Vol 4, No 2, July - December 2019, pp: 13 - 28

Faculty Publications
ISSN: 3008-1017
Title DOI: https://doi.org/10.62458/021024

An Estimation of Term Structure of Interest Rates in the Cambodia Banking System

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ABSTRACT

The objective of this research was to study about the term structure of interest rate by applied the four best well known models: CKLS, Merton, Vasicek, and CIR models over the 1-month US dollar lending interest rate of banks in Cambodia. The estimated method of the employed models was GMM. The CKLS result supported the mean reversion effect, but had no evidence of the level effect, while the result of the Merton model had not support even the mean reversion effect, but the diffusion parameter was highly significant. The Vasicek and CIR models had a weakly support the mean reversion effect, but the diffusion parameters were highly significant. The survey result revealed that banks faced with high level of interest rate risk because of the pressure from high level of competition due to the current existing of large numbers of market players in banking industry.

***Keywords*:** Term structure of interest rate, CKLS, Merton, Vasicek, CIR, GMM, Survey.

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1. Introduction

Economic growth has a positive link to the level of investment in a country. Increase in investment would boost up domestic outputs and economic growth, but the investment amount depends on the level of interest rate, the higher the interest rate, the lower the level of investments. The study of the movement of the interest rate which is known as the term structure of interest is an important thing to do to understand the fluctuation of investment as well as total output in one country.

Cambodia could maintain a real economic growth rate on average about 7% for the last four years thanks to the increased in the level of investment (gross fixed capital investment) on average 15.58% per year for the last four years, (ADB, 2018). The increased in the level of investment could be explained by the decreased in the level of interest rate at around 5.27%, from 16.66% in December 2016 to 11.49% in January 2018, (NBC, 2018). Understanding about the changes or movement in interest rate would understand about the fluctuation in investment as well as business cycle. To study about the term structure of interest rate, four most popular models have been developed such as Vasicek in 1977, Merton in 1977, Cox, Ingersoll, and Ross (CIR) in 1985, and Chan, Karolyi, Longstaff, and Sanders (CKLS) in 1992.

This research applies the four models in order to study about the term structure of the 1-month US dollar lending interest rate by banks in Cambodia, from December 2006 to April 2018. More interestingly, the future forecasting of the 1-month interest rate trend, from May 2018 to December 2019, is also conducted regarding to the estimated parameters generated from one of the best model among the four models. Besides using quantitative models in study about the movement of the 1-month lending interest rate, this paper also employs a qualitative research to investigate about the behavior of banks in determine based lending rate and how to measure interest rate risk/exposure as well as the instruments using by banks to manage the risk. To fulfill this research objective, a questionnaire is developed which consist of fifteen items and the target respondents are banks, both commercial and specialized banks.

2. Literature Review

To study about the changes of US one-month Treasury bill rate, CKLS; applied a single-factor short-term structure of interest rate model which has the following form:

$$dz = (\alpha + \beta r)dt + \sigma r^{\gamma} dz \qquad (*)$$

Where,

- r : US one-month Treasury bill rate,
- β : speed of mean reversion,
- σ : diffusion parameter: a scale factor for the volatility of unexpected interest rate changes,
- γ : sensitivity parameter: a sensitivity of the interest rate change with respect to interest rate level (this parameter is called the levels effect),
- dz : the increment to a Wiener process
- dt : changes in time,

The mean and variance of (*) are,

$$\text{Mean} \quad : E[dr] = (\alpha + \beta r)dt,$$

$$\text{Variance} \quad : Var[dr] = \sigma^2 r^{2\gamma} dt$$

The conditional mean and variance of dr depend on the level of r. To estimate sample parameters of this model, CKLS employed generalized method of moment (GMM) which was developed by Hansen, on US one-month Treasury bill rate over the period between 1964 and 1989. CKLS found a weak evidence of mean reversion effect and suggested that the best model of the term structure of interest rate must have high value of sensitivity parameter. This puzzle have led many researchers extended the CKLS model by imposing different assumptions as listed below.

1. Merton $dr = \alpha dt + \sigma dz$
2. Vasicek $dr = (\alpha + \beta r)dt + \sigma dz$
3. CIR SR $dr = (\alpha + \beta r)dt + \sigma r^{1/2} dz$
4. Dothan $dr = \sigma r dz$
5. GBM $dr = \beta r dt + \sigma r dz$
6. Brennan-Schwartz $dr = (\alpha + \beta r)dt + \sigma r dz$
7. CIR VR $dr = \sigma r^{3/2} dz$
8. CEV $dz = \beta r dt + \sigma r^{\gamma} dz$

Dahlquis found that mean reversion played an important role for the specification of the one-month interest rate dynamics in Germany, Sweden and UK, while structural change existed in Danish interest rate due to a change in monetary policy. The result of this study has shown evidence of both the mean reversion effect and the level effect. In addition, the Vasicek model worked well in Germany and UK. In contrast of Dahlquis in the case of Denmark, Germany, Sweden, and UK, Brailsford and Maheswaran found only a significant of the level effect but insignificant of the mean reversion effect on 30-days bank accepted bill rate in Australia, but this result was consistence with Faff and Gray in Austria, UK and US.

