Chapter 5

Empirical Results

The estimation results of NATREX for baht per US dollar will be explained in this chapter. The long run relationship of the non-tradable relative price model and real exchange rate model, which depend upon productivity, thrift, term of trade and real long term of interest, will be analyzed in this chapter. The methods of econometrics are estimated by Johansen methods.

5.1 Unit roots testing results

In time series analysis, it is important to determine whether the nature of the long run movements of the variable is stationary or non-stationary before carrying out any estimation. The non-stationary time series means the mean and/or variance of a time series are time-dependent. Augmented Dickey and Fuller (ADF) is a criterion for testing whether a time series is stationary.

Our approach is to use AIC and SBC to justify the appropriate lag length. We approximate[1] that an unknown ARIMA(p,1,q) process follow an ARIMA (n,1,0) autoregression of no more than $T^{1/3}$ order. Thus, we can solve problem by using a finite-order autoregression. Data that use in this thesis amount 68 observation, then the lag length is n = 5.

The table 5.1 shows that AIC and SBC results for each variable from lag 1 to lag 5. The least value of AIC and SBC indicate the appropriate lag length. For example, non-tradable relative price (NTREX) has minimum value of AIC and

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[1]Ender Walter, Applied Econometric Time Series. : 226.

SBC in lag 1, we will test this series is non-stationary in this lag by ADF statistic. However, the results of AIC and SBC are different for GDPDLABOR, RINTUS1 and DINTTHUS1. As the result, we will choose appropriate lag length by AIC.

After the test for lag length, we test stationary property of variables by ADF statistic . If calculated ADF less than ADF table it indicate that series is non-stationary; it has unit root. On the other hand, if calculated ADF grater than ADF table it indicate the series is stationary. Table 5.3 column 2 shows values of the calculated ADF and ADF table of appropriate lag length. The results indicated that almost of variables is non-stationary except difference of interest rate(DINTTHUS1). This means that if we employ ordinary least square (OLS) , it leads to nonsensical (or spurious) results.

Table 5.1 Statistic value of AIC and SBC at level

VARIABLES	lag = 1	lag = 2	lag = 3	lag = 4	Lag = 5
NTREX	-8.9874	-8.9578	-8.9154	-8.8970	-8.9297
	-8.8910	-8.8283	-8.7522	-8.6996	-8.6975
REX	-10.0744	-10.0470	-10.0317	-9.9973	-9.9790
	-9.9765	-9.9164	-9.8685	-9.7999	-9.7467
GDPDLABOR	-3.7929	-3.7859	-3.7670	-3.9312	-3.9416
	-3.6949	-3.6553	-3.6038	-3.7337	-3.7094
RSGDP88	-3.4439	-3.6977	-3.9091	-3.8625	-3.8246
	-3.3476	-3.5682	-3.7459	-3.6651	-3.5924
TOT	-4.0207	-3.9960	-3.9531	-3.9126	-3.8973
	-3.9243	-3.8664	-3.7899	-3.7151	-3.6651
RINTUS1	-7.0138	-6.9943	-6.9975	-7.0053	-7.1047
	-6.9159	-6.8637	-6.8343	-6.8079	-6.8725
DINTTHUS1	3.3274	3.3584	3.2995	3.3238	3.3518
	3.4237	3.4879	3.4627	3.5212	3.5841

Note: (1) AIC statistic is give above in each cells.

(2) Statistic calculate by program EVIEW version 3.1

(3) The column with underlined numbers indicate the lag length that are in testing ADF statistics

However the regression analysis makes sense only for data which are not subject to a trend. Since almost all economic data series contain trends, it follows that these series have to be detrended before any sensible regression analysis can be performed. A convenient way of getting rid of trend in a series is by using first differences (that is, the difference between successive observations) rather than levels of the variables.

Therefore, it is necessary to take first difference of each variable to estimate co-integration and error-correction. The series of data must be difference more than once, if that series still is non-stationary. AIC and SBC is use to select the appropriate lag length again(see table 5.2). Repeating process test ADF-statistic.

