AVOIDING RISK IN WORKING CAPITAL CREDIT DISTRIBUTION IN INDONESIA[1]

Aloysius Deno Hervino
Unika Atma Jaya
e-mail: deno.hervino@gmail.com

Abstract

This research analyzes risk avoidance behaviour of banking institutions in distributing working capital loan in Indonesia. Using Autoregressive Distributed Lag Error Correction Model, this paper uncovers three findings. First, in the short run, risk avoidance in working capital loan distribution depends on inter-call banking money market and *Sertifikat Bank Indonesia*. Second, following banking regulation after 1997 crisis, banks have become more careful in distributing credits, with SBI as a substitution instrument and inter-call banking money market as a complement instrument to spread the risk. Third, all explanatory variables take an average of 6 days or 1 week to influence bank's risk avoidance behaviour.

Keywords: Risk avoidance, working capital distribution, banking institutions
JEL classification numbers: C32, C52, D81, E51

Abstrak

Penelitian ini menganalisis perilaku penghindaran risiko lembaga perbankan dalam menyalurkan kredit modal kerja di Indonesia. Menggunakan Model Autoregressive Distributed Lag Koreksi Kesalahan, tulisan ini berhasil mengungkap tiga temuan. Pertama, dalam jangka pendek, penghindaran risiko distribusi kredit modal kerja tergantung pada pasar keuangan antar bank dan Sertifikat Bank Indonesia. Kedua, dengan adanya peraturan perbankan pasca krisis 1997, bank-bank menjadi lebih berhati-hati dalam menyalurkan kredit, dengan mengunakan Sertifikat Bank Indonesia sebagai instrumen substitusi dan menggunakan pasar uang antar bank sebagai alat pelengkap untuk menyebarkan risiko. Ketiga, semua variabel penjelas membutuhkan rata-rata 6 hari kerja atau 1 minggu untuk menghindari resiko mempengaruhi perilaku bank.

Keywords: Penghindaran resiko, distribusi modal kerja, lembaga perbankan
JEL classificatiomumbers : C32, C52, D81, E51

INTRODUCTION

Working capital loan is a type of fund supplied from banking to individuals and business entities that require additional funding for their business development. The performance of working capital loan by banks in Indonesia after the 1997 of economic crisis has been showing a positive trend, after a slightly decline as a result of the economic crisis. A large decline occurred in 1994 until the first quarter of 1995. However, the loan distribution after the crisis did not exceed that from the previous condition (see Figure 1).

Theoretically, banks performance in carrying out its function as an intermediary institution is influenced by internal and external variables. The internal variables are closely related to bank management, while the external variables are related to economic conditions and regulations set by Bank Indonesia (BI, or the central bank). In analyzing the performance of national

---

[1] This paper is part of the author's PhD thesis

banking system, especially those related to its function as an intermediary institution, it is important to consider the development of national banking system.

The economic crisis was caused by at least two factors, namely the bad performance of national banking system[2] and the financial liberalization as stipulated in the regulations issued by the government in 1988, better known as Package of October 1988 (*Pakto* 88).[3]

The crisis was initially triggered by the crisis that hit some Asian countries. The impact of this crisis was very bad for Indonesian economy. This marked the closing of 16 banks. Since then, the government guarantees public funds through the Bank Indonesia Liquidity Assistance (= BLBI = Bantuan Likuiditas Bank Indonesia) for worse conditions can be avoided. For banks that survive, the government conducted recapitalization program in 1999-2000.

At the same time, macroeconomic indicators such as inflation reached its highest level, namely 77% (in 1998). This condition was associated with higher interest rates and a weaker Rupiah, which depreciated up to 500 percent. Both the increase in interest rates and Indonesian economy that were not fully recovered has made loan distribution from banking system dropped dramatically. In addition, these conditions have made the demand side dropped too. Until year 2000, the credit market had been dominated by the supply side.[4]

