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EXAMINING THE BEHAVIOUR OF MONETARY POLICY IN FOUR ASIAN COUNTRIES: A THRESHOLD MODELLING APPROACH

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Abstract: *The setup and functioning of monetary policy in emerging economies is always the topic of interest in monetary research. To be specific, there are arguments that exchange rate can have large influences on the monetary policy and economy, hence monetary policy should target on exchange rate stability in emerging context. In this paper, empirical analyses are conducted on examining the behaviour of monetary policy in four Asian countries that have implemented inflation targeting and floating exchange rate regime after the financial crisis of 1997. In particular, we aim to examine the response of policy rule to economic variables and exchange rate changes in these countries under the threshold changes in economic variables using threshold modelling. Our results reveal evidences on the nonlinearity structure in the policy function in these economies. Also, there are evidences on the policy reaction to exchange rate changes under different thresholds which imply to the 'fear of floating' behaviour. Low inflation is the main objective as policy function has strong response to price changes. The central bank tends to implement contractionary or tight policy in response to higher inflation deviation and exchange rate changes.*

Keywords: *threshold modelling, Taylor rule, asymmetric effects, inflation targeting, exchange rate.*

I. INTRODUCTION

The monetary policy in emerging economies is always termed as exhibiting the 'fear of floating' behaviour where the policymakers in these economies are reactive to exchange rate changes although they officially declared themselves to be free floaters. Due to their economic structure which is open in trades but financially unstable or undeveloped, emerging economies are weak to the impact of external shocks/ effects including exchange rate volatility. These economies are reluctant to float exchange rate freely due to negative influences led by drastic changes in exchange rate under floating regime. Such 'fear of floating' behaviour is evident through many studies (for instance, [1], [2] and [3]).

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This argument is addressed again in the evaluation of monetary policy under inflation targeting framework. Inflation targeting is a monetary policy that operating through central bank policy rate with the main objective to achieve the price stability or low inflation and secondary objective to minimize output gap. This policy regime is implemented under flexible/ floating exchange rate regime.

Inflation targeting is assumed to follow a mechanic simple Taylor rule where the central bank policy rate is a function to inflation variation and output gap. This policy setup is designed for the closed economy context. When it is implemented in the emerging context, there are arguments that inflation targeting does not work effectively and is not sustainable as exchange rate is not freely floating probably due to the 'fear of floating' behaviour in emerging economies.

Rather than evaluating the performance of inflation targeting in emerging economies, we focus the investigation on studying the behaviour of monetary policy in four emerging Asian economies after the financial crisis of 1997. These economies have switched to floating exchange rate and inflation targeting since or after the financial crisis of 1997. Therefore, it is interesting to examine the policy reaction on response to economic variables, in particular to exchange rate changes using threshold modelling. Our results show that the policy function has nonlinearity structure where the policy rate is adjusted asymmetrically to different thresholds. There are evidences on the policy reaction to exchange rate changes which indicate to 'fear of floating' behaviour in emerging Asian economies. The policy function shows slow or partially adjustment in bringing the economy to its policy targets/ objectives. Also, inflation is the main concern as policy reaction shows strong response to inflation deviation in all cases except Philippines. Output gap is of secondary concern. The central bank tends to implement contractionary or tight policy in response to higher inflation deviation and higher exchange rate changes.

The remaining paper is organized as follows: section 2 provides a review on the literature; section 3 explains the data and methodology; section 4 discusses the results and section 5 concludes the findings.

