อัตราดอกเบี้ยต่ำอย่างต่อเนื่องเป็นเวลานานและพฤติกรรมปล่อยกู้ของธนาคารพาณิชย์: กรณีศึกษาของประเทศไทย

โกวิท ชาญวิทยาพงศ์
มหาวิทยาลัยธรรมศาสตร์ 99 ม.18 ถนนพหลโยธิน ตำบลคลองหนึ่ง อำเภอคลองหลวง ปทุมธานี 12121
E-mail: kovit@econ.tu.ac.th
พิมพ์ชนก โฮว
มหาวิทยาลัยธรรมศาสตร์ 99 ม.18 ถนนพหลโยธิน ตำบลคลองหนึ่ง อำเภอคลองหลวง ปทุมธานี 12121

ติดต่อผู้เขียนบทความที่ **โกวิท ชาญวิทยาพงศ์** มหาวิทยาลัยธรรมศาสตร์ 99 ม.18 ถนนพหลโยธิน ตำบลคลองหนึ่ง อำเภอคลองหลวง ปทุมธานี 12121
E-mail: kovit@econ.tu.ac.th

วันที่รับบทความ: 19 เมษายน 2563 วันที่แก้ไขบทความ: 30 เมษายน 2563 วันที่ตอบรับบทความ: 25 พฤศจิกายน 2563

บทคัดย่อ

วัตถุประสงค์ เพื่อศึกษาความไวของพฤติกรรมการปล่อยกู้ต่อสัดส่วนสภาพคล่องต่อสินทรัพย์ของธนาคารพาณิชย์ และผลของการมีอัตราดอกเบี้ยต่ำมากเป็นเวลานานต่อความไวของพฤติกรรมดังกล่าว **วิธีการศึกษา** วิธีการเป็นแบบ two-step procedures ใช้ panel vector autoregressive models (Panel VAR) ที่สามารถชี้ให้เห็นถึงความสอดคล้องของการเคลื่อนไหวของตัวแปรที่เกี่ยวข้องเมื่อมีการเปลี่ยนแปลงในอัตราดอกเบี้ย ใช้ข้อมูลรายธนาคารของ 19 ธนาคารพาณิชย์ในช่วงเวลาไตรมาสที่ 1 ของปี 2001 ถึงไตรมาสที่ 1 ของปี 2019 เพื่อวัดประสิทธิผลของพฤติกรรมการปล่อยกู้ของธนาคารพาณิชย์ ช่วงสุดท้ายวิเคราะห์ถึงนโยบายที่อาจสรุปได้จากการศึกษา **ผลการวิจัย** ธนาคารพาณิชย์มีการเปลี่ยนพฤติกรรมการปล่อยกู้ในช่วงดอกเบี้ยต่ำ ๆ ซึ่งมีผลต่อประสิทธิผลของการใช้นโยบายการเงินแบบผ่อนคลายของธนาคารพาณิชย์ **สรุป** นโยบายอัตราดอกเบี้ยต่ำมากต่อเนื่องเป็นเวลายาวนานทำให้ธนาคารพาณิชย์ปรับพฤติกรรมการปล่อยกู้และทำให้นโยบายการเงินแบบผ่อนคลายมีประสิทธิภาพลดลง

คำสำคัญ: อัตราดอกเบี้ยต่ำอย่างต่อเนื่องเป็นเวลานาน ช่องทางการปล่อยกู้ของธนาคาร สภาพคล่องของธนาคาร การขายตราสารหนี้ การก่อหนี้ การยืมเงิน

Prolonged Low Interest Rates and Commercial Bank Lending Behavior: A Case Study of Thailand

Kovit Charnvitayapong
Faculty of Economics, Thammasat University, Pathumthani 12121
E-mail: kovit@econ.tu.ac.th
Phimchanok Hou
Faculty of Economics, Thammasat University, Pathumthani 12121

Correspondence concerning this article should be addressed to **Kovit Charnvitayapong**, Thammasat University, 99 Moo18 Paholyothin Road, Klong Luang, Rangsit, Pathumthani 12121
E-mail: kovit@econ.tu.ac.th

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ABSTRACT

PURPOSES: This paper looked into the sensitivity of bank lending to bank liquidity behavior ratio and effects of low interest rates upon the sensitivity. **METHODS**: The study used a two-step procedures, panel vector autoregressive models (Panel VAR), to obtain impulse response functions (IRFs) revealing consistencies in the movement of different variables in response to interest rate shocks. The paper used bank level data from 19 commercial banks in Thailand from the first quarter of 2001 to the first quarter of 2019, to measure the effectiveness of bank lending channels. Finally, policy implications form the study were analyzed. **RESULTS**: Banks altered lending behavior under extended low interest rates. This lending behavior affected the effectiveness of quantitative casing monetary policy of the commercial banks. **CONCLUSIONS**: Prolonged low interest rates caused commercial banks to adjust their lending behavior and, thereby, diminished the effectiveness of expansionary monetary policy.

