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The impact of international financial crisis and the effect of China's macro policy response - based on an open economy DSGE - VAR Model

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Abstract: leverages an open economy DSGE - VAR The model simulates and calculates the effects of the international financial crisis on China's economy and its transmission channels " , and U.S. quantitative easing monetary policy spillover effects on China's economy ; and discuss China's monetary and fiscal policies in this framework anti- effect , identifies the long-term factors that cause China's economic fluctuations . The results of the study show that , first , Exchange channels and trade channels are the main channels for international finance The The crisis has an impact on China , US quantitative easing policy has a significant negative effect on China's economy . second , China government the Monetary and fiscal policy actions taken by the Government in response to the international financial crisis are timely and effective , Although the side effects are great ; without these stimulus policy , China's real output in 2009 Year will drop 5 percent , Exports will also drop significantly . third ,Consumer preference Impact , investment flush Click , Import price index impact , the main reason for China's macroeconomic fluctuation is the impact of interest rate shocks and foreign economic fluctuations .

Keywords: DSGE - VAR Model ; financial crisis ; monetary policy ; fiscal Policy ; economic cycle ; China Economy

1. Bow I Word

2007-2008 The international financial crisis that originated in the United States , not only cost Western advanced economies a great loss , euro zone deep sovereign debtcrisis , Emerging economies (including China) and other developing countries suffer too . . shortly after The outbreak of the crisis, to keep the Chinese economy continued growth , the Chinese government has launched a massive fiscal stimulus package and a very loose monetary policy. , reversing financial crisis China The trend of rapid economic decline . without These macroeconomic measures , What does the international financial crisis have to do with China's economic development effect ? How effective is China's unconventional macro-stimulus policy ? which economic factors have a greater impact on China's economic fluctuations should ? These are the questions the study tried to answer .

Study the spillover effects of the international financial crisis ① There are a lot of references to . 2008 in the aftermath of the international financial crisis, some scholars have paid special attention to the golden the The study of contagion effects of crisis on emerging economies such as China , such as Sun Tao and xiaojun Zhang (2009)②uses a The GARCH Model studies the contagion effects of the US subprime crisis through the stock market on mainland China and Hong Kong . Liu ligang (2009 © using structure vector autoregressive (SVAR) Model quantitatively measures the impact of the financial crisis on China's economy . Diao xinsheng etc (a) ④ through A dynamic computable one balanced (the dcge) Model The models simulate the effects of the financial crisis on China's economy and The effect of Chinese government incentives . Open Economy D S G E The model has been widely applied in the field of macroeconomic policy in recent years , is World Central banks (0 8,? positive 0^0 positive ^0 0 et)and International

Monetary Fund (1 dish ? organizations such as are used for policy emulation and economics

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① Some scholars refer to this kind of research as "" Financial contagion Research , such as Allen , Franklin ,Douglas Gale , Financial Contagion ,Tk Journal of polilical Economy , Vol. 108 , No. 1, To , pp. 1-33 , and so on .

② Sun , Tao ,xiaojing Zhang , ^spillovers of theU. S. Subprime Financial turmoil to mainland PRC and-Kong SAR b16>:

Evidence from-stock Markets , IMF Working Paper ,2009 wp/09/166.

③ Liu Ligang , Impact of the Global Financial Crisis on : empirical Evidence and Policy implications ,

World Economy ^ 2009, 1 (6), pp. 1-23.

④ Diao, Xinsheng ,yumei Zhang ,Kevin Z. Chen ,<s theGlobal recession and? s stimulus Package ",

Review , % , 1 (1) , pp. 1-17.

