The Degree of Pass Through and Asymmetric Behavior of Indonesian Banking Interest Rates

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Abstract. There is a trade off in interest rate movements due to capital inflows and the aim of controlling inflation. Capital inflow will reduce money market interest rates as low as possible, followed by lower lending and deposit rates. On the other hand, it is difficult to lower the benchmark interest rate, due to pressure on inflation. The asymmetric movement of lending and deposit interest rates to the benchmark interest rate has caused disturbances to the monetary transmission mechanism. The results of the estimated error-correction model for variable lending rates, found that the long-term pass-through of Indonesian banks was significant, but not perfect on interest rates on working capital loans and investment loans. This study shows that there is an asymmetrical behavior in banking interest rates in Indonesia. The pass-through degree is typical of being slow when there is a decrease in the benchmark interest rate.

Keywords: Interest rate pass-through, Bank interest rate, Inflation.

1. Introduction

Capital flows are needed to cover a country's domestic payment needs. However, a large proportion of portfolio investment in foreign capital flows, especially in Emerging Market countries such as Indonesia, can cause disruptions to price stability which then lead to financial instability. The high capital flight due to external shocks, has the potential to increase systemic risks in line with the considerable foreign ownership in the Indonesian financial market, especially those that take place suddenly and quickly [1]. Capital outflow is one of the risks in the financial market and can result in a decrease in third party funds in the banking industry, thereby tightening economic liquidity.

The capital inflows will push interbank money market interest rates very low (PUAB). Meanwhile, lowering the policy rate is difficult to implement given the high pressures on domestic inflation and the current account deficit. This in turn caused the deviation of the policy rate and the interbank rate to widen, resulting in suboptimal monetary policy signals and transmissions [2].

The realization of price stability (inflation) and financial stability depends on the effectiveness of monetary policy transmitted through the benchmark interest rate, thus affecting money market and banking interest rates in the direction desired by the monetary authority. Meanwhile, whether monetary policy is effective or not depends on how the bank's speed in passing through monetary policy to the amount of deposit and credit interest rates, where the money market is the platform for implementing its policies.

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Interest rate pass-through behavior varies between countries. Some research shows that the interest rate pass-through is not perfect and the interest rate adjustment is not symmetrical between the deposit rate and the lending rate [3]. The existence of different frictions, causes the pass-through interest rate to also vary between countries.

In 2005, Bank Indonesia adopted the Inflation Targeting Framework (ITF) to achieve the monetary stability target in Indonesia. The operational instrument used is the BI rate policy rate, which is evaluated periodically against the achievement of the inflation target that has been announced in that period. The policy rate is expected to affect money market rates, deposit rates and lending rates through monetary policy transmission mechanisms.

Perfect and symmetrical pass-through behavior guarantees the working of the monetary policy transmission mechanism. If the pass-through degree is not perfect, the deadline between the change in the benchmark interest rate and the adjustment of the banking interest rate becomes longer so that the impact cannot be felt.

This asymmetrical behavior of interest rates, gives rise to disruptions to the transmission of monetary policy. The speed of adjustment of the bank's interest rate to changes in the benchmark interest rate can be estimated through the value of MAL (Mean Adjusted Lag) [4]. Noted in the test results, it states that the adjustment of interest rates in Indonesia takes a long time.

The degree of pass-through measures the responsiveness of banks in setting their interest rates. In the case of a perfect pass-through degree, a reduction in the BI rate is offset by a reduction in the bank's interest rate with a proportional amount of decline. The persistence of interest rates brings further consequences to the speed of adjustment. This aspect of the speed of adjustment further characterizes symmetrical or asymmetric banking behavior. The behavior of banks in setting their interest rates in response to an increase in the benchmark interest rate, is often different when dealing with cases of lowering the benchmark interest rate.

Market interest rates with longer tenors significantly affect the interest rate of banks in the Euro. The presence of market interest rates with longer tenors, such as government bonds, can influence banking interest rate decisions and is one of the reasons for the slow interest rate pass-through in Europe. [5].

This study measures the degree of pass through and asymmetric behavior of banking interest rates on changes in monetary policy in the form of changes in the BI rate reference rate by the influence of investment portfolios and money market interest rates.

The rate adjustment speed is measured in short-term and long-term interest rate pass through measures using Vector Error CorrectModel (VECM). This study focuses on the behavior of lending rates (investment loans, working capital loans, consumption loans) and deposits (periods of 1 month, 3 months, 12 months) towards changes in the benchmark interest rate.

2 Literature Review

The monetary policy transmission mechanism basically describes how the monetary policy pursued by the central bank affects various economic and financial activities so that it can ultimately achieve the final goal set [6].