3. Methodology

3.1. Model Specification

The model specification is start up with the CKLS generalized continuous time model as specify below:

$$dr_t = (\alpha + \beta r_t)dt + \sigma r_t^{\gamma} dz_t \qquad (1)$$

Where,

r : interest rate,
t : time,
$\alpha, \beta, \sigma \; and \; \gamma$: parameter.

The CKLS continuous time model can be transformed to be discrete time model by using the Euler-Maruyama discrete time approximation.

$$r_{t+1} - r_t = \Delta r_t = \alpha + \beta r_t + \varepsilon_{t+1} \qquad (2)$$

Where, $E[\varepsilon_{t+1}] = 0$ and $E[\varepsilon_{t+1}^2] = \sigma^2 r_t^{2\gamma}$.

Model (2) consists of four parameters $\alpha, \beta, \sigma^2 \; and \; \gamma$. The imposing of restriction on those parameters could be used to obtain other short term interest rate model such as Merton, Vasicek and CIR SR model (see Table 1).

Table 1 Unrestricted and Restricted Interest Rate Models

Model	α	β	σ^2	γ
CKLS				
Merton		0		0
Vasicek				0
CIR SR				0.5

The parameters of the model can be estimated by using GMM since GMM does not require that the distribution of interest rate changes be normal. Especially, the estimators and standard errors still be consistent even if the disturbances, ε_{t+1}, are conditionally heteroskedasticity. To employ GMM, the moment condition equations have to be derived.

A set of observed variables, r_t, are determined by a set of parameters, θ, which is written in a vector form as below,

$$\theta = (\theta_1, \dots, \theta_k)'$$

With a set of observed variables which depend on a set of parameters, function f is developed to represent about this relationship.

$$f_i(r_i|\theta), i = 1, \dots, m \text{ and } m \geq k \text{ such that}$$
$$E[f_i(r_i|\theta)] = 0$$

Regarding to the classical method of moments, when number of parameters equals to number of functions, the function f_i is exactly equal zero. The value of sample parameters, $\hat{\theta}$ of θ such that

$$\frac{1}{N}\sum_{t=1}^{N} f_i(r_i|\hat{\theta}) = 0, \qquad i = 1, \dots, k \qquad (3)$$

Le denotes a set $f = (f_1, \dots, f_m)$ and define $\hat{\theta}$ to be

$$\hat{\theta} = \min f'Wf \qquad (4)$$

where W is a positive-definite symmetric weighting matrix. Minimizing $\hat{\theta}$ with respect to θ is equivalent to solving the equation

$$D'Wf = 0 \tag{5}$$

where D is the Jacobian matrix of f with respect to θ. As refer to equation (2), a set of parameter is $\theta = (\alpha, \beta, \sigma, \gamma)'$ and the residual of the model is

$$\varepsilon_{t+1} = r_{t+1} - r_t - \alpha - \beta r_t$$

The four moment conditions are written in a vector form of $f_t(\theta)$ as below

$$f_t(\theta) = \begin{bmatrix} \varepsilon_{t+1} \\ \varepsilon_{t+1} r_t \\ \varepsilon_{t+1}^2 - \sigma^2 r_t^{2\gamma} \\ \left[(\varepsilon_{t+1}^2 - \sigma^2 r_t^{2\gamma}) r_t\right] \end{bmatrix} \tag{6}$$

Each moment condition equation represents as

Zero mean condition:	$E[\varepsilon_{t+1}] = 0$
Orthogonality condition:	$E[\varepsilon_{t+1} r_t] = 0$
Variance condition:	$E\left[\varepsilon_{t+1}^2 - \sigma^2 r_t^{2\gamma}\right] = 0$
Zero covariance condition:	$E\left[(\varepsilon_{t+1}^2 - \sigma^2 r_t^{2\gamma}) r_t\right] = 0$

The four functions, f are,

$$f_1 = \frac{1}{N}\sum_{t=1}^{N}(r_{t+1} - r_t - \alpha - \beta r_t) \tag{7}$$

$$f_2 = \frac{1}{N}\sum_{t=1}^{N}(r_{t+1} - r_t - \alpha - \beta r_t) r_t \tag{8}$$

$$f_3 = \frac{1}{N}\sum_{t=1}^{N}\left[(r_{t+1} - r_t - \alpha - \beta r_t)^2 - \sigma^2 r_t^{2\gamma}\right] r_t \tag{9}$$