II. LITERATURE REVIEW

A. Policy reaction function and Taylor rule

[4] has proposed a simple monetary policy rule for US Fed where the Federal fund rate is a function to the GDP deviation from its target and inflation deviation from the target 2% respectively. Since this rule is originally designed for the closed economy of US, this rule has received critics and has been modified to be implemented in the small open economies. The augmented Taylor rules include the forward-looking, backward-looking and hybrid Taylor rules. Also, there are

suggestions to include exchange rate term in the rule to give role to the exchange rate for emerging context ([5], [6], [7] and [8]). These studies claim that such augmented rule may perform better than the simple Taylor rule. [5] demonstrated that policy rule with exchange rate has lower variance in consumer price index. Applying a dynamic stochastic general equilibrium model, [9] found that exchange rate movements can affect the behaviour of central banks. Although there are debates on the inclusion on exchange rate in the policy rule, this claim is supported by empirical studies that reported on the strong reaction of policy function to exchange rate movements, suggesting that the rule with exchange rate is the better rule for emerging markets (for instance [10] and [11]). In the following is one of the augmented Taylor rules with interest rate smoothing term in [12]:

$$i_t = a_0 + a_1\left(\pi_t - \pi^*\right) + a_2\left(y_t - \tilde{y}\right) + a_3\Delta e_t + a_4 i_{t-1} + \varepsilon_t \quad (1)$$

$$i_t^* = c_0 + \alpha\left(\pi_t - \pi^*\right) + \beta\left(y_t - \tilde{y}\right) + \delta\Delta e_t \quad (2)$$

$$i_t = (1-\rho) i_r^* + \rho i_{t-1} + \varepsilon_t \quad (3)$$

where ρ is the smoothing coefficient takes the value between 0 and 1;

$a_0 = (1-\rho)c_0$, $a_1 = (1-\rho)\alpha$, $a_2 = (1-\rho)\beta$, $a_3 = (1-\rho)\delta$ and $a_4 = \rho$, i_t^* is the central bank nominal rate; i_t is the central bank actual or real rate; $\left(\pi_t - \pi^*\right)$ is the deviation between inflation and targeted rate; $\left(y_t - \tilde{y}\right)$ is the output gap indicating the actual growth deviates from its potential rate; Δe_t is the changes in nominal exchange rate.

Equation (1) is the Taylor rule with smoothing term, i_{t-1}^* by assuming the policy rate is adjusted partially towards its target. This rule is the combination of the standard Taylor rule augmented with exchange rate changes (equation (2)) with the smoothing interest rate rule (equation (3)) in [13].

The above Taylor rule assumes on linear relationship. However, there are arguments that the nonlinear Taylor rule can be better representation to explain the behaviour of monetary policy. Nonlinearity rules are more effective in capturing the central bank asymmetric preferences and the nonlinear structure of economy. Many studies found evidences of asymmetries in monetary policy behaviour using threshold models and Markov-switching models. Among them include [14], [15], [16], [17], [18] and [19]. As discussed in [20], the nonlinearity in policy reaction function may due to nonlinear macroeconomic relationships or asymmetric preferences of policymakers. On the other hand, [21] has highlighted the two potential sources of asymmetric and nonlinearity in monetary policy. The first source is the nonlinear relationship between inflation and output due to price and wage rigidities. Such rigidities in price and wage lead to nonlinear Phillips curve

and asymmetric reaction through optimal policy may offset the nonlinearity in Phillips curve as in [14]. Second, asymmetric may arise through nonlinearity in loss function with respect to the size of inflation and output deviations. Such nonlinearity in loss function may due to the biases in central bank decision constraint by central bank credibility and political accountability and uncertainty in predicting economic development.

III. EMPIRICAL FINDINGS – MONETARY POLICY IN EMERGING ECONOMIES

Many studies were conducted on estimating the monetary policy of Taylor rule and augmented Taylor rules using country specific data. However, the studies that focused on emerging economies are limited. These studies applied the linear Taylor type rules. Only more recently, a number of studies started to apply the nonlinear Taylor type rules to study the monetary policy using empirical data. Most of the studies have detected the response of policy reaction function to exchange rate in emerging economies. Also, many studies reported nonlinearity in policy reaction function. Below is the review on previous studies.

