China’s domestic consumption under interest rate pegs-analysis based on simulation

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Abstract: Under the standard Taylor rule, the demand shocks (such as positive government spending shock or positive export shock) actually ‘crowd out’ private consumption by lowering household disposable income. However, under interest rate peg policy, this kind of demand shocks could actually ‘crowd in’ private consumption. What we mean by ‘crowd in’ effect of the positive demand shocks are that these shocks actually help improve the private consumption. This can be verified from the output/consumption multiplier and also the IRFs of consumption. So the policy implication here is that under the economic environment where prime interest rates have remained unchanged or relatively stable for few years, demand shocks could actually improve domestic consumption. The PBoC has enacted an interest rate peg policy for more than two years since 2012M7 for its prime policy rates, and nowadays, since China’s economy is experiencing downward pressures, we believe that Chinese government should use stimulative fiscal policies such as to increase the government spending or to offer more preferential policy for export, and in turn these policies will improve domestic consumption and hence GDP.

Keywords: consumption; crowd in; crowd out; Fiscal policy; interest rate peg; multiplier; simulation; Taylor rule.

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1 Introduction

China has a dual-track interest rate system for many years: the official regulated interest rates for deposit and loan and the market rates in money and bonds markets (He and Wang, 2012). Though the regulated policy rates has been liberalised a lot in recent years but some restrictions still remain. Nowadays, the regulated policy rates continue to serve as the benchmark in domestic financial market, especially in capital market. This can be well seen in the various issues of China Monetary Policy Report by the People’s Bank of China (PBoC, the central bank of China). The restrictions include the ceiling for deposit rates though the floor for the loan rates has been removed. However, the restrictions are not binding though the great efforts of liberalisation of regulated interest rates have been exerted in the last few years. The PBoC has continued to use this price instruments to fine tune the economy in the past decade. Figure 1 shows China’s one-year regulated official interest rate for bank deposit and lend from 1992Q1 to 2014Q2. The official rates peaked at the middle of 1990s due to the overheating from over-investment in private sectors and also local governments. And then, it sharply decreased due to the 1997’s Asia Financial Crisis. After that, the interest rates have been kept as relatively stable until the boom in Chinese stock market between 2006-2007 and decreased again due to the 2008’s financial crisis.

As we can see that there are some periods in which interest rates remain unchanged or stable as indicated by the shaded area. The most recent episode is the one starts from 2012Q3. This could be viewed as a typical ‘interest rate peg’ period for the PBoC’s monetary policy.

The ‘interest rate peg’ can be roughly defined as the periods in which nominal interest rates are fixed or relatively stable and without too much variations before or after the peg. The first period begins from 1999Q2 and ends at 2006Q2 prior to the boom of Chinese stock market in 2006–2007. The average deposit rate and loan
rate is about 2.14% and 5.59%, respectively, in the peg period. The second period is the post-crisis period start from 2012Q2 to 2014Q2 with average deposit and loan rate at 3.03% and 6.03% respectively. Chinese economy has grown so fast since the export demand is explosive from 2000. The average growth rate of total export from 2000–2006 is about 26.1% compared to 14% and 15.1% in 1994–1999 and 2007–2011, respectively.²

Figure 1 One year prime interest rates in China (see online version for colours)

Notes: The two shaded area represent 1999Q2–2006Q2 and 2012Q3–2014Q2 respectively.

Figure 2 Real consumption growth rate (YoY) (see online version for colours)

Notes: Real consumption level data are available by deflating the nominal consumption using fixed based CPI where 1992M1=100; The overall social retail sale from National Bureau of Statistics of PRC (http://www.stats.gov.cn) is used for the nominal consumption. The growth rate is year-over-year.
Many papers have studied how the government spending will affect output and consumption under zero low bound (ZLB), such as Christiano, Eichenbaum and Rebelo (2011). But little attention has given to the behaviour of economy under the interest rate pegs. What happens when nominal interest rate is fixed especially when the economy is hit by demand shocks? How will the output or consumption behave in these instances? It could be beneficial to look at the real consumption behaviour during the sample periods from the data at first.

It seems that there is no clear pattern in Figure 2. The real consumption growth is volatile in the sample period. However, the growth rate looks more volatile in non-peg periods than peg periods. This can be verified quantitatively as we can see from Table 1. Is this pattern can be verified theoretically? To answer this equation, we could use a simple DSGE model to illustrate and verify this pattern.