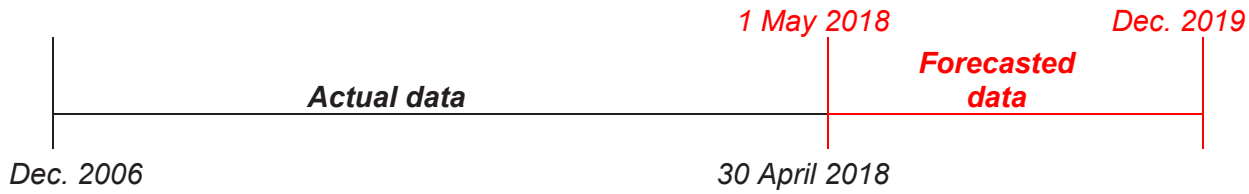
$$f_4 = \frac{1}{N}\sum_{t=1}^{N}\left[(r_{t+1} - r_t - \alpha - \beta r_t)^2 - \sigma^2 r_t^{2\gamma}\right] \tag{10}$$

The GMM estimates of $\alpha, \beta, \sigma \; and \; \gamma$ are

$$\left(\hat{\alpha}, \hat{\beta}, \hat{\sigma}, \hat{\gamma}\right) = \min \mathrm{J}(\alpha, \beta, \sigma, \gamma) \tag{11}$$

$W = S^{-1}$ for the restricted model (5), where $S = E[f \cdot f]$.

The short-term interest rates in this study is referred to the weighted average of the banks 1-month US dollar lending rate (the rate is quoted on annually basis) since the short-term interest rate in the money market such as treasury bill, commercial paper, certificate of deposit, and Repo or inter-bank market does not exist yet in Cambodia. Thus, the best proxy for the short-term interest rate is the banks 1-month US dollar lending rate. The period of the study of this research is covered from December 2006 to April 2018 and the banks 1-month US dollar lending rates are collected from the National Bank of Cambodia. By applying the GMM estimated method with the observed data, the estimated parameters are generated and the out-of-sample forecast of the 1-month US dollar lending rate, from May 2018 to December 2019, is conducted as indicated in the following time plan.



3.2. Research Design

To fulfill the objective of this research regarding to the determination of banks based lending rate, how to measure interest rate exposure, how to minimize interest rate risk and to develop a policy options which generate from this research results for policy makers in related ministries and institution in making future necessary policies to improve the management of interest rate risk in the Cambodia banking system, a survey is also conducted in this study and the target respondents are banks. The questionnaire (see Appendix) of this research consists of fifteen items which are classified into three main sections (see Table 2).

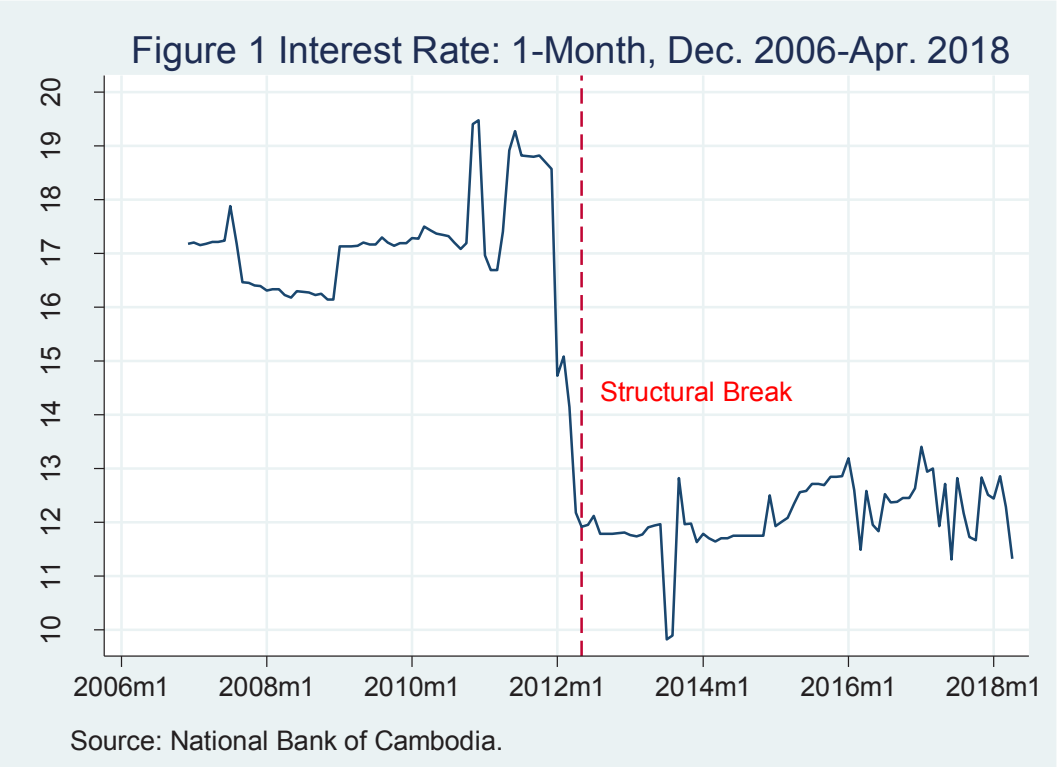
Table 2 Objective of Each Group Items of the Questionnaire

