MARKET EFFECTS OF INTEREST RATE LIBERALIZATION IN CHINA

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Abstract - Standard economic theory prescribes that a freely determined interest rate is the best way to allocate scarce financial capital, with savings channelled to the borrowers best able to afford the prevailing price of loans. Less profitable projects will be thus discouraged from being undertaken, and allocative efficiency in the economy is improved. In the long process of reforming the Chinese economy, liberalization of funding markets and interest rates had begun in 1996, when money and bond market rates were freed from regulation while restrictions on the interest rate of bank lending had officially been removed earlier in July 2013. Despite that, the People's Bank of China (PBOC) has never made explicit its main intermediate target for monetary policy, and the usage of tools to achieve any such target(s) remain pluralistic. With other quantity controls still in place today, interest rates in the Chinese financial markets can only be said to be on the road to deregulation and is far from fully liberalized. This paper aims to conduct testing for changes in this market, there are several facets to consider. Since bank lending is the most important form of finance for economic activity, the existence of a lending rate floor, if binding, can distort the interest rate as a price signal for the allocation of capital. With banks at the same time being participants in the money and bond markets, both in the short end with repurchase agreements (repos) and the long end with treasury bonds, all these other interest rates can also be affected. The absence of a lending rate floor may have enhanced the efficiency of the bank lending market. This improvement may be reflected in reduced deviation of lending rates from its equilibrium.

I. INTRODUCTION

Standard economic theory prescribes that a freely determined interest rate is the best way to allocate scarce financial capital, with savings channelled to the borrowers best able to afford the prevailing price of loans. Less profitable projects will be thus discouraged from being undertaken, and allocative efficiency in the economy is improved. In the long process of reforming the Chinese economy, liberalization of funding markets and interest rates had begun in 1996, when money and bond market rates were freed from regulation while restrictions on the interest rate of bank lending had officially been removed earlier in July 2013. Despite that, the People's Bank of China (PBOC) has never made explicit its main intermediate target for monetary policy, and the usage of tools to achieve any such target(s) remain pluralistic. With other quantity controls still in place today, interest rates in the Chinese financial markets can only be said to be on the road to deregulation and is far from fully liberalized. This paper aims to conduct testing for changes in this market, there are several facets to consider. Since bank lending is the most important form of finance for economic activity, the existence of a lending rate floor, if binding, can distort the interest rate as a price signal for the allocation of capital. With banks at the same time being participants in the money and bond markets, both in the short end with repurchase agreements (repos) and the long end with treasury bonds, all these other interest rates can also be affected. The absence of a lending rate floor may have enhanced the efficiency of the bank lending market. This improvement may be reflected in reduced deviation of lending rates from its equilibrium.

II. RESEARCH HYPOTHESES

H1: Not both the benchmark interest rate and monetary policy instruments of PBOC influence market interest rate, only benchmark interest rate significantly influences the market rate.

Unlike other central banks over the world, the PBOC determines the benchmark deposit and lending rates for all financial institutions in China, both benchmark deposit and lending rates are determined with multiple maturities, the shortest is overnight rate while the longest is five years, there is no routine schedule of updating the benchmark rates, all changes are subject to the PBOC's discretion. Required reserve ratio (RRR) and open market operation (OMO) are monetary policy tools of the PBOC, the PBOC announces RRR which specifies the percentage of customer deposits that must be placed with the central bank whereas the PBOC also issue and redeem central bank Treasury bills and to conduct repurchase (repo) operations to adjust money stock quantity in the market. Despite banks are allowed to price loans below and above the benchmark rate, however, some studies (E.g. He and Wang, 2012) showed that nearly 90 percent of all loans are still priced very close to the benchmark as banks desire to identify a useful and appropriate market-driven reference rate.

H2: Interest rate liberalization influences more on those market interest rates with more market transactions, whereas interest rate liberalization may not influences those market interest rates in 'inactive' marketInterest rate liberalization is supposed to enhance market efficient, repos represent the most efficient, most liquid and the largest segment of Chinese financial markets, repos are particularly important to smaller Chinese banks that do not have strong deposit bases, repos also allow for secured funding that alleviate the impact of large Chinese banks' market power towards the market. Repo markets will remain very essential to serve as funding source as well as being a liquidity measure even after interest rate liberalization. Investors and bankers are more alert of the changes in loanable market rate and thus interest rate liberalization influences more on those market interest rates with more market transactions.