<table>
<thead>
<tr>
<th>Table 1 Volatility and mean of real consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth rate mean</td>
</tr>
<tr>
<td>Peg</td>
</tr>
<tr>
<td>Non-peg</td>
</tr>
</tbody>
</table>

Notes: We calculate the mean and volatility by grouping the two peg and non-peg periods together.

2 Intuitions

Before proceeding, it is better to gain some intuitions about demand shocks which drive the economy growth. The intuitions about demand shocks are simple. We could think there are some exogenously determined demand shocks that drive net export and government spending fluctuate. This fluctuation in government spending or net export will affect output and consumption. From the national accounting identity

\[ Y_t = C_t + G_t + X_t \]  

where \( C_t, G_t \) and \( X_t \) are consumption, government spending and net export, respectively. We ignore investment for simplicity. Taking derivative with respect to (abbr. as w.r.t, hereafter) net export at both side,

\[ \frac{dY_t}{dX_t} = \frac{dC_t}{dX_t} + 1 + \frac{dG_t}{dX_t} \]

We define \( \frac{dY_t}{dX_t} \) and \( \frac{dC_t}{dX_t} \) to be the output multiplier and consumption multiplier of net export, respectively. If government spending is determined exogenously, we can simply set \( \frac{dG_t}{dX_t} = 0 \). Then we have

\[ \frac{dC_t}{dX_t} = \frac{dY_t}{dX_t} - 1 < 0 \]
if $\frac{dY_t}{dX_t} < 1$ and $\frac{dC_t}{dX_t} > 0$ otherwise. If $\frac{dC_t}{dX_t} < 0$, this means that the increase in net export shock actually crowded out the private consumption. This is to say that the private consumption actually decreases after the net export shock. We call this effect as the ‘crowd out’ effect. If $\frac{dC_t}{dX_t} > 0$, we say the net export shock actually crowds in the private consumption.

In the next section, we will use a NK model to identify and calculate the output multiplier under the demand shocks. Then using Equation (2), we could calculate consumption multiplier (all the results are shown in Table 4). In this way, we establish a connection between demand shocks and consumption. And in turn, the model will give us some policy implications.

3 Model

We use a simple ‘open’ new Keynesian model with sticky price without capital to illustrate our idea. We call it an ‘open’ economy model by simply introducing net export in the total absorption as displayed in Equation (1). The model is quite standard. We begin this section by briefly describing the model.

3.1 A simple NK model

3.1.1 Household

We assume that the economy has a representative household who has the period utility function as in Gali (2008):

$$U(C_t, N_t) = C_t^{1-\sigma} - \frac{1}{1-\sigma} - \psi \frac{N_t^{1+\eta}}{1+\eta}, \quad \sigma, \eta > 0$$

(3)

The parameter $\sigma$ is the inverse elasticity of inter-temporal substitution of consumption. And $\eta$ is the inverse of elasticity of Frisch labour supply. $\psi$ is a only scaling parameter which only affects the steady states of endogenous variables rather than the dynamics of the model. The household maximise its lifetime utility using the discount factor $\beta$, with $0 < \beta < 1$:

$$\max_{C_t, N_t} E_0 \sum_{t=0}^{\infty} \beta^t U(C_t, N_t)$$

(4)

The household consumes, supplies labour to firms and earns wage, accumulates bonds, holds shares in firms and hence can get dividends from firms every periods. The nominal flow budget constraint of household reads as follows:

$$P_tC_t + B_{t+1} \leq W_t N_t + \Pi_t + (1+i_{t-1})B_t$$

Here $P_t$ is the nominal price of goods, $\Pi_t$ is the nominal dividend or profit from firms. $B_t$ is the stock of nominal bonds a household decides to have when entering into period $t$ and payout of this bonds which is known at period $t-1$ is the nominal interest
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rate \( i_{t-1} \) and will be paid in period \( t \). The first-order conditions of household utility maximisation problems w.r.t consumption, labour and bonds are standard:

\[
C_t^{-\sigma} = \beta E_t C_{t+1}^{-\sigma} (1 + i_t) P_t / P_{t+1}
\]

(5)

\[
\psi N_t^i = C_t^{-\sigma} W_t / P_t
\]

(6)

Equations (5) and (6) are Euler equation and labour supply equation, respectively.

3.1.2 Production

As in the standard sticky model setting, we have both intermediate and final goods producers in the economy. Let us begin with the final goods producer.