Sections	Objectives	Item Number
1	Demography of bank	Item 1 to Item 3
2	Determination of interest rate	Item 4 to Item 9
3	Measuring and managing interest rate exposure	Item 10 to Item 15

Before the questionnaire is officially send to banks, the test of the validity of all items in the questionnaire is performed by randomly selected five experts who work in different banks to respond to the developed questions. The problems which occur during the survey time period by the five experts will be noted and used in order to update the items in the questionnaire. After this process is completed, the survey process is preceded by asking an expert of each bank to complete the developed questionnaire. The questionnaire is sent to all commercial and specialized banks. Data collection is conducted over the period of three months.

4. Research Result

During the period of the study, on average the 1-month lending interest rate is 14.46 percent, which bounded between 9.83 percent (minimum) and 19.48 percent (maximum). The highest interest rate is in December 2010 and the lowest is in July 2013.



As indicated in Figure 1, the structural break of the data series is found between the end of 2011 and the beginning of 2012. The cause of the break might be explained by the high level of competitiveness in the banking system due to so many numbers of banks in the market.

Table 3 Summary Statistics

Variable	Number of Observation	Mean	Standard Deviation	Minimum	Maximum	Skewness	Kurtosis
r	137	14.4615	2.6445	9.8300	19.4800	0.2453	1.4765
dr	136	-0.0430	0.6992	-3.8400	2.9300	-0.9070	12.7980

The CKLS model is regarded as an unrestricted model, while the Merton, Vasicek, and CIR are classified as restricted models as referred to the restriction imposed above. The estimated result of each model is shown in Table 4 below.

Table 4 Estimated Results of Respected Model, GMM Method

Model	α	β	σ^2	γ	χ^2	d.f.
CKLS	-0.00567*** (0.00325)	0.03627** (0.02179)	0.00002*** (0.00005)	-0.21176 (0.60382)		
Merton	-0.00037 (0.53800)	0.00000	0.00005*** (0.00100)	0.00000	2.69114 (0.26040)	2
Vasicek	-0.00573* (0.07700)	0.03670* (0.09200)	0.00005*** (0.00100)	0.00000	0.12802 (0.72050)	1
CIR	-0.00578* (0.07500)	0.03732* (0.08600)	0.00031*** (0.00200)	0.50000	1.40972 (0.23510)	1

p-value in parenthesis

***Significant at 1%

**Significant at 5%

*Significant at 10%

Regarding to the CKLS estimated result; all slopes parameters are highly significant, except the level effect or sensitivity parameter (γ) which is insignificant. This model supports only the mean reversion effect, $-\frac{\alpha}{\beta} = 0.1563$, but does not support the level effect. Even the Merton model is correctly specified, but the model generates only one highly significant parameter at 1 percent level which is the diffusion parameter. After imposed a zero restriction on level effect parameter of the CKLS model, the estimated result of the Vasicek model is found. The mean reversion parameters of the Vasicek model is $-\frac{\alpha}{\beta} = 0.1561$ but has a weakly significant, while the diffusion parameter is found to be highly significant. The model is correctly specified since the *p*-value of the calculated chi-square is 0.72050 which is greater than 0.05 significant level. The estimated result of the CIR model is similar to Vasicek model even the level effect parameter has restricted to be 0.5. The mean reversion parameters are weakly significant which is $-\frac{\alpha}{\beta} = 0.1548$, and the diffusion parameter is also highly significant and higher than the value of the Vasicek model, 0.00031 versus 0.00005. The model is also found to be correctly specified.

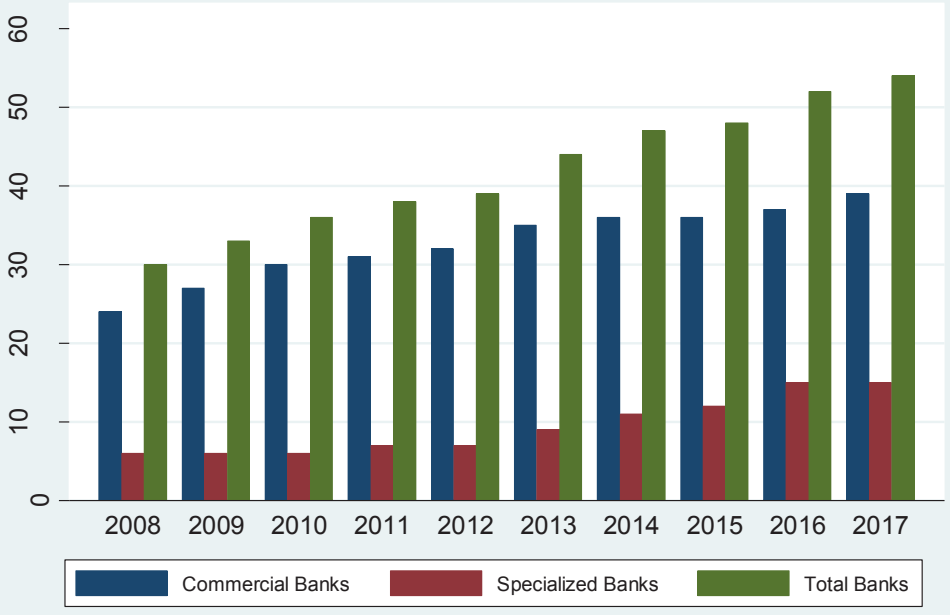
The next step is to conduct the out of sample forecast of the 1-month interest rate from May 2018 to December 2019 by using Vasicek model. The forecasted interest rate result is