Table 5.2 Statistic value of AIC and SBC at first difference

VARIABLES	lag =1	lag =2	lag = 3	lag = 4	Lag = 5
NTREX	-8.9756	-8.9320	-8.9074	-8.9225	-8.9219
	-8.8785	-8.8014	-8.7428	-8.7234	-8.6878
REX	-10.0309	-10.0107	-9.9656	-9.9398	-10.0072
	-9.9329	-9.8802	-9.8011	-9.7408	-9.7730
GDPDLABOR	-3.8027	-3.7804	-3.9019	-3.8708	-3.8446
	-3.7048	-3.6498	-3.7374	-3.6717	-3.6105
RSGDP88	-3.6857	-3.9183	-3.8732	-3.8348	-3.8141
	-3.5886	-3.7877	-3.7087	-3.6357	-3.5800
TOT	-3.9699	-3.9353	-3.8983	-3.8793	-3.8635
	-3.8727	-3.8047	-3.7337	-3.6802	-3.6293
RINTUS1	-6.9044	-6.8906	-6.9566	-7.0583	-7.0144
	-6.8065	-6.7600	-6.7921	-6.8593	-6.7802
DINTTHUS1	3.4354	3.4417	3.4664	3.5119	3.5134
	3.5326	3.5723	3.6309	3.7110	3.7475

Note: (1) AIC statistic is give above in each cells.

(2) Statistic calculate by program EVIEW version 3.1.

(3) The underline values of AIC and SCB are smallest that is criterion to choose the length lag to test the stationary.

From table 5.3, the column three shows the calculated ADF and ADF statistic value of the first difference. Most variables are stationary in first difference except productivity (GDPDLABOR) is stationary in second difference. However, if we use Phillips-Perron test, we find that all of variables are stationary in first difference. Therefore we will follow Phillips-Perron test that all of variables are stationary in first difference.

Table 5.3 Unit Root Tests of Non-tradable Relative Price, real exchange rate and Fundamental Variables

	ADF test		PP test	
Variable	Levels	First Difference	Levels	First Difference
NTREX	-0.88918(1) (-2.9029)	-5.17589(1) (-2.9035)	-0.763568(3) (-2.9023)	-6.794992(3) (-2.9029)
REX	-1.697345(1) (-2.9029)	-3.049265(1) (-2.9092)	-1.248035(3) (-2.9023)	-5.238667(3) (-2.9029)
GDPDLABOR	-2.506534(5) (-2.9055)	-0.918236(3)* (-2.9048)	-0.966189(3) (-2.9023)	-8.059298(3) (-2.9029)
RSGDP88	-1.13667(3) (-2.9042)	-10.4060(2) (-2.9042)	-2.774371(3) (-2.9023)	-10.49496(3) (-2.9029)
TOT	-1.97871(1) (-2.9029)	-4.76197(1) (-2.9035)	-1.708050(3) (-2.9023)	-5.804910(3) (-2.9029)
RINTUS1	-2.169104(5) (-2.9055)	--3.085262(4) (-2.9055)	-3.002547(3)* (-2.9023)	-7.404537(3) (-2.9029)
DINTTHUS1	-3.43733(3) (-2.9042)	-5.609100(1) (-2.9035)	-3.008635(3) (-2.9023)	-7.052231(3) (-2.9029)

Note: (1) Statistic values calculated by program EVIEW version 3.1

(2) Value in above in each variable is calculating value and the parenthesis is the appropriate lag. All values are the intercept case.

(3) Value ADF showed in below the value at the 5% level of significance, * indicate these series are I(2) but PP statistics showed these series are I(1).

(4) Value PP test showed in below the value at the 5% level of significant, * indicate these value are 1% level of significant at (the MacKinnon critcal value is -3.5239).

5.2 VAR(Vector Autoregressive)

The second step, before estimating all co-integration, the important condition is to select the lag length in unrestricted VAR. The procedure begins with the longest lag length and then tests whether the lag length can be shortened. The criteria that can be used to select lag length are AIC, SBC, FPE, and LR test.[2] This thesis will be use AIC and SBC as beginning for the selection of appropriate lag length (see table 5.4).

From table 5.4 and table 5.5, the results AIC, SBC for non-tradable relative price model and real excnange rate model are showed. AIC decreases whenever we expand the lags. However, SBC value increase when we expand the lags.

