Sterilized Intervention and Optimal Chinese Monetary Policy

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requirements constrain money creation and lending, and thus changes in monetary base directly

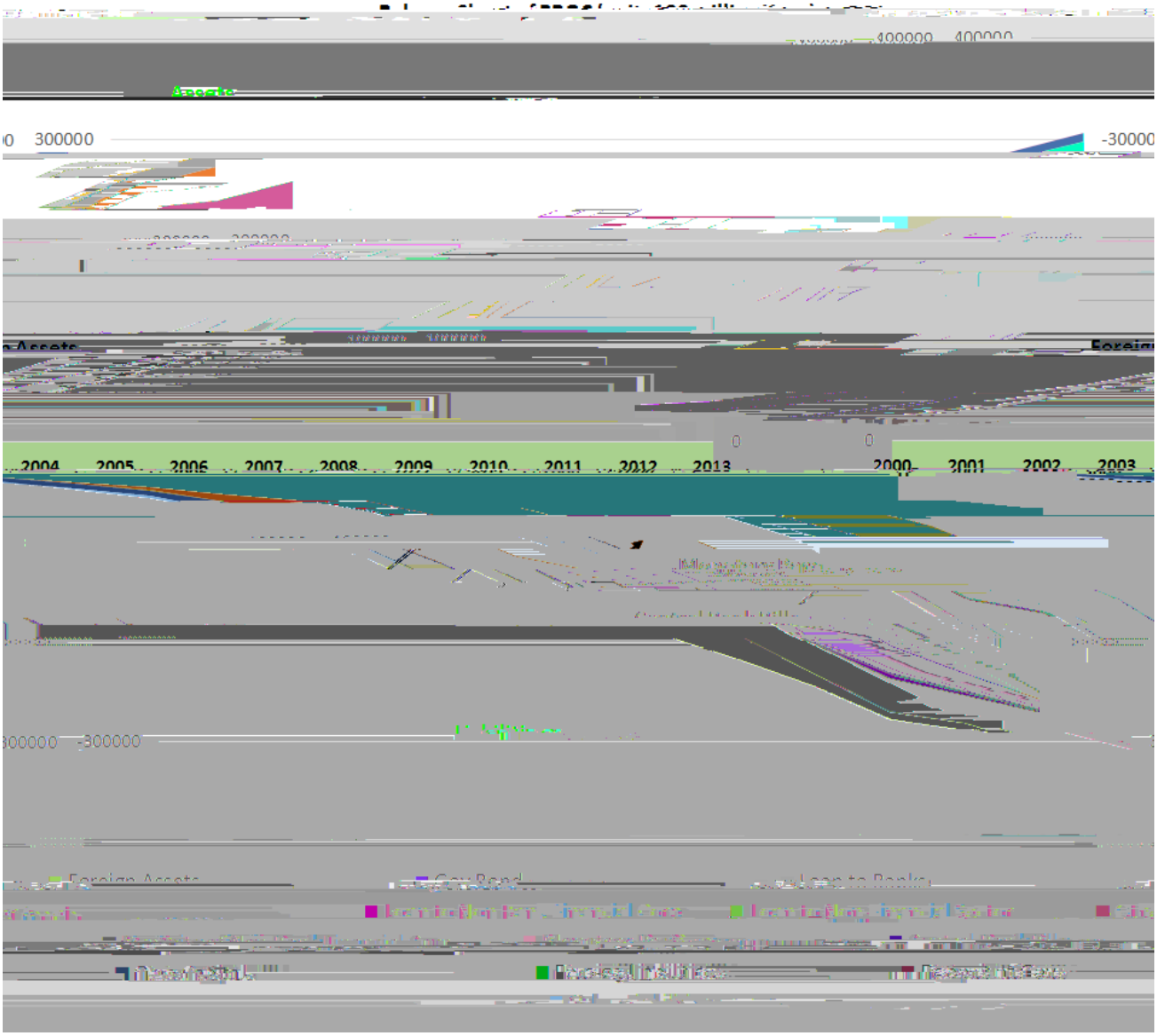


Figure 1: The Balance Sheet of PBOC

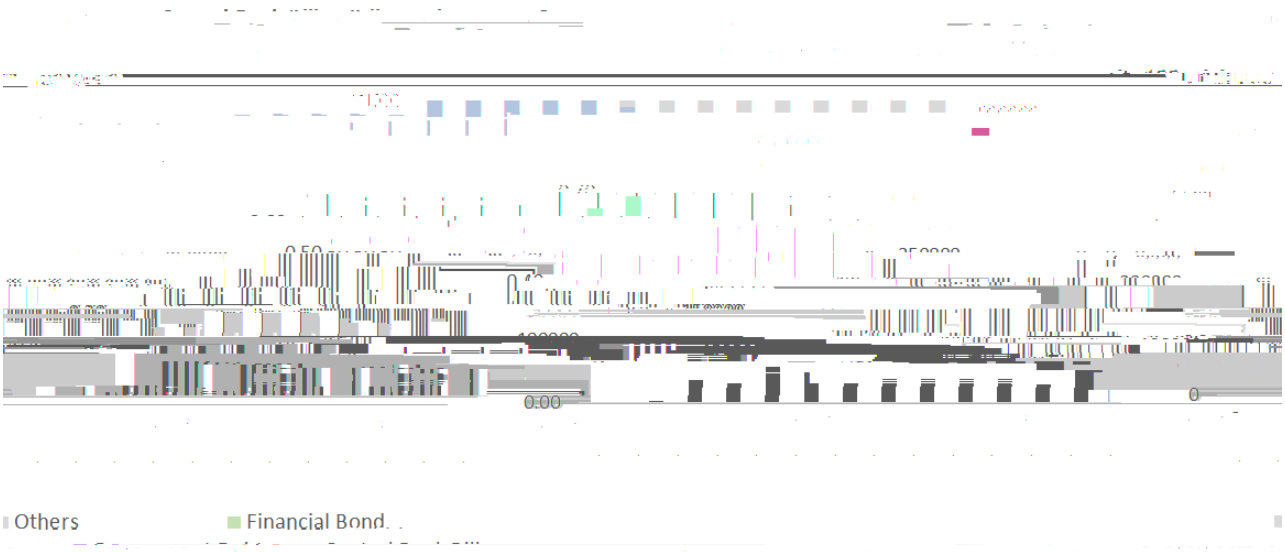


Figure 2: Transaction of Central Bank Bills in the InterBank Market

During the early 2000s, the PBOC depended mainly on OMO to sterilize its currency inter-

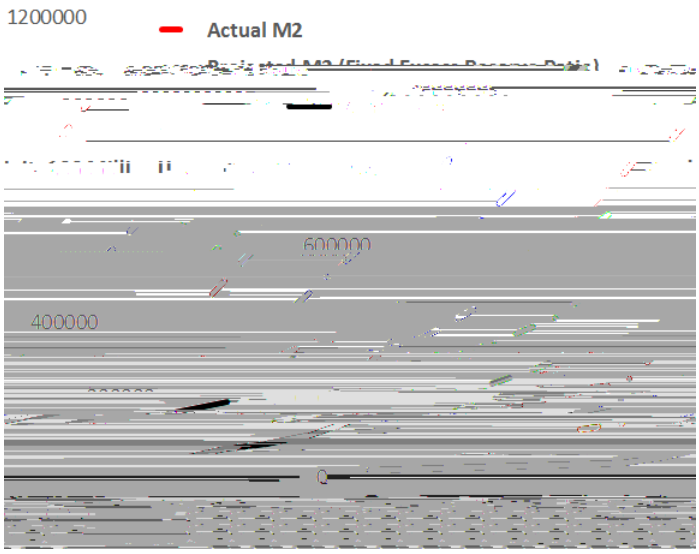

1200000
Actual M2
600000
400000
0

Figure 4: Required Reserve Ratio of China

The switch from OMO to RRR management well re ected the PBOC's awareness of the ineffectiveness of sterilization, and also could be a response to the increased sterilization costs. Since 2008, the Federal Reserve Bank of the US has been keeping the short term interest rates near zero. The three-month interest rate on the US Treasury Bills drops below the three-month interest rate on the PBOC's central bank bills, which increased the \quasi- scal loss" of currency sterilization (Chang, Liu and Spiegel, 2015). Besides the ine ectiveness of sterilization, the increases in sterilization costs could be another reason that made the PBOC switch from monetary sterilization to RRR management.