Keywords: Prolonged low interest rates, bank lending channel, bank liquidity, bond, leverage, borrow

Introduction

Previous global economic crises in Asia and the United States of America indicated that bank lending patterns significantly impacted economic networks. Fierce competition among banking businesses led to financial innovations which, in turn, led to even greater financial fragility. Generally, economists agree that monetary policies are effective in stabilizing and fine-tuning economies, at least temporarily. However, the most recent expansionary monetary policies in the US, EU, and Japan have proven otherwise. Despite expansionary monetary policies that simultaneously decrease interest rates to zero, policy impacts have been unsuccessful. As a result, nations have been maintaining interest rates at low levels since 2010.

In an era of economic globalization, further concerns exist about whether the monetary policy of small, open economies or emerging countries may be effective and free from the monetary policies of large countries. As it appeared, under free capital flows, small countries must lower domestic interest rates in the wake of large countries' monetary policies, to keep capital inflow and exchange rates at optimum levels.

Theoretically, bank lending increases, in response to expansionary monetary policies, drive down interest rates. This is because low interest rates reduce the cost of bank operation and stimulate banks to lend more. Increased lending to the public by banks causes the money supply to expand, consequently augmenting economic activity. Bank lending channels will be less effective if bank policy holds that domestic lending is not the best way to raise profits or that higher profits may be gained by international loans or investment in bonds and securities. In turn, these strictures would render an easy monetary policy less effective.

Thailand is a small, open economy (SOE). As foreign banks are added to its banking system, with increased access to foreign funds, Thai banks are increasingly obliged to compete in the complex world of the banking system network. The Thai banking system faces dynamic and fierce competition while monetary authorities tend to encounter constraints limiting their capacity to employ expansionary monetary policy effectively. This situation creates a policy dilemma.

Objectives of the research

The study examined two key points:

First, whether the Thai bank lending channel from 2001 to 2019 was effective.

Second, whether prolonged low interest rates in the US could cause commercial banks in Thailand to adjust bank lending behavior.

If the results show that prolonged low interest rates caused banks to adjust lending behavior in such a way that caused ineffective monetary policy, then policy suggestions would be made.

Reviews of literature and related research

Several studies investigated factors determining bank lending behavior during different policy regimes. Kashyap and Stein (2000) employed a two-step method to examine bank lending behavior of commercial banks in the US. Microdata for 961,530 commercial banks and bank characteristics from 1976Q1 to

1993Q2 were considered. The impact of monetary policies upon bank lending behavior was found to depend upon characteristics representing bank constraints, in terms of bank size, liquidity, and capital. Bank lending depends upon bank liquid assets.

Cetorelli and Goldberg (2012) employed a two-step method to examine differences in the response of global and domestic banks in the US at times of monetary policy shocks. The data included all commercial US banks from 2007 to 2009. Bank lending of global banks and large US banks was found to be inconsistent with Federal Reserve System (Fed) monetary policy, causing monetary policies to be less effective. This was due to the facility of access to foreign capital.

Ananchotikul and Seneviratne (2015) used a bank-level panel fixed effect model to examine how bank characteristics influence domestic monetary policy transmission in nine Asian countries. Data were obtained about 260 banks from 2000 to 2013. Results were that foreign bank lending did not face constraints from monetary policies. They depended more on non-deposits as ratio to capital. Lending was less sensitive to monetary policy than for that of traditional banks. This makes it more difficult for central banks to adjust domestic monetary policy. Therefore, increasing foreign bank dispersion in a domestic banking system reduces the credit response of all banks to changes in domestic monetary policy.

Bowman et al. (2011) studied the expansionary monetary policy or quantitative easing (QE) in Japan at a time of economic crisis. They used ordinary least squares (OLS) and the generalized method of moments (GMM) to analyze bank-level data from 2000 to 2009. They found that QE had expanded bank liquidity and stimulated the economy through bank lending. However, impacts were relatively insignificant.

Cao and Dinger (2018) studied the efficiency of bank lending channels by a two-step procedure, adding the cost of foreign funding to the framework of Kashyap and Stein (2000). The data included bank-level data from Norway for 1994 to 2015. Results were that foreign funding can affect domestic commercial bank lending. Consequently, monetary policies are less effective.

Chang and Talley (2017) studied risk-taking behavior by banks during low interest rate periods through on-balance sheet and off-balance sheet activities. They employed panel vector autoregressive models (Panel VAR) to examine bank data obtained from the Federal Financial Institutions Examination Council (FFIEC) from 2003 to 2014. During times of low interest rates, large commercial banks were found to have strong incentives to undertake riskier projects to raise returns and offset low interest income.

In general, during different times and in different places, bank lending channels were found to be essential for determining monetary policy effectiveness, although their role is decreased by many factors. This study attempted to reexamine monetary policy effectiveness through the bank lending behavior of commercial banks in Thailand from 2001 to 2019.

Research Method

The method used in the present study was developed by Kashyap and Stein (2000) and later improved by

Cetorelli and Goldberg (2012) and Cao and Dinger (2018). The method hypothesizes that monetary policy usage causes shocks to the operating costs of commercial banks. Shocks impact the liability side of bank balance sheets first, and are then transmitted to the assets side of balance sheets of commercial banks through liquidity. This causes banks to adjust their portfolios to lessen the impact of policy shocks. As a result, policy shocks have less impact on bank operating costs with more liquidity. This is the analysis on the supply side of loans.