The primary tool for prediction . This article draws on and references the adolfson and so on (2007)① for Swedish central bank (Riksbank) Open economies for developmentDynamic stochastic general equilibrium one variable autoregressive (Open DSGE - VAR) model , and combine the characteristics of China's economic and macro-policy practices has entered the model . based on an improved model we simulate and measure the effect of the international financial crisis on China's economy , United States quantitative easing the spillover effects of monetary policy on China's economy , Simulate the effect of China's macro-policy response , based on this analysis of the resulting Chinese economic wave The long-term factor of the move . The improved model also references Christiano , and so on (2 ⑻ 5) ② for DSGE fake for financial markets and enterprises in the model set , absorbing ECB (ECB) Medium Large DSGE model (smets and Wouters , 2003 ③) Many of the stickiness and impact assumptions in are .

This article is the first use of large DSGE - VAR model simulates the spillover effect of the international financial crisis and the response effect of China's macro policiesThe frontier empirical research of the fruit is _ . The model combines the characteristics of China's macroeconomic operation , based on previous research results calibration parameters reflect The uniqueness of the Chinese economy . The main contribution of this article is that,, and A , Research results reveal the impact of the international financial crisis on China's economy Delivery Channels , quantitative and accurate measurement of the negative effects of the American recession on China's economy caused by the international financial crisis , and simulates the U.S. The spillover effect of QE on China's economy : If there is no policy intervention , Short term (Two-quarter) make China true Real output drops immediately , RMB exchange rate will appreciate 0. 1%-1%, resulting in a rapid drop in exports 0. 3%-1%. second , on open Jinan environment ,This study empirically simulates the effects of China's unconventional monetary easing and massive fiscal stimulus , measuring results to medium The effect evaluation of national macro-control policy and the response of similar crisis in the future have important theoretical reference value , and help strengthen to international financial crisis and understanding of China's macroeconomic operation . the third , This article identifies the long-term factors affecting China's economic fluctuations , This is better for to understand the causes of the Chinese economic cycle is of significance .

2. Open Economy DSGE - VAR Model

The Open economy model used in this article contains two countries , assumes that foreign economic variables are given the , The national economy variable is onlyAffected by Foreign economic variables , without affecting foreign economy ④ , So this is a small country open economy model . The domestic economy in the modelDepartment

includes : maximize lifetime Utility present value residential home , pursuing profit-maximizing import Enterprise , Export Enterprise and internal to internal Trade Enterprise , Executing mixed monetary policy rules (Use the price tool, the interest rate rule , also use the Quantity tool that is the money supply rule The central bank and the government department enforcing fiscal policy . The foreign economies in the model consider only their major macroeconomic variables . , as product out , rates ,price Level , does not involve specific economic sectors .

(1) national Economy

1. Enterprise : to simulate and measure the impact of the financial crisis on China's international trade and domestic production , we introduced the following in the model three categories of Enterprise : products for domestic enterprises (Hereinafter referred to as domestic enterprise), Import Enterprises engaged in the import of goods(below Jane called Import Enterprise) and export enterprises engaged in export trade (hereinafter referred to as an export enterprise).

(1) Domestic Business: Domestic enterprises are divided into two categories , Enterprise that uses capital and labor to produce intermediate goods ; Use intermediate goods and residents ' homes The labor provided by the court to produce the final consumer goods Enterprise .

The production function of the final consumer goods production enterprise is

1

$Y_I = U\ 0\ )Y_I,^di\ ^{i}^-,\ 1 <x_{d,t}< ^$ (1)

where brother ,, is the first I Intermediate products produced by intermediate Enterprise , as an input to the final consumer goods production Enterprise . 夂 ,, is decision domestic business Dynamic cost added to a stochastic process for pricing , following AR (1) procedure .

Intermediate Commodity production Enterprise I The production function for is

Yifalh ' z ^ Ijh - z / (2)

① Adolfson , Malin ,Stefan laseen ,Jesper Linde , and Mattias Villani , ,,Bayesian estimation of an open economy DSGE

model with incomplete pass-through ,/omrnaz 0 /eccmomfcs , 2007 , 1 (2) , pp. 481-511.