3 The Model

We consider a global economy with two countries | home country and foreign country. We focus on the problems of the home country and assume that the foreign country is passive.

3.1 Households

Households live for in nite periods. They consume nal goods and supply labor. The preference of household i is given by

$$E_t \sum_{t=0}^{+\infty} \beta^t$$

Let $_t = P_t/P_{t\ 1}$ denote the in ation rate. The optimal choice of $D_t(i)$ and $F_{ht}(i)$ implies

$$1 = E_t \left[\frac{_{t+1}}{_t} \frac{R_t^D}{_{t+1}} \right] \tag{5}$$

$$1 + _t = E_t \left[\frac{_{t+1}}{_t} \frac{R_t}{_{t+1}} \frac{e_{t+1}}{e_t} \right] \tag{6}$$

In a symmetric equilibrium where $W_i^s = W_{i\text{ttw}\bar{\text{w}}\text{st}}^s$

holdings of physical capital:

$$\frac{R_t^l L_t}{P_t} \qquad E_t [q_t$$

Here, the price level of domestic goods P_t^d is related to the prices of retail intermediate goods $P_t^d(i)$ by $P_t^d = \left[\int_0^1 P_t^d(i)^{1-\rho} di\right]^{\frac{1}{1-\rho}}$, $\rho > 1$ governs the elasticity of substitution between di erentiated

Liquidity Management of Banks in Period t		
Stage One: Lending Stage	Stage Two: Liquidity Management Stage	Stage Three: Balancing Stage
Raises deposits D_t and Lend L_t L_t Chooses		

