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CREDIBILITY, MACROECONOMIC FUNDAMENTALS AND THE ASIAN MONETARY UNITS: A State Space Analysis of ASEAN+3

Jamshaid ur REHMAN,* and Tasneem ZAFAR**

Abstract

This study investigate the monetary credibility of ASEAN plus three countries (APTCs) participating in a proposed Asian monetary union, against three potential anchors economies, i.e., China, Japan and USA. The Capital Asset Price Model (CAPM), based on time varying monetary credibility indexes (TVMCIs) is developed and estimated with Kalman Filter Algorithm (KFA) of all APTCs. In the univariate Markov regime switching (MRS) models, a discrete regime shifts were found in the credibility. In multivariate MRS models, the study finds that macro-fundamentals exert asymmetric effects on credibility and time-varying transition probabilities (TVTPs). There is a strong evidence that macro-fundamentals cause when switching in TVMCIs and TVTPs, between the two regimes (high and low) in most APTCs. More significant outcomes are found against USA, *vis-à-vis* against China and Japan.

Key Words: Credibility, CAPM, Kalman Filter, Markov Regime Switching Model.
JEL Classification: F45, C24, E42, E52.

I. Introduction

The ASEAN movement started in the East Asia during 1960s, to take benefits of geographical proximity. It has extended from ASEAN to ASEAN plus three (APT) after the (1997-98) Asian Financial Crisis (AFC) by joining of China, Japan and South Korea. Before the AFC, East Asia was a region of unparallel economic and financial feat, as well as it attained higher standards of living [Park and Wyplosz (2010)]. The East Asian Countries (EACs) had huge savings and human capital that led them towards 'miraculous growth, during 1980s and 1990s [Rangkakulnuwat, et al. (2010), Stiglitz and Yusuf (2001)]. These regions also focused on policy coordination however, trade remained the foremost preference than monetary integration [Guillaumin (2009), Pomfret (2005)] based on 'hub and spoke strategy' [Langhammer (2007), Yu (2015)] argues that trade and FDI links among EACs were deep before the AFC, but they lack

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in regional based monetary cooperation [Shirono(2008)]. The AFC ended the EAC's miracle[1] and moved them towards economic reforms and restructuring [Park and Wyplosz (2010)]. After AFC, APTCs had taken all necessary measures to mitigate detrimental effects of it via monetary cooperation, reforming to exchange rate regime, alongside structural and institutional reforms to enhance credibility of the system [Allegret and Essaadi (2011), Langhammer (2007), Rana (2007)]. In fact, the AFC has developed a profound sense of unity among APTCs [Park and Wyplosz (2010)] and developed monetary and exchange rate cooperation [Lee and Azali (2010), Rose (2015)] - a 'one size fits all' policy to fortify monetary credibility [Kawasaki (2012)]. Sussangkarn and Manupipatpong (2015)] state that AFC is 'push factor for economic cooperation and integration' among APTCs.

Now, the region has been on the road of high level of policy-led monetary, trade and financial integration [Bashar (2012), Rangkakulnuwat, et al. (2010), Sussangkarn and Manupipatpong (2015)]. The main significant breakthrough of AFC is the initiative of common currency arrangements among the APTCs under CMI[2] [Gimet (2011), Lee and Azali (2012), Lee and Koh (2012)], and the established CMIM and AMRO institutions to achieve macroeconomic stability [Rana (2014)]. The AFC has significantly expanded the literature about currency area in the East Asia [Shirono (2008)] and opened the discussion regarding viability of a monetary union [Allegret and Essaadi (2011)]. In short, AFC has brought high synchronisation in trade and financial activities of the region that probably set the stage of take-off to form monetary union with common currency [Moneta and Rüffer (2009)].

The study strives to find whether or not there exists the monetary credibility among the APTCs, to form monetary union. The objectives of this study are three-fold: first, to find time-varying credibility of APTCs with 'Capital Assets Price Model' (CAPM) estimated by Kalman Filter Algorithm (KFA); second, to find the nexus between monetary credibility and macroeconomic variables of APTCs, against three potential anchors, i.e., China, Japan and USA [as taken by Nusair (2012), Quah (2012), Quah and Crowley (2012a)] with the Markov Regime Switching (MRS); third, to find the influence of macroeconomic fundamentals on time varying transition probabilities (TVTPs) between the states.

