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Is Fiscal Policy Effective?

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A R T I C L E I N F O

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A B S T R A C T

In the field of public economic policy, Adam Smith's classical economic theory advocates that any economic policy is ineffective, while Keynesianism believes that the government should adopt an active fiscal policy to address economic crises. Which of these two fundamentally opposing views is correct? Should the government intervene in the economy? If intervention is necessary, should it be through fiscal policy, monetary policy, or exchange rate policy? This study conducts a hypothesis test on the effectiveness of fiscal policy using economic data from China between 1999 and 2018 and regression methods. The research finds that fiscal policy is effective in China; therefore, the government should use an active fiscal policy to build infrastructure, drive economic development, and provide well-being for the people.

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INTRODUCTION

Over the years, there has been much debate in the field of public policy in public management. For example, there is ongoing discussion about whether the government should adopt an active fiscal policy to stimulate economic growth. This has been a contentious topic in the field of basic economics, as per the traditional views of Adam Smith, who argued that the economy does not require government intervention. However, the global economic depression of the late 1930s, known as the Great Depression, contradicted this theory. In 1963, Keynes published 'The General Theory of Employment, Interest, and Money,' proposing that the government can intervene in the economy through fiscal and monetary policies.

Due to the prolonged debate in the theoretical realm, public management practices vary. In modern democratic nations, policies rarely involve zero government intervention or, conversely, complete state control over the entire economy. There are various public policies that can be adopted, such as fiscal policies that stimulate economic growth through government investment in infrastructure or monetary policies involving central banks printing money. Some developing countries also use exchange rate policies to manipulate exports. So, should the government actively intervene in the economy? If intervention is necessary, which specific policy should be implemented? These questions can only be effectively assessed from a statistical perspective.

LITERATURE REVIEW

Of course, economists have conducted numerous studies and exerted

Considerable effort in the field of public policy in public management. As historical research is well-known, I will now provide a brief overview of new empirical studies on economic policy from 2018 to 2023.

(Fatás and summers 2018) used actual and potential GDP data from the IMF, regressing fiscal shocks against GDP data. They found that fiscal policy can alter the long-term development path of GDP, and post-global financial crisis fiscal tightening has a fundamental impact on economic development.

(Ramey, Zubairy, and National Bureau of Economic Research 2018) utilized new U.S. historical quarterly data covering multiple wars and the Great Depression. They estimated a state-dependent model where the shock response and multiplier depend on different historical states. Ultimately, they found no evidence of changing multipliers, suggesting the stability of the impact multiplier of fiscal policy.

(Dinçer and Yüksel 2019) used Indonesian data to fit a model assessing the effects of fiscal and monetary policies on Indonesian economic growth. Their conclusion is that both fiscal and monetary policies have a significant impact on Indonesia's economic growth.

(Success Ikechi, Christian Ugwueze, and Segun Matthew 2022) conducted a Vector Autoregressive analysis on data from Nigeria between 1999 and 2020. Their conclusion is that the short-term impact of fiscal policy is significant, but the long-term positive effect is not significant.

(Perotti 2023) employed a dataset covering 201 countries to estimate the role of fiscal policy in developing countries. They argue that fiscal policy is effective only when external policies, such as external debt, are simultaneously at play.

(Vtyurina and Leal 2023) constructed a new model with data from 19 EU Countries, controlling for country size, debt-to-GDP ratio, and openness. Using the VAR method, their conclusion is that EU countries should establish a fiscal union; otherwise, one country's austerity policy poses risks to others.

(Ramey, Zubairy, and National Bureau of Economic Research 2023) used Data from Nigeria, Gambia, and Ghana between 1980 and 2007. Their model represented economic output and volatility with real GDP and exchange rates, fiscal policy with deficits and government spending, and employed a regression model using the least squares method. The model showed that monetary policy was not significant, fiscal policy was significant in Nigeria and Gambia but not in Ghana.