Even though the performance and stability of national banking after the crisis have improved, its intermediation task has not fully recovered. This can be seen from the decline in demand for loan and the increase in undistributed loan, from Rp 50.9 trillion in 2005, Rp 165.3 trillion in 2006, and Rp 465 trillion in 2007.
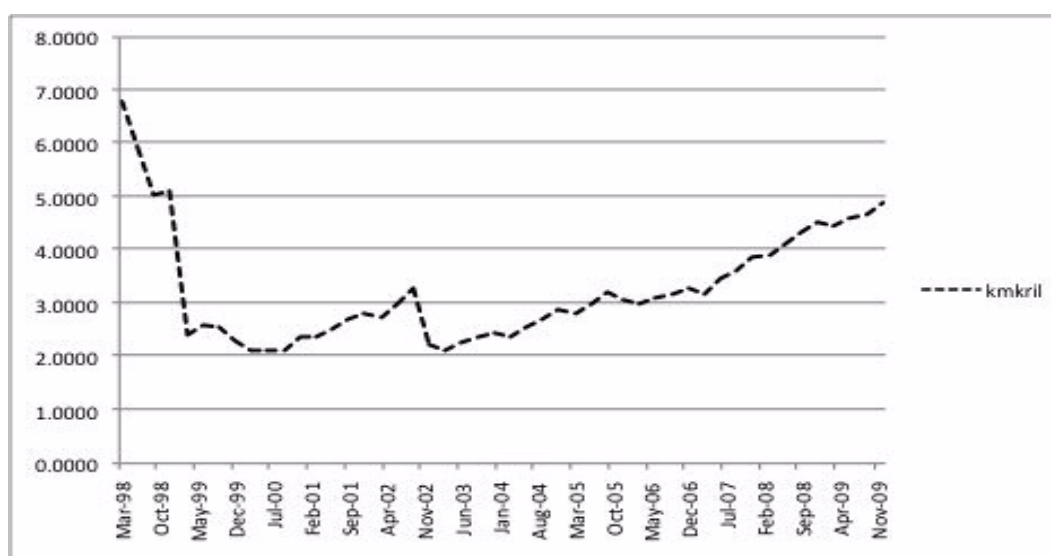
Source: Bank Indonesia.

Figure 1: Distribution of Real Working Capital Loan by Banks in Indonesia.

---

[2] The deregulation related to the banking prudential principal from Bank Indonesia (1991) was not appropriately conducted by banks in Indonesia. In addition, the monitoring system was not well conducted by Bank Indonesia, leads to a bad performance of banks in Indonesia.

[3] This policy has made the number of banks rose dramatically, along with the rapid development in banking activities.

[4] This condition occurs because of the ability of the real sector in absorbing new loans is limited (credit crunch), which stems from the lack of conducive investment climate, legal and political uncertainty, behaviour of banks which increasingly become more risk-averse, and the high interest rate loans.

The increase in banking risk has made banks to be more prudence in channelling the credit. Banks are also required to pay interest on debtor and finance their operational activities, so the decreased in loan distribution has made banks to put their funds to other assets, especially those with lower risk, such as SBI, government bonds, and the interbank money market. As a result, the profit in terms of net interest income (NII) increased and reached Rp 8.9 trillion in 2007.

As a developing country, despite the growth in its capital market, Indonesian economy is dominated by money market. So far, the banks funding to business activities is still low, as compared to that of before the economic crisis. The amount of loan distribution (loan to deposit ratio) has reached 75% of total of third party funds. The banks performance was not yet optimal because they put more funds into SBI (a bond issued by Indonesian central bank) and focused more on consumer loan.

Financial market is important due to its roles as intermediation agent, a parameter to measure the effectiveness of monetary policy, and an engine of economic growth. Well-functioning financial markets and financial intermediaries are needed to improve economic well being and economic health.

This research intends to examine the role of banks in distributing working capital loan, especially those related to the shifting of bank of bank's productive assets into other assets with lower risk.[5] This topic is of importance since the characteristics of investment loan markets is totally different with working capital loan market.

This paper examines variables which influence bank's risk avoidance behaviour on working capital loan distribution in Indonesia. The paper answers to the following questions. (1) What is the impact of banking deregulation on that behaviour? (2) How long does it take for each explanatory variable to affect the dependent variable in the long term?

Theoretical Background

Banks play important roles in developing countries. In addition to their role as sources of funds and public savings, they also act as institutions that are keys to economic business cycle. The fluctuation of bank performance is positively correlated with the economic condition. Financial markets will not work properly without the presence of intermediary institutions such as banks, although they have the same basic function in channelling funds from those who have surplus of funds to those who have a shortage of funds (Mishkin, 2001).

In financial markets, there are three main economic agents, namely lenders, borrowers, and intermediary institutions. The performance of intermediary institutions (banks) can be seen from their balance sheet which list bank's assets and liabilities (Mishkin, 2001).

The presence of financial intermediaries can minimize transaction costs and make the financial transaction process easier and faster. These transaction costs arise because one of the agents who conduct transactions do not have perfect information about other agents, so the agents cannot take the right decision. Such symptoms is commonly known as asymmetric information, which could lead to adverse selection and moral hazard problems in financial markets (Mishkin, 2001).