Bank-lending channel

The method used by Kashyap and Stein (2000) and Cetorelli and Goldberg (2012) is referred to as a two-step procedure.

First step:

In their models, the impact of monetary policy upon bank loans can be captured by the sensitivity of loans to the ratio of lending to liquid assets, which varies according to interest rates. This transmission channel works through the loan supply for commercial banks which differs from loan demand, as increased interest rates cause investment to rise.

The estimation in this study followed a two-step procedure (Kashyap and Stein, 2000; Cetorelli and Goldberg, 2012), as follows:

$$\Delta In\ loan_{i,t} = \sum_{j=1}^{m} \alpha_{i,j}\, \Delta In\ loan_{i,t-j} + \beta_t X_{i,t} + \gamma_t Cintrols_{i,t-1} + \varepsilon_{i,t} \ldots \quad (1)$$

Where $\Delta\, ln\, loan_{i,t}$ was loan growth of bank i at time t. $X_{i,t-1}$ was the ratio of liquidity to total asset of bank i at time t-1. $Control_{i,t-1}$ were characteristics of bank i relating to loan at time t-1 such as deposit growth, capital to total asset ratio, and leverage ratio. $\varepsilon_{i,t}$ was time-varying error term at time t. $\varepsilon_{i,t-1}$ was also used as the bank characteristic to avoid the endogeneity problem created by loan growth at time t-1. The value of β_t would be different in each t.

The number of lags on $\Delta loan_{i,t}$ was determined by optimal auto-regressive distributed lag (ARDL) structure for panel data using m equal to 4. Estimating equation 1 using a cross-sectional model for each period yielded a series of β_t, representing sensitivity of each bank loan at different period t subject to changes in liquidity to total asset ratio. High value of β_t means that the ratio of loan to total asset is more sensitive to changes in ratio of liquidity to total assets, less the value of β_t.

Second step:

$$\beta_1 = \delta_0 + \sum_{j=1}^{n} \delta r_{t-j} + \sum_{j=1}^{n} \lambda UIP_{t-j} + nControls_{i,t} + u_t \quad (2)$$

Where r_{t-j} was a policy variable interest rate. Optimum lag of r_{t-j} was determined by using the Akaike information criterion (AIC). The present researchers followed Cetorelli and

Goldberg (2012)'s method in correcting the autocorrelation problem using the Newey-West variance estimator with six lags. The optimum lag of interest rates was four, while that of uncovered interest parity (UIP) deviation was two. $Controls_{i,t}$ represented macroeconomic control variables, including gross domestic product (GDP), inflation, and difference in long-term and short-term rates.

If the transmission mechanism of monetary policy on a bank-lending channel is effective, interest rates will theoretically and positively affect bank lending. In this case, the sum of coefficients of interest rates must be positive and significantly different from zero. That is, the bank loan is less sensitive to liquid asset to total asset ratio during a time of low interest rate or expansionary monetary policy, when commercial banks may adjust liquid assets through bank-lending channels to soften the impact of monetary policy shock, causing monetary policy to be less effective.

The UIP variable representing uncovered interest parity was introduced in this study to capture foreign factors hypothesized to significantly impact monetary policy of an SOE, such as Thailand. Commercial banks of Thailand operating in a dynamic financial world would engage in arbitrage in terms of differences between domestic and foreign interest rates of a dominant economy, such as the US. If a UIP is realized by investors and banks, the interest rate spread will not affect the borrowing cost of banks, as the interest rate difference will be covered by the movement in exchange rate. If a UIP is unrealized or there is UIP deviation, investors and banks may still earn revenue from differences in interest rates. Thus, UIP may be used to measure the influence of foreign factors upon bank lending behavior. Increased UIP deviation suggests that banks may earn more profits from overseas, resulting in liquidity that translates to less lending. Since UIP deviation may be caused by the result of investment decisions and response to monetary policy, UIP movement is proxied by instrumental variables, such as the Chicago Board Options Exchange (CBOE) Volatility Index (VIX), commonly referred to as the fear index or fear gauge, which is exogenous to the studied system.

Factors affecting bank-lending and the changing behavior

The second part of the present study investigated the impact of changing interest rates upon different variables by using Panel VAR. Data were separated into two subperiods, from 2001 to 2009 and from 2010 to 2019. Changing behavior of commercial banks was measured through impulse response functions. Results from the latter subperiod would explain the interrelationship between variables, compared to the former subperiod.

A reduced form of Panel VAR:

$$Y_t = A_t + \sum_{p=1}^{P} BY_{t-p} + \varepsilon_t \qquad (3)$$

A_t represented vectors of bank-heterogeneity, Y_t was a vector of endogenous variables containing loan growth, interest rate, debenture and loans, and investment in securities; p was maximum lag used in the model; ε_t was the vector of idiosyncratic errors.

Impulse Response Functions (IRF) was calculated using Cholesky

decomposition. Initially, policy interest rate shocks are transmitted through changes in bank lending. Changes in bank lending affect bank revenue, causing banks to adjust portfolios and turn to other ways to generate revenue to maintain revenue balance. Monetary policy shocks may cause decreased lending, leading to declining revenue. In such cases, banks must rely on riskier activities, such as investing in high risk securities. Variables with the most exogeneity enter this VAR model first.