Among the previous studies, [21] focused the studies on 13 emerging economies using linear Taylor type rule. The results provided evidences on the responses of policy function to exchange rate in majority countries which support to the 'fear of floating' hypothesis. The study also found strong policy reaction to inflation which indicates to non-accommodating stance of monetary policy towards the shocks of price. On the other hand, [22] conducted the estimation on linear Taylor rule with exchange rate term using the data of three East Asian countries in the pre- and post- inflation targeting regime. The study reported weak relationship between exchange rate movement and policy rate in both sub-periods in two out of three sample countries.

[23] applied a simulation approach based on a small open economy model on comparing the efficiency of a set of inflation targeting rules for countries facing high liability dollarization. The study compared financially robust and financially vulnerable economies. The results showed that a nonlinear policy rule might optimal to defend real exchange rate in those financially vulnerable economies.

More recently, [24] investigated the monetary policy in two large emerging economies of Brazil and China using nonlinear approach of smooth transition regression. The study detected nonlinear adjustment of policy rate in response to output gap and real effective exchange rate in Brazil and the reaction of policy rate to inflation rate for China respectively. [25] applied a panel threshold model to examine the policy reaction to depreciation and appreciation of exchange rate in 12 inflation targeting developing countries. They found that the central banks react to exchange rate depreciation but not to exchange rate appreciation. On the other

hand, [26] estimated the policy reaction function in examining the performance of inflation targeting in five East Asian countries. They found that Korea has adopted a forward-looking policy rule with inflation responsive is effective in price stabilization. However, Indonesia and Thailand have adopted a backward-looking inflation responsive rule with no effect on price stabilization. Philippines has implemented the inflation targeting under pegged exchange rate regime while Malaysia is a non-inflation targeting adopter. Both countries show no policy effect on controlling inflation.

[20] compared the augmented rule and nonlinear threshold rule with the baseline Taylor in five emerging economies (Indonesia, Israel, South Korea, Thailand and Turkey). They found that nonlinear Taylor rule is the best rule to model the behaviour of monetary policy in emerging markets. They also detected the response of monetary policy to real exchange rate except Turkey.

Likewise, [27] investigated the relationship between exchange rate regime and the effects of inflation targeting in emerging markets. They found that countries adopted inflation targeting tends to have higher flexibility in exchange rate regime than other non-IT adopter. However, exchange rate flexibility is heterogeneous among IT countries which are determined by the degree of trade openness and the exposure to FX risks. Other related studies applied nonlinear estimation on policy function in emerging markets and revealed policy responses to exchange rate include [28] and [29].

Based on the above review on monetary policy framework and empirical findings, the nonlinear augmented Taylor rules can be better policy rule to represent the nonlinear structure of emerging markets and the asymmetric preferences/ decision by central banks.

IV. DATA AND METHODOLOGY

Our study is focused on the four Asian countries that have switched to floating exchange rate regime and inflation targeting, i.e., Indonesia, Korea, Philippines and Thailand. These countries have switched to free floating exchange rate regime immediate after the financial crisis in year 1997 but the adoption of inflation targeting is different across countries. Among them, Korea was the first to implement inflation targeting in April 1998. Then, Indonesia and Philippines joined the step to implement in January 2000 and May 2000 respectively. Finally, Thailand has adopted inflation targeting in January 2002. In examining the behaviour of policy reaction function aftermath the crisis, we collect the data starting in year 1999 for two reasons. The first reason is for consistency and secondly, these economies has recovered and started to gain stability after the end of crisis in year 1998. The data collected include consumer price index (CPI), gross domestic product GDP) in current USD (million) (GDP), central policy rate (I) and nominal exchange

rate of local currency per 1USD (EX). The data are collected from Datastream and ranging from 1999Q1 to 2016Q2. The output gap (GAP) is constructed as log of GDP deviates from its HP filter series. The annualized inflation rate (INF) is calculated as the log of CPI deviates from its 4 quarter lag. The exchange rate changes (DLEX) is the first differenced of log EX.