D_t

Pro ts Maximization. The optimal choice of L_t, E_t, B_t and D_t implies

$$R_t^L \quad R$$

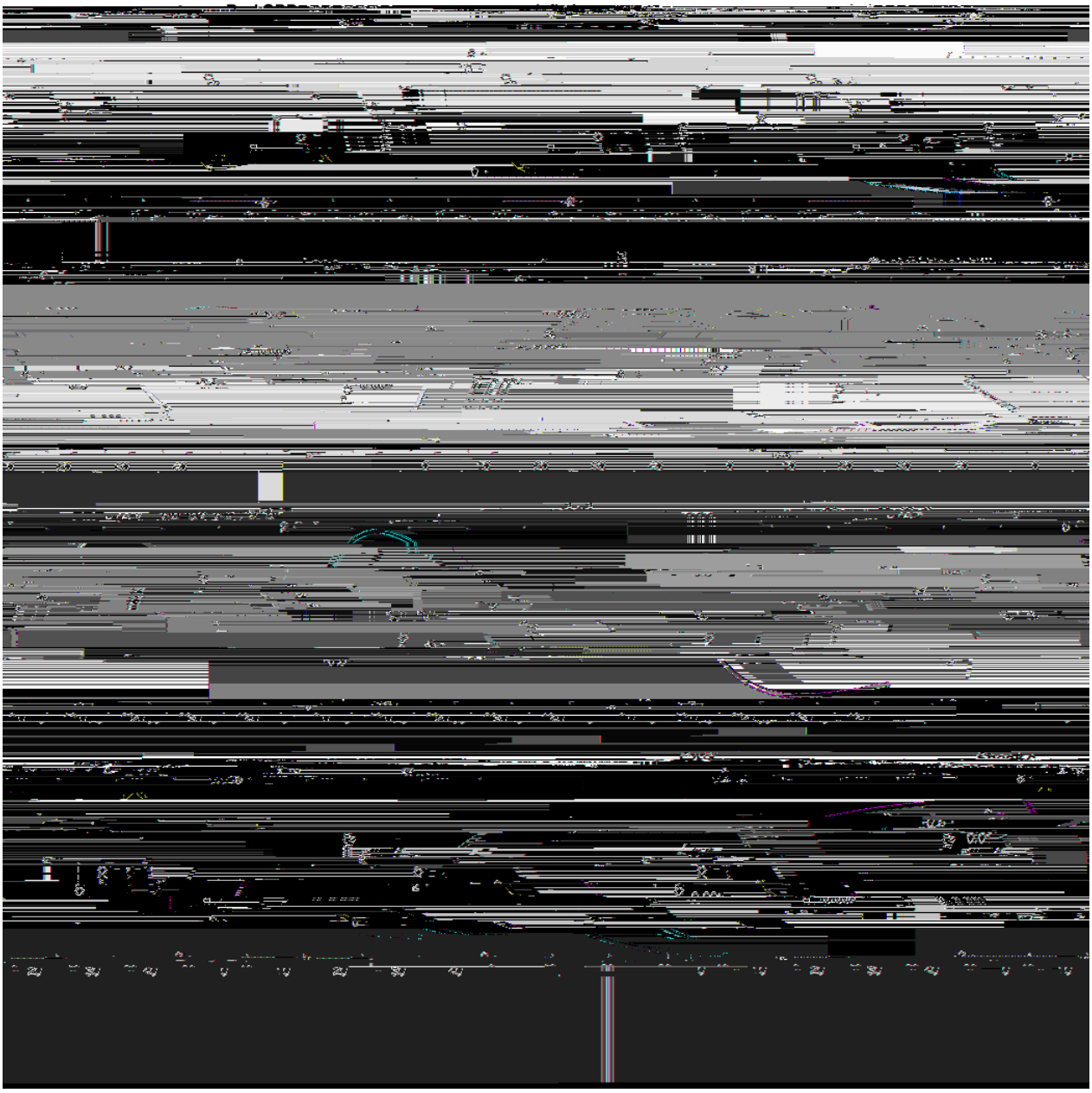
Balance of Payment. Let F_t denote the total foreign assets of the home country. The current

the realization of liquidity shock). Note that central bank bill is an one-period short-term debt in our setup. The arbitrage between the market for central bank bills and the central bank's discount window ensures that

For the parameters in the external sector, the share of domestic goods in the nal goods is set to 0.8 so that the import-to-GDP ratio is 80% in the steady state, which is consistent with Chinese data during 1990-2009. Following Chang, Liu and Spiegel (2015), we set the elasticity of foreign demand for domestic goods to 1.5.

Parameters	Description	Value
	Preferences	
	subjective discount rate (households)	0.99
e	subjective discount rate (entrepreneurs)	0.98
	weight of leisure in utility function	12
	inverse Frisch elasticity	2
	habit formation coe cient	0.5
	Technologies	
	capital share in production function	0.5

bank intervenes in the foreign exchange market. Sterilized intervention increases banks' holdings