After the introduction (Section I) of the study, Section II defines the macro-fundamentals and their description. Section III provides data description and sources. Section IV explains the methodology of CAPM estimation with Kalman filter. Section V describes

[1] The APTCs plunged from the highest real GDP growth rate to a bloc in which some countries experienced the negative growth [Lloyd and MacLaren (2000), Mandilaras and Bird (2007), Bayoumi, et al. (2000)] stated that '*exchange rates became locked in a death spiral … until nose-bleed-level interest rates were adopted*.

[2] Due to the meeting of ministers held in Chiang Mai, Thailand, it is called the 'Chiang Mai Initiative' (CMI). It augmented to Chiang Mai Initiative Multilateralization (CMIM) in May 2005.

the modelling with Markov Regime Switching model. Section VI presents estimation of time varying credibility indexes with Kalman filter. Section VII shows the estimates of univariate Markov Regime Switching model. Section VIII discusses the asymmetric effect of macroeconomic fundamentals on credibility. Section IX shows estimates of the Time Varying Asymmetric Effect of Macroeconomic Fundamentals on Credibility. The last part of the paper, Section X concludes the discussion with policy suggestions.

II. Macro-Fundamentals and their Description

The theoretical and empirical literature suggests several potential macro-fundamentals that may influence the credibility. The short-term interest rate (STIR) was used as an indicator of monetary policy conduct [Dahlquist and Gray (2000) Ng (2002)]. For instance, when monetary authorities change the interest rate, economy may likely change because public start to change their conduct in response to changed interest rate. Therefore, when authorities deviate from their declared policies in the short-run; in fact, it create a cynicism among public and force them to adjust their expectations, accordingly. Increasing (falling) deviation from the declared policy requires higher (lower) interest rate which makes the monetary policy less (more) credible [Lanzafame and Nogueira (2011)]. For instance, if policymakers follow strict monetary policies, it may increase credibility of their promises of controlling inflation and achieving the exchange rate parity but, at the same time they may experience adverse circumstances (i.e., increasing unemployment, decreasing output, falling trade commitments, raising exchange rate, etc). Drazen and Masson (1994) highlighted the same issue with signalling models that even strict policies cause loss of credibility instead of gaining. Thus, increasing unemployment make future policies less credible due to the high cost associated with it. The trade commitments of APTCs are linked with exchange rate stability (a gain of international competitiveness); however, any future financial crisis may weaken their commitments and may put pressure on policymaker to renege their policies [Sarantis and Piard (2004)].

Increased GDP growth rate enhances the country's credibility, and hence, there is a positive association with it [Tronzano, et al. (2003)]. Increase in inflation and unemployment show negative effect on credibility, due to growing inflation and unemployment pressure [Sarantis and Piard (2004). Knot, et al. (1998)] found that higher unemployment significantly deteriorate the credibility. The studies of Rose and Svensson (1994), Caramazza (1993) and Masson (1995) also support these findings. The real exchange rate helps to determine the macroeconomic stability, investment and external position of a country [Rodríguez, et al. (2008). It has been used as a measure of 'external competitiveness' by Caramazza (1993), Knot, et al. (1998), Tronzano, et al. (2003) and Sarantis and Piard (2004). The loss of 'external competitiveness' might exert pressure on the government to adopt expansionary policies; thus, reducing credibility is a positive association, with credibility. All APTCs are highly open as their share of traded

goods in total demand is high, and that, it possibly depreciate their domestic currencies, due to large demand effect [Berument (2007)]; and reduce their credibility. Moreover, the negative real shocks may disturb countries trade commitments which, eventually shows a negative impact on credibility [Tronzano, et al. (2003)].

III. Data Description and Sources

The data was extracted from IFS, DOTs and NUS,[3] online databases. The NUS quarterly GDP data was used to fill the missing values in IFS GDP series for Indonesia, China, Malaysia, and Thailand. The real effective exchange rate (REER) was used as exchange rate for all countries, except Indonesia and Thailand, where the US$/NC nominal exchange rate was used [Bonasia and Napolitano (2007)]. Inflation is CPI in percentage. The unemployment rate was available for all countries except Indonesia.[4] Trade openness was calculated as ratio of import plus export to GDP. The quarterly data (1980 Q1 to 2015 Q1) of money market rate and deposit rate was used as a proxy of interest rate.[5] Time period of each APTC was different.[6] All variables were used in first difference to overcome their non-stationary behaviour [Bonasia and Napolitano (2007), Kim and Nelson (1999), Lanzafame and Nogueira (2011), Sarantis and Piard (2004)].

