

Chapter 3

Methodology

3.1 Methodology

This study will examine the economic impacts of major financial liberalization in Thailand, particularly including the deregulation on domestic interest rate. The methodology of this study is to measure the degree of openness of Thailand financial liberalization, and to measure the speed of adjustment for fully of openness of Thailand financial liberalization by applying the ordinary least square (OLS) technique to set up the model for measure the openness of financial liberalization (ψ) which applied from the Edwards and Khan approach by viewing the observed the average overnight interbank rate¹⁸ series as proxy for domestic interest rate plus one month forward premium rate, and average one month LIBOR as proxy for foreign interest rate.

The basic approaches as the following equation:

$$i_t = \psi i_t^o + (1 - \psi) i_t^c \quad \dots(a)$$

and the approach for closed economy is

$$i_t^c = x_0 + x_1 \log y_t + x_2 \log m_{t-1} + x_3 \pi_{t-1} + E_t \quad \dots(b)$$

where i_t^c	=	domestic interest rate for close economy
x_i	=	parameters
y_t	=	Real GDP
m_{t-1}	=	lagged money supply
π_{t-1}	=	lagged inflation
E_t	=	error term

and the approach for open economy is

$$i_t^o = \Theta (i_t^* + fw_t) + (1 - \Theta) i_{t-1}^o \quad \dots(c)$$

¹⁸we will use overnight interbank rate as proxy for monthly interbank rate because of data constrain

where i_t^o	=	domestic interest rate for open economy
i_t^*	=	foreign interest rate
fw_t	=	forward premium rate
Θ	=	speed of adjustment to foreign interest rates

Where ψ measures the degree of openness of the economy in the long term (if $\psi = 1$, the economy is fully open). The model is extended so that the open economy interest rate adjusts to foreign interest rates with a speed of adjustment Θ (if $\Theta = 1$, then adjustment is instantaneous), allowing a distinction between the openness coefficient in the short run ($\Theta \psi$) and in the long term (ψ). The degree of monetary disequilibrium, which determines the real interest rate in developing countries, can be proxied in the equation:

$$i_t = d_0 + d_1(i_t^* + fw_t) + d_2 \log y_t + d_3 \log m_{t-1} + d_4 \pi_{t-1} + d_5 i_{t-1} + E_t \quad \dots (d)^{19}$$

where the d_i are parameters. A detailed derivation of this equation, and expressions for the d_i in terms of the underlying parameters of the system, can be found in Edwards and Khan. It is enough to note here that the openness coefficient ψ is the sum of the parameters d_1 and d_5 , where d_1 is $\Theta \psi$ and d_5 is $\psi(1 - \Theta)$, while the speed of adjustment can be derived by dividing d_1 by $(d_1 + d_5)$. The policies for analysis, was order by major of the chronology of financial reforms in Thailand which is the second stage of liberalization on foreign exchange control that considered for break in the period, because this phase provide more outward transfer of fund which have strong effected than other phase. The policy include more liberal outward transfer of fund for investments, provision for investments, provision for foreign investor to repatriate investment dividends profits and proceeds from the sales of stocks, Thai individual and juristic person in Thailand are allowed to open foreign currency accounts under certain conditions (on April 1, 1991) which exclude two major policy that are abolished interest rates ceiling policies, because of all interest rates ceiling are long term deposit and loan rates, such as MOR,

¹⁹ substitution equations (b) and (c) into (a), got

$$i_t = \psi \Theta (i_t^* + fw_t) + \psi(1 - \Theta) i_{t-1} + (1 - \psi) [x_0 + x_1 \log y_t + x_2 \log m_{t-1} + x_3 \pi_{t-1}]$$

$$i_t = (1 - \psi)x_0 + \psi \Theta (i_t^* + fw_t) + (1 - \psi)x_1 \log y_t + (1 - \psi)x_2 \log m_{t-1} + (1 - \psi)x_3 \pi_{t-1} + \psi(1 - \Theta) i_{t-1}$$

where d_0	=	constant
d_1	=	$\psi \Theta$
d_2	=	$(1 - \psi) x_1$
d_3	=	$(1 - \psi) x_2$
d_4	=	$(1 - \psi) x_3$
d_5	=	$\psi(1 - \Theta)$

MLR, and BIBFS policy which has just increased the degree of competition for local financial institutions.

However, this study tried to measure the degree of openness and speed of adjustment by test structure change for breaking with foreign exchange control liberalization and BIBFS policy and breaking with BIBFS policy (see appendix IV)

As we mention above, we will testing structural changes by measuring the openness of financial liberalization (ψ) and speed of adjustment (Θ) to foreign interest rates.