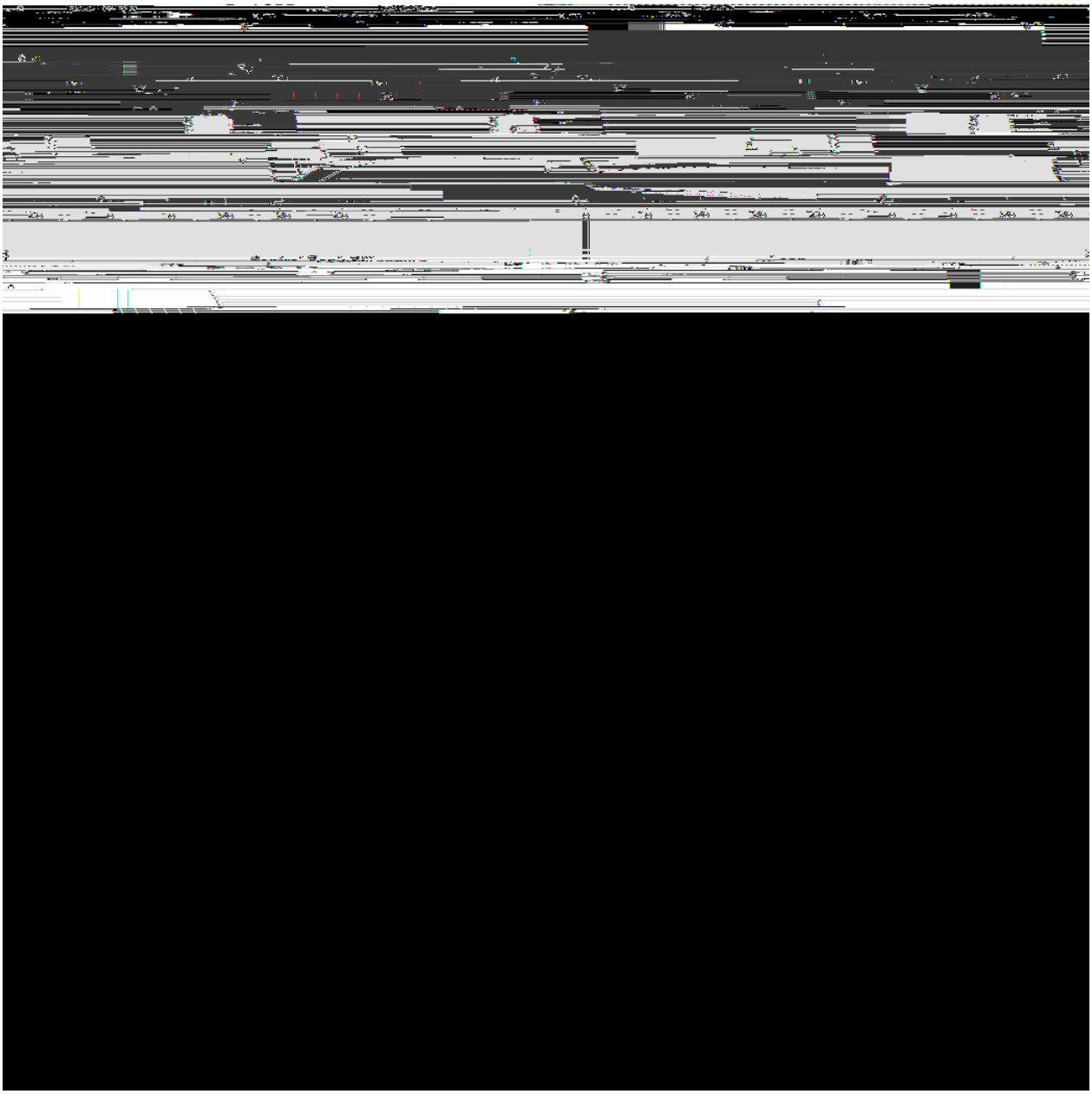


Figure 6: Impulse responses to a decrease in foreign interest rate (Fixed nominal monetary base)

Policy Rules				
	I. Open Market Operation Only		II. OMO + Reserve Requirement	
Parameters	Taylor Rule	Optimal Interest Rate Rule	Taylor + Optimal RRR	Joint Optimal Rules
$_{rp}$	1.50	1.75	1.50	0.30
$_{ry}$	0.50	0.59	0.50	0.89
$_{ep}$	-	-	2:18 10^3	0:14 10^3
$_{ey}$			ep:1810^3	

holdings of excess reserves. This raises the money multiplier and partially o sets the e ects of