Since many studies found nonlinearity in monetary policy reaction and the augmented Taylor rule with exchange rate is a better rule for emerging markets, we apply the threshold regression on estimating the augmented Taylor rule incorporating with exchange rate changes and interest rate smoothing.

$$\begin{aligned} i_t &= I\left[x_t \geq x_1^*\right]\left[a_0 + a_1\left(\pi_t - \pi^*\right) + a_2\left(y_t - \tilde{y}\right) + a_3\Delta e_t + a_4 i_{t-1}\right] \\ &+ I\left[x_t < x_1^*\right]\left[b_0 + b_1\left(\pi_t - \pi^*\right) + b_2\left(y_t - \tilde{y}\right) + b_3\Delta e_t + b_4 i_{t-1}\right] + \varepsilon_t \end{aligned} \tag{4}$$

$$\begin{aligned} i_t &= I\left[x_t \geq x_1^*\right]\left[a_0 + a_1\left(\pi_t - \pi^*\right) + a_2\left(y_t - \tilde{y}\right) + a_3\Delta e_t + a_4 i_{t-1}\right] \\ &+ I\left[x_2^* < x_t < x_1^*\right]\left[b_0 + b_1\left(\pi_t - \pi^*\right) + b_2\left(y_t - \tilde{y}\right) + b_3\Delta e_t + b_4 i_{t-1}\right] \\ &+ I\left[x_t \geq x_2^*\right]\left[c_0 + c_1\left(\pi_t - \pi^*\right) + c_2\left(y_t - \tilde{y}\right) + c_3\Delta e_t + c_4 i_{t-1}\right] + \varepsilon_t \end{aligned} \tag{5}$$

where I indicates to threshold effect. $x_t = LCPI_t, LGDP_t, LEX_t$ denotes the threshold variables while x_1^* and x_2^* are the threshold values by limiting the number of threshold to at most 2. Equation (4) is the threshold equation with one threshold value while equation (5) has two threshold values. The three variables of $LCPI_t, LGDP_t, LEX_t$ are used as threshold variables as they are important indicators to the policy targets of inflation deviation $\left(\pi_t - \pi^*\right)$, output gap $\left(y_t - \tilde{y}\right)$ and exchange rate changes Δe_t. Both threshold models (equation (4) and (5)) permits analyses on capturing the asymmetric responses/ adjustments on central policy rate towards changes in threshold variables. The threshold regression is based on Bai & Perron test and the threshold is globally determined using sequential evaluation. For details, see [30].

V. RESULTS

A. Preliminary tests

Prior to the threshold regression, unit-root tests of Phillips-Perron (PP), Kwiatkowski-Phillips-Schmidt-Shin (KPSS), breakpoint unit-root test of [31] and BDS independence test of [32] are conducted on each variable (INF,GAP,DLEX and I). The null hypothesis for PP and breakpoint tests are there is a unit-root but the null hypothesis for KPSS test is there is no unit-root. The results of unit-root tests are summarized in Table I.

Table I
Unit-root tests

Country	*Variable*	*Unit-root test statistics*		
		PP	*KPSS*	*Breakpoint*
Indonesia	GAP	-4.5070***	0.0898	-5.4788***
	INF	-7.5284***	0.3990*	-6.7949***
	I	-6.6483***	0.4894**	-4.3969*
	DLEX	-7.3028***	0.1089	-7.4143***
Korea	GAP	-4.0764***	0.0681	-6.0440***
	INF	-4.1327***	0.2285	-4.2314**
	I	-6.5852***	0.4926**	-11.8730***
	DLEX	-7.9607***	0.0626	-8.7606***
Philippines	GAP	-8.6281***	0.1524	-5.6001***
	INF	-3.1201**	0.4051*	-6.1236***
	I	-2.8714*	0.4465*	-7.3703***
	DLEX	-5.6041***	0.1912	-6.1539***
Thailand	GAP	-3.9110**	0.0865	-4.8066**
	INF	-3.0199	0.1429*	-5.7635***
	I	-6.0842***	0.0904	-6.0504***
	DLEX	-9.2005***	0.1652	-9.6798***

Note: * indicates significance at 10%, ** significance at 5% and *** significance at 1%

The results show that PP test is significant but KPSS test is not significant in majority test, indicating that stationarity (no unit-root) is achieved for majority variables. Breakpoint unit-root test rejects the null hypothesis of unit-root in all cases after considering the structural breaks. Since the financial crisis 1997 may cause to structural breaks, the breakpoint unit-root test may give more reliable results, confirming that all of variables are stationary in their constructed form. Therefore, we will proceed with the threshold regression using the variables in their constructed form.