Taylor (1995) states that the mechanism of monetary policy transmission is "The process through which monetary policy decisions are transmitted into changes in real GDP and inflation". Monetary policy transmission mechanisms are the channels through which monetary policy passes to influence the final target of monetary policy, namely real national income and inflation, through the direct monetary channel, interest rate channel, exchange rate channel, asset price channel, credit channel and expectation channel [7].

The transmission of monetary policy requires time lag to perfectly feel its effect in the real sector. The time it takes for a monetary policy transmission mechanism to run fully and perfectly through one transmission channel may be different from another.

The state of the financial and banking sectors affects the speed of transmission of monetary policy. The level of competition between banks is low and tends to be oligopolistic, making lending rates rigid and determined by each bank's internal pricing strategy. Low interest rates on bank loans and with a downward trend are not always followed by increased demand for loans.

The intensity of passthrough and the speed of retail interest rate adjustments when there was a change in the benchmark market interest rate in the period 1994 - 2004 in New Zealand. It is noted that New Zealand was the first country to adopt a full fledged inflation targeting regime with specific and relatively transparent accountability. These findings confirm the presence of friction in the interest rate channel, which is indicated by the difference in the speed of interest rate adjustments of various financial products. In addition, the study found that monetary policy has a faster influence on short-term interest rates than long-term interest rates [8].

Monetary policy in Portugal has a stronger effect on the cost of finance compared to the return on savings, which is indicated by a higher long-term pass-through rate for lending rates than deposit rates [9]. In general, short-term pass-throughs are not perfect, but will be close to perfect pass-throughs in the long run.

Rousseas defined pricing behavior (interest rates) by banks in the marginal cost pricing model as follows [10].

$$\text{Bank Rate}_t = \gamma_0 + \gamma_1 \text{Policy Rate}_{t+} \varepsilon_t \quad (1)$$

With the increasing integration of financial markets that can pose a risk of crisis in a country and quickly spread throughout the world, it becomes a challenge for the domestic economy and its monetary policy. Large portfolio investment (PI) in foreign capital inflows makes money market interest rates decrease, which of course will be followed by banking interest rates, so that the equation (1) is formed into:

$$\text{Bank Rate}_t = \alpha_0 + \alpha_1 \text{BI rate}_{t+} \alpha_2 \text{PUAB}_t + \alpha_3 \text{PI}_t + \mu_t \quad (2)$$

Model sepsification VECM from equation (2) is (3)

$$\text{DBank Rate}_t = \theta_0 + \theta_1 \text{DBI rate}_{t+} \theta_2 \text{DPUAB}_t + \theta_3 \text{DPI}_t + \text{ECT} + \nu_t$$

$$\text{and ECT} = \text{DBI rate}_{t-1+} \text{DPUAB}_{t-1} + \text{DPI}_{t-1} \quad (4)$$

To capture the pattern of relationships between variables that are non-stationary and the speed returning to the long-term equilibrium state, an error correction model is used that shows the speed of change to reach the long-term equilibrium position again after a disequilibrium occurs in the short term.

To measure the speed of adjustment towards long-term equilibrium, Hendry's formula is used to build a measure referred to as Mean Adjusted Lag (MAL) with the following formula [11]:

$$MAL = \frac{\beta_0 - 1}{\alpha_1 \ \delta} \quad (5)$$

The β_0 parameter is the short-term pass-through interest rate, which is the instantaneous change rate (t) of banking interest rates caused by changes in 1 unit of the benchmark interest rate; $\alpha 1$ is the long-term interest rate pass-through rate, which is the rate of change in the banking interest rate caused by a change of 1 unit of the benchmark interest rate at the time the equilibrium is reached; and δ is the error-correction term coefficient of the error correction model used.

3 Methodology

3.1 Data

The research period began after the launch of the ITF in Indonesia from 2005 to 2021 with semi-annual data, so that there were 34 months of observation. The period has also covered important periods such as the 2005 rise in world oil prices, the 2007 rate cut and the global crisis (GFC) in 2008.

3.2 Metode

The model used is the Error Correction Model (ECM) which is based on the co-integration between the variables to be tested. The stage is first, the unit root test/stationaryity test against free and bound variables. Second, cointegration tests against free and bound variables that have been tested stationary at the same derivation level. Third, based on the estimation of the errorcorrection process model with free and bound variables that have been tested, there will be a co-integration relationship.

In the VECM equation has contained short-term and long-term parameters that allow to know the response in the short-term and long-term. The bound variables used are (1) the interest rate on investment loans (2) the interest rate on working capital loans, (3) the interest rate on consumer loans, (4) the interest rate on rupiah 1-month time deposits, (5) the interest rate on rupiah 3-month time deposits, (6) the interest rate on rupiah 12-month time deposits.