shown a negative trend in the future (see Figure 2). The declining of the expected future interest rate might have been explained by the increase in the number of banks, commercial and specialized banks, as indicated in Figure 3. As of December 2017, totally; there exist 54 banks of which 39 commercial banks and 15 specialized banks are operating business in the Cambodia. Over the period of the last nine years from 2009 to 2017, on average, the growth rate of numbers of bank in Cambodia is approximately three banks per year which is supposed to be high as compare to the region. This number has not been taken into account numbers of Micro Finance Institutions (MFIs) yet which has 76, 69 is MFIs and 7 is MDIs, (NBC Report, 2017).

Figure 2 Interest Rate: Forecast, May 2018-Dec. 2019

Source: National Bank of Cambodia and Forecasted by Author.

Figure 3 Number of Banks: Commercial and Specialized Banks

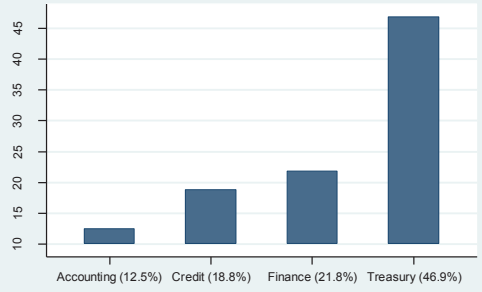


Source: National Bank of Cambodia (NBC).

To get through in-depth analysis about the term structure of interest rate as well as interest rate risk exposure of banks, this study also performs a microeconomics research related to the behavior of economic agent in the Cambodia banking system. As refer to the result of the survey, the majority of the respondent participation in answering to the assigned questionnaire work in the field of Treasury which accounted for 46.9 percent, while 21.8 percent, 18.8 percent, and 12.5 percent are Finance, Credit, and Accounting, respectively. During the three months of the opened survey period, 32 banks (not specified commercial or specialized bank) provided feedback to the sent questionnaire. Among those banks, 46.9 percent is local bank, 43.8 percent is foreign bank, and 9.4 percent is the joint between local and foreign bank. And, most of the banks are old bank which have run business in Cambodia for more than ten years.

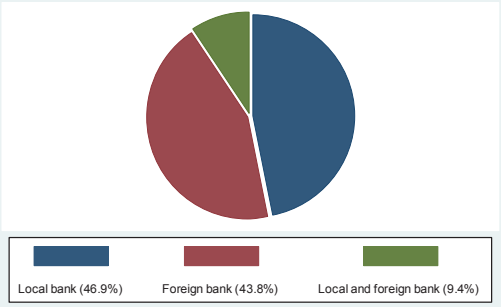
Each bank relies mainly on the credit risk (78.1 percent) which follows by the margin (the spread between lending and deposit interest rate, 71.9 percent), weighted average of the market interest rate (65.6 percent), market risk (43.8 percent) and only 21.9 percent of the banks are relying on inflation rate in determine the based lending interest rate.

Figure 4 Department/Section of the Respondents



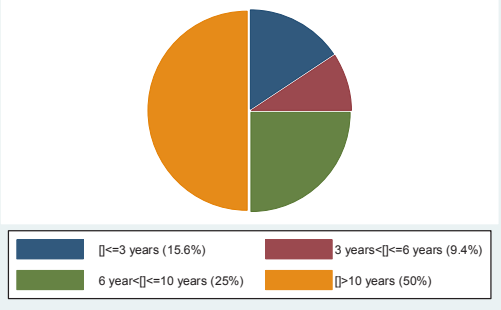
Source: Survey Data.

Figure 5 Type of Bank



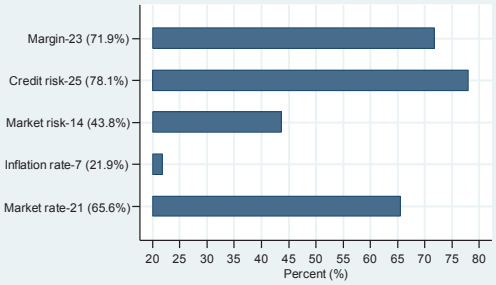
Source: Survey data.