Assuming there is one representative final goods producer who takes the prices of final goods it produces and the input prices of intermediate goods as given, and uses the Dixit–Stiglitz aggregator to produce the final goods:

\[
Y_t = \left( \int_0^1 Y_t(i) \frac{\varepsilon^{1-1}}{\varepsilon^{1-1}} \, di \right)^{\frac{1}{\varepsilon}}, \varepsilon > 1
\]

The parameter \( \varepsilon \) is the elasticity of substitution between different intermediate goods \( Y_t(i) \). We set \( \varepsilon > 1 \) to allows that the intermediate goods are substitutes. The profit maximisation problem of final goods producer gives the downward-slope demand curve for intermediate goods \( i \),

\[
Y_t(i) = \left( \frac{P_t(i)}{P_t} \right)^{-\varepsilon} Y_t
\]

(7)

where \( P_t(i) \) and \( P_t \) are prices index for the intermediate goods, \( i \) and final goods, respectively. The zero profit conditions of final goods firm give the CPI index as follows:

\[
P_t = \left( \int_0^1 P_t(i)^{1-\varepsilon} \, di \right)^{\frac{1}{1-\varepsilon}}
\]

(8)

We assume intermediate goods producer use the following simple production technology:

\[
Y_t(i) = A_t N_t(i)
\]

(9)

where \( A_t \) is technology shock and \( N_t(i) \) is the labour demanded by intermediate goods producer \( i \). We assume that technology shock follows a standard AR(1) process:

\[
\log (A_t) = \rho_t \log (A_t) + \varepsilon_t^A
\]

(10)

The decision problem of intermediate goods firms can be divided into two stages. In the first stage, the firms minimises its employment cost while taking the nominal
wage $W_t$ and the demand curve (7) as given. And this gives the labour demand equation:

$$mc_t = \frac{w_t}{A_t}$$

(11)

where $mc_t$ is the marginal cost and $w_t = \frac{W_t}{P_t}$ is the real wage. In the second stage, we introduce the price stickiness. The imperfect substitute between different intermediate goods gives rise to some monopolistic power for firms to price its goods. As it is common in the literature that we assume that the firms subject to Calvo (1983) price setting mechanism, i.e., they are not free to adjust its intermediate goods prices. In each period, the firm has the probability $1 - \phi$ to optimally adjust its price and the probability $\phi$ to fix its price.

The real profit of the firm $i$ is

$$\frac{\Pi_t(i)}{P_t} = \frac{P_t(i)}{P_t} Y_t(i) - w_t N_t(i)$$

Considering the firm which is able to adjust its price at period $t$. The firm adjusts its price will expect that it could be stuck at that price in the future for some periods. The probability that the price optimally chosen in period $t$ still operative in period $s$ from now is that $\phi^s$. Hence the profit maximisation of intermediate goods firms is dynamic.

$$\max_{P_t(i)} \mathbb{E}_t \sum_{s=0}^{\infty} \phi^s \lambda_{t+s} \frac{\Pi_{t+s}(i)}{P_{t+s}}$$

where $\lambda_{t+s} = \beta^s \frac{U'(C_{t+s})}{U'(C_t)}$ is the stochastic discount factor (SDF) of the firm. We consider symmetric solution and the optimal price chosen is independent of the specific firm $i$. We use $P^*_t$ to replace $P_t(i)$ as the optimally chosen price and the FOC is

$$P^*_t = \frac{\varepsilon}{\varepsilon - 1} X_{1t}$$

(12)

where the two auxiliary variables are defined as:

$$X_{1t} = U'(C_t) mc_t P^*_t Y_t + \phi E_t X_{1t+1}$$

(13)

$$X_{2t} = U'(C_t) P^*_t^{-1} Y_t + \phi \beta E_t X_{2t+1}$$

(14)

### 3.1.3 Interest rate peg and demand shocks

We incorporate a simple ‘interest rate peg’ into our model to see what happens in our economy when faced with demand shocks. Let $t$ be the current period, and we fix the short nominal interest rate for $H$ periods:

$$i_{t+h} = i_{t-1}, \quad h = 0, 1, \ldots, H - 1$$

and after that the interest rate is assumed to follow the simple and implementable Taylor rule as in Schmitt-Grohe and Uribe (2007)

$$i_{t+s} = i^* + \phi \pi (\pi_{t+s} - \pi^*)$$

(15)
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when \( s \geq H \). \( i^*, \pi^* \) are the steady states of interest rate and CPI inflation, respectively. In our model setting and afterward simulation, we only consider the simple case where \( H \) is fixed instead of a random number. Hence here the peg is the deterministic interest rate peg. We can set \( H \) to different values to see how it effects the IRFs of endogenous variables upon the demand shocks.