The aforementioned facts prompt the government to strictly regulate financial system. Associated with these regulations, there are three things that must be developed in the financial markets, which are increasing the presence of information for investors, ensuring the health of the financial system, and improving the control

---

[5] This condition can be seen from the magnitude of banking funds placed on low risk assets. This means that the bigger the bank, the more it tends to avoid the risk.

mechanisms of monetary policy. These regulations are important to reduce problems of adverse selection and moral hazard in financial markets. The presence of asymmetric information problems can cause agitation of financial intermediaries (financial panic) to the detriment of the economy in general, where the chances of a bad credit risk becomes larger. These suggest that a proper bank management is indispensable, both to manage credit risk and operational risk (Mishkin, 2001).

Supply of loans in the credit market consists of three components, namely direct loan from banks, consumer purchases of financial assets and new credit created by the central bank through open market mechanisms. There are two factors that affect the supply of credit, namely the willingness and ability of banks to extend credit. The willingness of banks to extend credit is influenced by internal factors such as the quality of bank assets, bad debt levels, availability of capital, and interest income, as well as external factors of the debtor's financial condition. If a bank cannot distinguish the feasibility of a debtor's loan, the credit volume will be limited (rationing). This means that there are some borrowers who can obtain credit while the other debtors cannot, although they the same level of performance (asymmetric information) (Agung et al., 2001).

When there is a decrease in the supply of loan, mortgage interest rates rise and the quantity of loan declines. However, if the willingness of banks to extend credit declines, there is no guarantee that the interest rate increases. What is more likely to happen is credit rationing. This indicates the prudential behaviour of banks in distributing loans, and that the interest rate is not the primary consideration in providing loan. In addition, to the bank's perspective, only low quality customers that are willing to pay high interest. This has been known as the adverse selection problem (Agung et al., 2001).

If asymmetric information problems occur in the credit markets, banks tend to impose a premium on borrowers over interest rates that should happen in a perfect market. The premium is inversely related to private funds, which means that the smaller the private funds (the greater for debtors to do moral hazard), the greater the premium charged by the bank. Moreover, the final impact of its condition is reducing in credit quantity supplied (lower than the symmetric information condition). If the adverse selection problem occurred, it means that the bank can no longer distinguish the quality of the debtors, there will be no credits supplied (disequilibrium), because of backward bending in supply curve (Agung et al., 2001).

Financial market conditions are in line with New-Keynesian assumption that explain that financial markets, such as credit markets do not working well (the imperfect market), especially in the presence of information asymmetry among economic agents. But this is different from the assumptions used by Neo Classical, where the market will work perfectly because of invisible hand. A very fundamental aspect here is the presence of uncertainty in every economy agent decision. The existence of this uncertainty aspect has a significant influence on banking behaviour in carrying out their intermediation function, whereby banking will tend to limit the credit supplied and placing their funds into low-risk assets (Bertocco, 2002).

The existence of asymmetric information problems in credit markets make the economic agents require time to gather relevant information, and this delays the making of decisions (Thomas, 1997). This is strong related with inter-temporal choice of economic agents in financial intermediary. And so the interaction among economic agents is not in same time (static), but involving more than one period, known as dynamic decisions, so it needed time ad-

justments (adjustment lags) toward equilibrium.

Many monetary literature focuses on working capital credit sector in particular is very limited. This may be associated with the thinking of the monetarists and the influence of Keynesian ideas of "liquidity preference" which emphasizes the importance of money from the credit (Gertler, 1988). Existing research can be classified into two approaches, i.e., equilibrium market and disequilibrium market, it known as the rationing equilibrium.

All of the previous researches use basic supply function with different estimation techniques to answer the research problem. In Indonesia, similar researches have been conducted by Siregar (2004), Chaikal and Warjiyo (2006), and a study conducted in Israel has been conducted by Ribon (2007) which emphasizes on micro banking. Shen (2002), Ikhide (2003), Armanto (2005), Harmanta (2005), Bauwens and Lubrano (2006), Hutapea (2007) and Hervino (2010) emphasis on macro side, while Agung et al. (2001) consider two approaches with two different estimation methods.

Some of the previous researches use a disequilibrium model to explain the loan markets, and use a maximum likelihood method in estimating both supply and demand sides for loan. Since developed by Laffont and Garcia (1977), the disequilibrium model has been widely used to estimate the loan markets. A couple of researches conducted by Agung (2001) in Indonesia and Ikhide (2003) in Namibia estimate disequilibrium models and switching regression model with maximum likelihood estimation methods.

Agung (2001) investigates the most dominant variables that cause a decline in bank lending, either demand or supply of loan. He considers credit capacity and factors that influence the willingness of banks to offer credit, namely interest rates, CAR, and NPL, as explanatory variables of the supply side of credit. He suggests that after the crisis, the loan distribution is mostly driven by supply-side, which is consistent with the hypothesis of credit crunch. He also finds that before the crisis, the dominant variable is on the demand side. Similar results are obtained by Ikhide (2003).