Table 5.4 AIC and SBC of non-tradable relative price model

Lag	1	2	3	4	5	6	7	8
Observations	67	66	65	64	63	62	61	60
AIC	-28.58679	-29.35422	-29.17230	-29.39803	-29.13852	-29.04750	-29.31065	-29.54426
SBC	-27.63073	-27.58754	-26.58203	-25.97085	-24.86076	-23.90513	-23.28927	-22.62909

Source: calculated from data series

[2]Ibid., pp. 315,397.

Table 5.5 AIC and SBC of real exchange rate model

lag	1	2	3	4	5	6	7	8
observations	67	66	65	64	63	62	61	60
AIC	-28.97343	-29.75646	-29.63622	-29.86948	-29.65608	-29.66084	-29.70481	-29.65906
SBC	-28.01737	-27.98979	-27.04595	-26.44236	-25.37832	-24.51847	-23.68343	-22.74389

Source: calculated from data series

From AIC and SCB results, it indicates that different lag length to test co-integration and error-correction model. We, therefore, use reasonable t-statistics of each variables and AIC results to select appropriate model. For the case of non-tradable, the appropriate lag length is lag 7 and the case of real exchange rate, appropriate lag length is lag 5.[3]

5.3 The co-integration and error-correction results of non-tradable relative price

The appropriate lag length that we have selected use to test co-integration model is 7. The results from the co-integration test indicate that there are 4 co-integrating equations. The statistic LR test calculated from eigenvalue (or characteristic roots) is showed in the first column in table 5.6. Eigenvalue(λ_{max}) in 5 variables are 0.527588, 0.401849, 0.271854, 0.214516, and 0.081678, LR test were calculated those eigenvalue (report in second column in Table 5.6). LR test is to test hypothesis $r = 0$ against the alternative $r = 1, 2, 3, 4$ and 5. From LR test, it indicates that they can reject null hypothesis in case $r = 3$, showing that the equation have co-integrating 4 equations. This suggest that there are two co-integrating relations among the five series.

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[3]LR test and FPE also suggested to select the long length.

Table 5.7 presents in co-integrating coefficients or the normalize co-integrating vector or (1, β_{12} , β_{13} ,..., β_{1n}) in these thesis with n = 5. The adjustment of co-integration given lag 7 is -0.567225, this error-correction is significant. Error-correction will be used to confirm the long run equilibrium exits (Appendix C)

Table 5.6 Eigenvalue or Characteristic roots of non-tradable relative price

Sample: 1980:1 1997:4
Included observations: 64
Test assumption: No deterministic trend in the data
Series: NTREX GDPDLABOR RSGDP88 TOT RINTUS1
Lags interval: 1 to 7

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.527588	122.0949	76.07	84.45	None **
0.401849	74.10106	53.12	60.16	At most 1 **
0.271854	41.21065	34.91	41.07	At most 2 **
0.214516	20.90643	19.96	24.60	At most 3 *
0.081678	5.453276	9.24	12.97	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 4 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

NTREX	GDPDLABOR	RSGDP88	TOT	RINTUS1	C
-72.63269	0.207247	-5.533939	-7.860721	-16.79788	12.60414
132.8300	-1.316049	1.969302	8.621085	-15.52595	-13.13166
-4.096413	-0.641181	-2.068784	2.421402	14.93783	-1.439073
159.6787	-1.823671	4.975054	14.44801	5.574638	-21.52144
-48.20213	2.904567	-9.464743	-1.254199	-1.982682	4.446573

Table 5.7 coefficient co-integrating equation of non-tradable relative price

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

NTREX	GDPDLABOR	RSGDP88	TOT	RINTUS1	C
1.000000	-0.002853	0.076191	0.108226	0.231272	-0.173533
	(0.00542)	(0.02038)	(0.01336)	(0.09603)	(0.02048)
Log likelihood	1113.366				

From normalize equation, we can show the long run solution of non-tradable relative price in the following.

Table 5.8 The co-integrating equation of non-tradable relative price

Variables	coefficients	standard deviation	t- statistics
GDPDLABOR	0.002853	(0.00542)	(0.52655)
SRGDP88	-0.076191	(0.02038)	(-3.73806)
TOT	-0.108226	(0.01336)	(-8.09950)
RINTUS1	-0.231272	(0.09603)	(-2.40835)
constant	0.173533	(0.02048)	(8.47314)

Most variables except GDPDLABOR are significant 95%. The signs of coefficients are different from the empirical work of Lim and Stein (1995). It will be discuss above in this chapter.