② Christiano ,Lawrence J . , matin Eichenbaum , Charles L. Evans , ^nominal rigidities and the Dynamic effects of a shock to

Monetary Policy[5], , ???? , No. 1 , pp. 1-45.

③ smets , Frank ,Raf Wouters , "An estimated stochastic Dynamic general equilibrium MODRL to the Euro area , Journal of

European Economic Association , 2003, 1 (5), pp. 1123-1175.

④ based on China's capital controls and Non-market financial systems , Although China is now the world's second largest economy , The Small country open model assumes that it is applicable to China .

where anti- ,, is the capital service provided by the Enterprise's stock capital (changes with the utilization of the capital stock), Hu hires on behalf of the Enterprise Total Labor (time) A represents a permanent technical impact ; Mountain is covariance steady-state technology impact 4 represents the fixed cost of the Enterprise . The fixed cost and consumption macro variables increase at the same rate in steady state .

Intermediate product manufacturers minimize their production costs :

min (3)

up W , is the nominal wage rate , RK is the total nominal rental price for the unit capital Rf represents the overall nominal financing rate for the enterprise . Intermediate product Enterprise Minimize cost , Constraint to production function (3):

The above nominal trend variable is an unstable variable with a unit root , We use the following method to convert these variables to true steady state variable :

the real marginal cost of the intermediate product Enterprise , with me , represents the Reference Adolfson , and so on

(2007),,smets and Wouters(2003) and other methods of the new Keynes model , assumes intermediate commodities The pricing principle of the industry follows Calv $_0$ (1983)① rules : The probability of the enterprise that can optimize its product price per period is (1- Kiss), does not Pricing rules for enterprises whose prices are optimized P+1- (heart)~ (3+1)$^{l-}$ ~ P , , where %- / ^ is the total inflation rate , 3 is
inflation target , k is the index of a domestic price . According to the enterprise maximization profit principle, you can export a logarithmic linearization of the total Philippines Lips curves ②:

T -[I1 (7mt)) id[ ]R ,1<Am,$^{!}$ <^ ()

Am , , , Mr Add index to the dynamic price of imported consumer goods and imported investment products , Follows the Autoregressive stochastic process .

Import Enterprises are the same as domestic enterprises according to Calvo (1983) Rule Pricing , The result of maximizing its profit also exports imported consumer goods and logarithmic linearization of imported investments Phillips curve .

(3) Export Enterprise : Export Enterprises Purchase domestic final products for brand differentiation , and then sell different products to foreign cities field foreign resident family . assumes export price PL is denominated in foreign currency , similar to , the price of a different export is randomly added to index variable l,t The also follows the Autoregressive stochastic process .

We assume that export prices are also sticky , Its pricing principles also follow the Calvo (1983) Rule . pursue profit-maximizing exit Enterprise means export price change(Export inflation rate) determined by the export Phillips curve :

2. resident Home : assumes that the number of domestic households is continuous , After the number of households is indexed J Family belongs to the interval (0, 1) de (0 , 1) . This family's current effect u^t from its current consumption , Labor time and cash holdings decisions :

① Calvo , G ,"staggered prices in a utility maximizing framework" , 0 /mem Wish ary , 1983 , 1 (3) , pp. 383-398.

② specifically inferred technical procedures see adofson etc (2007) and Smets and Wouters (2003) and christiano etc ( )??). variable n add symbol 3 the represents the logarithmic linearization of the variable .

③ also understands that the number of different imported consumer goods has been indexed in the (0 , 1) interval after use CES function add Total .

i+^ $_L$ ^ p ^ ^{9}

U $_{)\,U}$ ^ e$^{c}_{L}$ln (c$_{)\,U}$ - BC $_{)U}$-i)-e$^{h}_{l}$A$_l$+ A$_g$ -(9)

the Cp for residential home J in R consumption for the period ^ represents the habitual consumption factor ; Labor for residents ' families (

between), produces negative effects ; Q , for residents home z Non-interest assets held by the period (mainly cash), % = 9, for steady-state processing of

Real Cash holds Al and Q $_9$ The utility coefficient of labor and cash balances is a labor supply elasticity , is flexible for currency demand ; e Consumer preference Impact eimpact on labor supply , both follow ar (i) Autoregressive Procedure .