The free time series variables are the bi rate reference rate, money market interest rate and investment portfolio. The selection of the optimal time lag is carried out using the VAR Lag Order Selection Criteria in the statistical software version of Eviews 12. Then the measurement of the degree of interest rate pass-through to measure the speed of adjustment of interest rates on loans and deposits is measured by the MAL equation in equation (5).

4 Results and Analysis

National banking data in Indonesia, shows an imperfect pass-through degree in a few years. This is due to changes in the BI rate not being responded to in proportion to changes in bank interest rates. This means that there is still a rigidity of interest rates in the national banking industry.

The economic crisis of 1997/1998 in Indonesia is also a clear evidence of asymmetrical behavior of interest rates. This is indicated by the fact that the interbank money market interest rate (rPUAB) is 80.47%, the lending rate is much lower at 34.95% and the deposit rate is 55.43%.

When the benchmark interest rate increases, the lending rate rises faster than the deposit rate, and when the benchmark interest rate falls, the lending rate falls more slowly than the deposit rate. The movement of the interbank rate also does not follow the policy stance of the benchmark interest rate, causing monetary transmission to be disrupted (see Figure 1).

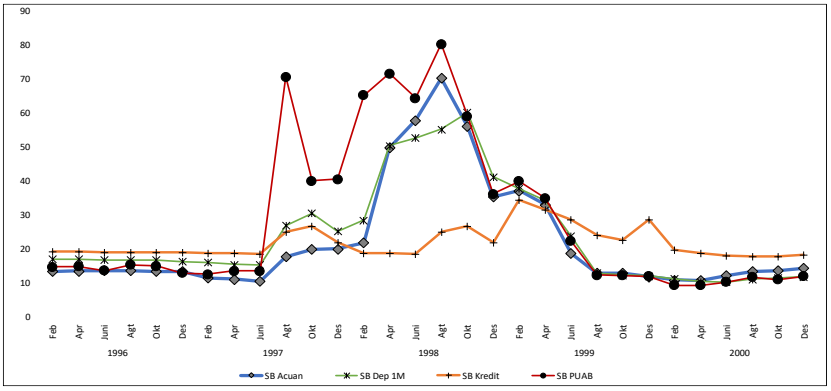

Fig 1. Benchmark Interest Rates and Banking Rates

In contrast to conditions from 2010 to 2018, where the monetary policy stance through the interest rate was responded well by the money market and banking industry, where the interbank rate policy spread did not widen (see Figure.2).

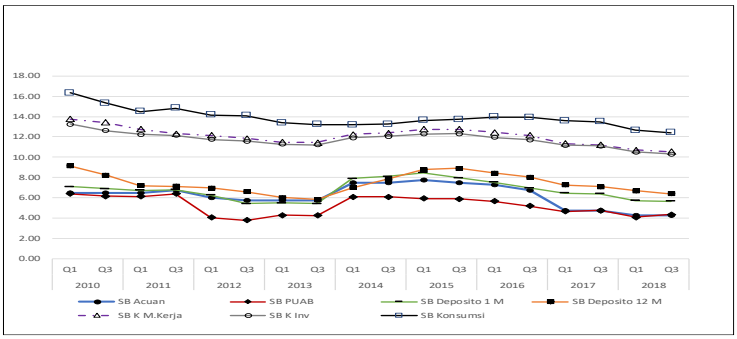

Fig 2. Benchmark interest rates and banking rates for the period 2010 – 2018

The cointegration test is used for decision making, whether there is a cointegration or not, which can be seen from the trace statistics and max-eigen statistic values. Both values are compared with critical values at a certain degree of significance. From the co-integration test with the Eviews software, it is indicated that there are 5 co-integrations.

Table 1. Trace Statistic Cointegration Test

Date: 09/15/22 Time: 20:25
Sample (adjusted): 2006S1 2021S2
Included observations: 32 after adjustments
Trend assumption: Linear deterministic trend
Series: BIRATE DEP12M DEP3M DEP1M KCON KINV KMK PI PUAB
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.979731	440.9241	197.3709	0.0000
At most 1 *	0.954049	316.1668	159.5297	0.0000
At most 2 *	0.912234	217.6007	125.6154	0.0000
At most 3 *	0.816535	139.7419	95.75366	0.0000
At most 4 *	0.702883	85.47858	69.81889	0.0017
At most 5	0.554077	46.64246	47.85613	0.0647
At most 6	0.339411	20.79896	29.79707	0.3703
At most 7	0.173961	7.531006	15.49471	0.5168
At most 8	0.043266	1.415372	3.841465	0.2342