We simply assume that both government spending \( G_t \) and net export \( X_t \) to be exogenous AR(1) processes:

\[
G_t = (1 - \rho_g) \tilde{G} + \rho_g G_{t-1} + \epsilon^g_t
\]

\[
X_t = (1 - \rho_x) \tilde{X} + \rho_x X_{t-1} + \epsilon^x_t
\]

where \( \epsilon^g_t, \epsilon^x_t \) are assumed to be followed i.i.d normal distributions. \( \tilde{G} \) and \( \tilde{X} \) are steady states or long-run values for government spending and net export.

3.1.4 Parametrisation

Before we solve the model, we parametrise the structural parameters in the model. Most parameters values are calibrated according to the literature and some of them will be calibrated using Chinese macro-economy data series.

We use the annual data of government spending (1993–2012) and net export (1994–2013) to calibrate the persistence of the AR(1) process and volatility of the i.i.d shocks.\(^3\) The results are listed in the following table. More information about parameters calibration can be found at Carlstrom and Fuerst (1997), Christiano, Eichenbaum and Evans (2005), Cogan, Cwik and Taylor (2010), Smets and Wouters (2003, 2007).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Interpretation</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta )</td>
<td>objective discount factor</td>
<td>0.99</td>
</tr>
<tr>
<td>( \eta )</td>
<td>the inverse of elasticity of Frisch labour supply</td>
<td>1</td>
</tr>
<tr>
<td>( \psi )</td>
<td>labour dis-utility scaling parameter</td>
<td>1</td>
</tr>
<tr>
<td>( \sigma )</td>
<td>the inverse of elasticity of inter-temporal sub.</td>
<td>1</td>
</tr>
<tr>
<td>( \varepsilon )</td>
<td>inter-temporal elasticity of intermediate goods</td>
<td>10</td>
</tr>
<tr>
<td>( \phi )</td>
<td>the price stickiness parameter</td>
<td>0.75</td>
</tr>
<tr>
<td>( \phi_{\pi} )</td>
<td>coefficient of inflation in monetary policy</td>
<td>1.5</td>
</tr>
<tr>
<td>( \rho_g )</td>
<td>persistence of government spending shock</td>
<td>0.9658</td>
</tr>
<tr>
<td>( \rho_x )</td>
<td>persistence of net export shock</td>
<td>0.8257</td>
</tr>
<tr>
<td>( \sigma_g )</td>
<td>volatility of government spending shock</td>
<td>0.1459</td>
</tr>
<tr>
<td>( \sigma_x )</td>
<td>volatility of net export shock</td>
<td>0.5010</td>
</tr>
<tr>
<td>( \tilde{G} )</td>
<td>government spending share</td>
<td>0.1413</td>
</tr>
<tr>
<td>( \tilde{X} )</td>
<td>net export share</td>
<td>0.0459</td>
</tr>
</tbody>
</table>

3.1.5 Equilibrium and aggregation

The final output will be absorbed by consumption, government spending and exports. Hence, we have the following resource constraint as given in Equation (1). Define the real interest rate \( r_t \) through the Fisher relationship,

\[
r_t = i_t - E_t (\pi_{t+1})
\]
where the CPI inflation $\pi_t \equiv \frac{P_t}{P_{t-1}}$. Define the aggregate labour demand as

$$N_t^d = \int_0^1 N_t(i) \, di$$

The labour market clear requires that labour supply equals the labour demand

$$N_t = N_t^d$$

The bond market in equilibrium requires $B_t = 0$ for all $t$. The monopolistic power of intermediate goods firms will create some distortion and inefficiency in the economy. That means the output level will be lower than the one in competitive economy. Aggregating demand curve Equation (7) and production function Equation (9), we have

$$Y_t = \frac{A_t N_t}{v_p^t}$$

where $v_p^t$ is the price dispersion and defined as

$$v_p^t = \int_0^1 \left( \frac{P_t(j)}{P_t} \right)^{-\varepsilon} \, di$$

It could easily show that the price dispersion is bounded below by unity as shown in Schmitt-Grohe and Uribe (2007). And this price dispersion is one source of inefficiency. And it can be written in recursive form to get rid of the heterogeneity:

$$v_p^t = (1 - \phi) (\pi^*_t)^{-\varepsilon} + \pi^*_t \phi v_p^{t-1}$$

where $\pi^*_t \equiv \frac{P^*_t}{P_{t-1}}$. Under the sticky price setting, the CPI index can be rewritten as

$$\pi_t^{1-\varepsilon} = (1 - \phi) (\pi^*_t)^{-\varepsilon} + \phi$$

A competitive equilibrium of this model is a set of prices $\{i_t, r_t, w_t\}$ and allocations $\{Y_t, C_t, N_t, \pi_t, \pi_t^*, v_p^t, X_{1,t}, X_{2,t}, m_c\}$, taking the TFP $A_t$, government spending shock $G_t$ and net export shock $X_t$ as given, such that all markets are clear and all agents behaves optimally. The equilibrium system is characterised by Equations (1,5,6, 10,11,12, 13,14,15, 16,17, 19,20,21). Totally, there are 15 endogenous variables and 15 equations.

3.1.6 Solution and simulation

The model is solved and simulated in Dynare v4.4.1 using first-order approximation. We set two demand shocks on, i.e. both government spending and net export shock when solves and simulates the model. After solving the model, we use the reduced form solution to do the simulation.

In order to see how well the model fits the data, we simulate the model for 5000 times and in each simulation we draw different observations for consumption which
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varies with the periods that the interest rate is fixed. We set the interest rate fixed for \( H = 8, 20, 32 \) periods, respectively. Then we calculate the mean of consumption, its growth rate and the volatility of consumption growth rate for peg and non-peg periods separately. The following Table 3 is the simulation results we got:

<table>
<thead>
<tr>
<th></th>
<th>Volatility</th>
<th>Level mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( H = 8 )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peg</td>
<td>N = 32</td>
<td>0.0243</td>
</tr>
<tr>
<td>Non-peg</td>
<td>N = 20</td>
<td>0.0245</td>
</tr>
<tr>
<td>( H = 20 )</td>
<td>N = 80</td>
<td>2.0164</td>
</tr>
<tr>
<td>Peg</td>
<td>N = 35</td>
<td>2.0239</td>
</tr>
<tr>
<td>Non-peg</td>
<td>N = 80</td>
<td>135.2039</td>
</tr>
<tr>
<td>Peg</td>
<td>N = 128</td>
<td>135.3707</td>
</tr>
</tbody>
</table>

Notes: The number \( N \) represents the number of observations sampled each time in one simulation. We choose different values for different \( N \) and \( H \) represents the number of periods where nominal short interest rate is fixed.

Comparing Tables 1 and 3, we can see that the model fits data well. The model can correctly reproduce the order of magnitude for the mean of level consumption and the volatility of growth rate in data for all values of \( N \) and \( H \). The mean of level consumption for peg periods is higher both in data and model prediction. The volatility of non-peg period is higher in non-peg period as in data and model than peg period.

3.1.7 IRF analysis

The following two figures are the IRFs of few endogenous variables to one unit of the government spending shock and net export shock. We set the nominal interest rate fixed for \( H = 0, 4, 8 \) periods which are showed by solid, dashed and dotted lines, respectively. From the figures, we can see that interest rates are indeed fixed for 4 or 8 periods in the IRFs of interest rate. The two demand shocks behave in a very similar way though some minor differences exist.

Under one positive demand shock (either government spending or net export shock), output will rise upon impact. As shown in Figures 3 and 4, the more periods the nominal interest rate is fixed, the more the output responds. With the positive response of output, inflation rises too. Consumption drops at first if we do not fix the interest rate and actually increases when we fix the interest rate. The more periods interest rate is fixed, the more consumption rises. With the household increases its consumption, it also increases its labour supply as indicated in the last row of Figures 3 and 4.

The results can also be verified quantitatively. We can calculate the two multipliers of the two demand shocks with respect to output and consumption. Table 4 shows the output and consumption multipliers under different pegs of interest rate. For government spending shock, the output multiplier is less than one, or consumption is
less than zero, and this implies consumption is actually crowded out when facing the shock. But when we have a longer interest rate peg, \( H = 8 \), we actually crowd in the private consumption. For net export shock, the result is slightly different, but roughly the same.