Results

Monetary policy effectiveness through bank lending

Estimating equation 1 yields a series of β_t representing loan growth sensitivity to bank liquidity at different times. The value β_t of this data set may be seen in Figure 1.

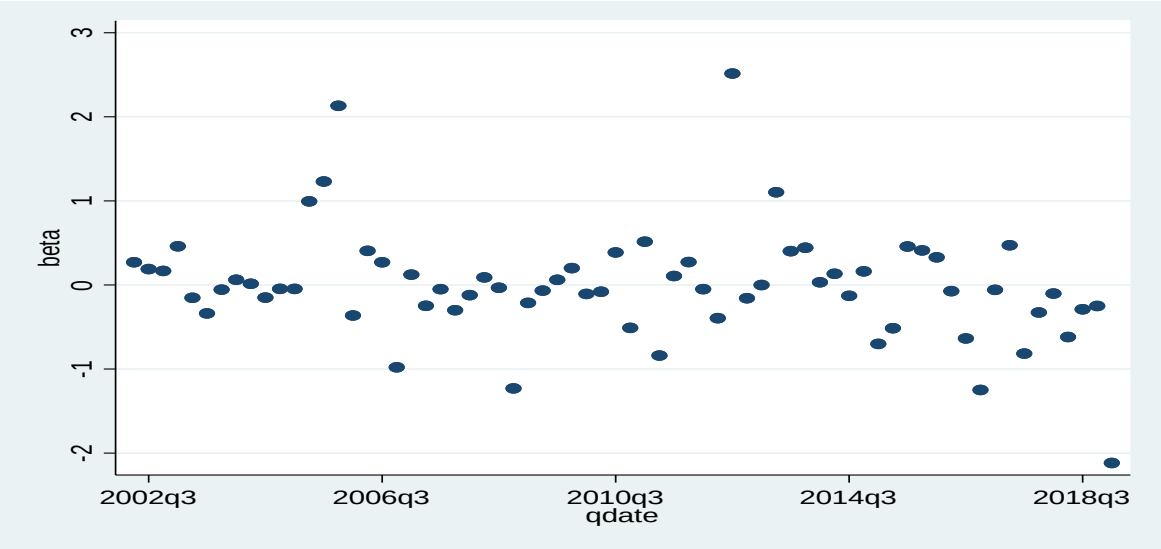


Figure 1 Value of β_t (used as of Equation 2).

Table 1 Bank-lending channels of Thailand from 2001 to 2019

Independent variables	β_t	
	Coefficient	P-value
Σ *Policy rate*	-.211983	0.106
Σ*UIP*	-.2215724	0.963
Yield spread	**.166639**	**0.096**
HHI index	-.089476	0.473
GDP Growth	6.899587	0.120
QE	**.8210226**	**0.077**
Cons	1.439355	0.455
R^2	0.1736	
Number of Observations	1349	

In Tabke 1, policy rate was proxied by market interest rate. QE equaled 1 during the QE policy of the US, = 0, otherwise.

Table 1 shows the results of equation 2, where interest rate was proxied by effective rate and the Bangkok Interbank Offered Rate (BIBOR). The sum of coefficients of policy rates was negative, but not significant, with a 10% level or a P-value < 0.10. The negative sum of coefficients means that when interest rates increase continuously and customers wish to borrow more, commercial banks tend to lend less, given a unit increase in liquid asset to total asset ratio. However, the sum of coefficients of interest rates was not significant, so the results could not explain lending behavior from 2001 to 2019 consistently with the bank lending theory which states that banks will lend more when given a unit increase in liquid asset to total asset ratio under low interest rates. The same could be said with the sum of UIP coefficients. Yield spread and quantitative easing policy (QE) were the only two significant variables. The statistically insignificant results of the sum of policy rate coefficients and the sum of UIP coefficients may be the result of changing behavior during economic downswings after 2010. To clarify bank lending behavior during different situations, the data were divided into two subperiods, Pre-US crisis, Q1 2001 to Q4 2009, and Post-US crisis, Q1 2010 to Q1 2019. Results are shown in Table 2.

Table 2 Lending channel in Thailand, precrisis and postcrisis

	Precrisis 2001-2009		**Postcrisis 2010-2019**	
	β_j		β_j	
	Coefficient	**P-value**	**Coefficient**	**P-value**
Σ *Policy rate*	**-.282128**	**0.065**	**.5017768**	**0.060**
Σ *UIP*	**.0053346**	**0.746**	**-.0289239**	**0.086**
Yield Spread	.13048	0.517	-.3548602	0.127
GDP Growth	11.417	0.371	4.127067	0.452
HHI index	**-.2733936**	**0.396**	**-.3654004**	**0.015**
Cons	4.205626	0.328	5.119127	0.033
R^2	0.2082		0.3419	
Number of Observations	665		684	

Table 2 shows the results of equation 2, which was regression of sensitivity (β) of bank lending on bank liquidity for policy interest rates proxied by effective rates. Results show the sum of the coefficient of lagged monetary

policy rate, sum of lagged UIP, yield spread, GDP growth, and the Herfindahl-Hirschman Index (HHI) for market concentration. The dummy variable QE was dropped because it had a value of 1 for the whole postcrisis period