(Leung 2023) fitted a Vector Error Correction Model (VECM) to quarterly data from Vietnam for the 20 years after 2000. The results supported the Keynesian view that fiscal policy is effective in influencing real output. (Cevik and Miryugin 2023) fitted a model to large-sample data from 139 countries spanning 1970 to 2021. They observed that the impact of fiscal policy is significant in developing countries, asserting that fiscal policy serves as a macroeconomic stabilizer.

(Mahtab, Shafique, and Shah 2023) used data from the Pakistan Economic Survey and WDI to study the impact of fiscal shocks on Pakistan's economy. Their conclusion is a positive correlation between fiscal policy and the economic growth rate. (Coskun Yilmaz 2023) utilized economic data from Turkey between 1990 and 2021, fitting a Vector Autoregression (VAR) model. The model indicated that fiscal policy has a short-term negative impact on employment but a long-term positive impact.

(Kadhim and Maarof 2023) used data on Turkish fiscal expenditure and other variables to predict GDP growth rate, finding that fiscal expenditure is the most significant factor driving GDP growth.

(Cyril et al. 2023) fitted a model to data from Nigeria between 1986 and 2020, examining the relationship between fiscal policy and the poverty index. Their conclusion is that government revenue and expenditure should increase while government debt should decrease to effectively address Nigeria's poverty Issues. (Cyril et al. 2023; Zhao et al. 2023) estimated a model of the impact of green fiscal policy on green total factor productivity using panel data from China between 2009 and 2020. Their conclusion is that green fiscal policy can improve green total factor productivity, and statistical analysis shows that the conclusion is robust.

(Mansur 2023) used quarterly data for the United States, applying the Bayesian Vector Autoregression method to estimate the impact of fiscal shocks, monetary shocks, and output shocks on various economic variables. They estimated a fiscal spending multiplier of 0.91, peaking at 0.94 after one quarter.

Research Gap

Previous studies did not include exchange rates as control variables, but in developing countries, currency manipulation is not an isolated phenomenon. Therefore, this study constructs a new macroeconomic model with exchange rate policy as a control variable. On the one hand, the new model aids in a better understanding of economic data, and on the other hand, it enhances the reliability of hypothesis test results. The absence of such a model in previous research on China's fiscal policy can be considered a research gap. Statement of the problem so, the question we want to investigate is: Is fiscal policy effective? If it is effective, then with a 1% increase in fiscal expenditure, by how much can the actual GDP grow?

Research Framework

Because a country may simultaneously implement several monetary policies, with monetary and exchange rate policies at play alongside fiscal policy stimulus, our model not only controls for monetary policy but also includes controls for exchange rate policy, which has not been observed in previous literature. Therefore, our econometric model is as follows: realGDP=a+b1*fiscal+b2*monetary+b3*exchangrate+error

Hypothesis

Our null hypothesis is H0: b1 = 0, and the alternative hypothesis is H1:b1 > 0 or b1 < 0.

METHODOLOGY

Sample and Sampling Techniques

The data we utilized is sourced from the National Bureau of Statistics of China. We randomly selected data spanning 20 years from 1999 to 2018. The economic indicators chosen include fiscal expenditure, broad money supply (M2), and the exchange rate of the Chinese Yuan to the U.S. Dollar. Fiscal expenditure reflects China's fiscal policy, broad money supply represents monetary policy, and the exchange rate of the Chinese Yuan to the U.S. Dollar reflects potential exchange rate policy. Additionally, we included China's Gross Domestic Product (GDP) data and Consumer Price Index (CPI) data. GDP naturally represents China's economic output, but due to the possibility of inflation, in such cases, even if GDP grows, living standards may not necessarily improve. Therefore, we also used the Consumer Price Index to calculate real GDP. Real GDP and prices reflect the economic conditions.

Paradigm

We will visualize the columns of data used in the regression, and below, we will examine each of these datasets one by one to see if we can identify any patterns.