The results can be interprets as follow. The coefficient of GDPDLABOR (the productivity proxies by real GDP per labor force) are positive, indicating when GDPDLABOR (or productivity in non-trade sector) increase by one percent , NTREX (non-tradable relative price) will appreciate by 0.002 percent.

This results are consistent with our hypothesis that an increase in productivity in non-tradable sectors will rise the supply of output in non-tradable sector. This indicate the significance of direct effect productivity on relative price of non-tradable and real exchange rate depreciate.

The estimated coefficient of RSGDP88 (or thrift) is negative, implying when an percent increase in thrift will depreciate the real exchange rate by 0.076 percent.

The thrift effect to the non-tradable relative price in negative direction as we expected. Namely, when an rise in saving leads to a decline in consumption, the demand for non-tradable (direct effect) , non-tradable relative price and real exchange rate value.

The estimated coefficient of terms of trade is negative and statistically significant. Our result is different from the results from the Australia study in which terms of trade is not significant and exclude from the model. The results implies that when an increase in terms of trade leads to increases in relative non-tradable price and real exchange rate.

The real long term foreign interest rate indicate its negative relation with non-tradable relative price. When real foreign interest rate rise by 1 percent, non-tradable relative price will decrease by 0.23 percent. This results consistent with our hypothesis.

5.4 The co-integration and error-correction results of real exchange rate

The results of the co-integration test show that there are 2 co-integrating equation in case of real exchange rate. The statistic LR test calculated from eigenvalue (or characteristic roots) is shown in the first column in table 5.9. Eigenvalue(λ_{max}) in 5 variables are 0.390472, 0.376152, 0.296422, 0.219146 and

0.097276, LR test calculates those eigenvalue, reported in second column in Table 5.9. LR test is to test hypothesis $r = 0$ against the alternative $r = 1, 2, 3, 4$ and 5. Table 5.9 indicates that they can reject null hypothesis in case $r = 3$ that show that the equation have co-integrating 4 equations. This suggests that there may be two co-integrating relations among the five series same as non-tradable relative price model.

Table 5.10 presents co-integrating coefficients or the normalize co-integrating vector or $(1, \beta_{12}, \beta_{13}, \ldots, \beta_{1n})$ in these thesis $n = 5$.

$$(1, \beta_{12}, \beta_{13}, \beta_{14}, \beta_{15}) = (1, -0.017421, 0.052555, 0.022766, 0.085481)$$

The adjustment of co-integration with 5 lag is -0.713355 and is statistically significant. Error-correction will be used to confirm the long run equilibrium exits (Appendix D).

Table 5.9 Eigenvalue or Characteristic roots of real exchange rate

Sample: 1980:1 1997:4

Included observations: 66

Test assumption: No deterministic trend in the data

Series: REX GDPDLABOR RSGDP88 TOT RINTUS1

Lags interval: 1 to 5

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.390472	110.1013	76.07	84.45	None **
0.376152	77.42667	53.12	60.16	At most 1 **
0.296422	46.28469	34.91	41.07	At most 2 **
0.219146	23.08060	19.96	24.60	At most 3 *
0.097276	6.754342	9.24	12.97	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 4 cointegrating equation(s) at 5% significance level

Unnormalized Cointegrating Coefficients:

REX	GDPDLABOR	RSGDP88	TOT	RINTUS1	C
-114.1659	1.988917	-6.000016	-2.599104	-9.759026	7.983762
138.5908	-1.038482	4.350012	3.415384	7.601977	-10.05360
32.91483	-0.232610	0.906909	-1.935134	-14.37559	0.929684
-81.66659	1.290905	0.250250	-2.260871	0.031828	4.635067
-64.89792	2.560839	-8.195606	-0.036819	1.350362	3.621584

Table 5.10 coefficient co-integrating equation of real exchange rate

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)

REX	GDPDLABOR	RSGDP88	TOT	RINTUS1	C
1.000000	-0.017421	0.052555	0.022766	0.085481	-0.069931
	(0.00273)	(0.00997)	(0.00530)	(0.02742)	(0.00541)
Log likelihood	1095.094				

Table 5.11 is the long run relationship of real exchange rate that derived from normalize equation.