The coefficient of policy rates during the precrisis period was negative (-0.282) and statistically significant, with a p-value of 0.065, as it was less than 0.10. Therefore, in normal situations, a rise in interest rate causes bank loans to be less sensitive to the ratio of liquid asset to total asset. That is, a one-unit rise in policy interest rate, on average, caused banks to lend less as the liquid asset to total asset ratio rises. The opposite was true for the postcrisis period. The coefficient of postcrisis policy rates was positive (0.502) and statistically significant, with a p-value of 0.060. Increasing interest rates caused banks to lend more. However, during the postcrisis period, interest rates were reduced to a low level. Therefore, during the postcrisis, banks lent less at every level of liquidity. Furthermore, the precrisis foreign factor UIP sum of coefficients was positive, but insignificant, at a p-value of 0.746. However, the postcrisis sum of UIP coefficients was negative at -.029 and significant, at a p-value of 0.060, so the foreign factor caused banks to lend less during the postcrisis. The sum of UIP with lags caused banks to lend less during times of low interest rates, suggesting that banks use liquidity on some profit opportunities rather than on lending. The precrisis HHI coefficient was negative and insignificant, while the postcrisis HHI coefficient was negative (-.365) and significant (p-value of .015), suggesting that more market concentration leading to less competition among banks will cause bank lending to be less sensitive to liquidity. This may significantly indicate that less competition causes banks to compete more on other means of profit raising rather than on lending.

Panel VAR model

The Panel VAR was used to investigate consistency of bank lending behavior during two subperiods, the precrisis and the postcrisis. The unit root test was performed on each subperiod to check the stationarity condition. Interest rate and loan growth were stationary at I(0), integration of order 0. Other variables were stationary at I (1). Optimum lag length was identified by using AIC at lag 2. The Granger causality test was then performed to determine causality direction of variables entering the Panel VAR model. After identifying significant variables, IRF was performed to ensure consistency of courses of interest rate change after prolonged low interest rates.

Granger causality test

To check consistency of response for each concerned variable, Granger causality tests were performed for both subperiods. Then IRFs were performed. Granger causality test results are shown in Table 3 and Table 4. IRFs were calculated using Cholesky decomposition and reported in graphs.

Table 3 Precrisis

Null Hypothesis:	F-Statistic	Probability
INTEREST does not Granger Cause LOAN GROWTH	1.75484	0.0938
INTEREST does not Granger Cause LIQUIDITY	4.06170	0.0002
INTEREST does not Granger Cause LEVERAGE	1.19762	0.3019
INTEREST does not Granger Cause DEPOSIT	2.51655	0.0148
INTEREST does not Granger Cause BOND	0.95201	0.4657
INTEREST does not Granger Cause INVESTMENT	1.31818	0.2389

Note: Significance level of 0.1.

Table 4 Postcrisis

Null Hypothesis:	F-Statistic	Probability
INTEREST does not Granger Cause LOAN GROWTH	2.97928	0.0516
INTEREST does not Granger Cause LIQUIDITY	0.06792	0.9343
INTEREST does not Granger Cause LEVERAGE	16.5789	1.E-07
INTEREST does not Granger Cause DEPOSIT	10.9874	2.E-05
INTEREST does not Granger Cause BOND	3.93886	0.0200
INTEREST does not Granger Cause INVESTMENT	2.88060	0.0569

Note: Significance level of 0.1.

Table 3 and Table 4 show the results of VAR Granger causality tests using Block Exogeneity Wald tests for Panel VAR during the precrisis and the postcrisis.

From the Granger test of the precrisis at a 10% significance level, change in interest rates caused changes in loan growth, liquidity, and deposits.