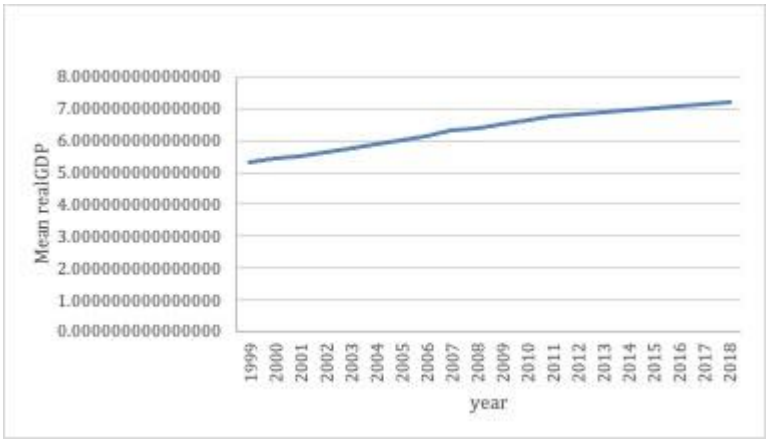


Figure 1. China's Real GDP from 1999 to 2018

China's real GDP maintained a high-speed growth trend from 1999 to 2018. On the one hand, this is a result of learning from Southeast Asian countries and the outcomes of economic reforms and opening up. On the other hand, it is also attributed to the effective macroeconomic control by the Chinese government, preventing the occurrence of economic crises. Even against the backdrop of a global recession,such as the 2008 financial crisis, the Mainland Chinese economy remained relatively stable

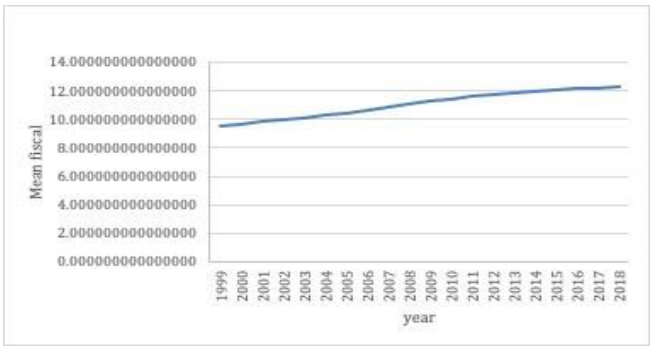


Figure 2. China's Fiscal Expenditure from 1999 to 2018

We observe that fiscal expenditure data has been consistently growing from 1999 to 2018, reflecting China's expansionary fiscal policy. As a transitioning country, China's emphasis on the stimulative role of fiscal policy in the economy reflects the influence of traditional planned economy thinking. Despite the shift towards a market economy after the reform and opening-up, there is still a strong emphasis on government macroeconomic regulation.

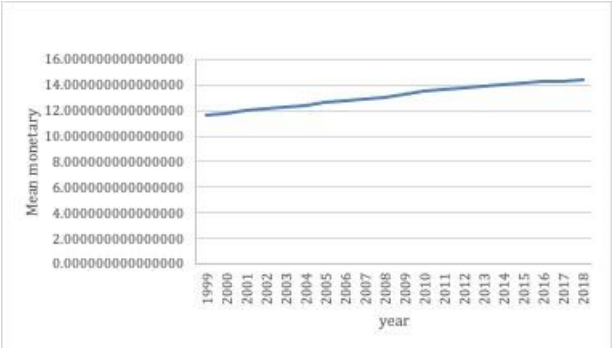


Figure 3. China's Money Supply from 1999 to 2018

Similarly, the broad money supply has been increasing year by year. Given that a market economy can lead to overproduction and deflation, moderate monetary growth is advantageous for price stability. Of course, China's pace of monetary expansion has been stable, ensuring price stability throughout these two decades.

