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The Macroeconomic Policies of China and the United States in Dealing with Economic Shock Based on the IS-LM Model

——Taking the Financial Crisis in 2008 and the COVID-19 in 2020 as Examples

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Abstract: The financial crisis in 2008 and the COVID-19 in 2020 have had a serious impact on the world economy. Macroeconomic policies are an effective regulatory approach for each country's government to respond to economic shocks. China and the United States, as the two major representatives of socialist and capitalist countries in the world, have distinct representativeness in their macroeconomic policies. The IS-LM model, is an important method for analyzing short-term economics, it can significantly demonstrate the effectiveness of a country's macroeconomic policies, and is an important component of Keynesian theory. By studying the changes in IS curve and LM curve caused by the macroeconomic policies of China and the United States during the financial crisis and the COVID-19 epidemic, it is concluded when dealing with potential economic shocks in the future, the government should implement strong macroeconomic policies, actively regulate supply and demand, and implement macroeconomic policies that are suitable for the country's social system and open economy.

Keywords: Macroeconomic policy, IS-LM model, COVID-19, financial crisis

1. Introduction

The financial crisis in 2008 and the COVID-19 in 2020 are both well-known events that have had a serious impact on the global economy. The 2008 global financial crisis was the most severe crisis since the Great Depression in 1929, directly triggering a sustained global economic recession, high unemployment rates, and a series of social problems, laying the groundwork for the future European debt crisis [1]. In 2020, countries have invested a lot of energy into epidemic prevention, but measures such as isolation, lockdown, and closure required for epidemic prevention have caused a large number of economic activities to suddenly shut down, including supply chain disruptions, restricted manufacturing and service industry activities, highly uncertain financial markets, intensified market panic, a sharp contraction of international trade, and a surge in unemployment. The world economy has fallen into an unprecedented "Great Blockade" and "Great Stop" [2].

Macroeconomic policies play a crucial role in responding to economic shocks, mainly by regulating total demand and supply to alleviate the impact of adverse economic environments.

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Macroeconomic policies mainly include monetary policy and fiscal policy, which have different effects through different means.

Monetary policy is mainly implemented by the central bank, which affects economic activities by adjusting interest rates, controlling the money supply and improving credit conditions. During economic downturns, central banks typically adopt expansionary fiscal policies such as buying bonds to increase the money supply or reduce the required reserve ratio and rediscount rate. Fiscal policy is implemented by the government by adjusting government spending and tax policies. When dealing with economic downturns, governments often adopt ways to increase government spending, such as directly investing in public projects such as infrastructure construction, which can create employment and increase future production potential, or adopting tax reduction policies to increase disposable income for businesses and households, stimulate consumption and investment.

Macroeconomic policies are important tools for dealing with economic shocks. Timely and appropriate policy interventions can effectively alleviate the impact of economic shocks, promote full employment, stabilize prices, promote economic growth, and maintain international balance of payments, promoting economic recovery and long-term stable development. This article studies the macroeconomic policies adopted by China and the United States in responding to crises, and explores how to face future economic shocks based on the movement of the IS-LM curve caused by macroeconomic policies.

2. Response of China and the United States

China and the United States are representatives of socialist and capitalist countries in the world, and they have clear representativeness in their macroeconomic policies to cope with economic shocks, targeting different political systems and public foundations.

The United States is a federal capitalist country, and policy decision-making typically involves a complex process involving legislation, administration, and the judiciary. In addition, due to the crucial role played by sovereign and independent state governments in many policy areas, federal decision-making and implementation often require collaboration among states. China is a socialist country, and the central government plays a decisive role in the formulation and implementation of macroeconomic policies. The Chinese government can make decisions more quickly and implement them nationwide. The United States is a market-oriented economy, and the government has relatively little direct control over the economy. The macroeconomic policy of the United States is usually implemented through active monetary policy (such as adjusting interest rates) and passive fiscal policy (such as stimulating government spending or tax policies). Tax and expenditure decisions require a political process. Although China's economy has implemented market-oriented reforms in the past few decades, the government still plays an important guiding and planning role in the economy. The government can regulate the economy through direct intervention and large-scale fiscal investment, such as controlling state-owned enterprises, managing loans from the National Development Bank, and directly participating in major infrastructure projects.

