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BEHAVIOR OF FUNDING AND LENDING PRICING OF INDONESIAN BANKS: EVIDENCE FROM AGGREGATE POST CRISIS DATA

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Abstract

The study aimed to reveal the behavior of lending and funding pricing (deposit interest rate and loan interest rate) of Indonesian banks after the great crisis in 1998. Specifically the research design aimed to uncover the form of interaction (state of equilibrium) and factors that might influence the state of equilibrium. We used a model developed by Niehans (1978) and De Grauwe (1982) as a point of departure to address the research problem. There were 12 variables used in a simultanous equation econometric model that would be estimated by using 4 different techniques namely GMM TS, GMM CS, 3SLS and SUR. Two variables namely price of deposit and price of loan were treated as endogenous. We also considered the impact of deposit insurance adoption that was took place in September 2005.The empirical findings showed that the slopes of DD and LL equation were largely consistent with the hypotheses. The parameters were positive and statistically significant. However the numerical value of LL slope that was greater than the other one and comparable to DD slope had raised a concern for the stability attainment. The most important variables (based on their magnitude and statistical significance) found to affect the constellation were business prospect, system size, exchange rate, operational cost and profitability. In the second tier of importance, we found that monetary policy instruments (policy rate differential and base money supply), quality of loan, capital and total liquidity affected the system in various degrees.

Keywords*: deposit interest rate, Indonesia Deposit Insurance Corporation, loan interest rate*

Bank is a business entity that deals mainly in taking deposits that are liquid and convertible on demand and transforming them into medium / long term loans (Mathews & Thompson, 2005). By so doing banks take risks most notably from maturity mismatch and asset quality degradation and earn interest spread in return to cover operational expense and profit margin.

In many countries banking is a major part of financial system that help allocate financial resources from surplus unit to deficit unit efficiently. In this regard banking plays a vital role in financ-

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ing the most profitable and the (hopefully) most needed productive opportunities in the economy. Certainly many factors could affect the performance of banking and sometimes they might deviate banks from attaining optimal goal from the social perspective.

Banking Industry in Indonesia is quite an old industry. It has important role in helping firms to finance their business activity. Role of banking especially pronounced since 1987 due to deregulation that substantially altered the landscape and mode of conduct. October 1987 deregulation (famously known as Pakto) has greatly eased opening and operating bank business requirements by removing interest rate cap and licencing obstacles.

Asian crisis in 1998 is another turning point for banking industry. The crisis revealed fundamental weakness in the system and as a result many banks had to be bailed out by the state. Government took over more than 60% banks of the system whose cost reached more than Rp. 600 Trillion (USD 67 Billions). Impact to the economy was a catastrophe with 13% annual decline in growth and total loss ratio to GDP estimated to be 60% (Caprio & Kliengebiel, 2008).

This disaster changed the authority poin of view and the new millenium marked reregulation perspective. Realizing the grim consequences of the loss, Bank Indonesia dramatically tightened the approach in supervising banking industry. New licences had beed stopped and regulator attempted to right sizing the industry through merger and acquisition.

Having been recapitalized by the state, banking industry in the early 2000's was largely in conservative mode. Most banks opted to place their money in safe haven assets such as placement in central banks and state recap bonds. Nevertheless this behavior have been significantly altered in last couple of years.

Continuing improvement in the country economic and political stability as well as brightening business outlook have increased banks risk appetite and confidence. Excluding global crisis in 2008, loan growth hovered around 20%-30%. Steady inflow of deposit funding (at around 15%-20% pace) has further supported the practices.

In light of these development, we see the importance and value of scientific endeavour of understanding of funding and lending behavior of post crisis Indonesian banks. More specifically we like to have further understanding on the behavior of lending and funding pricing (deposit interest rate and loan interest rate): the form of interaction (state of equilibrium) and factors that might alter the interaction. By designing a proper research design we hope to be able to address the following research questions: (1) how the funding and lending activities interact? Is there an equilibrium that could be reach? (2) What factors could influence the interaction? (3) Could existing literature explain the behavior? What is the best explanation? (4) What are the relevant and important findings from the study and what are the policy implications?

The study would have a greater marginal benefit considering that the topic is not sufficiently explored especially in the context of emerging market. Despite its simple and straightforward nature, we surprisingly are not able to collect substantial amount of materials.

With these in mind, we embark with the study. Gathering and studying the necessary literature, collecting data, designing best empirical scheme, reviewing and analyzing results and finally concluding the available findings.

There are various theoretical explanation for deposit mobilization and lending behavior of banks, see Mathews & Thompson (2005) and Freixas and Rochet (2008) for excellent review. In this study we use a model developed by Niehans (1978) and De Grauwe (1982). They are largely Monti Klein model, common used in industrial organization approach on banking behavior.

We make use a dataset composed from monthly banking industry aggregates from January 2003 to October 2011 (106 observations). Special treatment in empirical design is utilized to accommodate the operation of Indonesia Deposit Insurance Corporation (IDIC). Literature shows that bank and depositors behavior might be significantly influenced by the existance of explicit insurance scheme such as this.

The outline of exposition would go as follows: the first part conveys the introduction and motive of the study. The theoretical background and employed model would be put forward in the second part. Section three gives a brief review on existing scientifical works on the field. Part four describes the methodological approach in the study that subsequently be followed by analysis on the findings. The impact of IDIC implementation would be treated in a separate section: part six. The study would be closed by conclusion that highlight major findings and policy implications.

Asset Liability Management

There are various theoretical way to approach behavior of bank funding and lending. The basic approach usually found in intermediate macro economic (see for example Mishkin, 2008) is the money multiplier model. Here banks and their customers are treated as passive agents with predictable and rigid behavior. Having known certain characteristics like ratio of reserve to deposit, ratio of currency holding to deposits, ratio of checking account to loan, etc, one could project the outcome of expansion of a particular amount of monetary base.

A somewhat more advanced model is done by treating banks and their customer as competitive agents. Profit maximization on price taking behavior yields the well known preposition that dictates both deposits and loans expansion. Banks would produce deposits and loans to the point where marginal revenue equals to marginal cost. The marginal revenue is proxied by intermediation margin (spread between interest revenue and interest expense) and marginal cost is proxied by operating expenses and the cost in using interbank money market.

Modern approach in modeling funding and lending behavior utilizes micro economic approach. Early model perceived a bank as an agent in monopoly setting (see for example: Monti, 1971 and Klein, 1972). This approach later evolved into more competitive behavior with various oligopoly setting that designed to address particular question. Prisman et al. (1986) for example modeled a cournot duopoly in an attempt to examine liquidity management behavior. Santomero (1984) and Freixas & Rochet (2008) are excellent documentations on various model of bank behavior based on micro theoritic approach.

The model we employ here is based on the work of Niehans (1978) and De Grauwe (1982). We will follow closely the treatment in those works. The starting point is recognizing the (simplified) bank balance sheet equation and its objective function as follows

Banks Balance Sheet

$$L + R + P = D \qquad (1)$$

Where L is loans, R is reserve, P is placement in interbank money market and D is deposits taken from public. Note P in equation 1 is placed on the left hand side of the equation if it is assumed to be positive, on the contrary should it be negative we could consider it as part of liabilities (right hand side of the equation).

Banks Objective Function

$$\pi = r_L L + r_P P - r_D D\ C(D,L) \qquad (2)$$

Where r_L is the yield on loan assets, r_P is the yield (and also interest cost) of money market placement, r_D is interest cost of deposits and C(.)

is composite cost function of producing loan and deposits.