The cumulative process of capital is expressed as

i$_{+i}$ (i- Magic Tile + ea-sa/j,-i)) J, +a , Do)

up S (J$_T$/j,-i) for investment adjustment cost , its definition and stipulation reference Christiano , and so on (????). E. | for specific investmentsImpact (Its steady value is i) the follows the first-order autoregressive process .

assumes that the household is homogeneous , resident Home J to maximize the present value of its lifetime utility stream :

Max . E 0 , 2 P^{l}U$_{J,l}$ di)

the Budget constraint for a resident family is : °

M $_{J\,,\ i+}$ I +. S$_l$B * $_{i+}$ I + PC$_{J\ ,1}$(i+T$^{C}_{I}$)+PU$_{J,\ 1}$+P$_1$(a(u$_{J\ ,I}$) K$_{J,I}$+P$_K$, [], ""„ " " $_I$A$_I$)

two brother -I (mr-q?$_{?}$, R) +q $_{?}$, R + (i-) ^^ 7h,r + (i-T) Remember U,Kp + Brother -I in (,/ -i) SB Jr (2)

10 T ^{z}i -1

- T-^{T}$_{l}$L (r-ii') (M $_{1}$, $_{l}$ - Q $_{1}$, $_{l}$) + (R R -I ^ ($^{l)}$^ -I ,'^ -I)-I ') SB * , + B * $_{l}$ (S$_{l}$-s-i) + TR$_{l}$

^L-i

up , The equation to the left represents the residential home J use of resources (spends), the right represents the source of the resource (revenue) M , is residentfamilies J All domestic financial assets owned by (includes cash Q , bank deposits and domestic and foreign bonds) value of ; R , = I + R , is a financial asset Total returns a ((U) for capital Use cost function , Meeting $_{a}$(1) =0, U=1 (Capital Full use) and $_{a}$' = (1-T) r ^{t} ,$_{a}$ 〃 > 0. u for capital usage u = Kl / K ; P $_{k}$, A The appears to enable the calculation of capital prices in the model to be used in price indices . t ,t ,t,t represents the average consumption rate, respectively , Average personal income tax rate , Average Capital profit (Value Added) tax rate and average retirement and society Guaranteed Rate . R,* " is a risk-adjusted pre-tax total return on foreign bonds " .

Net foreign financial assets owned by domestic households (mainly for bonds) is defined as :

d^bp 10 (3)

Bf foreign bonds owned by a resident family (Nominal value). reference adolfson etc (2007) method , define foreign finance net)= Asset Premium function less i= er ¡î one /prophecymusic a 10 /) strictly decrements and satisfies less (0,0) = i;/ to dynamic risk-overflow

Wide I

Price Impact . TR, for a one-time transfer payment for government period .

Log-linearized non-parabolic rate parity (UIP) condition is :

- R , - R^{f} = EJ\ S , 10 I -/ jcil Ten , (i4)

here $_{d}$ is a dynamic risk premium : The steady value of .

3. labor Market : Assumes that the labour market is in a balanced state , Labor supply equals labor demand . domestic households to domestic enterprises

Industry provides differentiated labor supply . reference adolfson etc (2007),erceg etc (+) ① and Christian . etc (2⑻5) method , If each family's labor supply (Requirements)is H , The total labor supply follows the CES The method evaluates to the following :

H L = [li (H , L)J , KA $_{ro}$ < ⑺ (5)

up ; U adds an index to the payroll .

① erceg ,Christopher J. ,Dale Anderson ,Andrew Levin ,^optimal monetary Policy with staggered wage and price contracts ,,,Journal of monetary economics , ,, 1 (1) , thepp. 281-313.