Table 5.11 The co-integrating equation of real exchange rate

Variables	coefficients	standard deviation	t- statistics
GDPDLABOR	0.017421	(0.00273)	(6.38118)
SRGDP88	-0.052555	(0.00997)	(-5.26988)
TOT	-0.022766	(0.00530)	(-4.29251)
RINTUS1	-0.085481	(0.02742)	(-3.11729)
Constant	0. 069931	(0.00541)	(12.9346)

The model of real exchange rate shows positive relationship between non-tradable relative price and real exchange rate. Non-tradable relative price also determine on real exchange rate. The positive coefficient of GDPDLABOR means that when GDPDLABOR increases by one percent, REX will increase by 0.017 percent. Hence, total effect of non-tradable relative price and real exchange rate would appreciate when indirect effect dominate direct effect.

The negative coefficient of RSGDP88 (or thrift) implies that when thrift increase by 1 percent the REX will depreciate by 0.052 percent. Finally, if direct effect dominate indirect effect, non-tradable relative price and real exchange rate depreciate.

The terms of trade has negative and strong statistically significant coefficient. The negative relation between term of trade and real exchange rate implies that if term of trade increase by 1 percent, real exchange rate will depreciate by 0.022 percent. Therefore, sum of direct effect and indirect effect lead to depreciation of non-tradable price and real exchange rate.

The real long term foreign interest rate has a negative relation with non-tradable relative price. Namely, when foreign interest rate increase one percent, the non-tradable price will decrease by 0.085 percent. Therefore, the total effect that sum the direct effect and indirect effect indicated depreciation of non-tradable relative price and real exchange rate.

5.5 Comparison NATREX with Australia case

We can compare the difference of the our results from the NATREX in Australia case. Lim and Stein (1995) finds the negative relation between productivity and non tradable relative price and real exchange rate, indicating the domination of indirect effect over the direct effect. However, in Thailand case, we find the domination of direct effect .

The thrift in Australia case has positive effect on non-tradable relative price and real exchange rate. Lim and Stein (1995) explain that the indirect effect were more than the direct effect. However, we find opposition relationship for Thailand case.

The term of trade variables in Australia case show positive effect on non-real exchange rate (relative non-tradable price model exclude term of trade from the model). Since the indirect effect dominates direct effect, the real exchange rate appreciate as term of trade rises. NATREX in Thai case show that direct effect more than indirect effect.

The real long term interest rate have negative impact on non-tradable relative price and real exchange rate.

5.6 Evaluation real value of Baht

We use the results of co-integration in non-tradable relative price and real exchange rate model to test the movement of both model in period 1980 until 1997. The results indicate misalignment of non-tradable relative and real exchange rate.

The figure 5.1 and 5.2 present the estimated co-integration result. Before 1997 exchange rate regime change, non-tradable relative price has been overvalued since 1986.

Figure 5.1 the movement of non-tradable relative price and equilibrium of non-tradable relative price

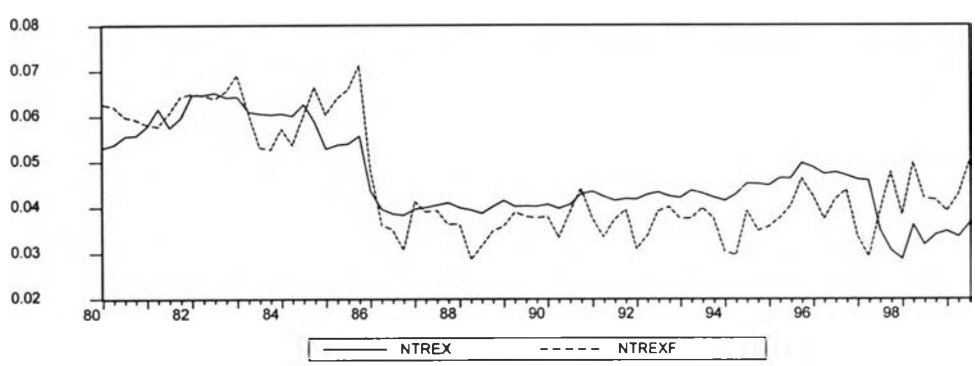
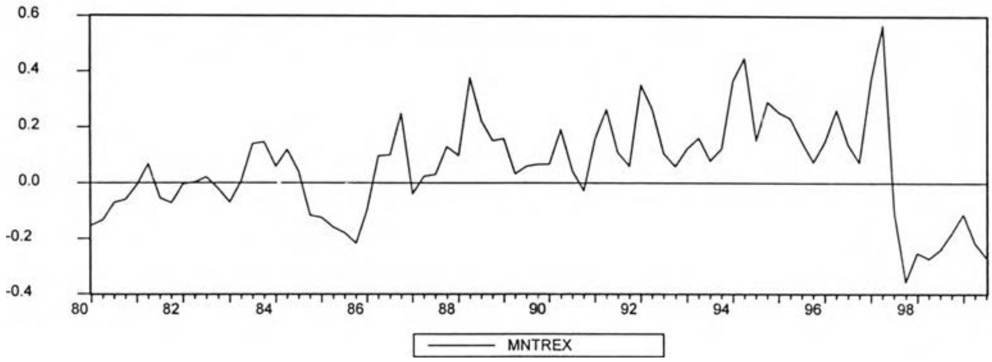


