Scientific
Research
Publishing

Excess Liquidity and Bank Managers' Remuneration: The Role of Monetary Policy

Thai Vu Hong Nguyen*, Tam Vi An Le, Greeni Maheshwari

RMIT Vietnam University, Ho Chi Minh City, Vietnam
Email: *ngvh.thai@gmail.com

Abstract

This paper investigates the impacts of monetary policy on bank managers' remuneration in Vietnam and China where excess liquidity is present in the economies. The study argues that excess liquidity provides the condition to conceal risk taken by bank managers, and hence their remunerations are improved. However, the capability of excess liquidity in concealing risk is attenuated during the tightening monetary policy regime. The study extends the relationship between monetary policy and risk taking incentives of bank managers to the context of excess liquidity condition.

Keywords

Excess Liquidity, Remuneration, Monetary Policy, Emerging Markets

1. Introduction

The past decades have witnessed large capital inflows into Asian emerging economies, particularly in Vietnam and China (see [1] [2] [3] [4]), which have been argued to result in excess liquidity in the banking systems [3] [5]. This is because the central banks increase money supply to neutralize the currency appreciation pressure [2] [3] [5]. For example, the literature has documented that excess reserves in the Chinese banking system averaged around 10% of deposit during 2000s and remained high at 3.3% during 2012 [6] [7] [8]. In Vietnam, the excess liquidity has been argued to lead to high inflation rate to around 18% during 2010s [1] [2] [9]. The literature has raised concerns that excess liquidity condition, *i.e.* the oversupply of money beyond optimal level, may induce risk taking behaviors of commercial banks, and hence, lead to financial instability (for example, [8] [10]). [10] posit that excess liquidity forms the perception of low illiquidity risk among bank managers, who tend to lend out aggressively to improve their remunerations. The aggressive lending may take the forms of re-

laxing credit criteria or lending to borrowers with low creditworthiness. [11] find evidence that excess reserves in the banking system have a positive effect on bank managers' remuneration. In this study, we examine the role of tightening monetary policy on the relationship between excess liquidity and bank managers' remuneration. The central banks can impose tightening monetary policy by increasing policy interest rates. We argue that tightening monetary policy deteriorates the balance sheet position of borrowers and reduces the loan return probability [12] [13], and hence, materializes the risk concealed by excess liquidity, and attenuates the positive impact of excess liquidity on bank managers' remuneration.

We examine the impact of monetary policy on remuneration of bank managers in Vietnam and China as the excess liquidity condition is prominent in these two countries (see [1] [2] [3] [9]). The study contributes to the literature of monetary policy and risk-taking behaviours of commercial banks in the context of emerging economies experiencing excess liquidity condition (see [8] [14]). The study provides empirical evidence that excess liquidity condition measured by the ratio of M2 to nominal gross domestic product (M2/NGDP) beyond the optimal level indicated alternatively by Taylor rule (see [15] [16] [17] [18]), Hodrick-Prescott filter [19] and Baxter-King filter [20], tends to improve bank managers' remuneration. However, tightening monetary policy is found to attenuate this positive relationship. This result provides implications to the conduct of monetary policy to the wider context including advanced economies which have recently accumulated excess liquidity as the result of the quantitative easing policy introduced after the global financial crisis [21].

The remainder of the study has following structure. Section two presents the literature and arguments. Section three provides dataset and econometric strategy. The data analysis is discussed in section four, followed by the conclusion and policy implications in section five.