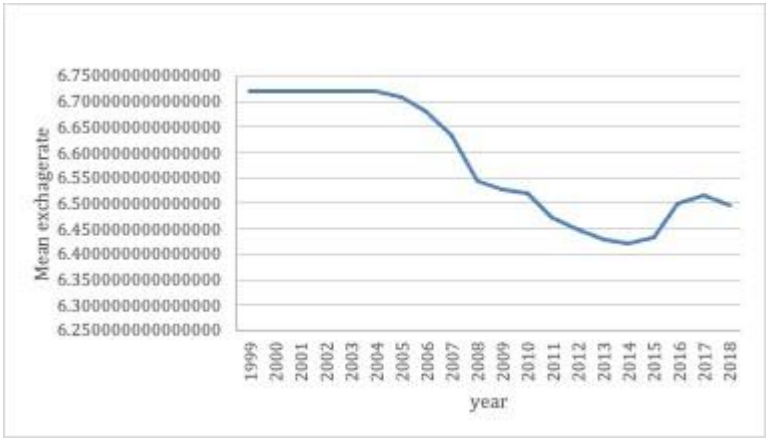


Figure 4. CNY to USD Exchange Rate from 1999 to 2018

Over the course of these two decades, exchange rate fluctuations have been quite evident.Before 2004, the Chinese yuan to U.S. dollar exchange rate remained stable, as it was government-controlled at that time. After market liberalization in 2004, the yuan depreciated significantly against the U.S. dollar, continuing until a slight recovery in 2015. This was mainly due to the lack of competitiveness of Chinese industrial products in the market liberalization phase. Of course, intentional depreciation measures to boost exports cannot be ruled out. After 2015, the quality of Chinese industrial products improved, exemplified by new domestic brands like Xiaomi, leading to an appreciation of the exchange rate. Moreover, currency depreciation can face retaliatory measures from other countries and is inherently unsustainable.

Research Design

This study utilizes observational data, and since the data is sourced from the National Bureau of Statistics of China, which is inherently sampled data, it can be used for at least predictive purposes.

Instrumentation Techniques

This study does not require experimental instruments; it only involves accessing the official website of the National Bureau of Statistics of China to download data using a computer.

Data Gathering Procedures

We start by opening the official website of the National Bureau of Statistics of China, with the URL http://www.stats.gov.cn/. Then, click on 'Data,' and on the lower left side of the page, there is a section for data queries. Click on 'China Statistical Yearbook,' and you can find all the necessary data for this study

Data Analysis Procedures

This study conducted regression analysis on four columns of data using SPSS Statistics software. RealGDP was used as the dependent variable, while fiscal, monetary, and exchange rate were used as independent variables. The regression procedure was executed in SPSS Statistics.

RESULT AND DISCUSSION

The regression results of this study are as follows:

	realGDP
Cons	-2.675
	（0.101）
fiscal	0.918
	（0.005）**
monetary	-0.227
	（0.420）
exchange rate	0.289
	（0.245）
P-value in parentheses, *p<0.05, **p<0.01, ***p<0.001	

The multiple regression model fitted by least squares is as follows: realGDP=（-）2.675+0.918*fiscal-0.227*monetary+0.289*exchangerate+error

Decision Criteria

The decision criterion for this study adopts the commonly used 95% confidence interval, and the null hypothesis is rejected if the coefficient p-value is less than 0.05.

Significance of the Study

The results of our regression analysis indicate that the coefficient b1 for fiscal policy is significant, but the coefficients b2 for monetary policy and b3 for exchange rate policy are not significant.

Scope and Delimitation

The scope of this study is the impact of fiscal policy, monetary policy, and exchange rate policy on current real output. It is also possible that the effects of monetary and exchange rate policies have a longer time span, significantly influencing real output in the subsequent years.

Additionally, the data used in this study are specific to China and are intended for prediction, not necessarily generalizable to other countries. However, assuming commonality in human economic systems, the conclusion that fiscal policy is effective could serve as a reference for other countries.

The results of this study show an impressively high R Square of 0.997285, indicating an excellent fit of the data. For each 1% increase in fiscal expenditure, it can drive a growth of 0.918% in current real GDP. Therefore, the impact of fiscal policy is significant, yielding nearly a 1:1 effect on real output. The standard error of the fiscal policy coefficient is se=0.284. Under our null hypothesis H0: b1=0, the test statistic is t=3.231. The p-value, shown under Sig, is 0.005, which is less than 0.05. Therefore, with a 95% probability, we can reject the null hypothesis, indicating that the effect of fiscal policy on real GDP is significant.