In the face of the huge impact of the financial crisis in 2008, both countries experienced a serious economic downturn. Therefore, both countries have adopted a "double loosening" policy combination to stabilize their economies and prevent further economic decline. Our country's policy focuses on supporting the real economy, especially the manufacturing industry. The US bailout policy focuses on helping the service industry, especially the financial sector. China adheres to fiscal policy as its mainstay, and large-scale fiscal stimulus has had an immediate effect on economic recovery. During crises, the United States mainly adopted monetary policy and introduced many innovative and unconventional monetary policy tools. As the crisis deepened, the United States gradually implemented fiscal policy. In 2020, facing the sudden impact of the epidemic, both China and the United States adopted a targeted combination of loose fiscal and monetary policies to prevent

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and control the epidemic and stimulate economic development based on their own epidemic development situation and economic and financial environment. However, China's fiscal and monetary policies are showing a trend of "expansion contraction expansion", and the United States is showing a trend of "expansion contraction". The policy priorities of China and the United States are different. The focus of China's policy implementation is on supporting the development and growth of market entities, while the focus of US policy implementation is on directly subsidizing residents and stimulating consumption [3].

3. Research on IS-LM Model and Policy Effectiveness

From a short-term perspective, both the economic crisis and the COVID-19 epidemic have had a strong impact on the world market. The IS-LM model, which analyzes the short-term economy, is an important part of Keynesian theory. The model assumes that the prices of all goods in the market remain constant in the short term, and studies the impact of a change in a certain factor on national income at a given price level [4].

3.1. Building an IS-LM model

The IS curve represents the equilibrium of the product market, while the LM curve represents the equilibrium of the money market. This study sets Y as total income or output, C as consumption, I as investment, G as government purchase, T as tax, NX as import and export, L as money demand, M as money supply, P as price level, k as income coefficient of money demand, h as interest rate coefficient of money demand, and r as interest rate.

When the product market is in equilibrium under an open macroeconomy, IS can be expressed as

$$Y = (C - T) + I + G + NX \tag{1}$$

The nominal demand for money can be expressed as

$$L = (kY - hr)\,P \tag{2}$$

At equilibrium in the money market

$$L = M \tag{3}$$

So when the money market is in equilibrium, LM can be expressed as

$$M/P = kY - hr \tag{4}$$

3.2. Analyzing the Impact of Fiscal Policy and Monetary Policy Based on the IS-LM Model

3.2.1. China

From the perspective of the IS-LM model, when responding to the financial crisis in 2008 and the COVID-19 in 2020, China adopted expansionary fiscal and monetary policies to stimulate aggregate demand and thus stimulate economic growth. Specific data can be found in Table 1. During the 2008 financial crisis, the IS curve of the IS-LM model showed a significant right shift, as increased government spending increased total expenditure at all interest rates (i.e. the IS curve shifted to the right). The result is an increase in output (Y) and an increase in interest rates (r). In addition, the Chinese government has provided a large amount of liquidity through monetary policy and lowered borrowing and lending rates, which causes the LM curve to shift to the right (i.e., relative to each

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output level, interest rates decrease, or relative to each interest rate level, liquidity supply increases), thereby preventing upward pressure on interest rates due to fiscal expansion and ensuring a significant increase in final output. In response to the economic impact of the COVID-19 in 2020, the Chinese government also implemented proactive fiscal and monetary policies. Fiscal policies such as increasing public health spending, reducing taxes and fees, and providing relief funds for businesses can all help increase total demand and shift the IS curve to the right. At the same time, the People's Bank of China has pushed the LM curve to the right by lowering interest rates, reducing reserve requirements, and providing liquidity support (Figure 1). Just like dealing with the 2008 financial crisis, the combined effect of these two policies kept interest rates low while driving economic output growth.