2. Hypothesis Development

This study is connected to two strands of literature, namely, excess liquidity and monetary policy. A conceptual framework developed by [10] posits that excess liquidity provides the condition for bank managers to easily conceal the risk they create through aggressive lending. This is because excess liquidity condition makes illiquidity risk unlikely and the costly internal audit detecting the risk taking behaviour of bank managers will only be conducted once the liquidity shortfall exceeds a certain level [10]. As bank managers are remunerated positively to the loan volume they generate but negatively to the risk they create, and as the latter can be concealed by excess liquidity, [11] find evidence that the presence of excess reserve in the banking system tends to improve bank managers' remuneration. In this study, we further examine the relationship between excess liquidity and bank managers' remuneration by investigating the moderating role of monetary policy. [12] [13] argue that tightening monetary policy

weakens firms' balance sheet as they are re-valuated at higher interest rates, and hence, reducing their creditworthiness and increasing the likelihood of loan default. Therefore, tightening monetary policy has been argued to materialize the risk created by aggressive lending of banks, making the risk less likely to be concealed [8] [22]. For this reason, we argue that the capability of excess liquidity in concealing the risk is attenuated in the tightening monetary policy regime. We hypothesis that tightening monetary policy has a negative impact of bank managers' remuneration. In addition, the nexus of monetary policy rate and excess liquidity also has a negative relationship with bank managers' remuneration.

3. Methodology and Data

3.1. Data

We collect banking data for Vietnam and China from Thomson Reuters Eikon for the period from 2006 to 2015. In cases of missing data, we also collect financial statements from commercial banks' websites. We examine commercial banks only as other types of banks may not be profit-maximization oriented. Only banks with data of more than 3 consecutive years are considered. Our final sample consists of 123 banks with 733 annual observations. Macro data are collected from World Bank Database, International Monetary Fund, and websites of State Bank of Vietnam and People's Bank of China.

3.2. Econometric Model

Following [10] [11] we apply the below econometrics model to capture the impact of monetary policy on bank managers' remuneration in the context of excess liquidity:

$$
\begin{aligned}
REM_{it} = {} & \beta_1 REM_{i,t-1} + \beta_2 GL_{i,t-1} + \beta_3 RISK_{i,t-1} + \beta_4 ROA_{i,t-1} \\
& + \beta_5 EL_{i,t-1} + \beta_6 MP_{t-1} + \beta_7 EL_{i,t-1} \times MP_{i,t-1} + \beta_8 GDP_{t-1} \\
& + Country + \varepsilon_{it}
\end{aligned}
$$

Following [11], bank managers' remuneration (*REM*) is measured as the ratio of personnel expenses to total assets. As bank managers are argued to be remunerated based on the loan they generate and the risk they create [10], we include the logarithm of gross loan (*GL*) and *RISK* measured by ratio of loan loss provision to net interest revenue. We index the monetary policy (*MP*) as the change in policy interest rate. As refinance rate and deposit benchmark rate are argued as effective policy rates in Vietnam [23] and China [6], we employ them to capture monetary policy stance for Vietnam and China, respectively. We also control for bank performance by return on assets (*ROA*), and economic performance by growth rate of gross domestic products (*GDP*). We also include a dummy variable for country (*Country*).

Following [3], we measure excess liquidity (*EL*) based on the ratio of broad money M2 to nominal gross domestic products (M2/NGDP) with three alternative methods. For the first method, we measure excess liquidity as the difference

between actual M2/NGDP ratio and the theoretical ratio suggested by Taylor Rule [16]. Taylor Rule suggests that money supply is a function of three variables, namely, real GDP per capita growth rate, inflation and real interest rate (see [15] [16] [17] [18]). Any positive deviation from the suggested M2/NGDP value, *i.e.* positive error term, is considered as excess liquidity. Therefore, we collect the positive residuals from the Taylor Rule regression to reflect excess liquidity condition. The regression model for excess liquidity based on Taylor Rule is reported in **Appendix 1**. With regard to the second and the third methods, we apply Hodrick-Prescott filter (HP) [19] and Baxter-King filter (BK) [20] respectively to capture the trends of M2/NGDP. We collect the positive deviations from the trends as excess liquidity condition.