Bauwens and Lubrano (2006) analyze credit channelling in Poland using a dynamic imbalance model with a simple simulation and Bayesian inference. On the supply side of loan, they include volume of the loan, total long term debt to total extended loans, and deposits from abroad.

Hutapea (2007) uses the autoregressive distributed lag (ARDL) bounds testing to test cointegration and error correction model (ECM) as a model of long-term equilibrium. On the supply side of loan, he puts real variable mortgage interest rates, real lending capacity, real interest rate of SBI (alternative placement of bank assets) and exchange rates. The results suggest that the slow recovery process after the crisis in loan distribution Indonesia is mainly caused by low demand for loan.

Hervino (2010) discusses investment loan market using a dynamic imbalance model, namely the ARDL-ECM. On the supply side, he considers total bank assets in the form of instrument other than loan as the dependent variable. As for explanatory variables, he considers investment loan interest rate and inflation rate. The results suggest that after the crisis, banks tend to avoid risk in distributing loan as indicated by diverting investment bank's productive assets in other headings (SBI) which have low risk The presence of d e-regulation following the banking crisis makes banks more circumspect in extending the investment loan to the debtor.

The use of the unbalanced models in the loan market is motivated by the presence of asymmetric information among economic agents. This condition involves time dimension, so that the necessary adjustments in the process of interaction

among economic agents prior to the optimal economic decisions can be taken. The model is able to describe the dynamic imbalance with better market conditions for bank loan in Indonesia, both in terms of supply and demand for loan.

In analyzing the risk avoidance behaviour by banks in providing working capital, the author's purposes are: (i) investigating variables which influence the behaviour, in both the short and long terms, (ii) determining risk avoidance behaviour of these investments as a respond to the deregulation of national banking, and (iii) estimating the time required by explanatory variables in influencing dependent variable. Models and theories used to analyze this behaviour are dynamic models of working capital loan markets.

The models in this study are derived from the theory of public offering (see for example Agung et al., 2001; Ikhide, 2003; Bauwens and Lubrano, 2006; and Hutapea, 2007). The bank's risk avoidance behaviour can be seen from the placement of their productive assets in instruments other than loan which consists of cash reserve, securities and interbank money market, fixed assets, and assets.

There are some instruments available for banks to place their assets. The instruments have different risks, where lending instruments have the biggest risk of default. Banks tend to distribute their assets into these instruments in order to manage the assets and liabilities, and spread the risk.

In loan markets, banks are on the supply side while the debtors are on the demand side. The paper uses the volume of assets allocation into instruments other than bank loans to proxy the pattern of risk aversion from the supply side.

This study considers three variables which are internalized into the model of risk aversion in banking system, namely (i) interest rate loans for working capital as the price of real dollars for working capital loans, (ii) interest rates as the price of real SBI, and (iii) real interest rate of interbank money market real.

An analysis of loan markets cannot be separated from the government's regulation. Various regulations have affected the behaviour of risk aversion. The questions need to be answers regarding the issues are the magnitude and patterns of the influences. The deregulations are internalized into the model as a dummy variable. In the long run, each variable will lead to equilibrium, despite imbalances in the short-term.
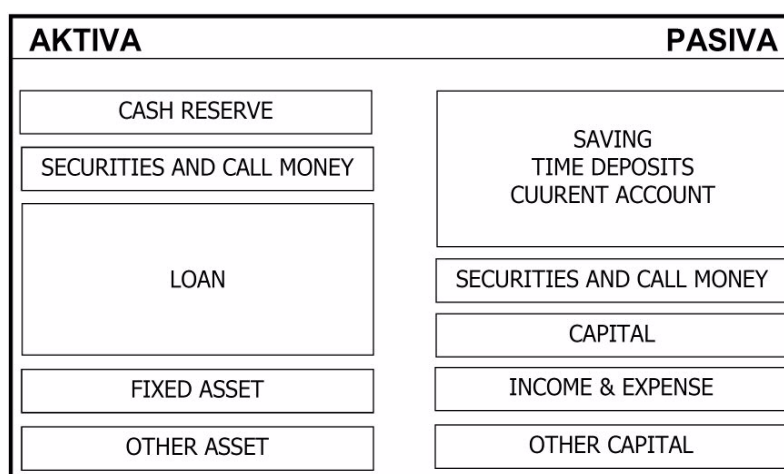
Figure 2: Topology of Banking Accounts