Next we assume the behavioral equation of (banks) deposit supply as a positive function of intermediation margin or

$$D^s = h(r_L - r_D); \quad h'(.) > 0 \qquad (3)$$

Substituting 3 to 1, we will obtain the loan supply (implicit) function in the form of

$$L^s = g(r_L - r_D, k, r_P);$$
$$g'_1(.) > 0, g'_2(.) < 0, g'_3(.) < 0 \qquad (4)$$

Where k is the reserve ratio and r_p is the interbank money market rate.

The demand for deposits and loans could be given as follows

$$D^d = D(r_D, X); \quad D'(.) > 0 \qquad (5)$$
$$L^d = L(r_L, Z); \quad L'(.) < 0 \qquad (6)$$

Where X and Z are vector of exogenous variables that might influence deposits and loan taking in the part of customers.

We could combine equation 3 to 6 into equilibrium condition of loan and deposits as follows

$$D(r_D, X) = h(r_L - r_D) \qquad (7)$$

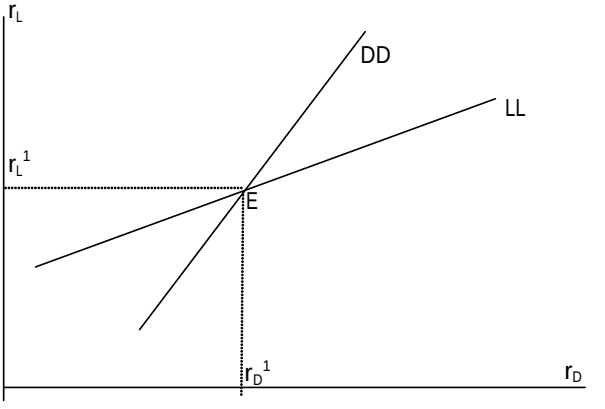
$$L(r_L, Z) = g(r_L - r_D, k, r_P) \qquad (8)$$

We could then make several comparative statics exercises with condition 7 and 8. Two of the most important are the stability of funding and lending condition which are obtained through total differentiation of 7 and 8.

$$\left.\frac{\partial r_L}{\partial r_D}\right|_{LL} = \left(\frac{g'_1}{g'_1 - L_r}\right) < 1 \qquad (9)$$

$$\left.\frac{\partial r_L}{\partial r_D}\right|_{DD} = \left(\frac{D_r + h'}{h'}\right) > 1 \qquad (10)$$

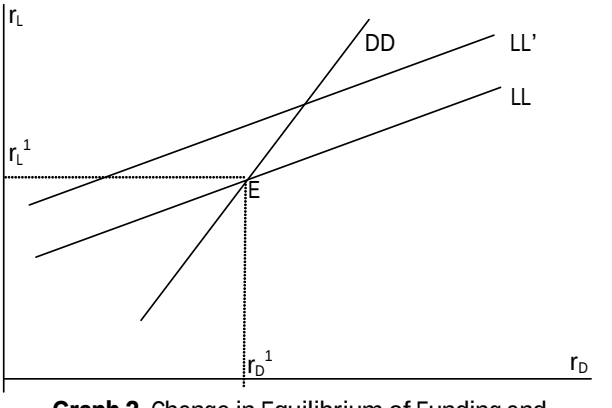
Graphically the condition of 9 and 10 could be depicted in graph 1. Both lines are postively sloped with DD equation is larger than LL. Equilibrium in both funding and lending are obtained when both lines are intersected in point E with $r_L = r_L^1$ and $r_D = r_D^1$.



Graph 1. Equilibrium of Funding and Lending

We could obtain other variabels theoretical conjecture as follows.

$$\frac{\partial r_L}{\partial k} = \left(\frac{-g'_2}{g'_1 - L_r}\right) > 0; \quad \frac{\partial r_L}{\partial Z} = \left(\frac{L_z}{g'_1 - L_r}\right) < \text{or} > 0$$
$$\frac{\partial r_L}{\partial r_p} = \left(\frac{-g'_3}{g'_1 - L_r}\right) > 0; \quad \frac{\partial r_D}{\partial X} = \left(\frac{D_X}{h'}\right) < \text{or} > 0$$



Graph 2. Change in Equilibrium of Funding and Lending due to Reserve Requirement

The above quantitative projection could be given qualitative intrepretation. For example a rise in required reserve (perhaps imposed by the central bank) would raise loan interest rate. A rise in reserve ratio would shift the LL schedule above (to LL') since it is now costlier for banks to channel loan for every given deposit rate.

The traditional approach to view the role of banking for the economy is through its impact on central bank monetary channel. One of the most influential channel by which central bank policy affects aggregate economy activity is through commercial bank intermediation.

Commercial banks do business by taking deposits from the public and subsequently lending them and receive interest spread as a return (Freixas & Rochet, 2008). This so called intermediation activity would create money and by do so influence the available financing and thus business activity (output and price). In this traditional model, a bank is regarded as a passive entity that pass through the money initially created in the system (by the central bank). The behavior is assumed to be stable hence the central bank could calculate with reasonable accuracy the impact of its monetary policy.

Money is treated as "goods" that would provide better ease and comfort in doing transaction compared to ordinary goods (Walsh, 2010). Although various assumptions and specifications could be developed to meet the purpose at hand, researchers typically interested in the relationship of money creation with aggregate output and interest. We will convey several influential and most updated works on this.

Recent development has put more emphasized in the role of intermediation activity. This so called credit view (Walsh, 2010) highlight the importance of lending activity in determining monetary policy efficacy. Various imperfections in credit market could significantly alter the monetary policy process. These imperfections stem from adverse selection (Jaffe & Russel, 1976), Moral Hazard (Stiglitz & Weiss, 1981), Monitoring Cost (Williamson, 1987) and Agency Cost (Bernanke & Gertler, 1989). These imperfections could result in failure of supply to meet the demand, *credit rationing*. Furthermore interest rate (the price of credit) could not be expected to remedy the problem.

The above market imperfections are especially important in banking, called bank lending channel (Walsh, 2010). Given the dominant role in the economy financing, business would find it difficult to search for alternatives in times of sudden dried up of lending. It is not surprising then that disruption to banking lending ability would adversely affect real sector.

Despite the strong logic of credit view arguements, researchers fail to find strong evidence of bank lending channel. King (1986) found that monetary aggregates were better predictors of future output than were bank loans. Different approach used by Kashyap et al. (1993) is trying to differentiate bank lending channel from others. They find that the financing mix shifts away from bank loans after a monetary tightening move by the central bank.

A more distinct and gaining popularity research approach of bank behavior is industrial organization approach. Here the bank is modeled as a profit maximizing firm with deposits and money market as one of the input (in addition to the standard capital and labor) and credit is the main output. One of the original work with this approach is The Monti (1972)-Klein(1971) Model.

This initial work has been expanded to various direction, according to purpose at hand. Niehans (1978) and De Grauwe (1982) developed the model as to explain the joint behavior of deposit and lending interest. Santomero (1984) gives an excellent survey on early work of banking behavior model. Mathews & Thompson (2005) and Freixas & Rochet (2008) summarize the more mod-

ern development include among others: oligopoly and various institutional set up.

Empirical research using the industrial organization approach mostly aims to explain the impact of an exogenous shock to the behavior of production ie banks output (deposit and credit) and price (interest rate). Neumark & Sharpe (1992) show that response of deposit rates are asymetric, they adjust faster when they are low and slower when they are high. Berger et al. (2004) and Degryse & Ongena (2005) use the model to focus on the impact of competition on price dynamics.