Although the resident family is the monopoly provider of their own labor , but does not always optimize your own salary level . The decision principle of assumes that the salary level the also follows the Calv $_{0}$ (1983) rules , is every a The probability that a resident's family can optimize their wage level is (1 a ^), A resident whose salary level is not optimized to sign a labor contract with the employer based on the inflation level . Optimal payroll issues enough to export the following Euler equation about the wage rate :Pi

When an enterprise is confronted with a labor supply shock or other economic impact , The enterprise adjusts its number of employees , but due to state-related laborrestrictions on legal and labor contracts , Corporate adjustment to employment level is also sticky ; also assume that the stickiness complies with Calvo (1983) rule , the probability of an enterprise that can be adjusted per period is , The Enterprise's optimal behavior can derive the total of logarithmic linearization as follows

Employment Equation (E represents overall employment level , Tile = DE$_{t}$ / E):

E = e , E +1 + $^{(1}$ First , [)] [] (+)] called) ^ a LU called) (Yuan one E) ()

C 0 e

4. relative Price : We follow the Adolf son etc (2 0 0 7) practices , Several relative price variables are introduced into the model to simplify Processing of multiple priceson each market. includes two domestic relative prices including relative price of consumer goods and relative price of investment grid y . Consumers face imports that also contain two relative prices : relative price of imported consumer goods and relative price of imported investment goods y r^ yr' Relative price of domestic export products relative to foreign goods yf, * .

5. Monetary Authority (Central bank , People's Bank of China) and monetary policy : The operation practice of the Chinese monetary policy in Burgundy , We assume the Chinese Bank of banks implementing a mixed monetary policy rule , That is, the People's Bank camera decides to use the interest rate rule , or the money supply quantity rule .

When the People's Bank uses the interest rate rule , We use the following Taylor (T a y 1 $_0$ r) rule to simulate Chinese monetary policy response function :

$R_t = P_rR_T$-l + (1 First) puhnt+rn (^$_1$ one 1 one ^$_1$+ R) + 3,5^$_1$l +r_Ix_t-l) +r^$_\times$ (ni -^ $^{:}_l$-l) +r^$_x$

where the variable F represents the real exchange rate , inflation rate with CPI represents the .

When the People's Bank uses the amount of currency growth to enforce monetary policy , assumes that the currency growth variable is ^:

- m , +1 - R +1 z_tp_t - R +1 p^ ,n

^ Mt m_tz_t: 1P $_t$-1 ^{r}

The People's bank adjusts the rate of growth of the currency based on changes in inflation and output ; So we use the so-called maccullum Ruleto simulate the reaction function of central bank monetary policy at this time :

Pp -^ ^-1 I) ^, yy 1-1 ~+ Pix . XF 1-1 I ^^-t $^{()}$

6. is independent of DSGE Fiscal authorities outside the model (Government Treasury) and fiscal policy : assumes that the government is budgeting for a balanced budget policy , Their budget constraint is :

P_tG_t + TR_t = (+), * [* *] R , (m±1-m_I)+ RP^c $_1$ Ct + ^{Tl} ±±t nine + $_{(a)}$

T [(R-1-1)] M ,- Q ,) + R_W + (R*-1 Wipes ' -1 / -1)-1)]

The Government implements fiscal policy by adjusting tax rates and government spending , The main toolbox of fiscal policy is (Gt ^ C ^ y , , |). divide do not for government expenditures , Personal income tax , Excise tax , Social Security rates and sales tax . We use a vector from the regression (V A R) model to simulate the implementation process of fiscal policy .