Figure 3 The IRFs of government spending shock

Notes: vertical axis represents how much the variables deviate from the its steady states in respond to one unit or one standard deviation of shock to government shock. For interest rate and inflation, the vertical axis denotes the absolute deviation.

The results are consistent with Christiano, Eichenbaum and Rebelo (2011).

What is going on behind? Taylor rule says if inflation is rising, nominal interest rate will rise more than the inflation\(^7\) and hence the real interest rate is rising by the classical Fisher relationship. But if the nominal interest rate is fixed, then rising inflation actually means falling real interest rate. Hence, interest rate peg just reverses the direction that real interest rate and inflation move. And this helps to explain why consumption rises when facing positive demand shock\(^8\). If we log-linearise the Euler equation (5),

\[
c_t = E_t c_{t+1} - \frac{1}{\sigma} r_t
\]

where the small letters denote the deviation form. If we solve this deviation form equation forward, we could get

\[
c_t = -\frac{1}{\sigma} \sum_{j=0}^{\infty} r_{t+j}
\]

This is to say that consumption moves in opposite way with real interest rate. Hence, a negative real rate will help improve the domestic consumption.
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Figure 4  The IRFs to net export shock

![Image](image_url)

Table 4  Multipliers of demand shocks

<table>
<thead>
<tr>
<th></th>
<th>$H = 0$</th>
<th>$H = 4$</th>
<th>$H = 8$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government spending shocks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output multiplier</td>
<td>0.5554</td>
<td>0.7845</td>
<td>1.5744</td>
</tr>
<tr>
<td>Consumption multiplier</td>
<td>−0.4446</td>
<td>−0.2155</td>
<td>0.5744</td>
</tr>
<tr>
<td><strong>Net export shocks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output multiplier</td>
<td>0.6521</td>
<td>1.2097</td>
<td>2.2106</td>
</tr>
<tr>
<td>Consumption multiplier</td>
<td>−0.3479</td>
<td>0.2097</td>
<td>0.2106</td>
</tr>
</tbody>
</table>

*Sources:* author calculation. The output multipliers are calculated using the simulated data. The consumption multipliers are calculated using output multipliers and the formula developed at Section 2.

This simulation result is meaningful for policy-makers. Under the current peg periods, the overall economy of China is experiencing downward pressure and domestic consumption is low. Chinese government should actively employ the fiscal policies to stimulate the domestic consumption and hence the overall output. Fiscal policies could include the government spending or more preferential policies for export.

So in summary, the logic is simple here: the demand shock actually drive the economy up and the inflation rise as a result. If the nominal interest rate is fixed for some periods, then the real interest rate will actually fall. Hence, this will stimulate the household to consume more since real rate is low and the overall consumption will increase as a result.
4 Conclusion

In this paper, we use a simple New Keynesian model to illustrate what the economy will look like under interest rate pegs and demand shocks. We calibrate the model with China’s macro-economy data series. The simulation results show that under the interest rate peg periods, the GDP and domestic consumption actually increase a lot upon the demand shocks. Interest rate peg helps the household build up the expectation that real interest rate will fall upon demand shocks. Hence it helps to stimulate the domestic consumption as a whole.

This simulation result of our model fits the data well. So the policy implication of our simulation is interesting and meaningful. Nowadays, the overall economy is experiencing downward pressure and the overall domestic consumption is low. Chinese government should actively employ the fiscal policies to improve the domestic consumption and hence the overall output. Fiscal policies could include the government spending or more preferential policies for export. As shown in our model, this policies will serve as the demand shocks and this shocks will help improve domestic consumption as long as the economy still lies in interest rate peg period.

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References


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Notes

1 The reports can be downloaded at http://pbc.gov.cn. The reports are quarterly.
2 CEIC database, annual changes.
3 The data is from CEIC database and is available upon request.
4 The steady states of the model is calculated under the assumption that steady state inflation is zero. Dynare is a set of Matlab program which aim to solve, simulate and estimate DSGE models.
5 We use the Dynare default seed for random number generator. For each simulation, we draw the random number independently from standard normal.
6 One standard deviation of exogenous shocks in the government spending and net export AR(1) equation.
7 The coefficient of inflation in Taylor rule is generally greater than one, otherwise the model could have indeterminacy problem.
8 The intuition here is simple too. The real interest rate is low, the household will consume more and will save more if the real interest rate is high. High real rate means you earn more in the next period if you save more at current period.