One of the closest recent work to ours is Kashyap et al. (2002). Drawing from the work of Diamond & Dybvig (1983), they model banking business as liquidity provider hence attempt to show the co existance of lending and deposit taking in the bank. The logical flow follows like this: bank is in a business of liquidity provision to its clients. To meet this end, it could use outside finance (money market) or pursue more stable funding through selling deposits. In the presence of market imperfection namely (1) volatile external finance cost and (2) high cost of maintaining buffer stock, it can be shown that there exist an optimal mix of market versus deposit funding that depends to various factors.

They attempt to verify the theorem using firm level quarterly data from 9262 banks during period of 1992:1 to 1996:4. They run two OLS regressions using ratio of liquid assets (cash + securities) to total assets (called LIQRAT) and ratio of securities to total assets (called SECRAT). The ratio of transacting deposits to total deposits (called DEPRAT) is used as an independent variable along with various controlling variables. They found a positive and statistically significant estimate that in line with the hypotheses.

The price of deposit paid by banks also could be explained by market discipline mechanism. This approach assumes that the public exerts influence over banks behavior through market: deposits, stocks and other claims. Investors and depositors would avoid and/or reduce exposure to banks considered ill managed (too risky). These banks would find itself hard to fund its business. This principle is logically sound and indeed Bank for International Settlement (BIS) has put forward the idea as one of the three pillars of ideal banking system (BASEL II) in additon to capital adequacy and regulatory supervision. Interested readers could further consult Landskroner & Paroush (2008) and Stephanou (2010) on theoretical details.

Deposit insurance is a scheme to restore and preserve the confidence of the public to the banking system. By establishing formal guarantee of deposits repayment, authorities hope that the pervasive problem of bank run could be contained. Though the first scheme was introduced in 1934 in United States, deposit insurance gains popularity following the decade of crisis in 1990's. During 1995-2003, countried adopted explicit deposit insurance have increased by 80%, from 49 to 87 (Demirguc-Kunt et al., 2008).

The stabilizing banking system argument of deposit protection implementation is still hotly debatable. The existance of deposit insurance would reduce early withdrawal as foreseen by Diamond & Dybvig (1983) since there is no need to be the first in line. On the other hand, a comprehensive empirical investigation by Demirguc-Kunt & Detragiache (2002) showed that the implementation increases the likelihood of crisis when the institutional set up is weak and deposit protection scope is extensive.

Our research is different with the previous works in several ways: (1) the study is an attempt to revisit a somewhat old model but we think have powerful insights and implications that still under explored. We put more emphasis on empirical work hence highlight the practical aspect of this simple theoretical model. (2) Rather studying the firm

data, we use aggregated (banking system) data. In line with Monti-Klein spirit, we hope the micro behavior of banks would be depicted finely in the aggregated view. In so doing we hope for more useful and policy relevant insights. (3) The study accounts for the impact of deposit protection mechanism. As mentioned by studies cited before, this mechanism could potentially affect market discipline unfavorably. (4) Data set up is Indonesian banking, one of the largest developing countries. Studies on banking behavior in developing countries are still relatively rare. Therefore we hope it would result in more marginal scientifical benefit.

METHOD

To verify the conjecture put forth by the above theoretical model, we employ simultanous econometric modeling. Simultanous econometric modeling is suitable to deal with variables that have contemporanous and two way causation (Heij et al, 2005). In this regard, relationship among variables is specified in a structural manner involving several equations. Several estimation technique could then be applied, among other General Methods of Moments (GMM), Seemingly Unrelated Regression (SUR) and Three Stage Least Squares (3SLS).

Appriorily we are not favoring any of the technique. We more concern on the results consistency with different technique provided they pass the endogeneity test. To this end, we are estimating the simultanous specification with various technique and highlight whether there is a consistency with the result.

The estimated econometric model could be proposed as follows

$$r_L = \alpha_0 + \alpha_1 r_D + \alpha_2 X_{RB} + \alpha_3 X_M + v_L$$
$$r_D = \beta_0 + \beta_1 r_L + \beta_2 X_{RB} + \beta_3 X_M + v_D$$

Where
r_D = proxy of deposit price
r_L = proxy of loan price
X_{RB} = vector of banks risk and business activities
X_M = vector of macro economic variables
v_L and v_D are idiosyncratic error that are assumed to be not correlated to each other.

We employ a monthly dataset of banking and economic aggregates from period of January 2003 to October 2011 (106 observations). The data was obtained from Bank Indonesia and CEIC data feeder. The study involves 12 variabels/instruments in which 2 variabels are assumed to be endogenous. We also utilize instruments constructed from lagged values of existing variables where deemed to be necessary.

We also test whether the implementation of IDIC has possibly altered banks behavior. To this end we use IDIC as a dummy variable which has value of zero for time periode before the operational of IDIC (September 2005) and one after that. Specification for the D_IDIC includes as both a one off effect (event marker) and interaction terms. We interact the D_IDIC with endogenous variables: r_L and r_D.

Some variables like depo, loan, assets, gdpn and m0 are converted to log form for standard empirical reasons: reducing for possibility of heterocedasticity and outlier and elasticity intrepretation.

Not all variables affect the equilibrium rate of loan and deposit (entering in each of DD and LL). Several variabels are most deemed to be relevant in Deposit Equilibrium Equation (DD) while the others perhaps could be thought best explain the Loan Equilibrium Equation (LL). In this regard we classify the exogenous variables in the Table 1 into DD and LL variables (also with the expected algebraic sign) as follows.

Table 1. List of Variables and Instruments

Variables/Instruments	Description, Proxy and Notation
Endogenous variables	
Price of Deposits	Realization proxy: the ratio of interest rate expense to third party funding, also widely known as Implied Cost of Fund. Notation: **ICOF**
Price of Loans	Realization proxy: the ratio of interest rate revenue to total loans (implied loan rate). Notation: **L_yield**
Bank Risks and Business Activities Variables	
Capital	Capital owned by banks which is proxied by capital adequacy ratio: CAR (in percentage). Notation:**CAR**
Quality of Loan	Ratio of non performing loan (gross) to total loan. Notation: **NPL**
Total liquidity	Ratio of total banking loan to deposit in particular periode. Notation: **LDR**
System Size	Value of total asset in billion Rupiah. Notation: **Asset**.
Operational Efficiency	Ratio of non interest expense to total asset, measuring how much is the cost to maintain Rp. 1 Assets. Notation: **Ast_Cost**
Profitability	Ratio of net interest revenue: interest revenue minus interest cost to earning assets (net interest margin). Notation: **NIM**
Macro Economic Variables	
Business Activity	National output measured by gross domestic product at current price. Notation: **GDP_NL**
Level of Exchange Rate	The value of national currency (Rupiah) as measured by amount of rupiah per USD. Notation: **IDR_I**.
Base money supply	Amount of base money supply (currency in circulation plus banks reserve) in Billion Rupiah. Notation: **M0_I**
Interest rate differential: Domestic Policy rate - Foreign Policy Rate	Difference of Benchmark rate set by BI and The Fed as monetary instrument. Notation: **R_ID - R_US**

Table 2. Classification of Explanatory Variables and Expected Sign

Variables	Classification	Expected Sign (for equilibrium r_L and/or r_D)
Capital	LL	Negative
Quality of Loan	LL	Positive
Total liquidity	Both.	Positive
System Size	DD	Negative
Operational Efficiency	DD	Positive
Profitability	LL	Positive
Business Activity	Both	Positive
Level of Exchange Rate	LL	Positive
Base money supply	DD	Negative
Interest rate differential	DD	Positive

The model satisfy the order condition for identification (in fact the model is overidentified). The DD equation has one right hand side endogenous variable (l_yield or r_cred) while it has 4 excluded exogenous variables namely capital, quality of loan, profitability and level of exchange rate. The LL equation also has one right hand side endogenous variable (icof or r_dep) while it has 5 excluded exogenous variables namely system size, operational efficiency, base money supply, domestic and foreign policy rate.