Based on the aforementioned considerations, the empirical model to analyze the behaviour of avoidance risk can be written as follows:

$$\Delta kmkril_t = a_0 + \sum_{p=1}^{n} b_p \Delta kmkril_{t-p}$$

$$+ \sum_{p=0}^{n} c_p \Delta rkmkril_{t-p}$$

$$+ \sum_{p=0}^{n} e_p \Delta sbi\_ril_{t-p}$$

$$+ \sum_{p=0}^{n} f_p \Delta puab\_ril_{t-p}$$

$$+ \sum_{p=0}^{n} g_p \Delta sbi\_ril*dummy_{t-p}$$

$$+ \sum_{p=0}^{n} h_p \Delta puab\_ril*dummy_{t-p}$$

$$+ \pi_1 kmkril_{t-1} + \pi_2 rkmkril_{t-1}$$

$$+ \pi_3 sbi\_ril_{t-p} + \pi_4 puab\_ril_{t-1}$$

$$+ \pi_5 sbi\_ril*dumny_t$$

$$+ \pi_6 puab\_ril*dummy_t + \varepsilon_t \qquad (1)$$

The dependent variable *kmkril* (or real working capital loan) is banks assets in terms of working capital. *rkmkril* is the price of loan on real working capital in terms of Rupiah. *sbi_ril* is the price of assets on SBI instrument. *puab_ril* is the price on assets on PUAB. *sbi_ril* and *puab_ril* are variables describe bank's risk hindering behaviour in distributing loan. *Dummy* is the dummy variable for monetary policy regulation. ε_t and v_t are errors which are assumed to be normally distributed and have zero expectation values (white-noise disturbance terms). The author ignores the existence of correlations between ndependent variables and *sbi_ril* and *puab_ril*, because both variables placement of productive assets in sectors other than bank loans.

The variables in this study are real variables. Δ describes the changes in each

variable, and *n* describes the degree of integration of all variables. This model specification allows the searching for speed of adjustment coefficients, denoted by π_i. This paper considers six disequilibrium error or error correction term (ECT) to explain the speed of adjustment of each explanatory variable on the dependent variable towards long-term equilibrium.

METHODS

This study uses quarterly time series data from 1998 to 2009. All data is real data because it is associated with the New-Keynesian approach used in this study. Therefore the the data is a stochastic sequential data (mean, variance and covariance are not the same). To accommodate this issue, prior to model estimation, stationarity tests are performed on all variables. The unit root stationarity tests are conducted using Phillips Perron (PP) test because it is associated with changes in the national banking structure as a result of the banking policy ever made by the government and BI post-1997 economic crisis, other than that the result will be confirmed using other tests commonly performed the Autocorrelation Function (ACF) and the Augmented Dickey Fuller (ADF).

When all the variables are stationary in-level or *I*(0), then the appropriate model is the long-term model of simple linear regression. If all the variables are not stationary at a certain degree and cointegrated, the appropriate dynamic model is the Error Correction Model-Engle Granger (ECM-EG). When all the variables does not have the same degree of integration, then the dynamic model to be constructed is the Autoregressive Distributed Lag Error Correction Model (ARDL-ECM), with ARDL as the tool for cointegration testing. Besides conducting the classical assumptions tests, the paper also conducts the stability test using the CUSUM and CUSUMQ tests.

This paper estimates only the risk-hindering model for bank's lending on working model in Rupiah. As mentioned earlier, if all variables do not have the same degree of integration, then the model is estimated by a technique of Error Correction Model Distributed Lag (ARDL-ECM). The short-term model specification is given as follows

$$\Delta kmkril_t = a_0 + \sum_{p=0}^{n} b_p \Delta rkmkril_{t-p}$$

$$+ \sum_{p=0}^{n} c_p \Delta sbi\_ril_{t-p}$$

$$+ \sum_{p=0}^{n} d_p \Delta puab\_ril_{t-p}$$

$$+ \sum_{p=0}^{n} e_p sbi\_ril * dummy_{t-p}$$

$$+ \sum_{p=0}^{n} f_p puab\_ril * dummy_{t-p}$$

$$+ \pi_1 kmkril_{t-1} + \pi_2 rkmkril_{t-1}$$

$$+ \pi_3 sbi\_ril_{t-1} + \pi_4 puab\_ril_{t-1}$$

$$+ \pi_5 sbi\_ril * dummy_{t-1}$$

$$+ \pi_6 puab\_ril * dummy_{t-1} + \varepsilon_t \quad (2)$$

To find out how long it takes for the explanatory variables to influence the dependent variable in the adjustment process towards long-term equilibrium, the paper conducts a manual calculation of the mean-lagged from the short-term ARDL-ECM model (Thomas, 1997).