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 2. Maximum Eigenvalue

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.979731	124.7573	58.43354	0.0000
At most 1 *	0.954049	98.56609	52.36261	0.0000
At most 2 *	0.912234	77.85876	46.23142	0.0000
At most 3 *	0.816535	54.26335	40.07757	0.0007
At most 4 *	0.702883	38.83612	33.87687	0.0118
At most 5	0.554077	25.84350	27.58434	0.0821
At most 6	0.339411	13.26795	21.13162	0.4279
At most 7	0.173961	6.115634	14.26460	0.5984
At most 8	0.043266	1.415372	3.841465	0.2342

Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The results of the estimation with VECM are summarized in table 3. The long-term pass-through coefficient indicates the presence of frictions in the mechanism of transmission of monetary policy through interest rates. The interpretation of this coefficient is that after reaching long-term equilibrium, a change in 1 unit of the benchmark interest rate will have an impact on a change of less than 1 unit of the interest rate on investment and working capital

loans, except for consumption credit. The deposit rate that responds most quickly to changes in the benchmark interest rate is the deposit rate with a longer tenor.

Table 3. Long Term Interest Pass Through

Dependent	Independent	Long-Term	Pass-Through
Kinv	BI Rate, PUAB,PI	0,6786	Incomplete
KMK	BI Rate, PUAB,PI	0,859**	Incomplete
Kcons	BI Rate, PUAB,PI	1,3493	Complete
Dep1M	BI Rate, PUAB,PI	0,7037**	Incomplete
Dep3M	BI Rate, PUAB,PI	0,5354	Incomplete
Dep12M	BI Rate, PUAB,PI	1,45**	Complete

A short-term pass-through coefficient smaller than 1 indicates the presence of frictions in the mechanism of monetary policy transmission through short-term interest rates. The short-term pass-through coefficient is significant on interest rates on short-term deposits of 1 month, 3 months and 12 months. Interest rates on working capital loans are better able to adjust to changes in the benchmark interest rate than interest rates on investment and consumption loans.

Table 4. Short Term Interest Pass Through

Dependent	Independent	Short -Term	Pass-Through
Kinv	BI Rate, PUAB,PI	-0,1906**	Incomplete
KMK	BI Rate, PUAB,PI	-0,5447**	Incomplete
Kcons	BI Rate, PUAB,PI	-0,1100	Complete
Dep1M	BI Rate, PUAB,PI	-0,7293**	Incomplete
Dep3M	BI Rate, PUAB,PI	-0,7559**	Incomplete
Dep12M	BI Rate, PUAB,PI	-0,3705**	Complete

Table 5. Error Correction Term

Dependent	Independent	ECT	Pass-Through
Kinv	BI Rate, PUAB,PI	-0,1954**	Incomplete
KMK	BI Rate, PUAB,PI	-0,3193**	Incomplete
Kcons	BI Rate, PUAB,PI	-0,113**	Complete
Dep1M	BI Rate, PUAB,PI	-0,277**	Incomplete
Dep3M	BI Rate, PUAB,PI	-0,4052**	Incomplete
Dep12M	BI Rate, PUAB,PI	-0,1657**	Complete

4 Conclusion

The results of the estimated error-correction model for variable lending rates with the accounting impact of capital flows affecting money market interest rates, found that the long-term pass-through of Indonesian banks was significant, but not perfect on interest rates on working capital loans and investment loans.

This indicates the presence of frictions in the interest rate channel. In the short term, significant pass-throughs were found for all three types of credit, and the speed of adjustment to the benchmark interest rate and foreign capital flows was about 12 months for working capital loans, 18 months for investment loans and 14 months for consumption credit.

The deposit rate has a significant long-term passthrough in Indonesian banks but is not perfect at the deposit rate for 1-month, 3-month, or 12-month tenors. This indicates the level of friction in the interest rate channel that varies in level.

In the short-term dynamics, a significant pass-through was found for 1-month deposits with an adjustment speed of about 18 months, for 3-month deposits the adjustment speed was about 16 months and 12-month deposits the speed of its adjustment was 12 months. The variety of banking products has different levels of friction and speed of adjustment.

Mapping the friction and speed of adjustments to the benchmark interest rate is necessary to set an inflation policy target and control foreign capital flows that are very dominant in

influencing the independence of a monetary policy. The pass-through coefficient of lending rates is lower than the 1-month deposit rate, indicating that in the short term the effect of monetary policy is stronger on return of savings compared to the cost of capital.
Research shows that there is an asymmetrical behavior in banking interest rates in Indonesia. The pass-through degree is typical of being slow when there is a decrease in the BI rate. Banks as profit-oriented business institutions tend not to rush to cut their interest rates in the face of falling BI rates. However, when the BI rate rose, banks played offensively by immediately raising their interest rates.

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