Figure 6 Ages of Banks



Source: Survey Data.

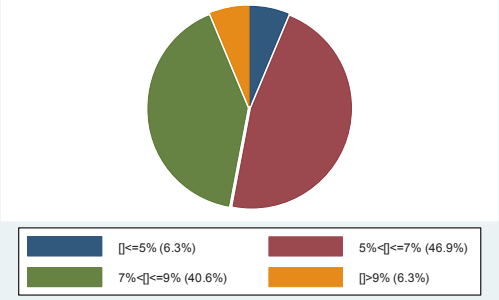
Figure 7 Methods: Interest Rate Determination



Source: Survey Data.

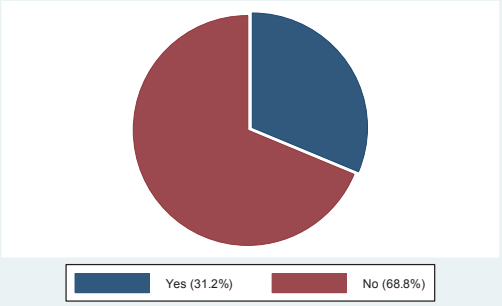
This study has also found that the interest rate spread on average is between 5 percent and 9 percent which is consistence with the report of the central bank. About 31.2 percent of the banks have taken into account the movement of London Interbank Offered Rate (LIBOR) or Singapore Interbank Offered Rate (SIBOR) to determine the based lending interest rate. In contrast, 68.8 percent of the banks do not depend on LIBOR or SIBOR rate. In addition, the sources of the funds of banks are not largely funded from abroad since only 28.1 percent of banks use foreign funding, while 71.9 percent use banks' owned sources of funds. From this result, this might have claimed that the external shock on the world interest rate would have no significant effect on banking system in Cambodia. This result of the survey has also revealed that the trend of the interest rate of each bank has declined as compare to the past time.

Figure 8 Interest Rate Spread, Percentage



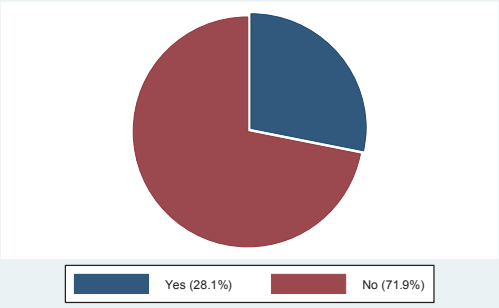
Source: Survey Data.

Figure 9 Using SIBOR or LIBOR



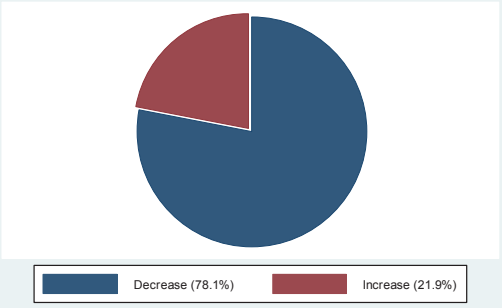
Source: Survey Data.

Figure 10 Using Foreign Funds



Source: Survey Data.

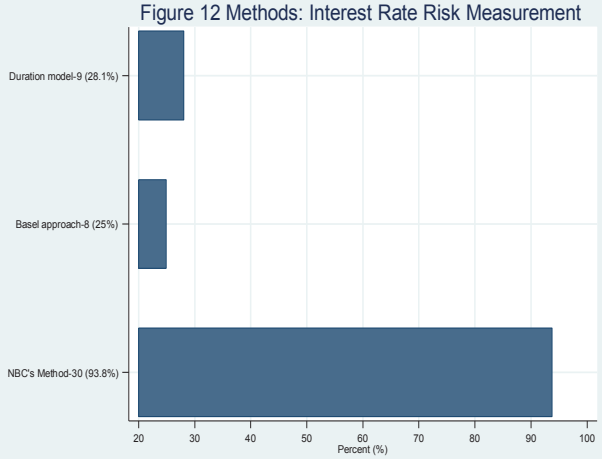
Figure 11 Past Trend of Interest Rate



Source: Survey Data.

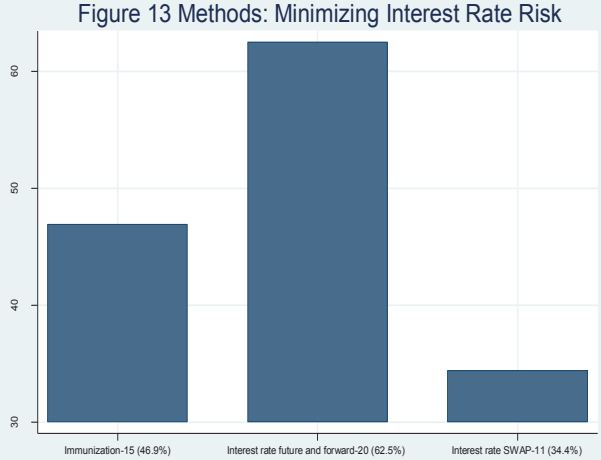
To measure the interest rate risk, 93.8 percent of the banks employ the National Bank of Cambodia's method; follow by 28.1 percent and 25 percent use Duration model and Basel approach, respectively. In hedging or diversifying the interest rate risk, the most popular instrument use by banks is interest rate future and forward which is accounted for 62.5 percent of the banks, and follow by immunization of 46.9 percent, and interest rate SWAP of 34.4 percent.