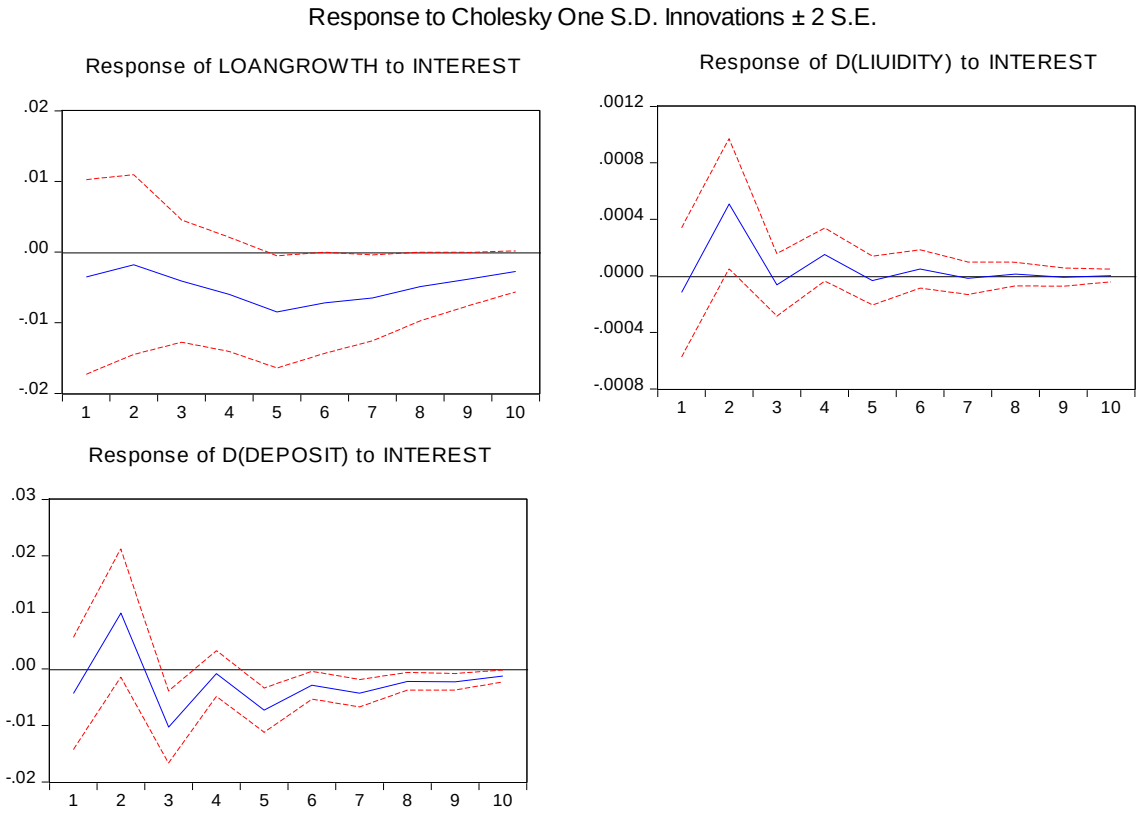
From the Granger test of the postcrisis, change in interest rate caused changes in loan growth, bonds (selling bank bonds), investments, liquidity, deposits, and leverage.

Comparing causality test results for both subperiods, during the precrisis, interest rates did not impact leverage, bonds, or investment. However, during the postcrisis, interest rates, only, did not impact liquidity. Results show the reverse in causality of bank lending to the increase in interest rate. Thus, banks changed lending behaviors during times of prolonged low interest rates. To ensure consistent responses, IRFs were calculated and shown in graphs. After that, the same analysis of causality tests and IRFs were repeated for different-sized banks, with only IRFs reported.

Impulse Response Functions (IRF)

This section reports the results of IRFs of response to one standard deviation (SD) of interest rate shock for each variable passing causality tests.

