shanghai Composite Index.

#### **3.2. Data Sources**

The research component of this work selects China as the topic of empirical research. The time frame for the observation was from 1992 to 2021. The sample data used are from the National Bureau of Statistics of China (NBS). The descriptive statistical table of the data in this paper is shown in Table 1, and all the data are processed logarithmically.

Table 1: Descriptive statistics.

Variable	Obs	Mean	Std.Dev.	Min	Max
Per capita GDP/yuan	30	28039	24295	2334	80976
Shanghai Composite Index/Close	30	2157	1138	555.3	5262
GDP / 100 million yuan	30	382745	344583	27194	1.14E+06
Shenzhen Composite Index/Close	30	931.8	729.1	113.2	2530
Household consumption / 100 million yuan	30	146128	130006	12312	438849
Government spending / 100 million yuan	30	60899	57192	3927	182072
Aggregate capital formation / 100 million yuan	30	165370	152407	10625	489897
Services and goods net exports / 100 million yuan	30	10455	8734	-679.5	29522
The primary industry's added value / 100 million yuan	30	34397	23350	5800	83086
The secondary industry's added value / 100 million yuan	30	161242	134642	11725	450904
The tertiary industry's added value / 100 million yuan	30	187106	187772	9669	609680

### 3.3. Model Setting

The unitary linear regression research model for this work is as follows:

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

where Y is the explained variable of China's GDP per capita, X is the core explanatory variable of the Shanghai Composite Index, and  $\varepsilon$  is the random error term.

## 4. Demonstration Analysis

### 4.1. Correlation Analysis

Figure 1 shows the connection between China's GDP per capita and the Shanghai Composite Index's closing. According to the trend in the chart, China's per capita GDP increases with the growth of the Shanghai Composite Index. However, the association between China's per capita GDP and regression analysis must be used in this research to further verify the Shanghai Composite Index's closing.

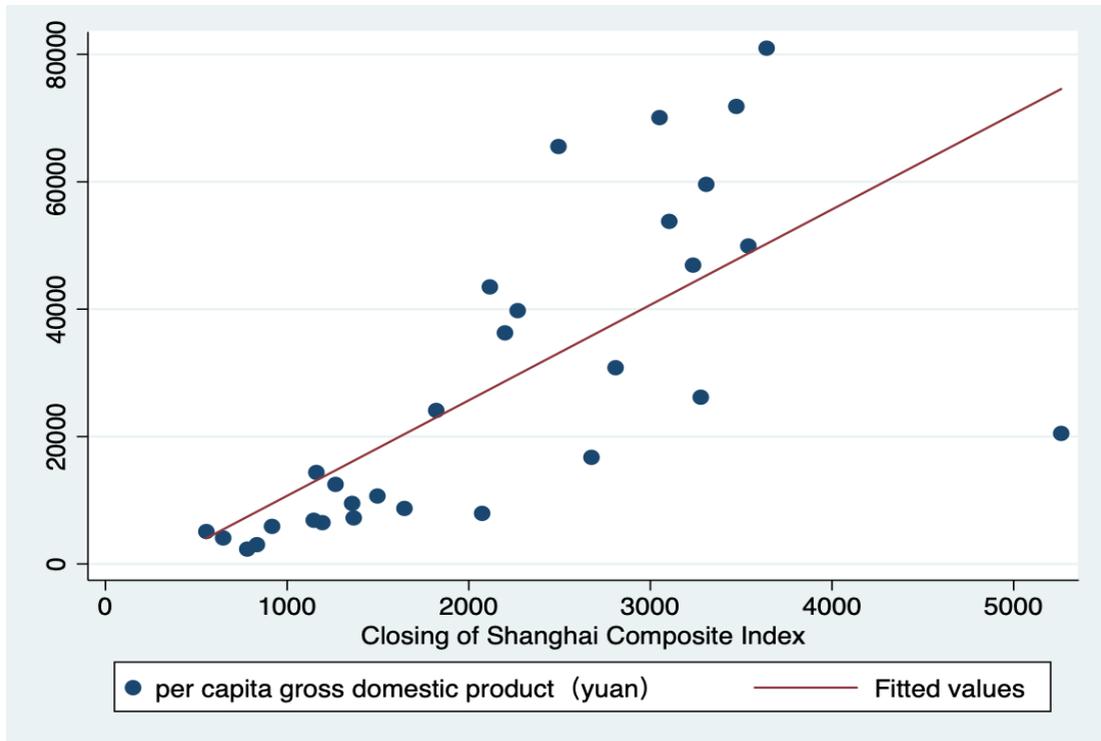


Figure 1: Correlation between per capita GDP and the Shanghai composite index.

#### 4.2. Baseline Regression

Model (1) in Table 2 presents the primary regression findings of the influence of the closing price of the Shanghai Composite Index on GDP per capita. To be more specific, the estimated coefficient of the central explanatory variable in the model is 1.5420, which is a significantly positive value at the 1% significance level. According to the preliminary findings of the regression, the current closing price of the Shanghai Composite Index has a positive effect on China's per capita GDP overall. Therefore, the closing price of China's Shanghai Composite Index has a certain barometer function.

Table 2: Reference regression and conservatism test.