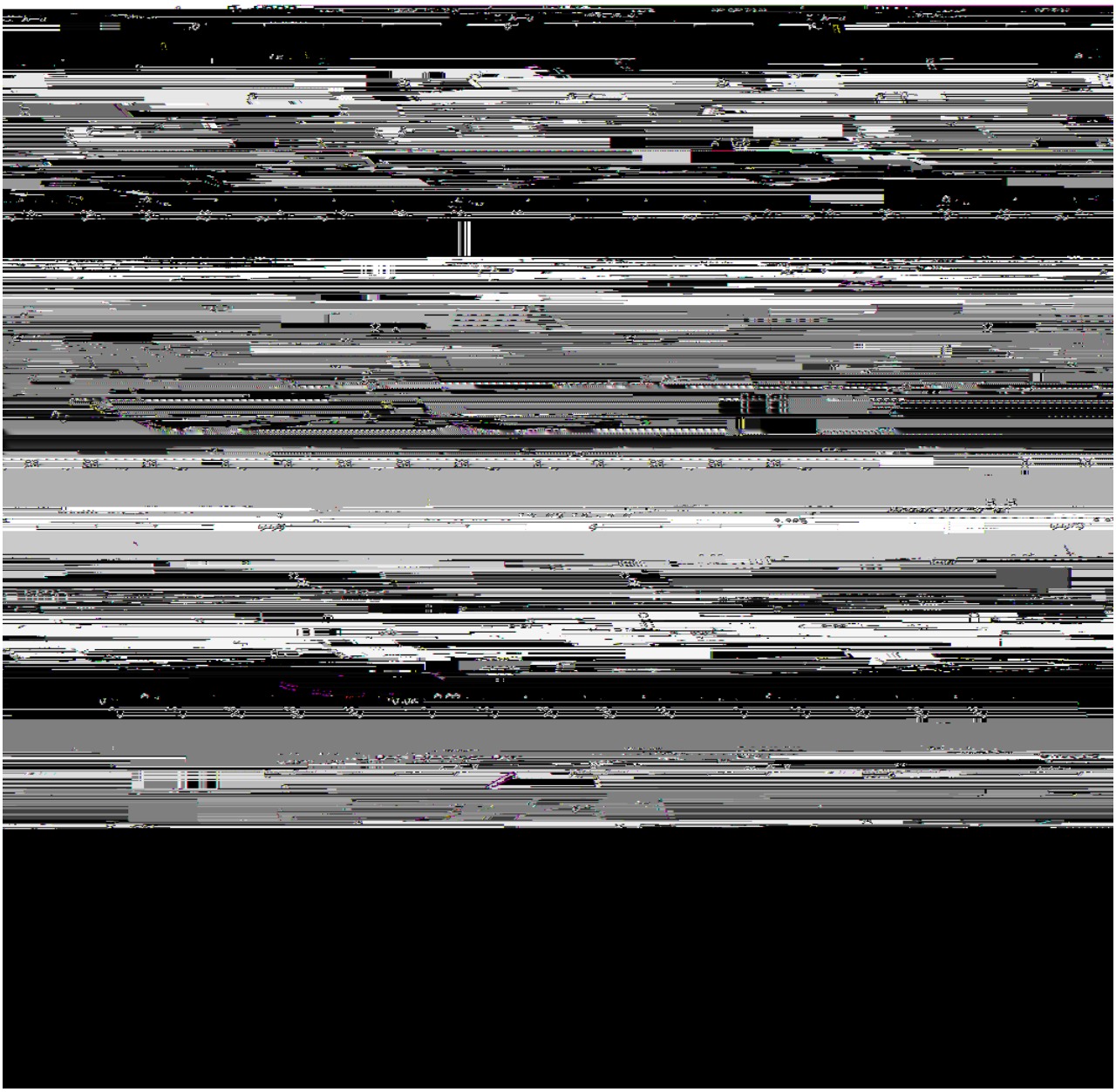


Figure 7: Impulse responses to an increase in exports demand
blue line (solid): OMO only - optimal interest rate rule
red line (dashed): OMO+RRR - joint optimal rules