Most of the algebraic expected sign hypothesized above derived from logic and common sense. The impact of capital is well recognized to the lending process. Higher capitalized banks tend to be more aggressive in making loan and to achieve that they more willing to offer lower rate.

The same could be said for the impact of loan quality, profitability and level of exchange rate. They are maintaining sufficient risk appetite necessary for expanding loan.

On the other hand assets and operational efficiency could be related to ease of conducting intermediation. Larger assets and more efficiency should support public confidence to store money in the banks, thus decrease their required return. In light of this, we view the increase in asset and efficiency as more favorably affect the deposit market (DD equation).

Total liquidity (as measured by LDR) and business activity affect both LL and DD. Higher LDR means smaller liquidity available in the system. Thus banks would compete more fiercely for the available funds (hence affect the DD equation). Furthermore facing tighter liquidity, it is customarily for banks to also reduce the credit expansion. They don't want to get caught in an adverse liquidity gap that could be detrimental for their profitability. The impact of business activity could be inferred from Macro Economics Theory of aggregate demand and supply. Higher business activity would reduce the real balance of money stock hence would increase its price (interest rate).

Other macro economics variables also use the same logic. A rise in base money would depress interbank rate that could ease banks funding need from the public. The same logic though somewhat reversed applies to domestic interest rate (central bank rate). Exchange rate impact assume to impact more adversely in loan producing process. Higher exchange rate (depreciation) is considered as an increase in business uncertainty hence act as an inhibitation for banks risk appetite. Foreign interest rate could affect negatively to deposit market since consumers now would probably prefer to invest overseas.

Since we are estimating a simultanous equation econometric model, we have to employ instruments. We use several instruments based on logic and theoretical reasons. The validity of instruments are tested using J Statistics (Hausman, 1978) that verify the correlation degree between instruments and residuals. The list of instruments are car(-1) nim ast_cost (r_id-r_us) ldr(-1) idr_l gdp_nl npl(-1) m0_l.

RESULT

In this part we will first present the descriptive statistics to inform the reader on the statistics profile of variables used in the study. We will convey the result of the estimation and notes on the econometrics works in the next sub section. Inference and analysis on empirical findings would be delivered in three separated parts. We will focus in the relationship of funding and lending first. The impact of banking aggregates on this relationship would be highlighted in the subsequent part. We will complete the discussion with the review on influence of macro variables: business activity and risk appetite.

Descriptive Statistics

Table 1 reports basic statistical properties of variables used in the study. Most of the variables have been converted to percentage, hence comparable to each other and makes intrepretation of further process result easier. Though there are several variabels that have quite distance value (maximum-minimum), we think that there is no outlier in the data.

We should take a note that the study cover a period in which the banking system undergoing a structural and positive trend in behavior. After the 1998 crisis, many major banks were heavily recapitalized. As a result state bond is dominant in many banks book and risk appetite is severely curtailed. This is a relevant situation between 2003-2006 period. As memory of crisis faded and pushed by more agressive profit seeking motive, banks expanded the lending substantially in later

period (2006-2011). We control this factor through nominal output, that accounts for better prospect through both higher growth and inflation.

Data coverage also includes few depressed periods namely: July-Des 2005 and Aug 2008-March 2009. The first period is triggered by fuel price hike and funds massive withdrawal and the second is triggered by global crisis. We view that in both periods though the economic and banking situation is depressed however it is not extreme hence no further treatment is necessary.

Estimation Results and Notes

As stated above we will run the regression using two proxies for each variables: price of credit and price of deposit, namely realization based (implied cost of fund:ICOF and loan yield: l_yield) and announcement (counter rate deposits: r_dep and published loan rate: r_cred). For robustness check we employ 4 methods of estimation for each regression: GMM Time Series (GMM TS), GMM Cross Section (GMM CS), SUR and 3 SLS.

Table 2 reports the estimation result scheme not account for IDIC implementation.

We find that the slope of DD and LL equation = $\partial r_L / \partial r_D$ are positive as expected and highly significant. These findings are consistent regardless estimators used, indicating their robustness. We also find

Table 3. Descriptive Statistics (I)

Sample: 2003M01 2011M10								
	R_DEPO	**R_CRED**	**ICOF**	**L_YIELD**	**CAR**	**NPL**	**LDR**	**ASSETL**
Mean	5.690434	15.01292	6.350486	20.50207	19.73116	5.223741	66.28880	14.39741
Median	4.952547	14.82150	5.707657	19.13618	19.60000	4.945000	63.62028	14.37269
Maximum	10.77409	18.74200	11.06161	36.37974	25.30000	8.420000	87.17913	15.04149
Minimum	4.061194	12.84700	4.415728	14.01400	16.44000	2.562003	43.63566	13.89316
Std. Dev.	1.568229	1.434917	1.635777	5.225360	2.189484	1.893716	11.57430	0.344473
Skewness	1.400612	0.715112	1.263157	1.061351	0.268093	0.219161	-0.136560	0.155448
Kurtosis	4.356727	3.061451	3.552830	3.569534	2.020199	1.593644	1.996711	1.756323
Jarque-Bera	42.78676	9.051143	29.53815	21.33352	5.509814	9.584006	4.775229	7.258300
Probability	0.000000	0.010829	0.000000	0.000023	0.063615	0.008296	0.091849	0.026539
Sum	603.1860	1591.369	673.1515	2173.220	2091.503	553.7166	7026.613	1526.126
Sum Sq. Dev.	258.2310	216.1937	280.9553	2866.960	503.3531	376.5468	14066.26	12.45945
Observations	106	106	106	106	106	106	106	106

Table 4. Descriptive Statistics (II)

	AST_COST	**OCOI**	**NIM**	**ROA**	**GDP_NL**	**IDR_L**	**M0_L**	**R_ID**	**R_US**
Mean	0.072972	88.71371	5.603679	2.714203	11.96192	9.134299	12.48996	8.970561	2.077830
Median	0.065322	87.58326	5.730000	2.705000	11.97323	9.121673	12.57962	8.156940	1.250000
Maximum	0.175656	123.2600	6.400000	3.520000	12.52488	9.422221	13.34621	14.59615	5.250000
Minimum	0.046609	75.20000	4.200000	1.270000	11.39180	9.020994	11.60988	6.098000	0.250000
Std. Dev.	0.022983	6.527612	0.435230	0.362332	0.341476	0.074922	0.446236	2.225587	1.877613
Skewness	2.281505	2.413370	-1.979075	-0.557715	-0.142304	1.588196	-0.293939	0.995180	0.619357
Kurtosis	8.244167	12.76967	6.220536	4.454142	1.718700	6.203250	2.299171	2.878329	1.840873
Jarque-Bera	213.4237	524.4517	115.0047	14.83432	7.536953	89.88036	3.695702	17.39648	12.71111
Probability	0.000000	0.000000	0.000000	0.000601	0.023087	0.000000	0.157575	0.000167	0.001737
Sum	7.735023	9403.653	593.9900	287.7056	1256.002	968.2357	1323.936	941.9089	220.2500
Sum Sq. Dev.	0.055461	4474.021	19.88967	13.78490	12.12703	0.589391	20.90826	515.1367	370.1704
Observations	106	106	106	106	105	106	106	105	106

that the slope of DD is greater than 1 (between 1.99 to 2.27) and also greater than LL in line with the theoretical conjecture. However the slope LL equation also greater than one (between 1.27 to 1.74).