In addition, we also conduct the BDS independence test to test for the nonlinearity in each variable. The null hypothesis is the tested variable is independent and identically distributed. The rejection of null hypothesis may imply nonlinearity in the data. The results are summarized in Table II.

Since BDS test statistics are significant in majority cases, we can say that there is nonlinearity structure in the data. Therefore, it is appropriate to apply the threshold regression on estimating our policy reaction function (equation (4) and (5)).

B. Threshold regression

The results of estimations on the monetary policy reaction function for Indonesia, Korea, Philippines and Thailand are summarized in Table III, IV, V and VI respectively as shown below.

Table II
Nonlinearity test – BDS independence

Variable	*Dimension*	*BDS statistic*			
		Indonesia	*Korea*	*Philippines*	*Thailand*
GAP	2	0.0742***	0.1163***	-0.0044	0.0485***
	3	0.1181***	0.1796***	0.009	0.0675***
	4	0.1355***	0.2295***	0.0294**	0.0756***
	5	0.1344***	0.2606***	0.0744***	0.06939***
	6	0.1219***	0.2730***	0.0955***	0.0713***
INF	2	0.1214***	0.1213***	0.1155***	0.1067***
	3	0.1954***	0.1903***	0.1795***	0.1717***
	4	0.2408***	0.2241***	0.2047***	0.2089***
	5	0.2604***	0.2383***	0.2124***	0.2179***
	6	0.2632***	0.2381***	0.2037***	0.2127***
I	2	0.1662***	0.1601***	0.1706***	0.1521***
	3	0.2744***	0.2636***	0.2756***	0.2474***
	4	0.3418***	0.3304***	0.3475***	0.3016***
	5	0.3820***	0.3709***	0.3897***	0.3265***
	6	0.4065***	0.3938***	0.4117***	0.3338***
DLEX	2	0.0428***	0.01	0.0371***	0.0021
	3	0.0842***	0.0152	0.0691***	-0.0003
	4	0.0978***	0.0104	0.0884***	-0.0073
	5	0.1097***	0.0049	0.0940***	-0.0032
	6	0.1090***	0.01	0.0922***	0.0052

Note: * indicates significance at 10%, ** significance at 5% and *** significance at 1%

The tables also show the policy reaction under different threshold variables with the identified threshold values. In all cases, the policy rate reacts significantly to its own lag term, indicating the existence of partial adjustment in policy rate. However, the policy function reacts differently to the policy objectives/ indicators under different threshold variables.

Table III shows that inflation is the main concern in Indonesia. The policy reaction reacts strongly to inflation deviation under all threshold variables. This may due to the price fluctuation in Indonesia. On the other hand, the policy function does not react significant to output gap although growth stability is the policy target under inflation targeting. Besides, we also the responses of policy function to exchange rate changes when $LEX \geq 9.06\%$. $10.75\% \leq LGDP < 11.26\%$ and