The interaction term between monetary policy and excess liquidity $\left(EL_{i,t-1} \times MP_{t-1} \right)$ indicates the impact of monetary policy on remuneration in the presence of excess liquidity. We employ two-step System Generalised Method of Moments (SGMM) estimator [24] [25] [26] to deal with any potential endogeneity problem. The model residuals are free of serial correlation and unit root. **Table 1** summarizes data descriptions for the variables. Remuneration varies between 0.006% and 2.08% of total assets. Excess liquidity spans between 8.2% and 53.83% of NGDP across different measurements.

3. Estimation Results

The regression results are reported in **Table 2**. Regarding to control variables, loan loss provision (RISK) has a negative relationship with remuneration, while higher bank profitability (ROA) and higher economic growth rate (GDP) increase remuneration. The result for gross loan is controversial as it shows a negative impact on remuneration. With regard main variables, we find that excess liquidity condition in the economy improves bank managers' remuneration in China and Vietnam. This result is statistically significant and in line with the findings of [11] and supports the argument that excess liquidity helps conceal the risks that bank managers take and hence enhances their remuneration.

Table 1. Summary statistics for remuneration regression variables.

Variable	Mean	Std. Dev.	Min	Max
REM	0.00531	0.003059102	0.000057	0.020854
GL	12.2769	4.321948	5.70378	25.3979
RISK	0.14633	0.1026856	−0.04655	0.46472
ROA	0.00972	0.004669185	0.00025	0.02458
GDP	0.10034	0.03998337	0.03779	0.142
EL - Taylor Rule	0.1176	0.1734927	0	0.523807
EL - HP filter	0.08217	0.1025397	0	0.331034
EL - BK filter	0.08325	0.1675185	0	0.538364
MP	−0.0012	0.01873699	−0.0647	0.0622

Table 2. Remuneration regression results.

REM (remuneration)	EL-Taylor Rule	EL-HP filter	EL-BK filter
REM (lag 1)	0.869***	0.888***	0.861***
	(0.0335)	(0.0278)	(0.0297)
GL (gross loan)	−0.00789***	−0.00554***	−0.00612***
	(0.00222)	(0.00168)	(0.00220)
RISK (loan loss provision)	−0.000994	−0.00287***	−0.00368***
	(0.000887)	(0.000762)	(0.00107)
ROA (return on assets)	0.0272*	0.0149	0.0179
	(0.0144)	(0.0154)	(0.0182)
GDP	0.0138***	0.0122***	0.0134***
	(0.00248)	(0.00214)	(0.00298)
Country	0.0206	0.0305	0.0609**
	(0.0320)	(0.0272)	(0.0271)
EL (excess liquidity)	0.0994***	0.0762***	0.0695*
	(0.0265)	(0.0273)	(0.0376)
MP (monetary policy rate)	−0.00815*	−0.00671	−0.0126**
	(0.00460)	(0.00517)	(0.00527)
EL × MP	−0.279***	−0.116*	−0.298***
(excess liquidity × monetary policy rate)	(0.0524)	(0.0688)	(0.0997)
Observations	610	610	610
Number of instruments	45	49	41
Number of groups	123	123	123
AR (1)	−3.128	−2.915	−2.854
Prob.	0.002	0.004	0.004
AR (2)	−1.466	−1.016	−1.183
Prob.	0.143	0.310	0.237
Hansen test	42.33	49.05	38.14
Prob.	0.217	0.154	0.210

Note: 1. ***, ** and * denote statistical significance at the 1%, 5% and 10% significance levels, respectively. 2. Robust standard errors adjusted for heteroskedasticity are reported in parentheses.

Higher policy interest rates (MP) are found to reduce bank managers' remuneration. This supports the argument that tightening monetary policy weakens bank balance sheet position [12] [13], making risk less likely to be concealed [22] and hence, reducing bank managers' remuneration. Interestingly, the interaction between excess liquidity and policy interest rate has a statistically negative effect on remuneration. This result indicates that tightening monetary policy attenuates the capability of excess liquidity in concealing risk and hence reducing bank managers' remuneration.