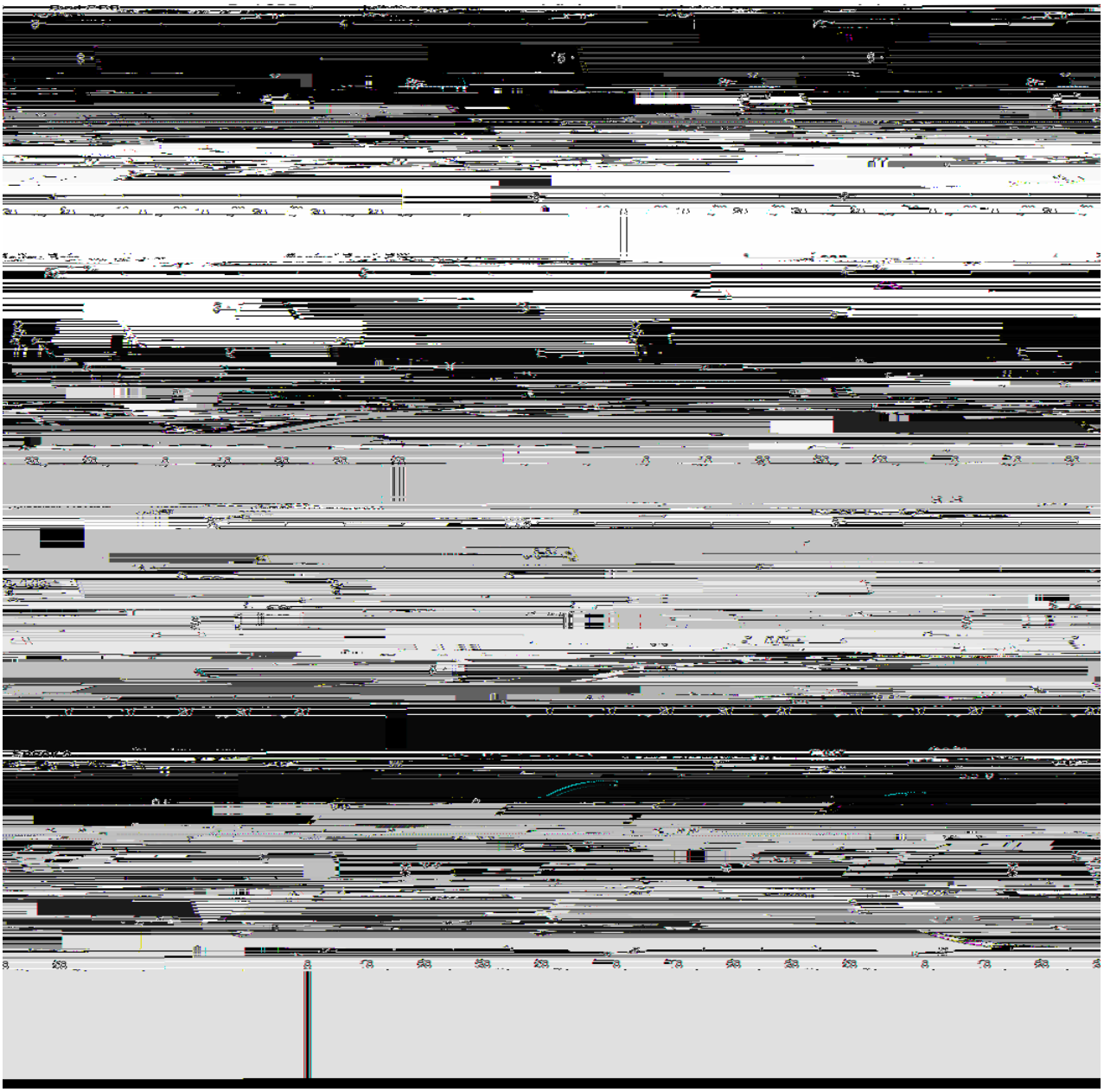


Figure 8: Impulse responses to a decrease in foreign interest rate
blue line (solid): OMO only - optimal interest rate rule
red line (dashed): OMO+RRR - joint optimal rules

6 Conclusion

Since the early 2000s, the PBOC had been intervening actively in foreign exchange markets to prevent sharp appreciation of the Yuan. To absorb the increase in monetary base caused by currency intervention, the PBOC issued central bank bills as sterilization instruments. During 2000-2006, China's foreign reserves had increased signi cantly; however, its monetary base remained nearly una ected. This implies th32(curr(the)-urr(PBOC)-urr(had)-343conduecteC)-urrcomplethesterilizationth32(cu3(r

mostlyrstedilizatiod.weiverha,WaCitsaselcly

therpeiobde(of)-206ased intervention,zon,ppedppsharlcySliesheetsb

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