III. EMPIRICAL MODEL

We use the following regression to test hypotheses (1) and (2):

$$\Delta y_{i,t} = \alpha_0 + \alpha_1 \Delta BLR_t + \alpha_2 RRR_t + \alpha_3 PDummy + \sum_{k=4}^{10} \alpha_k \Delta X_t + \varepsilon_{i,t} \quad (1)$$

where

$$\sum_{k=4}^{10} \alpha_k \Delta X_t = \alpha_4 \Delta PPI_t + \alpha_5 \Delta CPI_t + \alpha_6 \Delta Retail_t + \alpha_7 \Delta M2_t + \alpha_8 \Delta Export_t + \alpha_9 \Delta Import_t + \alpha_{10} \Delta GDP_t$$

To remove possible non-stationarity in time series variables, log-difference forms are utilized for all interest rates, so the dependent variable is the percentage change of market interest rates, two interest rates with different duration periods were adopted, including China government bond yield rate in 1 year, 2 year, 5 year and 10 year (denoted by TB) and Repo rate in 1 day, 7 day and 1 month (denoted by Repo), both measure the market interest rate changes. The independent variables include percentage change of 1-year Benchmark Loan Rate (ΔBLR), BLR is directly under the control of PBOC and consistently employed as policy instruments with no break since 1986 (Xiong, 2012), some studies found that PBOC's decisions on BLR are mainly based on the changes in inflation and money growth. More importantly, market interest rates have been significantly influenced by these benchmark rates (He and Wang, 2012). Another independent variable is required reserve ratio (RRR), which is one major monetary policy instrument in China, a policy dummy variable (PDummy) is also employed to test if there exist any significant change in percentage change of market interest rates (ΔBLR) after interest rate liberalization on 23 July 2013.

We control for the change macroeconomic condition using ΔX_t, ΔX_t consists of change of Producer Price Index (ΔPPI), change of Consumer Price Index (ΔCPI), change of retail sales (ΔRetail), change of M2 (ΔM2), year-to-year change of exports (ΔExport), year-to-year change of imports (ΔImport) and year-to-year change of GDP (ΔGDP), ε_(i,t) represents an i.i.d. random error term with zero mean and unit variance. The standard ARCH(1) and GARCH(1,1) models were adopted to model volatility clustering, the estimated results are shown in Table 1.

IV. RESULTS

Table 1 showed all ARCH and GARCH coefficients are statistically significant the implies volatility clustering happens in Δy_(i,t), more importantly, the result shows the significance of policy dummy for Repo (interbank market) interest rate, that supports the hypothesis (1) of not both the benchmark interest rate and monetary policy instruments of PBOC influence market interest rate, only benchmark interest rate significantly influences the market rate, and hypothesis (2) of interest rate liberalization influences more on those market interest rates with more market transactions, whereas interest rate liberalization may not influences those market interest rates in 'inactive' market

Table 1. ARCH/GARCH Estimated by Maximum Likelihood - Full Sample

Variables	Dependent Variables						
	TB_1YR	TB_2YR	TB_5YR	TB_10YR	Repo_1D	Repo_7D	Repo_1M
Mean Equation							
ΔBLR	0.273***	0.454***	0.188***	0.215***	0.814***	0.555***	0.730***
	(0.036)	(0.012)	(0.032)	(0.021)	(0.063)	(0.103)	(0.125)
RRR	0.022	-0.007	0.130*	0.054	1.053***	0.300	0.445
	(0.103)	(0.079)	(0.072)	(0.079)	(0.219)	(0.244)	(0.442)
PDummy	-0.001	0.000	0.001	0.000	0.023***	-0.015***	0.010**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)
ΔPPI	0.000***	0.000	0.000*	0.000	0.006***	0.002***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ΔCPI	0.001***	0.001***	0.000	0.000	0.014***	0.009***	-0.002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)

ΔRetail	-0.001***	-0.001***	0.000	0.000	-0.006***	-0.006***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
ΔM2	0.001***	0.000***	0.000	0.000	0.006***	0.002***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
ΔExport	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ΔImport	0.000	0.000	0.000	0.000	-0.001***	-0.001***	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ΔGDP	-0.001	0.000	0.000	0.000	0.006***	0.003**	-0.004***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.002)	(0.001)
Constant	0.058	0.039	0.023	-0.029	-0.648***	-0.328*	0.354**
	(0.048)	(0.038)	(0.055)	(0.038)	(0.108)	(0.171)	(0.137)
Variance Equation							
Constant	0.000***	0.000***	0.000***	0.000***	0.001***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
RESID (-1)	0.201***	0.397***	0.102***	0.133***	2.193***	1.723***	0.598***
	(0.009)	(0.021)	(0.008)	(0.011)	(0.070)	(0.063)	(0.038)
GARCH (-1)	0.836***	0.687***	0.889***	0.844***	n.a.	n.a.	n.a.
	(0.005)	(0.012)	(0.009)	(0.011)	n.a.	n.a.	n.a.
Observation	2159	2159	2159	2159	2158	2158	2098
Log-likelihood	6008.485	6486.960	6671.380	7271.403	2942.801	2592.644	2938.638
AIC	-11988.970	-12945.920	-13314.760	-14514.810	-5859.603	-5159.288	-5851.275
BIC	-11909.490	-12866.440	-13235.280	-14435.320	-5785.803	-5085.487	-5777.842

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