7. Domestic Market equilibrium

(1) total resource constraints (Commodity Market balance) : The requirements and production of the domestic economy must meet the following constraints

c.^d_t + I^d_t + G_t + C^I_t + I^x_t +^ u_l)K*^$a_l$$K^A_l$($z_l$H t1 ^^- Z /

(2) Domestic Credit market : The equilibrium condition of the credit market is that credit demand equals credit supply :

vw*h *= F*mi - Qi

(3) International bond market : The dynamic process of a net foreign bond owned by a resident family is :

d_L = (MC^ ')-^{1} CRR *)- ^{n}fy : z :-(rD^^{1}(c :$^>$+tt ') +rr-i^(d_L-$_1$ (a)

NIFJ - zu ^ l-i

So we get a include of the native variable DSGE Model ; to understand the DSGE Model , We first need to convert all the nonlinear first-order conditions in the second section to linear equations , Then the numerical method is used to find the approximate solution . We take the "" number Linearization method for linearization ①. DSGEmodel Many solutions , We use Blanchard and Kahn (1980) ② developed by solution for numerical approximate solution .

(two) foreign economies

We assume that a foreign economy is given a , So do not examine its economic structure and micro-enterprise , Consider only its macroeconomic changes amount ,focus on output of foreign economies , price Level , inflation and interest rates (represents a variable for foreign currency policy operations) Change impact on China's economy . This article uses the following variables for autoregressive (VAR) model to simulate time series changes for foreign macroeconomic variables process :

F_0^* = F (L)// y $_{1}$ -$_{1}$ + $_{LL}$ ~N (0,sy *)

where =(y,NF, Rf "") vector for foreign macroeconomic variables , KL) for latency operator L Matrix ; F . is given by the next :

1,0,0 Flame

F 0 = 0,1,0

- y :,. , one yy ,. , 1_

the can see that the matrix of coefficients makes the VAR The regression process for foreign interest rates in the model is a Taylor (T a y 1 $_{0}$ r) rule procedure , conforms to the practice of monetary policy in major Western countries .

three ,3. Data and parameter calibration

in this paper DSGE all parameters in the model use the calibration method (Calibration) to assign a value , Assignment Standard reference Sun

and Sen(a) ③, Zhang(2009)④,adolfson etc (2007) , smets and Wouters (2003) and so on domestic and foreign research The value of the parameter in the .

① Logarithmic linearization method see uhlig ,H ,A toolkitfor Analyzing nonlinear dynamicstochastic modelseasily " , inR.

Marimon and A. Scott (eds.) ,computational Methods for the Study ofdynamiceconomies , Oxford : Oxford University

Press, 1999, pp. 30-61.

② Blanchard, Olivier J., Charles M. Kahn, "The Solution of Linear difference Models under Rational expectation" ,

econometrica^ 1980,No. 5, pp. 1305-1311.

③ Sun, Lixin, Somnath Sen, ^monetary Policy Rules and the Business Cycle in, a Bayesian DSGE Model simulation ,

SSRN Working Paper, unpublished.

④ Zhang , Wenlan , "s monetary policy:quantity versus price Rules ,Journalof Macroeconomics , 2009 , 1 (3),

pp. 473-484.

two VAR Parameter estimates in the model : foreign economies VAR Model , data from the United States 1990 QL -2012 QL Quarterly time Series data (Quarterly Adjusted), mainly includes the federal funds rate , inflation rate and real output (with H - P Filter eliminates trend potential ( ); and China fiscal policy VAR data used by the model , from the government expenditure in the network database (uses the HP Filter Remove trend) and various taxes 1994 QL -2012 Q 2 the quarterly data series for . VAR model mathematical stability test etc references Sun Lixin etc (① method , All inspections conform to the relevant diagnostic criteria .

four ,4. Research Results

using the improved open economy above DSGE - VAR Model , We simulate and measure the impact of the international financial crisis (causes foreign economies falling into recession) effect on Chinese economy , spillover effects of quantitative easing in the U.S. ; unconventional monetary and fiscal policy in China stimulus effect on China's economy ; on this basis the , uses the variance decomposition technique to analyze the main factors that cause China's economic fluctuations .