The model is quite well specified. The J statistics that evaluate overidentifying restrictions: instruments do not correlate with the model residuals lays in the accepting area. From Table 2 we could see, for example, the residual determinant covariance of model of DD equation estimated by GMM TS is 0.0682 while using GMM CS it is 0.0725. These correspond with p value of 0.0817 and 0.239 respectively, that is the null hypotheses of no correlation could not be rejected.

Table 3 and 4 reports the estimation result using scheme that considers the impact of IDIC implementation. The algebraic signs are the same however the magnitudes are somewhat smaller for DD equation and somewhat greater for LL equation. Nevertheless the IDIC interaction terms have taken place the difference.

The l_yield parameters (in DD equation) take values of 0.329 to 0.394 in which the interaction terms take values of 0.130 to 0.199. The icof parameters on the other hand take values of 2.345 to 3.049 in which the interaction terms take values of -0.550 to -0.232. The scheme has separated the magnitude of responses to IDIC implementation quite well.

Nevertheless the reliability of instruments are falling under the scheme that accounts for IDIC implementation. The p values of J statistics are decreasing from 0.816 to 0.053 (GMM TS estimator) and 0.239 to 0.058 (GMM CS estimator) respectively. Therefore we have to be cautious in intrepreting the result from the latter scheme.

Table 5. Estimation Result Initial Scheme

Variables	Coefficients (p value in parenthenses)							
	GMM TS		GMM CS		3SLS		SUR	
	Coeff.	P value	Coeff.	P value	Coeff.	P value	Coeff.	P value
DD Equation (dep var: icof)								
Constant	-18.23041	0.0017	-21.94286	0.0000	-27.18896	0.0000	-31.05126	0.0000
L_Yield	0.433651	0.0000	0.455120	0.0000	0.472584	0.0000	0.473322	0.0000
Asset_I	-5.743315	0.0001	-5.619841	0.0000	-3.833590	0.0003	-2.336807	0.0010
Ast_cost	-2.921855	0.2294	-4.378354	0.0129	-4.495567	0.0085	-1.834276	0.2053
LDR	-0.000937	0.9592	0.001484	0.9064	0.015592	0.2989	0.020220	0.0464
R_ID-R_US	0.090349	0.0000	0.092812	0.0000	0.089631	0.0000	0.087991	0.0000
GDP_NL	7.270512	0.0000	7.389060	0.0000	5.701043	0.0000	4.739474	0.0000
M0_I	0.882762	0.1295	0.882075	0.0348	0.760498	0.0677	0.225315	0.5662
LL Equation (dep var: l_yield)								
Constant	129.6049	0.0000	130.1895	0.0000	109.4157	0.0000	100.8397	0.0000
ICOF	2.685878	0.0000	2.741017	0.0000	2.665225	0.0000	1.888670	0.0000
NIM	0.954610	0.5033	1.351594	0.1954	1.393882	0.0553	-0.169029	0.4077
CAR	0.047654	0.7429	0.002450	0.9837	0.038061	0.7063	0.242789	0.0000
NPL	-0.640680	0.0574	-0.732874	0.0018	-0.646645	0.0003	-0.230072	0.0000
IDR_I	-5.827032	0.0000	-5.331609	0.0000	-3.136980	0.0052	-3.765920	0.0000
LDR	-0.047761	0.1072	-0.060280	0.0137	-0.066229	0.0379	-0.075719	0.0000
GDP_NL	-6.080666	0.0005	-6.536012	0.0000	-6.516396	0.0000	-4.642534	0.0000
Goodness Fit								
Det. Residual Cov.	0.068223		0.072568		0.047378		0.015205	
J Statistics	0.081661		0.239145					

Table 6. Correlations Statistic (I)

Variables	R_DEPO	R_CRED	ICOF	L_YIELD	CAR	NPL	LDR	ASSETL	AST_COST
R_DEPO	1.000000	0.908628	0.877369	0.768476	0.536829	0.710467	-0.595718	-0.535428	-0.074203
R_CRED	0.908628	1.000000	0.912371	0.912072	0.687007	0.788951	-0.787592	-0.726384	-0.041022
ICOF	0.877369	0.912371	1.000000	0.901808	0.632358	0.697732	-0.676895	-0.582914	0.022801
L_YIELD	0.768476	0.912072	0.901808	1.000000	0.829320	0.772796	-0.887169	-0.822740	-0.004598
CAR	0.536829	0.687007	0.632358	0.829320	1.000000	0.725681	-0.796415	-0.805886	-0.006912
NPL	0.710467	0.788951	0.697732	0.772796	0.725681	1.000000	-0.783582	-0.813569	-0.095316
LDR	-0.595718	-0.787592	-0.676895	-0.887169	-0.796415	-0.783582	1.000000	0.892765	0.062478
ASSETL	-0.535428	-0.726384	-0.582914	-0.822740	-0.805886	-0.813569	0.892765	1.000000	0.144338
AST_COST	-0.074203	-0.041022	0.022801	-0.004598	-0.006912	-0.095316	0.062478	0.144338	1.000000
OCOI	0.413597	0.357575	0.454170	0.321860	0.162117	0.278796	-0.157593	-0.057297	0.625841
NIM	-0.622163	-0.661880	-0.709507	-0.670033	-0.324717	-0.306291	0.475598	0.393510	0.220377
ROA	-0.635522	-0.613072	-0.583211	-0.493754	-0.199940	-0.561169	0.353065	0.382876	0.009077
GDP_NL	-0.529412	-0.728706	-0.589445	-0.842532	-0.797203	-0.779340	0.915909	0.989226	0.140444
IDR_L	0.012780	-0.098814	-0.225461	-0.369540	-0.376797	-0.165410	0.318072	0.207760	-0.028046
M0_L	-0.586749	-0.792885	-0.654970	-0.878050	-0.767848	-0.742427	0.908727	0.959153	0.111563
R_ID	0.733816	0.566405	0.479320	0.364328	0.268680	0.652567	-0.301308	-0.414081	-0.068750
R_US	0.291550	0.248800	0.249685	0.227102	0.483018	0.630128	-0.284158	-0.379762	-0.157428

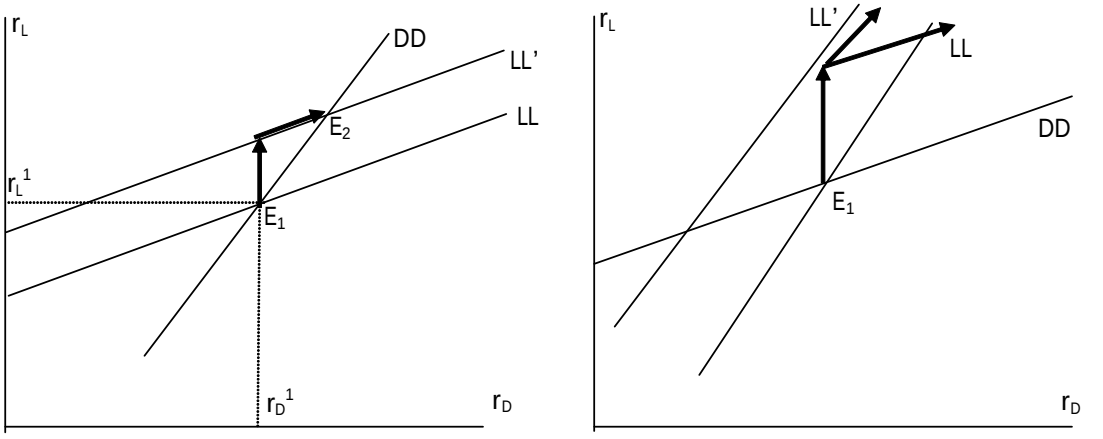
Table 7. Correlations Statistic (II)