Therefore, in the model controlling for monetary and exchange rate policies, our study finds that fiscal policy is effective. Thus, Adam Smith's theory of completely liberal economics not only fails in practical application but is also rejected at a 95% probability under the statistical analysis of economic data. According to rigorous statistical analysis of economic data, the impact of national policy on real GDP is not zero. On the one hand, this could be due to the multiplier effect generated by government spending; on the other hand, government policies may influence people's expectations for economic development. Since the economy itself is largely a result of people's expectations, if people expect a recession and reduce consumption, it will naturally lead to an economic downturn. This, in turn, affects people's income, leading to further reductions in expectations. This helps explain why Adam Smith's classical economics contributed to the Great Depression in the UnitednStates, and one solution to this problem is an active fiscal policy.

There's an old saying in China: 'Trust the person you employ, do not employ a person you distrust.' In democratic countries, the president is elected by the people. Since the people have chosen him, they should trust him. He should be endowed with strong fiscal powers to lead the people out of economic difficulties.

Another question raised at the beginning of this article is what intervention policy should be adopted if it is effective. This study also provides an answer to this question. Since the coefficients of monetary policy and exchange rate policy are not significant, we can say that the conclusion of the effectiveness of these policies cannot be generalized to the overall population. It is possible that our sample data is not sufficient, but with the current sample data, we cannot reject the null hypothesis that these two policies are ineffective at a 95% probability. However, because the coefficient of fiscal policy is significant, we can reject the null hypothesis that fiscal policy is ineffective at a 95% probability. Therefore, we believe that fiscal policy is an effective means of government intervention in the economy. Compared to monetary policy, fiscal

policy does not lead to inflation and is more direct. Government projects can immediately solve the problem of employment for workers, and once these workers have income, they will naturally purchase various consumer goods, thereby boosting businesses along the project route. With increased business, there will be a stimulative effect on demand for products in various industries. Therefore, fiscal policy is beneficial to all social strata, as it triggers a multiplier effect.

There is only one criticism for fiscal policy, which is that government investment may raise market interest rates and crowd out private investment. However, this criticism is not valid because government investment is in significant infrastructure projects that cannot be completed by the private sector. Even if private capital has the capacity for investment, they would be unwilling to invest in these areas due to insufficient profit margins. For example, in the construction of highways and high-speed railways, the tolls collected in the end can only cover the costs, and private capital is not inclined to invest in these areas. This is a conclusion from the field of public economics – for projects like building bridges and roads, government investment is undoubtedly more suitable than private investment. On the other hand, the construction of government projects also brings benefits to investors. For instance, construction workers employed in government projects may have a demand for rental housing, which contributes to increasing returns on real estate investments. Since returns are rising alongside increased interest costs, there will naturally be no crowding-out effect on private investment.

Therefore, in summary, this study provides new evidence using Chinese data and statistical analysis, showing that government intervention does have a tangible impact on the economy, and the null hypothesis of Adam Smith's classical economic theory is rejected. On the other hand, the study also indicates that if government intervention is to be adopted, fiscal policy should be the specific choice. This is because, in this study, monetary policy and exchange rate policy did not show overall effectiveness, but fiscal policy did reject the null hypothesis. Hence, countries can use fiscal policy to stimulate the economy according to China's practice.

CONCLUSIONS AND RECOMMENDATIONS

This section allows you to describe your research findings academically. You may not enter figures related to your statistical tests here; instead, you should explain those numbers here. You should structure your discussion with academic support for your studies and a good explanation according to the specific area you are investigating.

Definition of Terms

GDP：Gross domestic product (GDP) is the standard measure of the value added created through the production of goods and services in a country during a certain period. As such, it also measures the income earned from that production, or the total amount spent on final goods and services (less imports).

VECM：Vector Error Correction Model is a cointegrated VAR model. This idea of Vector Error Correction Model (VECM), which consists of a VAR model

of the order p - 1 on the differences of the variables, and an error-correction term derived from the known (estimated) cointegrating relationship.

VAR : Vector autoregression (VAR) is a statistical model used to capture the relationship between multiple quantities as they change over time. VAR is a type of stochastic process model. VAR models generalize the single-variable (univariate) autoregressive model by allowing for multivariate time series. VAR models are often used in economics and the natural sciences.

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