4. Conclusion

This study investigates the impact of tightening monetary policy on bank managers' remuneration in Vietnam and China where the excess liquidity condition is present. The study finds that excess liquidity condition helps conceal risk bank managers take and improves their remuneration while tightening monetary policy reduces the remuneration. In addition, we also find that tightening monetary policy attenuates the capability of excess liquidity in concealing risk, and hence, reducing bank managers' remuneration. These results suggest that excess liquidity condition may induce bank managers to take risk to improve their remuneration. Tightening monetary policy should be considered to restrain the risk taking behavior of bank managers to maintain the soundness and stability of the banking systems.

Acknowledgements

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Miura, J. (2008) Is Vietnam on the Brink of a Currency Crisis? Deciphering Signs of Increased Vulnerability Resulting from Globalization. *Pacific Business and Industries*, VIII, 1-28.

[2] Menon, J. (2009) Managing Success in Vietnam: Macroeconomic Consequences of Large Capital Inflows with Limited Instruments. *ASEAN Economic Bulletin*, **26**, 77-95. https://doi.org/10.1355/AE26-1F

[3] Zhang, C. (2009) Excess Liquidity, Inflation and the Yuan Appreciation: What Can China Learn from Recent History? *The World Economy*, **32**, 998-1018. https://doi.org/10.1111/j.1467-9701.2009.01191.x

[4] Azis, I.J. and Yarcia, D. (2015) How Capital Flows in the Midst of Excess Savings Affect Macrofinancial Vulnerability. *Asian Development Review*, **32**, 115-152. https://doi.org/10.1162/ADEV_a_00054

[5] Nguyen, V.H.T. and Boateng, A. (2015) Bank Excess Reserves in Emerging Economies: A Critical Review and Research Agenda. *International Review of Financial Analysis*, **39**, 158-166. https://doi.org/10.1016/j.irfa.2015.02.005

[6] Anderson, J. (2009) The China Monetary Policy Handbook. In: Barth, J.R., Tatom, J.A. and Yago, G., Eds., China's Emerging Financial Markets—Challenges and Opportunities. Milken Institute, Santa Monica, CA. https://doi.org/10.1007/978-0-387-93769-4_5

[7] Laurens, B.J. and Maino, R. (2009) Monetary Policy Implementation in China: Past, Present and Prospects. In: Barth, J.R., Tatom, J.A. and Yago, G., Eds., *China's Emerging Financial Markets—Challenges and Opportunities*, Milken Institute, Santa Monica, CA. https://doi.org/10.1007/978-0-387-93769-4_4

[8]   Nguyen, V.H.T. and Boateng, A. (2015) An Analysis of Involuntary Excess Reserves, Monetary Policy and Risk-taking Behaviour of Chinese Banks. *International Review of Financial Analysis*, **37**, 63-72. https://doi.org/10.1016/j.irfa.2014.11.013

[9]   Vo, X.V. and Nguyen, P.C. (2014) Monetary Policy and Bank Credit Risk in Vietnam Pre and Post Global Financial Crisis. *Contemporary Studies in Economic and Financial Analysis*, **96**, 277-290.
       https://doi.org/10.1108/S1569-375920140000096011

[10]   Acharya, V. and Naqvi, H. (2012) The Seeds of a Crisis: A Theory of Bank Liquidity and Risk-Taking over the Business Cycle. *Journal of Financial Economics*, **106**, 349-366. https://doi.org/10.1016/j.jfineco.2012.05.014

[11]   Nguyen, V.H.T., Boateng, A. and Nguyen, C.T. (2018) Involuntary Excess Reserve and Bankers' Remuneration: Evidence from Chinese Banks. *Applied Economics Letters*, **25**, 518-522. https://doi.org/10.1080/13504851.2017.1340568

[12]   Angeloni, I. and Faia, E. (2009) A Tale of Two Policies: Prudential Regulation and Monetary Policy with Fragile Banks. Kiel Working Paper No. 1569, Kiel.