The effect of international financial crisis on China's economy

US 2007-2008 The subprime crisis of the year led to the worst economic crisis in western economies since the

Great Depression . it times economic recession caused by financial crisis , has far-reaching implications for emerging economies, including China, as well as countries around the world ; to

① Sun, Lixin, J. Ford, David G. Dickinson, ᵘBank loans and effects of monetary polic Yin-: var/vecm

eight Pproach ,eccmomfc , , 1 (1) , pp. 65-97.

maintain stable and sustained economic growth , The Chinese government has launched a huge fiscal stimulus and extremely loose monetary policy . here , i they measure and simulate assumptions without these policy measures , What changes the Chinese economy will produce under the impact of the international financial crisis .

The International financial crisis has led to a recession in the US economy . First we simulate the impact of the financial crisis on America's real output . - The impact of a percentage point on China's macro-economy , See the following figure 1:

from Diagram 1 to see , If the financial crisis occurs , The Chinese government has not taken the appropriate stimulus measures , China's true GDP (yjao will drop down quickly , and in the 3 drop about quarterly 1 2% around . China's consumption and investment will decline , and export more newsletter speed down to 10% around ; Imports increase in the short term , will also decrease in the medium term ; China's renminbi exchange rate short term (5 Quarter) Appreciation , period depreciation (due to drop in output). The various inflation levels in China have declined . 2008 year -2009 Year of the United States actual GDP down about 4%, This means , If the Chinese government didn't take the stimulus . , China's true GDP should drop probably 5 percentile .

After the financial crisis the United States adopted quantitative easing monetary policy to stimulate the economy (is called Q E), What does this have to do with the Chinese economy ?- like spillover effects ? We've modeled the U.S. increase 1 percent of the effect of money supply on China's economy , See figure 2.

diagram 2 and Diagram 3 indicates that , loose monetary policy of the United States in response to the financial crisis , Short-term (two quarter) will make China's trueoutput drop immediately , export also drop quickly 0. 3%-1% (the federal funds rate cut led to a decline in China's exports for a longer period of time , under drop greater than and China's imports will rise (approximately 0. 1%- 0 . 5%); RMB exchange rate will appreciate (0. But China's

Consumer and investment not only didn't drop , goes up instead . , This may be due to an increase in imports of consumer goods and investment products . on this bar next ,The level of inflation in China has increased .

The simulation and test results above indicate that , The impact of the international financial crisis is mainly through foreign trade channels (China exports significantlyDrop) and exchange rate channel (causes import and export commodity price level changes) to affect China's economy , These spillover effects are negative for China's economy surface affect , increase China's economic instability .

(two) effect of China's monetary policy

We simulate the effect of the People's Bank of China on easing monetary policy . If the people's Bank faces financial crisis or domestic economy austerity , lower interest rates , Increase money supply , Its effect is as shown in **Figure 3** ,.

from Diagram 3 to see , When the people's bank drops the interest rate 5 Cardinal Point , Other conditions unchanged , China's true output level rises approximately 1percentage points , consumption increases by about 1 percentile , Investment increased 1-1. 8 percent , Devaluation of the renminbi , Import and export increase in China ,Export increased amplitude (about 2. 5%) greater than import increase (about 0. 5%); But at the same time China's price level will rise by about 0. 4%.

People's bank increases broad money supply 5% effect : China's real output increases by about 0. 01%, consumption and investment 0 010. 02% RMB Real exchange rate depreciation 0. 04%, Export increase 0. 04%, Import Increase 0. 008%, Employment Increase 0. 01%, Price Water flat up approximately 0. 8%.

The analysis above shows that , China's central bank can play a stable economy in the short term by adopting a loose monetary policy , Increase the utility of employment . But employment increases at the same time , Policy makers have to face another negative effect : Rising inflation .