Variables	OCOI	NIM	ROA	GDP_NL	IDR_L	M0_L	R_ID	R_US
R_DEPO	0.413597	-0.622163	-0.635522	-0.529412	0.012780	-0.586749	0.733816	0.291550
R_CRED	0.357575	-0.661880	-0.613072	-0.728706	-0.098814	-0.792885	0.566405	0.248800
ICOF	0.454170	-0.709507	-0.583211	-0.589445	-0.225461	-0.654970	0.479320	0.249685
L_YIELD	0.321860	-0.670033	-0.493754	-0.842532	-0.369540	-0.878050	0.364328	0.227102
CAR	0.162117	-0.324717	-0.199940	-0.797203	-0.376797	-0.767848	0.268680	0.483018
NPL	0.278796	-0.306291	-0.561169	-0.779340	-0.165410	-0.742427	0.652567	0.630128
LDR	-0.157593	0.475598	0.353065	0.915909	0.318072	0.908727	-0.301308	-0.284158
ASSETL	-0.057297	0.393510	0.382876	0.989226	0.207760	0.959153	-0.414081	-0.379762
AST_COST	0.625841	0.220377	0.009077	0.140444	-0.028046	0.111563	-0.068750	-0.157428
OCOI	1.000000	-0.165498	-0.488209	-0.064951	0.039879	-0.105761	0.349793	0.011606
NIM	-0.165498	1.000000	0.511778	0.451976	0.208641	0.560451	-0.202681	0.241373
ROA	-0.488209	0.511778	1.000000	0.375791	-0.084726	0.422829	-0.629956	-0.088174
GDP_NL	-0.064951	0.451976	0.375791	1.000000	0.237007	0.972584	-0.356686	-0.289530
IDR_L	0.039879	0.208641	-0.084726	0.237007	1.000000	0.181302	0.276270	-0.028317
M0_L	-0.105761	0.560451	0.422829	0.972584	0.181302	1.000000	-0.342731	-0.170912
R_ID	0.349793	-0.202681	-0.629956	-0.356686	0.276270	-0.342731	1.000000	0.514658
R_US	0.011606	0.241373	-0.088174	-0.289530	-0.028317	-0.170912	0.514658	1.000000

Behavior of Funding and Lending

Table 5 reports the result of estimation for DD and LL equation. We need to invert the findings (L_yield) to be in line with the theoretical preposition. The estimation result shows that all parameters are positive and significant as expected. The coefficient for DD equation ranges from 2.114 (=1/0.473) to 2.309 (=1/0.433). These findings are in line with the theory. On the other hand the coefficient of LL equation (ICOF parameter) ranges from 1.889 to 2.741. These findings are somewhat different from what initially conjectured that the LL slope should be less than 1 and lesser than DD.

These findings are important. The stablity condition requires that DD equation slope be positive and higher than LL. We could deduce this conclusion from the standard demand supply equilibrium characteristics. Should the DD equation be flatter than LL, equilibrium deposit interest rate would fail to clear the loan market. We could evaluate this preposition qualitatively with graph 2.



a. Case of Slope DD greater than LL b. Case of Slope LL greater than DD

Graph 3. Stability Requirement in DD and LL Slope

Graph 3a. shows that standard case as assumed in the beginning of the paper. Suppose initially both deposits and loan market clears at E_1. An exogenous shock happens to alter the LL equation to LL'. The loan rate implied by the initial equilibrium would be too low, bank now requires more. The equilibrating process would go first by jumping to LL' and gradually move along the curve until it intersects with DD (see the bold arrow). However with the case of LL slope greater than DD, the equilibrating process is unstable. While the bank require more yield from its loan, the deposit market fails to meet this shift (see the bold arrow).

What cause this phenomenon? We could adress this to two reasons . First, higher LL slope signifies greater response of credit activity to funding than the other way around. This signifies the strain in funding, more intense competition in deposit market. This could be due to the fact that loan growth is higher than deposit growth. In Indonesia average annual loan growth is around 30% to 50% higher than deposits growth. Second, since we also expect higher DD elasticity due to the work of market discipline mechanism then the estimated result shows the lack of it. We think further research should investigate the findings and more micro oriented approach (unlike our macro approach) would be more advantegous.

We now move to evaluating the impact of exogenous shocks. We will first review the common characteristics (variables that appear in both DD and LL equation) before the specific variables.

The system liquidity proxy: LDR has a incorrect parameter sign in DD and LL equation with numerical value ranging from -0.075 to -0.0009. Accepted significance is obtained in LL equation from GMM CS, 3SLS and SUR estimator. These parameters suggest that an increase in LDR would correspond to a decrease in equilibrium interest rate.

The incorrect sign (and somewhat large) parameters of LL equation have came as an intriguing result. We argue that higher LDR has been taken as a signal of heightened competition in lending. Since we have controlled the business prospect variable, then bank would be tempted to offer better price to win the competition.

The business prospect variable as proxied by nominal GDP has correct sign and is significant in DD equation. Better (macro) economic condition would increase lending opportunities but the competition would also get more intense. Quite

substantial parameter values obtained, in magnitude of 4.74 to 7.39, one of the largest in the model, gives impression that business prospect is one major driver in the setting of lending and funding behavior.

The parameters change sign but remain significant in LL equation. The numerical value obtained ranges from -6.53 to -4.64. We think better prospect is also taken by banks as signal of elevated competition. To retain market portion (or win it over), banks would likely use price as their main strategy.

The net effect of business prospect in DD and LL equation is still positive (in range of 0.1 to 0.86). Better business prospect would increase equilibrium deposit and loan interest rate.

The system size variable (as proxied by log of asset) is large (value ranging from -5.74 to -2.34) and highly significant. The findings are consistent with the initial hypotheses. It seems that public confidence has increased in line with the size. Depositors feel safer to put their saving in an increasingly larger system hence demand smaller return. This findings could be verified with further studies especially those using bank level data. It is certainly logical that larger bank could pay less for deposits compares to small ones.

The efficiency variable as proxied by ast_cost are found to be negative in the magnitude of -4.49 to -1.83. The parameters are statistically significant when obtained by GMM CS and 3SLS estimators. These findings are somewhat inconsistent with the initial hypotheses. The negative parameters suggest that higher operational cost associate with lower deposit rate. The findings are consistent with the hypotheses. Banks pass the higher operational cost to the customers via the higher price of deposit, which is reflected in lower interest rate offer.

There is also significant positive relationship of deposit rate and international interest parity (here proxied by difference in policy rate between Indonesia and US). The magnitude is not particularly high: between 0.088 and 0.092. We think this is the standard monetary policy effect working through bank lending channel (Walsh, 2010). As the central bank attempt to cool the economy by raising policy rate, and reflected through interbank money market, banks would accomodate the move.