In the long run, these conditions create an equilibrium in which each variable has stabilized at a certain scale values (stationary). The long term equation is derived from the short-term ARDL-ECM model, namely when the value of $\Delta kmkril$, $\Delta rkmkril$, Δsbi_ril, $\Delta puab\_ril$, and $\Delta sbi\_ril*dummy$, $\Delta puab\_ril*dummy = 0$. The specifications are as follows

$$kmkril_t = a_0 + a_1 rkmkril_t + a_2 sbi\_ril_t$$

$$+ a_3 puab\_ril_t + e_t \quad (3)$$

Technically, the specification is obtained by applying the assumptions of stasionarity variables and lack one period.

RESULTS DISCUSSION

The characteristics of most macroeconomic variables undergo structural changes as the result of the dynamics in the economy. On the domestic front, changes in the structure can also be influenced by policies such as happened in the first quarter to the third quarter of 1999 when BI and the government imposed a regulatory principle of prudential banking in the management of banks and banking restructuring.

Based on the ACF test, all variables are not stationary at level degree, but using the ADF test, all variables are stationary at level degree. Using PP test, only real interest rate of SBI (sbi_ril) is stationary in degree one, while the rest are stationary at level degree. The test on cointegration shows that none of pairs of variables are cointegrated. Based on this result, then the appropriate model specification is the ARDL-ECM, which is a third alternative in the loglin form.

The estimate of short-term ARDL-ECM model from the bank side is done with lag of one period. This is done by considering the smallest value of Akaike Info Criterion (AIC) and Schwarz Criterion (SC). The ARDL-ECM model is compliant with the assumptions of classical tests which are serial correlation, heteroscedasticity, and linearity tests. In general, this model is valid to be used to explain the behaviour of risk aversion by banks, with a quite large coefficient of determination of 0.7477.

The stability test is performed using CUSUM and CUSUMQ tests with an error rate of 5 percent (see Figure 3). The CUSUM nad CUSUMQ tests show that, in general, all the residuals in the equation are in the line. This condition indicates that the variables in the system are stable.

Table 1: Estimation of Stationarity Test

Variabel	Level	ACF	ADF	PP
log*kmkril*	In-level		-3.634148 (0.0375)	-4.614729 (0.0029)
	Degree 1	Stationary		
	Degree 2			
Puab_ril	Aras		-4.817166 (0.0003)	-2.638531 (0.0094)
	Degree 1	Stationary		
	Degree 2			
Rkmkril	In-level		-3.768007 (0.0060)	-4.202579 (0.0017)
	Degree 1	Stationary		
	Degree 2			
	Degree 2			
Sbi_ril	Aras		- 4.291054 (0.0014)	
	Degree 1	Stationary		-8.264194 (0.0000)

Notes: Entries in parentheses are the probability.
Source: Data estimation.
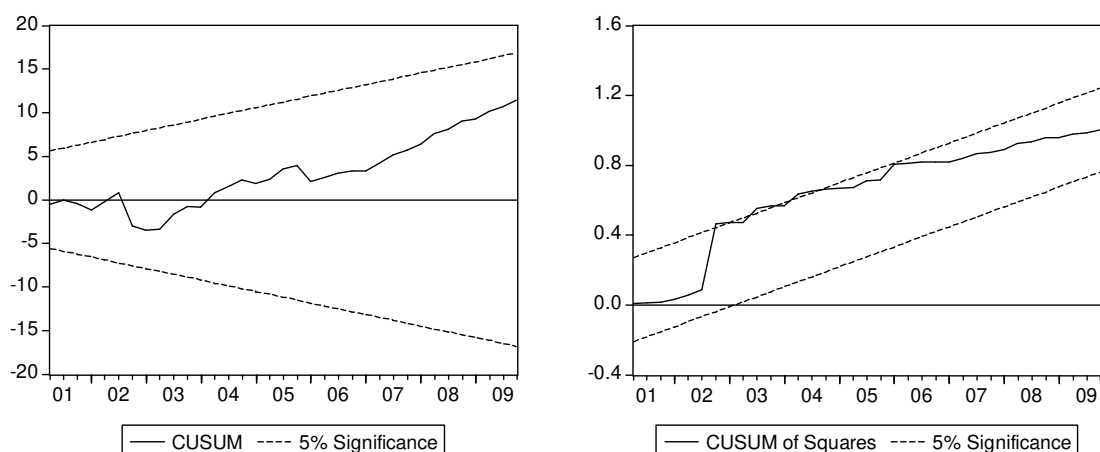
Source: Data processed.