Figure 5.2 co-integration equation of non-tradable relative price



From the figure 5.3 and figure 5.4, before exchange rate crisis the actual exchange rate overvalue its long run equilibrium. This show the monetary policy maker did not carefully follow the long run factors of real exchange rate. From the co-integration model suggest that before the exchange rate crisis 1997. non-tradable relative price and real exchange rate overvalued by 56.8 %, 23.5 % respectively.

Figure 5.3 the movement of real exchange rate and equilibrium real exchange rate

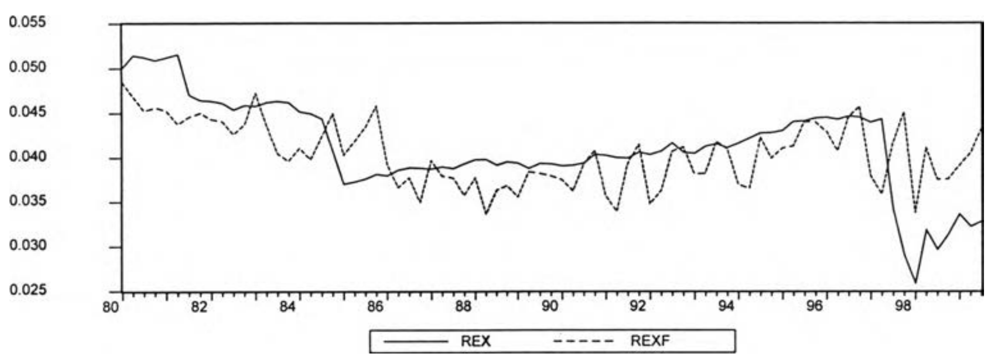
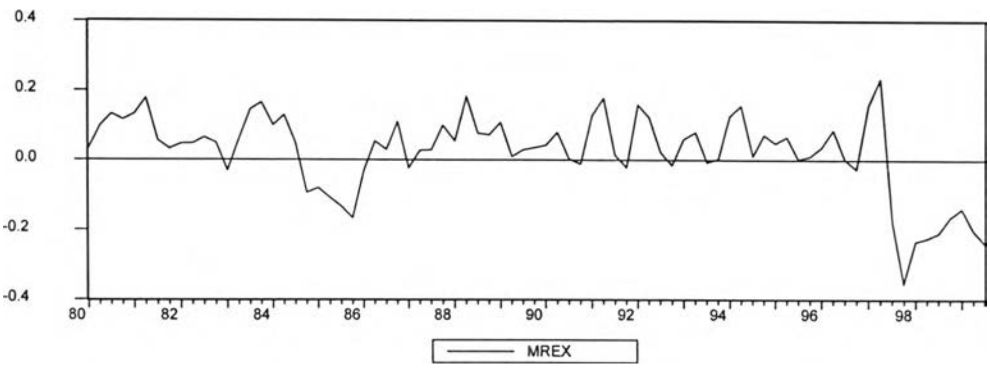


Figure 5.4 co-integration equation of real exchange rate



I will explain the movement of non-tradable relative price and real exchange rate during three periods. First 1980-1985, Thailand economy devalued the currency four time(1.1 percent in May 1981, 8.7 percent in July 1981, 14.9 percent in November 1984, and 1.9 percent in December 1985). During s1986-96, the movement of non-tradable shows slight overvaluation. However, in 1997, the currency was sharply overvalued.