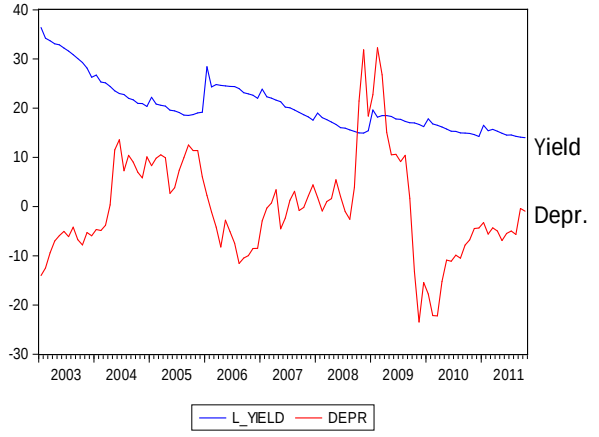
The other monetary policy proxy, base money, is not statistically significant (except using GMM CS estimator). It seems that the effect of the policy has largely been taken by the policy rate. Since 2005, Bank Indonesia officially implemented inflation targeting framework monetary regime with interest rate as its main policy instruments (called BI rate). We think the practice has preceeded before the formal announcement.

On the LL equation side, we notice that Net Interest Margin (NIM) parameters have positive sign but only 3SLS parameter is significant. The magnitude of variable are ranging from -0.169 to 0.955. We think this finding is quite important. It gives an insight that in better managing monetary policy, the central bank should pay attention to the bank nim. It measures bank drive for profitability that could affect the pricing of lending.

The impact of CAR is positive but only significant with SUR estimator. The parameters magnitude are ranging from 0.0024 to 0.243. The findings are inconsistent with the hypotheses. Higher CAR is associated with higher lending rate. It seems that higher capital would reduce somewhat risk appetite. We could addresss this a way of capital preservation.

However we should take a special note in the case of Indonesia. Banks were heavily recapitalized after the 1998 crisis in which they hold a substantial portion of government bond in their book. The recapitalization condition came with a strict supervisory condition attached. During the first part of the decade (2000-2005), lending activity was conservative. However as memory fades

and regulator increasing awareness for growth have put the condition more favorable.



Graph 4. The Loan Yield and Depreciation

The parameters of credit quality are negative and highly significant. The magnitudes range from -0.73 to -0.23. These findings are inconsistent with the initial hypotheses. We think these findings are due to unique data characteristics. Indonesia banking industry exhibit a somewhat unconventional feature. The loan quality was low for most of the part of early period (before 2005, in which NPL were ranging around 5%-6%) and low loan expansion (around 10-15% annually). In the other end of the period, the characteristics changed with NPL substantially reduced to aroud 2.3% and loan expansion hovered around 20%-24%.

Exchange rate has a large negative and statistically significant impact to lending rate (with

Table 8. Estimation Result of the Impact of IDIC

Variables	Coefficients (p value in parenthenses)							
	GMM TS		GMM CS		3SLS		SUR	
	Coeff.	P value	Coeff.	P value	Coeff.	P value	Coeff.	P value
DD Equation								
Constant	-31.23746	0.0597	-35.67690	0.0017	-31.67718	0.0006	-30.91485	0.0000
L_Yield	0.329424	0.0000	0.346441	0.0000	0.340783	0.0000	0.393918	0.0000
Asset_I	7.492634	0.1755	8.658085	0.0231	10.22399	0.0003	2.096452	0.0093
Ast_cost	-6.980452	0.0487	-9.085489	0.0007	-8.681282	0.0007	-4.576722	0.0002
LDR	0.023461	0.4375	0.039282	0.1391	0.045235	0.0354	0.026141	0.0015
R_ID-R_US	0.075082	0.0222	0.075621	0.0032	0.066384	0.0255	0.088074	0.0000
GDP_NL	-4.531039	0.3552	-5.430362	0.1235	-7.485093	0.0064	1.044535	0.2270
M0_I	-1.992328	0.0574	-2.226283	0.0025	-2.422826	0.0026	-1.264747	0.0007
IDIC	-2.442069	0.4182	-2.789754	0.1822	-2.122572	0.1606	-1.965068	0.0006
IDIC*L_Yield	0.175825	0.2051	0.198882	0.0371	0.183042	0.0052	0.130528	0.0000
LL Equation								
Constant	81.35445	0.0520	95.19103	0.0068	71.48503	0.0982	67.56130	0.0000
ICOF	2.726157	0.0003	3.049224	0.0000	3.028929	0.0000	2.345010	0.0000
NIM	1.386593	0.4932	2.471135	0.1630	2.538865	0.1071	0.915971	0.0031
CAR	0.194013	0.0624	0.086490	0.3542	0.193563	0.0531	0.258129	0.0000
NPL	-0.296385	0.2189	-0.438138	0.0174	-0.330792	0.1324	-0.084534	0.1230
IDR_I	-4.576783	0.0807	-5.028565	0.0158	-4.172833	0.1044	-3.113173	0.0000
LDR	-0.017967	0.5034	-0.019402	0.4165	-0.013109	0.6675	-0.053878	0.0000
GDP_NL	-3.699813	0.0060	-4.931909	0.0000	-3.856825	0.0007	-3.250120	0.0000
IDIC	-0.044508	0.9940	0.588369	0.8963	0.854693	0.8676	2.116111	0.0105
IDIC*L_Yield	-0.231704	0.8099	-0.350291	0.6433	-0.474036	0.5820	-0.550071	0.0000
Goodness Fit								
Det. Residual Cov.	0.032515		0.059154		0.058967		0.005709	
J Statistics	0.053230		0.059141					

magnitude of -5.82 to -3.13). This finding is contradicting the hypotheses. We think this also could be attributed the data characteristics. As can be seen from Graph 4, the loan yield experienced a steady declining trend during the study period, in which there are several interrupting bouts of depreciation. The latter effect dominated the first.

The Impact of Deposit Insurance Scheme

The implementation of deposit insurance scheme (IDIC) does alter the DD and LL equation. We could view the impact in general or specific perspective. By general, we mean that the impact of IDIC implementation would shift the whole DD and LL schedule, while for specific we mean for more localized impact to particular variables. Due to limitation of degree of freedom, we only asess the impact to r_D and r_L (the interaction terms of IDIC dummy with the price of credit and deposit).

The overall impact of IDIC implementation is of limited significance. Only parameters obtained from SUR estimator are found to be significant. In LL equation the parameter is found to be negative with the magnitude of -1.965 and in DD equation it is positive with size of 2.116. We do not think this finding would alter the results obtained previously.

Interaction terms for l_yield (DD equation) are found to be positive and significant with magnitude ranging from 0.13 to 0.199. The parameters are significant using GMM CS, 3SLS and SUR estimators. Nevertheless we also find that the initial l_yield parameters are smaller compared to sample without accounting for IDIC implementation. The net effect is not altered too much ie the slope is still positive and greater than one.

On the other hand, the interaction terms of icof (LL equation) are found to be negative and only significant using SUR estimator. The magnitude ranges from -0.55 to -0.23. However the initial icof parameters are somewhat larger compared to sample without accounting for IDIC implementation. This gives impression that the IDIC implementation has increased the response of loan rate to changes in equilibrium deposit rate.

The scheme that accounts for IDIC has altered several variables significantly. The LDR parameter experiences a decrease in significance though we do not think the magnitude changes significantly.

Under empirical scheme that not accounted for IDIC implementation, the algebraic and numerical values of GDP_NL in DD equation are positive in the range of 4.74 to 7.39. The parameters are all significant. Nevertheless when we consider the IDIC impact, the algebraic and numerical values are changed dramatically. The parameters are negative in the range of -7.48 to -4.53, the exception is for parameters obtained from SUR estimators which is still positive 1.04. Except for 3SLS estimator, the parameters are not statistically significant.