The approach for measure the openness of financial liberalization (ψ) and speed of adjustment (Θ) to foreign interest rates in each period;

$$i_t = d_0 + d_1(i_t^* + fw_t) + d_2 \log y_t + d_3 \log m_{t-1} + d_4 \pi_{t-1} + d_5 i_{t-1} + E_t$$

where i_t is domestic interest rate was proxy by average overnight interbank rate

i_t^* : foreign interest rate was proxy by average one month LIBOR

fw_t : one month forward premium rate

y_t : real GDP was proxy by monthly private investment index

m_{t-1} : lagged money supply

π_{t-1} : lagged inflation rate

d_i : regression coefficients

E_t : error term

and

$$\psi = d_1 + d_5,$$

$$\Theta = d_1 / (d_1 + d_5)$$

$$d_1 = \Theta \psi$$

$$d_5 = \psi(1 - \Theta)$$

where ψ : degree of openness of the economy in the long term, is the sum of the parameters d_1 and d_5

Θ : speed of adjustment to foreign interest rates

3.1.1 Overall of Thailand Financial system during the period 1985-1994

We will measure the overall of Thailand financial system by observed the openness of financial liberalization (ψ) and speed of adjustment (θ) to foreign interest rates with the whole period without braked by any policy.

3.1.2 Foreign exchange control policy.

We tried to braked its into 2 periods by the foreign exchange control policy only, as follow; January 1985 - March 1991 is the period for measure the openness of financial liberalization (ψ) and speed of adjustment (θ) to foreign interest rates before foreign exchange control liberalization, April 1991 - December 1994 for testing the impact of the foreign exchange control policy.

Moreover, in each sample break will applied a Chow test²⁰ to test the hypothesis of parameter stability for sample break.

However, this study tried to followed the Edwards and Khan approach by changing lagged inflation (π_{t-1}) to expected inflation (π^e_t), the approach is

$$i_t = d_0 + d_1(i_t^* + fw_t) + d_2 \log y_t + d_3 \log m_{t-1} + d_4 \pi^e_t + d_5 i_{t-1} + E_t$$

for the periods which testing for this approach used as the first approach. The result of this approach presented in appendix V.

3.2 Source of Data and Description

The study is using monthly data, ranging from January 1985 to December 1994, supplied by the Bank of Thailand, the National Economic and Social Development Board, and treasury department of commercial banks.

²⁰ The appropriate test statistic is

$$[(ESS_R - ESS_{UR})/q] / [ESS_{UR}/(N-k)]$$

Here, the numerator is the increase in the error sum of squares divided by the number of parameter restrictions implicit in the null hypothesis, and the denominator is the error sum of squares in the original unrestricted model divided by the number of degrees of freedom in the unstricted model.

Data description

We compared statistical in each period as follows;

Table 3.1: Mean

Variables	1985-1994	1985.01-1991.03	1991.04-1994.12
$i_t^* + fw_t$	9.69	10.45	8.44
i_t	9.27	10.28	7.59
y_t	4.73	4.78	4.66
m_{t-1}	12.01	11.76	12.41
π_{t-1}	0.35	0.34	0.36
i_{t-1}	9.32	10.31	7.69

Table 3.2: S.D.

Variables	1985-1994	1985.01-1991.03	1991.04-1994.12
$i_t^* + fw_t$	2.87	3.14	1.77
i_t	3.28	3.26	2.55
y_t	0.25	0.30	0.11
m_{t-1}	0.40	0.28	0.16
π_{t-1}	0.95	0.43	1.46
i_{t-1}	3.29	3.28	2.61

Table 3.3: Correlation to i_t

Variables	1985-1994	1985.01-1991.03	1991.04-1994.12
$i_t^* + fw_t$	88%	92%	69%
y_t	6%	-7%	18%
m_{t-1}	-30%	14%	-37%
π_{t-1}	3%	6%	5%
i_{t-1}	88%	92%	67%

An domestic interest rate (i_t) has the most positive correlation to foreign interest rate ($i_t^* + fw_t$) in during the period 1985.01-1991.03, 1985-1994, and 1991.04-1994.12 respectively. For the domestic interest rate (i_t) and real GDP (y_t) are both positive and negative correlation with period 1985-1994 and 1991.04-1994.12 are the positive correlation. Once again, there are the both positive and negative correlation between domestic interest rate (i_t) and

lagged money supply (m_{t-1}) with period 1985-1994, and 1991.04-1994.12 are the negative correlation. The correlation between domestic interest rate (i_t) and lagged inflation (π_{t-1}) are less than with other variables, but there are all positive correlation. The correlation of domestic interest rate (i_t) with itself with a lagged, also have positive correlation with the highest in the period 1985.01-1991.03, 1985-1994, and 1991.04-1994.12 respectively.