Table III
Monetary policy reaction function - Indonesia

Threshold	*Variable*	*Coefficient* $LGDP < 10.75\%$	*Coefficient* $10.75\% \leq LGDP < 11.26\%$	*Coefficient* $LGDP \geq 10.56\%$
LGDP	C	12.63***	0.33	1.25***
	I(-1)	-0.11*	0.90***	0.62***
	INF	45.99***	4.03	24.77***
	GAP	-4.69	-5.76*	-0.48
	DLEX	-0.76	14.07***	-0.46
	R-sq	0.99	0.99	0.99
	Obs	10	16	42
LEX		$LEX < 9.06\%$	$LEX \geq 9.06\%$	
	C	1.88**	0.03	
	I(-1)	0.68***	0.87***	
	INF	-10.31	14.55**	
	GAP	17.56**	-2.95*	
	DLEX	4.64	5.61**	
	R-sq	0.96	0.96	
	Obs	10	58	
		$LCPI < 3.94\%$	$3.94\% < LCPI \leq 4.34\%$	$LCPI > 4.34\%$
LCPI	C	12.95***	-0.21	1.18***
	I(-1)	-0.13**	0.73***	0.70***
	INF	48.79***	32.92***	16.08***
	GAP	-4.39	-1.27	0.32
	DLEX	-1.08	10.74***	0.8
	R-sq	0.99	0.99	0.99
	Obs	10	18	40

Note: * indicates significance at 10%, ** significance at 5% and *** significance at 1%

$3.94\% < LCPI \leq 4.34\%$. The increase of exchange rate changes leads to the increase of policy rate or contractionary policy in Indonesia.

On the other hand, Table IV shows that the policy reaction function in Korea reacts significantly to both inflation deviation and output gap under different threshold variables. Still low inflation is the main target in Korea as the coefficient to inflation deviation is the largest. Higher inflation deviation and output gap lead to higher policy rate, i.e. the policymaker tends to implement contractionary

Table IV
Monetary policy reaction function - Korea

Threshold LGDP	*Variable*	*Coefficient LGDP < 6.33%*	*Coefficient LGDP ≥ 6.33%*
	C	6.44***	0.08
	I(-1)	-0.49***	0.90***
	INF	32.58***	7.29***
	GAP	11.46***	3.34***
	DLEX	6.07	-1.3
	R-square	0.96	0.96
	Obs	10	58
		LEX < 7.11%	*LEX ≥ 7.11%*
LEX	C	0.61	2.19***
	I(-1)	0.83***	-0.14
	INF	0.68	86.55***
	GAP	0.48	8.60***
	DLEX	-1.63	6.47**
	R-square	0.76	0.76
	Obs	56	12
		LCPI < 4.33%	*LCPI > 4.33%*
LCPI	C	6.21***	0.11
	I(-1)	-0.48***	0.88***
	INF	35.07***	8.81***
	GAP	7.64***	3.42***
	DLEX	3.45	-1.56*
	R-square	0.96	0.96
	Obs	10	58

Note: * indicates significance at 10%, ** significance at 5% and *** significance at

in response to higher inflation and growth. The policy function also reacts to exchange rate changes when exchange rate is higher ($LEX \geq 7.11\%$), i.e. policymaker tends to increase the policy rate in response to exchange rate depreciation.

Table V shows that the policy function in Philippines has a weak control on the policy variables. The policy function only reacts significantly to inflation deviation when the LCPI and LGDP are high and the reaction to output gap only significant when LGDP is relatively low. We also detect the response of policy function to exchange rate changes under all three threshold variables where higher exchange rate changes lead to higher policy rate responses.

Table V
Monetary policy reaction function –Philippines

Threshold LGDP	*Variable*	*Coefficient LGDP < 9.92%*	*Coefficient 9.92% < LGDP ≤ 10.49%*	*Coefficient LGDP ≥ 10.49%*
	C	5.30**	3.21***	0.98***
	I(-1)	0.60***	0.59***	0.69***
	INF	13	-4.36	7.00***
	GAP	44.16**	0.75	0.54
	DLEX	0.08	0.83	2.62**
	R-sq	0.97	0.97	0.97
	Obs	10	24	35
		LEX < 3.90%	*LEX ≥ 3.90%*	
LEX	C	0.46**	1.88**	
	I(-1)	0.88***	0.68***	
	INF	0.29	10.45	
	GAP	0.57	5.59*	
	DLEX	6.74**	21.82*	
	R-sq	0.94	0.94	
	Obs	44	25	
		LCPI < 4.37%	*LCPI > 4.37%*	
LCPI	C	1.51	-0.03	
	I(-1)	0.74***	0.96***	
	INF	4.06	4.88**	
	GAP	0.39	0.16	
	DLEX	25.71*	2.54*	
	R-sq	0.95	0.95	
	Obs	13	56	