<u>First period (1980-1985):</u> In figure 5.1 and figure 5.2, the actual non-tradable relative price was in line with the equilibrium non-tradable relative price in during 1980-1982. In 1983, the real exchange rate also show that the actual real exchange rate overvalued the equilibrium real exchange rate. This periods the devalued currency in May and July 1981 did not enough, the monetary authorities need to devalued again in 1984 and 1985. We can see that in 1981.2 and 1983.4 the actual value of non-tradable over the equilibrium 6.7 % and 14.6 % respectively. But the actual real exchange rate over the equilibrium 17.8 % and 16.5 % in 1981.2 and 1983.4 respectively. The result of devaluation, in 1985.4 the actual value of non-tradable move below the equilibrium line 21.7 % and 16.7 % in case of real exchange rate (see appendix F and appendix G).

Second period (1986 - 1996): After devaluation, the non-tradable relative price and real exchange rate tend to overvalue continually. This imply that monetary authorities can not managed the shocks. In this periods Thailand had financial deregulation and liberlization in early 1990s. International capital flows to the developing countries had become an important phenomenon. In Thailand, the inflows of foreign capital averaged about 10 % of GDP between 1990-1995.

Under the pegged exchange rate regime, the implementation of monetary policy was undermined by an implicit guarantee of currency value. The implicit guarantee, coupled with financial liberlization, encouraged excessive reliance on the external borrowing, due to low exchange rate risk.

With freer and cheaper means of funding from abroad, enhanced by various tax concessions, net capital inflows of non-bank increased from approximately 20 billion baht per month in 1991 to some 40 billion baht per month at the end of 1995. The some part of foreign capital was allocated to investment projects in unproductive sectors which were not generating foreign exchange rate earnings to service the foreign borrowing. The non-tradable relative price and real exchange rate continue to appreciate due to an increase in productivity in non-tradable sector. In figure 5.1 and figure 5.2 , movement of actual non-tradable relative price in second haft 1980s were less overvalued than in first haft of 1990s. It indicates that booming non-tradable sector in the first haft of 1990s grater than the late 1980s. Real exchange rate tended to increase continually (in figure 5.3 and figure 5.4).

1997 -1999.3 periods: before July 1997 the non-tradable relative price and real exchange rate overvalue from its equilibrium value by 56.8 % and 23.5 % respectively. After floating exchange rate, the non-tradable relative price and real exchange rate declined sharply. The non-tradable relative price and real exchange rate depreciate 35.8 % and 35.6 % in 1997.4 respectively.

5.7 Forecasting

We can use the co-integration results of real exchange rate model to test with data of four variables when we expand data from 1998.01 until 1999.03.(see appendix H)

Table 5.12 showed that actual real exchange rate undervalue when compare with equilibrium real exchange rate. However, in 1999 this values move near the equilibrium in 1999.01 and 1999.02. the results indicate that the monetary authorities need to solve the problem of currency. However, this undervaluation periods showed the movement of real exchange rate same as the devaluation of 1984 periods. However, the values of forecasting, for example column 1, 3 and 5, may not be good prediction. Since the data that used to forecasting came from the difference source, for example the real saving ratio, I approximated this series from the series of current account plus investment. The productivity variables came from the quarterly data of NSEDB, but the period 1980.01-1997.04 this variable calculated from the regression model.

Table 5.12 Results of Forecasting

years	inverse R	inverse actual R	R	actual R	nominal R	actual nominal	mis-rex
1998.1	0.033761	0.025839	29.61962	38.70119	36.16462	47.25279	-0.23466
1998.2	0.041112	0.031851	24.32354	31.39619	30.20486	38.98804	-0.22527
1998.3	0.037515	0.029621	26.65614	33.75983	33.41368	42.3181	-0.21042
1998.4	0.037548	0.031367	26.63251	31.88064	32.93467	39.42406	-0.16462
1999.1	0.039089	0.033616	25.58251	29.74774	31.54498	36.68071	-0.14002
1999.2	0.040456	0.03223	24.71844	31.02699	29.89927	37.52977	-0.20332
1999.3	0.043146	0.032766	23.17703	30.51944	27.97401	36.83589	-0.24058