Figure 12 Methods: Interest Rate Risk Measurement



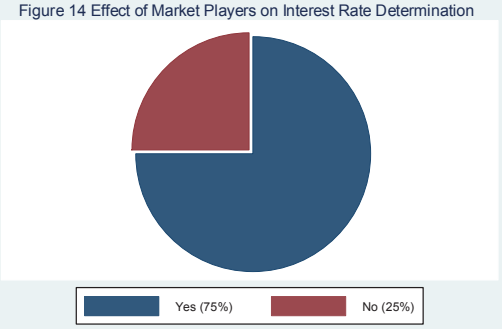
Source: Survey Data.

Figure 13 Methods: Minimizing Interest Rate Risk



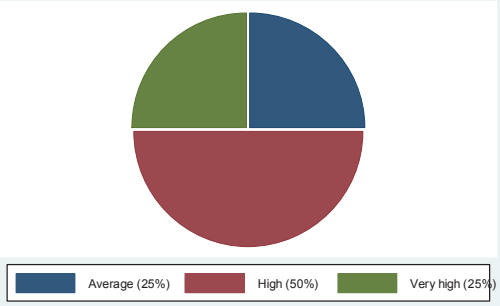
Source: Survey Data.

Figure 14 Effect of Market Players on Interest Rate Determination



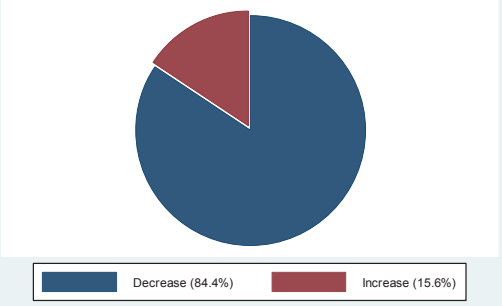
Source: Survey Data.

Figure 15 Level of Competition



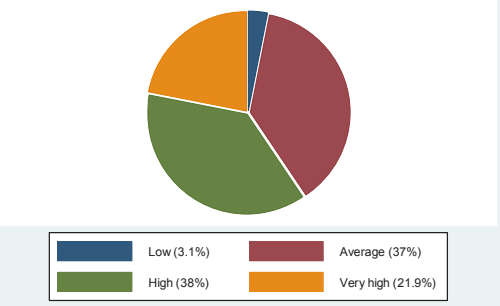
Source: Survey Data.

Figure 16 Expected Future of Interest Rate



Source: Survey Data.

Figure 17 Limited Number of Banks



Source: Survey Data.

Of course, 75 percent of the banks have responded that the number of market players in the banking industry has a significant effect on the way that bank determines interest rate. Regarding to the large number of banks, more than 50 percent of the banks have claimed that the level of competition is high and 84.4 percent of the banks expect that the future interest rate of bank would fall which is consistence with the prediction of the Vasicek model as shown in Figure 2. Moreover, most of the banks highly agree on the imposing of the restriction on the issue of new license to open a new bank, if this policy is planned to be conducted by the National Bank of Cambodia in order to limit number of competitors in banking industry which might help reducing the level of interest rate risk as well as bank failure.

5. Conclusion

The unrestricted model, CKLS; support the mean reversion process and the diffusion parameter is highly significant, but does not support the level effect parameter. The mean reversion process is not found in the Merton model despite the level effect has been restricted to be zero, while the diffusion parameter has found to be highly significant. In contrast to the result of Merton model, Vasicek and CIR models have found the evidence of the mean reversion process even the result is weakly significant. As consistence with CKLS and Merton models, the diffusion parameter of both Vasicek and CIR models have found to be highly significant, but the value of the CIR's diffusion parameter is greater than the Vasicek. This result is similar to the research result of CSKL which was conducted on the one-month US Treasury bill but the estimated result is inconsistence with the Dahlquis that support both the mean reversion effect and the level effect of the one-month interest rate dynamics in Germany, Sweden and UK as well as inconsistence with Brailsford and Maheswaran research result on 30-days bank accepted bill rate in Australia since the result support only the level effect, but

have no evidence of mean reversion effect which is consistence with the estimated result of Faff and Gray in Austria, UK and US.

Each bank is currently facing with high market risk due to large number of market players in the Cambodia banking industry which increase the level of competition among banks that is the main reason that lead to the decline of interest rate as well as the increase of interest rate risk in the past few years and this situation is expected to persist if the National Bank of Cambodia keeps licensing new banks.