(three) effect of China's fiscal policy

We modeled the Chinese government's aggressive fiscal policy (Increase government spending) and tightening fiscal policy (Tax Increase) two emotions effect : The process of financial policy shocks is through DSGE Model A VAR(vector self-regression the model implementation .

effect of government spending increases see figure 4. from Diagram 4 See , On the one hand , increased government spending 1 percentile , Output , consumption andInvestment increases quickly (respectively 0. 18%,0. 01% and 0. 018%; Devaluation of the renminbi , An increase in imports can be negligible , and Export add 0. 04% Increase in labor and employment ; inflation level is up (inflationary effects of fiscal policy); On the other hand , Change of government expenditure Dramatically increases the short-term volatility of China's economy , This is very significant in the diagram .

diagram 5 Tax increase for government (tightening fiscal policy) effect . Tax Increase simulation results show , Increase personal income tax will be clear reduce consumption and output levels , and reduce employment ; But adding VAT increases consumption , output and employment (Graphics Omit); consumption Increase in taxes short term increases consumption and output , But medium-term (5 after quarter) consumption , investment , output and employment will fall . and Social Security The effect of the change on macroeconomic variables is negligible (at the order of magnitude). tax rate adjustment for different taxes on the macro-economic influence is inconsistent , This is particularly worthy of policy makers ' attention .

① Review policy practices of the People's Bank of China , The Central bank has raised or lowered interest rates several times base Point .

(four) Factors affecting China's economic volatility

decomposition by variance technology , We measured the contribution of various shocks to China's economic fluctuations , The results are shown in table 2.

Table 2 indicates that , The long-term factor that causes China's economic output to fluctuate is : Consumer preferences Change (Contribution 39.43%, Investment Impact (contribution 74%, fluctuations in the import commodity price index 19%, interest rate fluctuation (9.37% and foreign economic real output fluctuations (8 86%);Impact of the money supply (monetary policy) and fiscal policy (changes in government spending and tax rates) Has a small impact on the economic cycle in the long term.

Long-term fluctuations in price levels (inflation) on , affects factors by importance : fluctuations in the import commodity price index ([7]%) Consumer preferences Impact (A. 1%) fluctuations in interest rates 0%) and foreign output fluctuations (1. 58% indicates the Chinese economy The long-term inflation level of the is significantly affected by the volatility of input prices .

for China's international trade , looking at in the long run , The biggest impact on exports is the volatility of foreign real output (98% followed by Lao Impact of supplies (+ , The can be interpreted as the impact of fluctuations in the supply of cheap labour on exports) and import changes (8. 54% and Fee Preference Change (7. 7 2, can be interpreted as a change in consumption substitution elasticity) . and the most influential factor for imports is investment shocks (A. 61%, can be interpreted as a greater reliance on foreign equipment imports by Chinese investment), Next is Labor supply impact (22. 81% and fluctuations in foreign output 43%). The long-term biggest factor influencing the fluctuation of RMB exchange rate is the real output fluctuation of foreign economy (\ 83%) Other factors including import price index fluctuation (A. 62%Labor Supply Impact (one. 68% Investment Impact (7. 45% and interest rate fluctuations (7. 13%, conforming to non-parabolic rate parity conditions UIP theory .

five ,5. Conclusions and recommendations

This article leverages an improved open economy DSGE - VAR The model measures the impact of the international financial crisis on China's economy should , and US quantitative easing monetary policy spillover effects in China ; simulates China's monetary policy and fiscal stimulus in an open economy Policy effect ; on this basis , uses the variance decomposition technique to identify the long-term factors that cause China's economic fluctuations .

The international financial crisis has led to a deep recession in advanced economies , This has and continues to have a negative and far-reaching impact on the Chinese economy . Our simulation findings , If the US economy causes its real output to fall because of the financial crisis 1% words , China's true GDP in 3 drop about quarterly 1 2%around . China's consumption and investment will also decline , and export up to about 10% so , if China

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