Note: * indicates significance at 10%, ** significance at 5% and *** significance at 1%

As in the case of Indonesia and Korea, inflation is the main concern in the monetary policy of Thailand. As observed in Table VI, the policy function of Thailand reacts strongly to inflation deviation under all threshold variables. However, its reaction to output gap only significant at certain threshold variable/ value. We only detect one significant reaction of policy function to exchange rate changes when LGDP is low ($LGDP < 10.39\%$). In majority cases, the policy function does not react significantly to exchange rate changes, indicating a weak relationship between exchange rate changes and the policy rate.

Table VI
Monetary policy reaction function –Thailand

Threshold	*Variable*	*Coefficient* *LGDP < 10.39%*	*Coefficient* *10.39% ≤ LGDP < 10.64%*	*Coefficient* *LGDP ≥ 10.64%*
LGDP	C	1.34***	1.06***	0.08
	I(-1)	0.12***	0.54***	0.83***
	INF	1.54	-12.39**	13.98***
	GAP	-4.66	4.37**	-0.65
	DLEX	-5.46***	3.83	-1.24
	R-square	0.94	0.94	0.94
	Obs	10	10	49
		LEX < 3.61%	*LEX ≥ 3.61%*	
LEX	C	0.26*	0.40**	
	I(-1)	0.79***	0.50***	
	INF	8.92***	29.31***	
	GAP	1.13	-0.82	
	DLEX	0.02	-3.64	
	R-square	0.88	0.88	
	Obs	38	31	
		LCPI < 4.35%	*4.35% ≤ LCPI < 4.52%*	*LCPI > 4.29%*
LCPI	C	0.85***	-0.57***	0.21
	I(-1)	0.41***	0.86***	0.83***
	INF	34.07**	31.26***	8.02***
	GAP	2.87	2.44***	0.09
	DLEX	-4.05**	-0.5	0.76
	R-square	0.95	0.95	0.95
	Obs	16	21	32

Note: * indicates significance at 10%, ** significance at 5% and *** significance at 1%

Based on the results of all, we have detected 'fear of floating' behaviour, i.e. the response of policy function to exchange rate changes under floating exchange rate and inflation targeting regime. Although low inflation is the main objective under inflation targeting, this is only observed in Indonesia, Korea and Thailand but not Philippines. Output gap is not main concern in majority countries. Besides reacting to exchange rate changes, the other similarity in the monetary policy behaviour among these countries is reacting to the lag of policy rate, i.e. the policy

function shows a slow and partially adjustment in bringing the economy to its targets/ objectives.

VI. CONCLUSION

We employ empirical analyses on examining the behaviour of monetary policy function in four Asian countries that have experienced drastic switch to floating exchange rate and inflation targeting regime after the financial crisis of 1997. In particular, we seek to detect if the central bank in these economies exhibit the 'fear of floating' behaviour, i.e. reacting to exchange rate changes although they officially declared themselves to be freely floating in exchange rate regime. The threshold regression is applied on estimating the augmented Taylor rule incorporating with interest rate smoothing and exchange rate terms using the data ranging from 1999Q1 to 2016Q2. Our results show evidences on the 'fear of floating' behaviour on the policy reaction function under different threshold variables. Besides, the policy function reacts significantly to its own lag, indicating slow and partial adjustment in the policy rate. Apart from this, the policy functions vary in their behaviour. Low inflation is the main objective for Indonesia, Korea and Thailand. These countries implement a tight or contractionary policy by increasing policy rate in response to higher inflation deviation exchange rate changes. Output gap is of secondary concern. The policy function in Philippines has weak control on the policy variables/ objectives. To be concluded, exchange rate can have its impact on the monetary policy setup in emerging Asian economies and that the policy functions in these emerging countries exhibit the nonlinearity structure where the central banks show asymmetric preferences/ adjustments in the monetary framework decision.

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