Table 1: Short term interest rates and gross domestic product in China from 2008 to 2009, 2020 to 2021

Time	**2008Q1**	**2008Q2**	**2008Q3**	**2008Q4**	**2009Q1**	**2009Q2**	**2009Q3**	**2009Q4**
Interest rate	4.3	4.4	4.2	3.2	1.6	1.2	1.7	1.9
GDP	59640.3	65699.9	66919.4	72213.3	63431.9	71090.4	74022.5	80785.1
Time	**2020Q1**	**2020Q2**	**2020Q3**	**2020Q4**	**2021Q1**	**2021Q2**	**2021Q3**	**2021Q4**
Interest rate	3.07	2.33	2.91	3.36	3.11	2.86	2.82	2.91
GDP	183177.8	224846.8	238702.1	263508.9	245513.7	268481	278521	306681.3

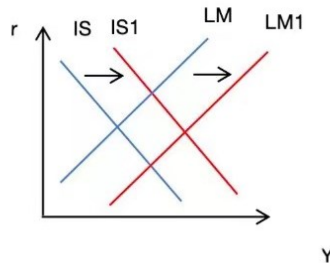

Figure 1: Changes in China's IS-LM curve

3.2.2. United States

During the 2008 financial crisis in the United States, with loan losses and an increase in non-performing assets, bank credit tightened, leading to a decrease in investment spending, i.e. the IS curve shifted to the left. This will result in a decrease in output (Y) and a decrease in interest rates (r) (Figure 2). In order to offset this impact, the US government and the Federal Reserve system have adopted active fiscal and monetary policies, including large-scale fiscal stimulus and loose policies that almost reduce interest rates to zero, specific data can be found in Table 2. This has caused both the IS curve and LM curve to shift to the right, thereby minimizing the impact of financial crises on real economic output as much as possible (Figure 3). The COVID-19 led to a large number of business stoppages, a sharp drop in consumer spending, and a serious impact on investment spending, which moved the IS curve to the left, leading to a decline in output and interest rates. In response to this huge negative impact, the US government has implemented large-scale fiscal stimulus measures, such as the CARES bill, which has shifted the IS curve to the right. At the same time, the Federal Reserve system has also adopted aggressive monetary policy, lowering the federal funds rate to near zero and implementing large-scale quantitative easing policies, which has caused the LM curve to shift to the right (Figure 3). The sum of these policies helps stabilize the economy and prevent more severe recessions. During these two crises, the US

fiscal and monetary policies counteracted the leftward shift of the IS curve caused by initial shocks by changing the positions of the IS curve and LM curve, minimizing the impact of these two crises on US real economic output and interest rates.

Table 2: Short term interest rates and gross domestic product in the US from 2008 to 2009, 2020 to 2021

Time	**2008Q1**	**2008Q2**	**2008Q3**	**2008Q4**	**2009Q1**	**2009Q2**	**2009Q3**	**2009Q4**
GDP	14706.538	14865.701	14898.999	14608.209	14430.902	14381.236	14448.882	14651.249
Interest rate	3.2	2.8	3.1	3.2	1.6	1.2	1.7	1.9
Time	**2020Q1**	**2020Q2**	**2020Q3**	**2020Q4**	**2021Q1**	**2021Q2**	**2021Q3**	**2021Q4**
GDP	21706.513	19913.143	21647.640	22024.502	22600.185	23292.362	23828.973	24654.603
Interest rate	1.53	0.18	0.15	0.15	0.12	0.1	0.1	0.14

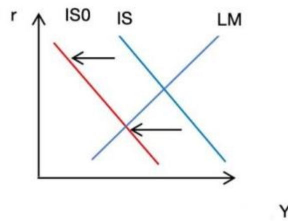

Figure 2: IS curve of the United States under impact

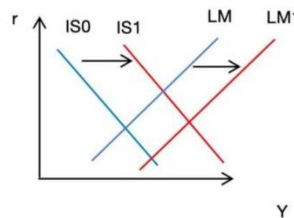

Figure 3: IS and LM curves after adopting monetary and fiscal policies

4. Relevant suggestions for dealing with economic shocks

4.1. Implementing policies with greater intensity

When responding to an economic shock, determining policy intensity is a very important task. In order to avoid panic and its resulting significant decline in the real economy, which may have an impact on people's livelihoods, timely and vigorous policy responses are still necessary, even if accurate targeting cannot be achieved yet [5].