On the other hand, in the LL equation while the result of IDIC considered scheme retains their algebraic signs (which are negative) however their magnitude are greatly reduced. The values now range from -4.932 to -3.25, largely halved from the previous scheme whose value range from -6.53 to -4.64. It seems that the implementation of IDIC has dampened the intensity of competition in lending market triggered by better business prospect.

A substantial departure is also experienced by size variable. In previous scheme the impact of increasing banking system size is negative for cost of funding (in the order of -5.74 to -2.33). However if we take control the influence of IDIC implementation, the estimated conclusion is reversed. The parameters now are positive in the range of 2.09 to 10.22. Except estimate obtained under GMM TS, the parameters are statistically significant.

We think the latter findings could be spurious. Radical changes in parameters, we think, are caused by absent of IDIC dummy interaction terms on assetl. When we redo the estimations and include the interaction terms (IDC*Assetl), we find the interaction terms parameters mostly negative and roughly in the opposite of the assetl parameter alone. More specifically we find the net numerical value (after substracting the individual effect with interaction terms) to be -6.07, -3.6, -6.79 and -1.86 which are largely in line with the initial findings. Therefore the IDIC implementation reduce the deposit interest rate and the effect increase along with the size.

The algebraic signs of ast_cost in DD equation are largely the same. However their (absolute) magnitude are somewhat elevated. In the initial scheme, the parameter values range from -4.49 to -1.83 where in the later scheme they are increased to -9.08 to -4.57. The parameters are statistically significant using GMM CS, 3SLS and SUR estimators. It seems that the implementation of IDIC enable banks to pass more freely the operational cost to customers without worry that it would spark withdrawals.

The impact of policy rate differential in DD equation is somewhat dampened in the scheme which accounts for IDIC adoption. In the initial scheme we find the parameters to be in the range of 0.088 to 0.092 where in the latter scheme they are slightly declined to 0.066 to 0.088. The parameters are statistically significant under every estimators. These findings shows that while they remain consistent with the hypotheses however the impacts are slightly discounted with the adoption of IDIC.

Though we find that the effect of policy rate is slightly reduced, nevertheless this is not the whole story related to monetary policy. Unlike the findings in the initial scheme, the parameters of base money supply (M0_l) are found to be negative and are statistically significant. The numerical values of base money supply are in the range of -2.42 to -1.26. These findings tell us that higher injection of cash to the economy is associated with the decline of deposit rate:1.26% to 2.42% decrease for every 1% rise in money supply. The findings are consistent with the hypotheses.

We still find the impact of NIM in LL equation as positive despite its weak statistical significance (the parameter is statistically important only with SUR estimator). The numerical values are somewhat elevated. In the previous scheme the parameters are in the range of -0.169 to 1.384, now we find them to be around 0.916 to 2.54.

The findings are still in line with the hypothesis thus the qualitative inferrence stays the same. Higher NIM correlated with higher loan yield, however the impact is raised with IDIC adoption. We think this is due to the evidence that IDIC implementation helps increase public confidence (thus lowering cost of funding) then banks could gather higher NIM.

The impact of CAR remains positive and except for GMM CS the parameters are mostly statictically significant. The parameters magnitude are increased from the range of 0.0024-0.243 in the initial scheme to 0.086–0.258. These are quite significant increase. Again the findings are inconsistent with the hypotheses. Like before we could address these findings to the evidence of a way of capital preservation.

The parameters of credit quality are still negative but suffer a decrease in statistical significance. The magnitudes somewhat decline in absolute value from initial scheme. Previously we find the parameter to be in the range from -0.73 to -0.23, now we find the statistics to be in the range of -0.438 to -0.084. These findings are again inconsistent with the initial hypotheses. We could use the previous argument of Indonesian banking specific feature to explain the findings.

Like the initial scheme, exchange rate has also a large negative and statistically significant

impact to lending rate. The magnitudes are qualitatively the same where in the initial scheme we find them to be in the magnitude of -5.82 to -3.13, now we find them to be in the range of -5.03 to -3.11. These findings are contradicting the hypotheses. We think this also could be attributed the data characteristics (see our argument above).

CONCLUSION AND SUGGESTION

Conclusion

In this study we have outlined the theoretical foundation in an attempt to evaluate one aspect of funding and lending behavior of Indonesian banks, particularly the interest rate offer (deposit interest rate) and charge (loan interest rate). Departed from simple model first proposed by Niehans (1978) and De Grauwe (1982), we design empirical scheme to to answer the form of interaction (state of equilibrium) and factors that might influence the constellation.

We employ a monthly dataset of banking and economic aggregates from periode January 2001 to October 2011 (130 observations) to help answer the research question. There are 16 variables used in a simultanous equation econometric model that would be estimated using 4 different techniques namely GMM TS, GMM CS, 3SLS and SUR. Two variables namely price of deposit and price of loan are treated as endogenous. Employing different techniques hopefully could help us in addressing the robustness problem of found estimates.

We run the empirical schem twice: without and with accounting for IDIC adoption. The implementation of deposit protection scheme in September 2005 is expected to alter the banks behavior of funding and lending pricing.

First important empirical findings is that the behavior of funding and lending rate is generally consistent with the theory. The slopes are positive and statistically significant: (equilibrium) deposit interest rate increase as a response to a rise in (equilibrium) loan interest rate and vice versa (since they are both endogenous). However unlike the hypotheses, the slope of LL equation is greater than one. Moreover since the magnitude is somewhat comparable to the DD equation, it also raise the issue of possibility to reach equilibrium (the stability).

Second, there are several variables: general to both DD-LL equation and specific that statistically significant alter funding-lending behavior and its equilibrium attainment. The most important variables (based on their magnitude and statistical significance) are business prospect, system size, exchange rate, operational cost and profitability. In the second tier of importance, we find monetary policy instruments (policy rate differential and base money supply), quality of loan, capital and total liquidity to affect the system in various degree.

Third, the adoption of IDIC does not change materially the slope of DD and LL hence does not alter the previous qualitative conclusion. Nevertheless the implementation of IDIC alter the influence various exogenous variables that have been obtained from initial scheme. There is a change that possibly could be regarded as spurious, but there are several changes that quite material. In light of this we view the IDIC implementation does alter the behavior of banks funding and lending.

We could convey several policy implications derived from the study. They are: (1) The is strong and important link between funding and lending market. Shocks in one market could alter the overall equilibrium: deposit and loan interest rate. In this regard, efforts by authorities to stem exogenous adverse effect to intermediation activity should be aimed at both market not only one side. (2) Business prospect works in opposite ways in funding and lending market. Better economic environment would trigger intense competition that tend to depress loan interest rate but on the same

time elevate the deposit rate. Authorities should monitor closely the impact of business cycle to this behavior dynamic. Moreover since we also identify lack of stability in the system, it could be a hint to possibility of price war that could jeopardize the system. (3) Monetary policy is important and works as expected. Therefore authorities could stimulate the economy with more loose monetary policy. (4) NIM is identified as a factor of influencing the loan yield. We think this opens a way for moral suation to become feasible policy alternatives in stimulating economy.

Suggestions

The study also identifies various opportunity for further research. Empirical designs using bank level data could shed better light in the study findings and certainly would be valuable. The current research theme could also be approached in terms of dynamic paradigm. Time changing views of lending and behavior would be very welcome improvement to current endeavour.

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