Panel A: Response to interest rate shock: Q1 of 2001 to Q4 of 2009

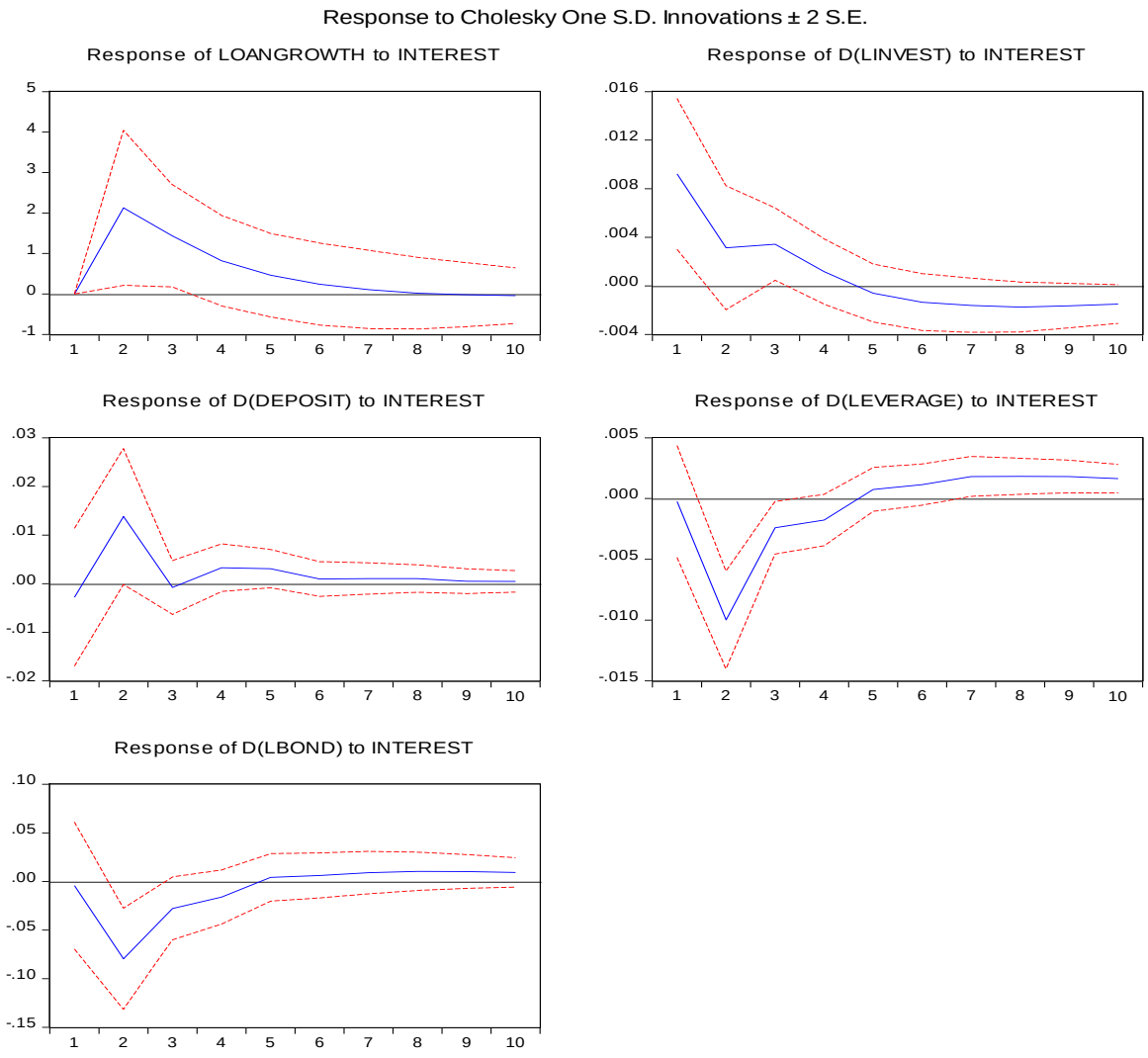


IRF graphs show that during the precrisis, an increase in interest rate causes deposits to rise, leading to an increase in liquidity. Banks use this liquidity to expand loans so that loan growth increases. Therefore, these results show consistencies with IRFs.

The same is true for Panel B, where IRFs for variables passing causality tests during postcrises were calculated and reported in graphs to ensure that responses were mutually consistent.

The results suggest that during the postcrisis periods, which are periods of prolonged low interest rates, interest rates decrease for most of the time. A unit drop in interest rate causes deposits to draw down, leading to a decrease in liquidity. With less bank liquidity, banks borrow money, causing leverage to increase. Banks then invest the borrowed money, and money from selling bonds, instigating a rise in investment. IRFs for postcrisis are again consistent with expected adjustments.

Panel B: Response to interest rate shock: Q1 of 2010 to Q1 of 2019

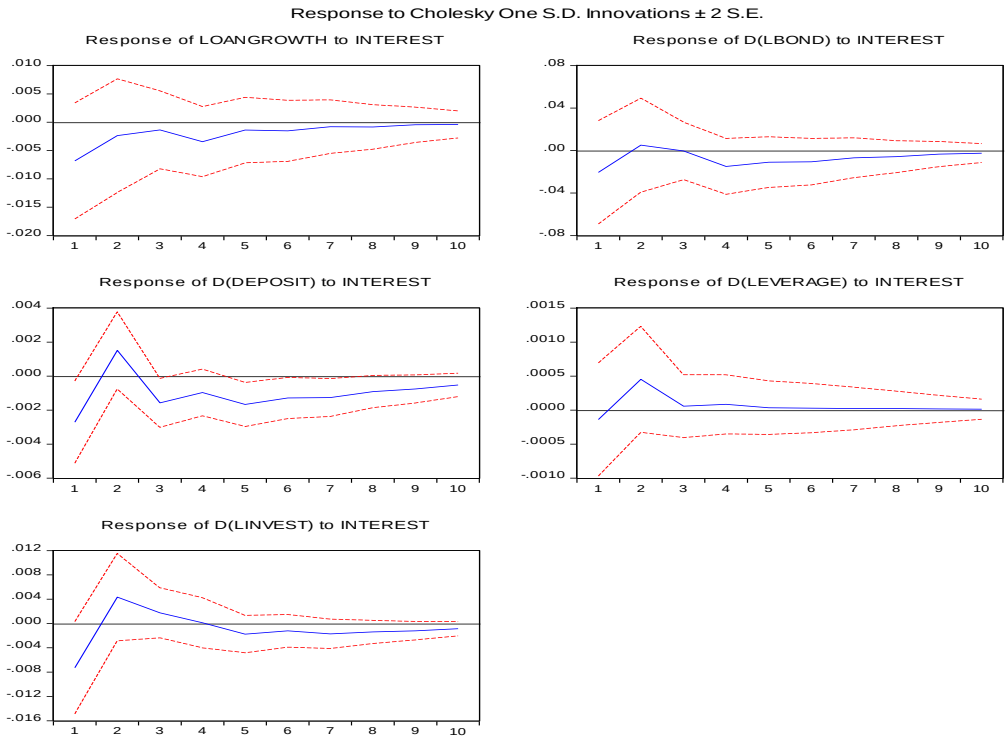


This section reports the IRF results for one-unit change in interest rate during the postcrisis to identify differences in bank lending behavior between large commercial banks and medium and small banks.