When the economy declines, the expectations of consumers, investors, and businesses may become pessimistic, which may lead to further declines in consumption, investment, and employment, forming a negative cycle. Relatively strong policies can more effectively stabilize the expectations of all parties and break the negative cycle. In addition, total demand may sharply decline. Large scale fiscal stimulus can directly increase public spending, or increase total demand by stimulating individual consumption and corporate investment, thereby driving economic growth. Secondly, economic crises are often accompanied by turbulence in financial markets. Large scale monetary policy interventions, such as providing liquidity support, lowering interest rates, and even purchasing assets, can help stabilize financial markets and reduce risks in the financial system. Finally, without

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policy intervention, the unemployment rate may rapidly rise. Intensive policies can prevent excessive increases in unemployment rates by stimulating demand or providing direct employment support.

4.2. Increasing total supply and total demand

Total demand and total supply are the two main factors that determine the level of national economic and social development. Increasing total demand and total supply is the main method to promote economic development.

Faced with the dual decline in economic growth rate and price index caused by insufficient total demand, increasing efforts to stimulate total demand is an inevitable choice to solve the current problem [6]. The government should actively adopt expansionary fiscal policies, such as increasing public spending or reducing taxes. This can directly increase total demand, or stimulate consumption and investment by increasing people's disposable income. The central bank can also lower interest rates or increase the money supply, thereby reducing financing costs and stimulating corporate investment and personal consumption.

The total supply should also keep up with the growth of total demand. Governments and private enterprises can invest in production facilities, infrastructure, and technological innovation, or improve labor skills and knowledge through education, training, and other means to increase productivity, thereby increasing total supply. Economic systems can also be reformed, such as by reducing trade barriers, relaxing market access, reforming tax systems, etc., which can improve economic efficiency.

4.3. Social system, open macro and policy implementation

For capitalist countries, the market plays a leading role in economic activities, and the government's role is more to address economic shocks by fine-tuning and regulating the economic cycle. For socialist countries, the government plays a more important role in the economy, and economic policies need to consider broader socio-economic goals, including income redistribution and social stability.

In the context of an open economy, a country's macroeconomic policies can have spillover effects on other countries. For example, the monetary policy trends of Western countries represented by the Federal Reserve not only affect the flow of global capital both domestically and internationally and China's foreign trade, but also affect China's macroeconomic policy regulation [7]. Therefore, it is also very important to grasp the macroeconomic policies that are suitable for one's own country in the context of an open economy.

Firstly, a country should have diversified trading partners. By establishing trade relations with different countries, it can reduce dependence on any single economy and mitigate the impact of external economic fluctuations. Secondly, sufficient foreign exchange reserves should also be established to withstand the impact of international capital flows in the short term and maintain currency stability. Finally, optimize the economic structure, reduce dependence on industries that are susceptible to international environmental influences, and develop industries with more advantages and resilience. In fact, no country can completely avoid the economic impact of other countries, but effective economic management and policies can alleviate these impacts and make the domestic economy more resilient.

5. Conclusion

Both China and the United States successfully responded to economic shocks in 2008 and 2020, and macroeconomic policies played an important role in this. In the face of potential economic shocks in the future, the government should implement strong macroeconomic policies, actively regulate

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supply and demand, and implement macroeconomic policies that are suitable for the country's social system and open economy.

This article may have limitations as the analysis based on the IS-LM model may have certain limitations. Firstly, the price assumption in the IS-LM model is fixed, which excludes the impact of price changes such as inflation or deflation. However, in reality, price fluctuations are a common phenomenon that can affect economic activity and policy effectiveness. Secondly, the IS-LM model ignores expected factors and does not take into account the impact of people's expectations on economic behavior and policy effects. But in reality, expectations have a significant impact on investment, consumption, financial markets, and even the entire economy. Then, the IS-LM model is built on the basis of a perfectly competitive market model, ignoring the influence of market structure, such as monopolies, oligopolies, and other phenomena. Finally, the default premise of the IS-LM model is a closed economy, which does not take into account international trade, capital flows, and other factors. This assumption overlooks the impact of economic changes in other countries on the domestic economy in the context of globalization. In the future, other more comprehensive models can be used to analyze the positive effects of macroeconomic policies and provide more comprehensive recommendations for addressing economic shocks.

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