	(1) Y	(2) Y	(3) Y
X	1.5420*** (8.6957)	1.0899*** (11.2882)	1.6277*** (8.7400)
_cons	-1.8222 (-1.3614)	2.6956*** (4.2562)	0.1020 (0.0726)
N	30	30	30
R2	0.7298	0.8198	0.7318

Note: The symbols \*\*\*, \*\*, and \* denote statistical values that are significant at the 1%, 5%, and 10% levels of significance, respectively, with T-values in parentheses. The same below.

#### 4.3. Conservatism Test

To guarantee the consistency and dependability of estimated findings, this article from the replacement measure of China's stock market index and regional economic measure looks at two

aspects of robustness testing. (1) This paper selects the closing price of the Shenzhen Composite Index to replace the Shanghai Composite Index's closing price to carry out regression. Regression outcomes are displayed in Model (2) in Table 2, and the results are consistent with the benchmark model. (2) This paper chooses GDP to replace GDP per capita to carry out regression. The regression results are shown in the model in Table 2 and Model (3), and the results are consistent with the benchmark model. It can be seen that the conclusion of this paper is basically stable, that is, that the Chinese stock market has a certain function as a barometer.

#### 4.4. Analysis of Heterogeneity

##### 4.4.1. Industrial Heterogeneity Analysis.

Based on industry, this paper divides China's gross regional product into the primary, secondary, and tertiary industry's added value and carries out an industry-based heterogeneity analysis. Table 3 Models (1), (2), and (3) respectively provide the regression analysis findings of the closing price of the Shanghai Composite Index on the value-added that comes from primary, secondary, and tertiary industries. The estimated coefficients of the explanatory variables were 1.0876, 1.5680, and 1.8509, respectively, and the regression's findings were all significant at the 1% significance level. The regression's findings indicate that the influence of China's stock market on the three industrial added values is significantly positive; that is, there is a barometer function. However, the added value of the tertiary industry is most impacted by the closing price of the Shanghai Composite Index, followed by the added value of the secondary sector and has the least impact on the added value of the primary industry.

Table 3: Heterogeneity analysis of industry.

	(1) Y	(2) Y	(3) Y
X	1.0876*** (8.0198)	1.5680*** (8.8447)	1.8509*** (8.8662)
_cons	2.0059* (1.9595)	-0.2643 (-0.1975)	-2.4236 (-1.5380)
N	30	30	30
R2	0.6967	0.7364	0.7374

##### 4.4.2. Heterogeneity Analysis Based on Expenditure Approach.

Based on the expenditure approach, this paper divides China's GDP into household consumption, government spending, aggregate capital formation, and services and goods net exports and carries out an expenditure approach-based heterogeneity analysis. Table 4 Models (1), (2), (3), and (4) respectively report the regression analysis results of the closing price of the Shanghai Composite Index on household consumption, government spending, aggregate capital formation, and services and goods net exports. The estimated coefficients of the explanatory variables were 1.4962, 1.7015, 1.7086, and 1.8454, respectively, and the regression outcomes were all significant at the 1% significance level. The regression's findings indicate that the components of China's stock market to GDP of expenditure method are all significantly positive, indicating that they all serve as a barometer. However, the closing price of China's Shanghai Composite Index has the greatest effect on services and goods net exports, followed by government consumption and aggregate capital formation, and the least effect on household consumption.

#### 4.4.3. Time Heterogeneity Analysis.

Based on the feasibility of the data, this paper takes 2008 as the time node and carries out a time heterogeneity analysis by dividing the sample period into two time periods. Table 5 Model (1) and Model (2) provide a breakdown of the impact's regression results of the closing price of the Shanghai Composite Index on China's per capita GDP from 1992 to 2007 and from 2008 to 2021. The explanatory variables' estimated coefficients of correlation were 0.8840 and 0.6859, respectively. However, the regression result of the effect of the closing price of the Shanghai Composite Index on China's per capita GDP is just 1% significant that it is a substantial positive from 1992 to 2007. In this paper, the regression result of the effect of the closing price of the Shanghai Composite Index on China's per capita GDP was not significant after the outbreak of the American substandard goods crisis in 2008. The regression results show that the function of China's share market barometer has the characteristics of time and stage. China's stock market was only effective before the subprime mortgage crisis in 2008, but failed after the crisis broke out.

Table 4: Heterogeneity analysis based on expenditure approach.

	(1) Y	(2) Y	(3) Y	(4) Y
X	1.4962*** (8.4715)	1.7015*** (8.9035)	1.7086*** (8.3957)	1.8454*** (8.9029)
_cons	0.1827 (0.1371)	-2.3313 (-1.6162)	-1.4010 (-0.9121)	-5.1557*** (-3.2835)
N	30	30	30	29
R2	0.7193	0.7390	0.7157	0.7459

## 5. Conclusion

In light of the aforementioned scientific findings, this essay thinks that China's stock market has the function of a barometer. Taking into account various economic sectors, the barometer function of China's share market is effective in different industries, but China's stock market has the greatest effect on the tertiary industry, the second industry, and the least effect on the primary industry. Based on the expenditure approach, the barometer function of China's share market is effective for different components of GDP, but the effect of China's share market on services and goods net exports is the largest, followed by government consumption and aggregate capital formation, and the effect on household consumption is the least. Based on the consideration of timing, the economic indicator function of China's share market only took effect before the outbreak of the subprime crisis in 2008 and failed after the outbreak of the crisis.

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