Figure 3: Plot of CUSUM and CUSUMQ Recursive Residual, ARDL-ECM

The results of the estimation, which can be seen from the sign and significance of the coefficients of the explanatory variables in the short term, are in accordance with the theory. They have significant effects on the supply of working capital credit banks in Indonesia, except for the variable of real interest rates for working capital. Estimates show that in offering working capital loans, the banks do not take into account the amount of working capital loan interest rates (*rkmkril*), which is shown by the insignificance of the coefficient of this variable in the short term, although the coefficient sign is in accordance with the theory of the basic offerings.

Table 2: Estimates of ARDL-ECM Model for *logkmkril*

Variable	Coefficient	Variable	Coefficient
Constant	0.188866 (0.1348)	*sbi_ril*dummy*(-1)	-2.594580 (0.2428)
d(*rkmkril*)	0.503971 (0.4578)	*Serial Correlation LM Test*	1.777058 (0.411260)
d(*puab_ril*)	-8.450293 (0.0000)	*White Heteroskedasticity Test*	17.07882 (0.758996)
d(*puab_ril*dummy*)	3.774581 (0.0297)	*Ramsey RESET Test*	0.682189 (0.408834)
d(*sbi_ril*)	6.519369 (0.0016)	*R-squared*	0.747666
d(*sbi_ril*dummy*)	-3.511988 (0.0459)	*Adjusted R-squared*	0.668361
logkmkril(-1)	-0.056529 (0.3654)	*Akaike info criterion*	-2.020389
rkmkril(-1)	-0.798300 (0.1651)	*Schwarz criterion*	-1.548011
puab_ril(-1)	-4.288843 (0.0191)	*Log likelihood*	59.47913
*puab_ril*dummy*(-1)	3.079961 (0.1544)	*F-statistic*	9.427713 (0.0000)
sbi_ril(-1)	3.659290 (0.0352)	*Durbin-Watson stat*	2.138317

Notes: Entries in parentheses are the probability.
Source: Data estimation.

Table 3: Mean-Lag Calculation

Components	Calculation	Mean-Lag
rkmkril	1(-0.798300/-14.1219551)	0.0565
puab_ril	1(-4.288843/-75.86978365)	0.0565
*paub_ril*dummy*	1(3.079961/54.48461851)	0.0565
sbi_ril	1(3.659290/64.73296892)	0.0565
*sbi_ril*dummy*	1(-2.594580/-45.89821154)	0.0565

Source: Data estimation.

In the short term, it appears that the placement of bank's assets in the interbank money market is one way to avoid the risk from offering working capital. This means that interbank lending is the substitution of working capital. Based on the estimation results in Table 2, if the interbank interest rate (*puab_ril*) rises by 1 percent, the banks will reduce lending on working capital by 8.45 percent. The interesting result can be seen from the placement bank's assets on SBI which have a complementary relation-ship to working capital lending by banks. The estimation result shows that the increase in SBI rates (*sbi_ril*) by 1% would increase the lending on working capital by 6.52%. The results also show that the most influential variables influencing the bank's efforts to avoid risk is the placement of bank assets in the interbank money market.

From the results of short term esti-mates, we can see that the interaction across interbank interest rate (*puab_ril*) and banking deregulation (dummy variables)

has a positive and significant impact on working capital lending banks. With the deregulation, while interbank interest rates rise by 1 percent, then the working capital lending, banks rise by 3.77 percent. This means that the presence of banking deregulation makes the bank look at the placement of its assets in interbank market as a motive for risk-spreading (complement), not risk avoidance. Different things happen to the placement of bank assets at SBI. Post-deregulation of banking, the bank looked at the placement of its assets in the SBI as a motive for avoiding the risk (substitution). This can be seen from the results of the estimates which suggest that if the SBI interest rates rise by 1 percent, lending on working capital reduces by 3.51 percent.

The behavioural risk avoidance is conducted in a response to the requirement by BI regarding banks health issue such as legal lending limit, the minimum capital that must be owned by banks, credit crunch and the maximum limit permitted by the BI. However, in the long run, SBI is the complement of working capital distributed by banks. This can be seen from the coefficients which have a positive direction, while the interbank constitutes as a substituted variable (with a negative sign in the coefficient). In the long term, working capital loans are also not affected by the amount of working capital loan interest rates (negative coefficient).

From the estimation of ARDL-ECM models, we can find the period took by each explanatory variable in affecting the dependent variable, which can be done by calculating the mean-lagged value of short term model of the ARDL-ECM.

From the banking point of view, the manual calculation of the mean-lag is as seen on Table 2. The results of these calculations suggest that, on average, all explanatory variables are of the same speed in influencing the dependent variable, namely 0.0565 quarters, or 0.1695 months, or 5.085 days.