Panel C: Response to interest rate shock: Q1 of 2010 to Q1 of 2019 for two different sizes of banks:

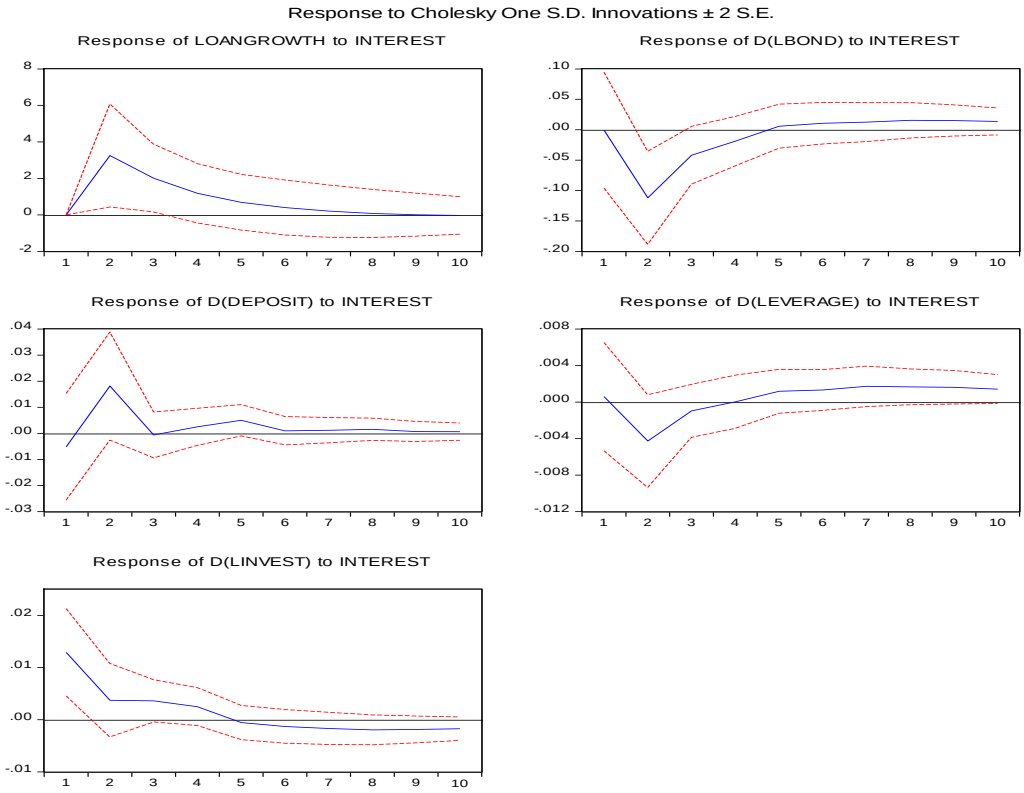
1. Large commercial banks

Figure 1 Response to Cholesky One S.D. Innovations±2S.E.



2. Medium-sized and small banks

Figure 2 Response to Cholesky One S.D. Innovations±2S.E.



During the precrisis, IRFs showed that interest rate shock caused loan growth increase from a low level, liquidity growth, and deposit growth at a 10% level of significance.

During the postcrisis with prolonged low interest rates, medium-sized and small banks had fewer deposits as depositors managed portfolios, so they raised funds by borrowing money and selling bonds for higher yield investments. Consequently, they might tend to take more risks than large banks. This result was consistent with that of Ananchotikul and Ratanavararak (2018), who studied lending risk of banks in Thailand, finding that medium-sized and small banks tended to take more risks during low interest rate periods.

Our results suggest that over the whole period, 2001-2019, bank lending did not respond to monetary policy. This unresponsiveness may be the offsetting outcome of changing bank behavior during the economic cycles. To have a clearer view, the study period was divided into the precrisis and the postcrisis periods. During the postcrisis period, when prolonged low interest rates had prevailed, monetary policy was less effective. This lack of effectiveness was caused by the bank lending channel being less sensitive to changes in interest rates during the postcrisis period. The lack of

sensitivity of bank lending to interest rates may result from nonperforming loan (NPL) controlling. If banks lent less money, then economic activities would grow less, making monetary policy less effective. To increase monetary policy effectiveness, at least marginally, during low interest eras, Thai monetary authorities may encourage non-banking sectors, such as savings unions and the Islamic Bank of Thailand to increase activity. Based on the HHI and IRFs of medium-sized and small banks, we may infer that medium-sized and small banks tend to take more risks. To promote financial stability, Thai monetary authorities should take note of risk-taking behavior of medium-sized and small banks. Expansionary fiscal policies may also be required to increase monetary policy efficiency.

Conclusions and policy implication

The present study examined monetary policy effectiveness from 2001 to 2019 by dividing the period of study into two subperiods, pre-US crisis and post-US crisis. A two-step procedure was employed to investigate the dynamic of bank lending behavior, while IRFs of Panel VAR were used to examine the dynamic impact of prolonged interest rates upon relevant variables.

Findings revealed that during times of low interest rates, Thai banks generally received fewer deposits, as depositors changed money deposits to other assets or saved less. Consequently, banks reduced loans, raising more funds through borrowing and selling bonds. They used these funds, in turn, to increase revenue through investment. However, these activities involved higher risk and diminished the effectiveness of expansionary monetary policy. The less effective easy money policy is, the more expansionary it must be to achieve targeted, short-term growth. The economy of Thailand appeared to be trapped in the loop. Prolonged low interest rates caused policy dilemmas.

To increase monetary policy effectiveness, Thai monetary authorities should encourage the non-banking sector and the Islamic Bank of Thailand to expand lending activities. Risk-taking behavior of medium-sized and small banks should be attentively evaluated during low interest rate periods. Certainly, some fiscal policy stimulants could increase monetary policy effectiveness.

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