[13]   Bernanke, B.S., Gertler, M. and Gilchrist, S. (1999) The Financial Accelerator in a Quantitative Business Cycle Framework. In: Taylor, J. and Woodford, Eds., *Handbook of Macroeconomics*, Elsevier, Amsterdam.

[14]   Borio, C. and Zhu, H. (2008) Capital Regulation, Risk-Taking and Monetary Policy: A Missing Link in the Transmission Mechanism? BIS Working Papers No. 268, Basel.

[15]   Litterman, R.B. and Weiss, L. (1983) Money, Real Interest Rates, and Output: A Reinterpretation of Postwar US Data. NBER Working Paper No. 1077, Cambridge.

[16]   Taylor, J.B. (1993) Discretion versus Policy Rules in Practice. *Carnegie-Rochester Conference Series on Public Policy*, **39**, 195-214.
       https://doi.org/10.1016/0167-2231(93)90009-L

[17]   Woodford, M. (2001) The Taylor Rule and Optimal Monetary Policy. *American Economic Review*, **91**, 232-237. https://doi.org/10.1257/aer.91.2.232

[18]   Orphanides, A. (2003) Historical Monetary Policy Analysis and the Taylor Rule. *Journal of Monetary Economics*, **50**, 983-1022.
       https://doi.org/10.1016/S0304-3932(03)00065-5

[19]   Hodrick, R. and Prescott, E.C. (1997) Postwar U.S. Business Cycles: An Empirical Investigation. *Journal of Money, Credit and Banking*, **29**, 1-16.
       https://doi.org/10.2307/2953682

[20]   Baxter, M. and King, R.G. (1999) Measuring Business Cycles: Approximate Bank-Pass Filters for Economic Time Series. *Review of Economics and Statistics*, **81**, 575-593. https://doi.org/10.1162/003465399558454

[21]   Berger, H. and Harjes, T. (2009) Does Global Liquidity Matter for Monetary Policy in the Euro Area? IMF Working Paper, WP/09/17.

[22]   Rajan, R. (2006) Has Finance Made the World Riskier? *European Financial Management*, **12**, 499-533. https://doi.org/10.1111/j.1468-036X.2006.00330.x

[23]   Vo, X.V. and Nguyen, P.C. (2017) Monetary Policy Transmission in Vietnam: Evidence from a VAR Approach. *Australian Economic Papers*, **56**, 27-38.
       https://doi.org/10.1111/1467-8454.12074

[24]   Arellano, M. and Bond, S. (1991) Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, **58**, 277-297. https://doi.org/10.2307/2297968

[25] Arellano, M. and Bover, O. (1995) Another Look at the Instrumental Variables Estimation of Error Components Models. *Journal of Econometrics*, **68**, 29-51.
https://doi.org/10.1016/0304-4076(94)01642-D

[26] Blundell, R. and Bond, S. (1998) Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, **87**, 115-143.
https://doi.org/10.1016/S0304-4076(98)00009-8

Appendices

Appendix 1: Excess Liquidity Measurement Based on Taylor Rule

Following [15] [16] [17] [18], we estimate the optimal money supply from the following model using Ordinary Least Squares estimator (OLS).

$$M2/NGDP_t = \alpha_0 + \alpha_1 RIR_t + \alpha_2 Inflation_t + \alpha_3 GDPPC_t + \varepsilon_t$$

where $M2/NGDP$ is the ratio of broad money to nominal GDP. The regressors are real interest rate (RIR), inflation ($Inflation$) and growth rate of real GDP per capita ($GDPPC$). The sample covers the period of 2005-2016 with quarterly data. The model is regressed separately for Vietnam and China. The positive residuals are collected as excess liquidity and averaged to form annual observations. The regression results are provided upon request.