CONCLUSION

This paper made three conclusions. Firstly, in the short term, working capital loans is affected by interbank interest rate (substitution) and SBI interest rate (complement), but it was not influenced by the lending rates for working capital. In the long run, avoidance behaviour by the bank's risk in disbursing working capital loans was influenced by interbank interest rate (substitution), but it was not influenced by SBI interest rate (complement). Secondly, in the short term, post-1997 economic crisis deregulation had made banks to be more cautious in extending credit, indicated by the placement of productive assets in the SBI. Thirdly, all explanatory variables in this research take an average of 6 days or a week in influencing bank behaviour in avoiding the risk of Rupiah working capital loans by banks.

A possible future research might be in the form of empirical analysis of consumer loan risk avoidance behaviour by banks. Consumer loan has different characteristics from investment and working capital loans. By so doing, we might get a clearer picture of bank's risk-averse behaviour in offering consumer loan post-1997 crisis.

REFERENCES

Agung, J., B. Kusmiarso, B. Pramono, E.G., Hutapea, A. Prasmuko, and B.J. Prastowo (2001), "Credit Crunch di Indonesia Setelah Krisis: Fakta, Penyebab, dan Implikasi Kebijakan," Direktorat Riset Ekonomi dan Kebijakan Moneter, Bank Indonesia, Jakarta.

Armanto, B. (2005), *Fenomena Credit Crunch dalam Pasar Kredit dan Implikasinya ter-*

hadap Intermediasi Perbankan: Analisis Empiris Perbankan Indonesia: Sebelum dan Setelah Periode Krisis, Postgraduat Dissertation, Economics Programme, Fakultas Ekonomi Universitas Indonesia.

Bank Indonesia, 1998-2008, *Laporan Tahunan Bank Indonesia*, Bank Indonesia, Jakarta.

Bank Indonesia, 1998-2008, *Statistik Ekonomi dan Keuangan Indonesia (SEKI)*, Bank Indonesia.

Bank Indonesia, 1998-2008, *Buku Statistik Perbankan Indonesia (BSPI)*, Bank Indonesia, Jakarta.

Bauwens, L. and M. Lubrano (2006), *Bayesian Inference in Dynamic Disequilibrium Models: An Application to the Polish Credit Market*, Oxford University Press, Oxford.

Bertocco, G. (2002), "The Role of Credit in a Keynesian Monetary Economy, Reviews of Political Economics," *Tylor and Francis Journals*, 17(4), 489-511.

Chaikal, N., and P. Warjiyo (2006), "Prilaku Penawaran Kredit Bank di Indonesia: Kasus Pasar Oligopoli Periode Januari 2001-Juli 2005," Bank Indonesia, Jakarta.

Gertler, M. (1988), "Financial Structure and Aggregate Economic Activity: An Overview," *Journal of Money, Credit and Banking*, 20(3), 559-588.

Harmanta (2005), "Disintermediasi Fungsi Perbankan di Indonesia Pasca Krisis 1997: Faktor Permintaan atau Penawaran Kredit, Sebuah Pendekatan Dengan Model Disequilibrium," *Buletin Ekonomi Moneter dan Perbankan,* 8(1), 51-78.

Hervino (2010), "Perilaku Perbankan Indonesia dalam Menghindari Risiko Kredit Setelah Krisis Ekonomi," *Jurnal Keuangan dan Perbankan*, 12(12), 37-52.

Hutapea, E.G. (2007), "Credit Downturn in The Aftermath of Indonesian Crisis 1997 Revisted: An Application of ARDL Bounds Testing Approach," Bank Indonesia, Jakarta.

Ikhide, S. (2003), "Was There A Credit Crunch in Namibia Between 1996-2000?" *Journal of Applied Economics*, 6(2), 269-290.

Mishkin, F.S. (2001), *The Economics of Money, Banking, and Financial Markets*, 5th Edition, Pearson Addison Wesley, Boston, America.

Ribon, S. (2007), "The Credit Market in Israel: Empirical Testing of The Credit Channel," *Israel Economic Review*, 5(2), 1-32.

Shen, C.H. (2002), "Credit Rationing for Bad Companies in Bad Years: Evidence from Bank Loan Transaction Data," *International Journal of Finance and Economics,* 7(3), 261–78.

Siregar, R.Y. (2004), "Interest Rate Spread and Mandatory Credit Allocation: Implication on Bank Loans to Small Businesses in Indonesia," CIES Discussion Paper, No. 0402.

Thomas, R.L. (1997), *Modern Econometrics: An Introduction*, Addison Wesley, Longman, London.