With respect to the research results of this study, six policies recommendation have been imposed on the National Bank of Cambodia and the related institutions or ministries in order to secure the stability of banking system and to maintain a long run sustain economic growth and development in Cambodia. First, the National Bank of Cambodia should consider stop licensing new bank. Second, the merger between small and small banks has to be encouraged. Third, the central bank should promote large and strong banks to acquire or take over weak and small banks. Fourth, encourage banks to go public which listed in the Cambodia Securities Exchange (CSX) by issuing stock, bond or others financial instruments such as certificate of deposit (CD) or commercial paper (CP) sell to the public in order to increase the sources of financing by not relying too much only on the deposits accounts as a short or long term of sources of funds in making loan to customers and the interest rate risk might also be reduced. Fifth, the central bank should increase the regulations and laws enforcement especially on the complying based risk management to all banks to guarantee a sound and safe banking system. Last but not least, banks should be encouraged the use of financial derivatives or others financial instruments in hedging the risks faced by banks.

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Appendix

Questionnaire

Currently, I am conducting a research related to the determination of interest rate and interest rate risk in the Cambodia banking system**.** The main purpose of this study is to investigate which factors that banks use to determine interest rate and how bank's interest rate risk be measured by which methods or approaches. In addition, this research also try to find out which factors affect interest rate risk and how the risk be minimized. The contribution of your time in responding to this questionnaire will make this research be completed successfully. The research finding of this study would be used by policies makers in related ministries or institutions in constructing future policies for improving the Cambodia banking system in managing interest rate risk more effectively. Your responding to this questionnaire will be kept as secret and you are not required provide the name of your bank as well as your name.

1. Which department/section of the bank do you work?_____
2. Does your bank is a local, foreign or co-operation between local and foreign bank?
   ☐ Local bank ☐ Foreign bank ☐ Co-operation between local and foreign bank
3. How many years have your bank operated business in Cambodia?
   ☐ ≤3 years 3 years< ☐ ≤6 years 6 years< ☐ ≤10 years ☐ >10 years
4. Which methods does your bank use in determine the lending interest rate (based lending rate)? (Note: You could tick more than one choice.)
   ☐ Market rate
   ☐ Inflation rate
   ☐ Market risk
   ☐ Credit risk
   ☐ Margin (spread between deposit and lending rate)
   ☐ Others methods, please
   specify:_____
5. On average, how much is the spread between lending rate and deposit rate of your bank?
   ☐ ≤5% 5%< ☐ ≤7% 7%< ☐ ≤9% ☐ >9%
6. Does your bank use SIBOR (Singapore Inter-Bank Offer Rate) or LIBOR (London Inter-Bank Offer Rate) as the basis for determining the interest rate on a short-term loan?
   ☐ Yes ☐ No
7. Does your bank use foreign investment funds to provide loans to its customers?
   (Note: If you tick "No", please skip question 8.)
   ☐ Yes ☐ No
8. If the bank uses foreign investment funds, on average, how long will it last?
   ☐ ≤1 year 1 year< ☐ ≤3 years 3 years< ☐ ≤5 years ☐ >5 years

9. In your bank, if you compare the current based lending rate with the last three years (2015, 2016, and 2017), does it decrease or increase?
   ☐ Decrease ☐ Increase
10. Which method does your bank use in determining or measuring interest rate risk?
    (Note: You could tick more than one choice.)
    ☐ Methods introduced by National Bank of Cambodia
    ☐ Basel approach
    ☐ Duration model
    ☐ None of above, or if you have others methods, please specify:_____
11. Which tools or approaches does your bank use in managing interest rate risk?
    (Note: You could tick more than one choice.)
    ☐ Immunization (Duration model)
    ☐ Interest rate futures and forward
    ☐ Interest rate SWAPS
    ☐ None of above, or if you have others tools or approaches, please specify:_____
12. As of 31 December 2017, totally, there are 54 banks in Cambodia of which 39 Commercial Banks and 15 Specialized Banks. Regarding to the steady increase in number of banks, does it affect your bank in determine based lending rate?
    ☐ Yes ☐ No
13. How do you think the current level of competition in the Cambodia's banking sector?
    ☐ Very low ☐ Low ☐ Average ☐ High ☐ Very high
14. Regarding to the current economic situation, number of banks, as well as the level of competitiveness in the Cambodia banking industry, do you expect your bank's interest rate (based lending rate) would increase or decrease in the next one or two year in the future?
    ☐ Decrease ☐ Increase
15. If the National Bank of Cambodia has a policy to stop issuing licenses for the opening of a new bank in order to limit the number of banks, as well as to reduce the level of competition in the banking sector in Cambodia, how much do you agree on the policy?
    ☐ Very low ☐ Low ☐ Average ☐ High ☐ Very high

Thank You!!!