IV. Time-Varying CAPM Model for Estimating Credibility

The random walk process of KFA was used to measure time varying credibility with CAPM as used by Bonasia and Napolitano (2007), Lanzafame and Nogueira (2011), Sarantis and Piard (2004)]. In total estimates, 39 TVCIs were taken against China, Japan and USA. The utilized CAPM model is

$$(r_{it} - r_{it}^{f}) = \alpha_{it} + \beta_{it}\,(r_{it}^{m} - r_{it}^{f}) + \varepsilon_{it}\;\varepsilon_{it} \sim N(0, \sigma_{i}^{2}) \tag{1}$$

where, r_{it} is the STIRs of every APTCs, and r_{it}^{f} is Chinese, Japanese and USASTIRs considered as the risk free rate; and r_{it}^{m} is the weighted average market interest rate.[7] The value of CAPM *'beta'* determines the credibility of a country's monetary policy *vis-à-vis* the weighted average of APTCs credibility. If estimated *beta* is greater than 1, it indicates the lower credibility of a country's monetary policy against the weighted average of APTCs credibility. Similarly, if estimated *beta* is less than 1, it indicates

[3] National University of Singapore, data available at this link http://www.fas.nus.edu.sg/ecs/esu/data.html

[4] We interpolated and backcasted where required to make the symmetry in data.

[5] The deposit rate is only used for Brunei, Cambodia, Laos, Myanmar, Vietnam (BCLMV) and China due to non-availability of MMR. The interest series of BCLV are back-casted to get symmetry.

[6] CHN (1986Q4-2015Q1), IDN (1985Q1-2015Q1), JPN (1985Q1-2015Q1), KOR (1985Q1-2015Q1), MYS (1982Q1-2015Q1), PHL (1986Q1-2015Q1), SGP (1984Q1-2015Q1), and THA (1985Q1-2015Q1).

[7] The weights of APTCs are BRN (0.0041), CHN (3.3140), KHM (9.1081), IDN (653.5770), JPN (21.2407), KOR (113.2602), LAO (13.2004), MYS (0.1825), MMR (0.0271), PHL (0.9810), SGP (0.1064), THA (2.1147), and VNM (349.1325). These weights are the 10th version of the Asian Monetary unit, updated in October, 2014 by RIETI.

higher credibility of a country's monetary policy *vis-à-vis* weighted average of APTCs credibility. Equation (3) shows the state space specification of CAPM model, assuming both α_t and β_t are time varying for ease the subscript I is dropped. The 'measurement equation' develops the dynamic nexus among the observed variables and unobserved state or latent factors/variables [Kim and Nelson(1999)]. In a more compact form:

$$y_t = [1 \quad x_t] \begin{bmatrix} \alpha_t \\ \beta_t \end{bmatrix} + \varepsilon_t \tag{2}$$

$$y_t = Z_t S_t + \varepsilon_t \; \varepsilon_t \sim N(0, H_t) \tag{3}$$

where, y_t is $1\times n$ vector of variables observed at time t; S_t $k\times 1$ vector of unobserved state variables; Z_t is a $n\times k$ vector that makes connection amid the observed y_t; and unobserved state vector S_t; H_t is a $(n\times n)$ covariance matrix. The 'transition equation' develops the dynamic association in state variable in term of AR(1) equation in the state vector of the system [Kim and Nelson(1999)].

$$S_t = T_t S_{t-1} + e_t \; e_t \sim N(0, Q_t) \tag{4}$$

where, $S_t = \begin{bmatrix} \alpha_t \\ \beta_t \end{bmatrix}$, $T_t = \begin{bmatrix} \gamma_{11} & 0 \\ 0 & \gamma_{21} \end{bmatrix}_{(k\times k)}$ and $e_t = \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix}_{(k\times 1)}$

The T_t is a stationary diagonal $k\times k$ matrix known as a transition matrix. $E(e_t)=0$ and $Q_t = cov(e_t)$ matrix. In case if both $\gamma_{11} = \gamma_{21} = 1$, then the time varying coefficients CAPM α and β moves over time as random walk. The models presented have two distinct natures of parameters: (a) the regression parameters, i.e., α_t and β_t; (b) the 'hyper parameters of Equations (3) and (4), which are elements of H_t, Q_t and T_t. The KFA finds maximum likelihood estimates of parameters through prediction error decomposition, i.e., the prediction error ($\eta_{t|t-1}$) and its variance ($f_{t|t-1}$). The sample log likelihood function based on prediction error decomposition is represented by

$$ln\, L = -\tfrac{1}{2} \sum_{t=1}^{T} ln(2\pi f_{t|t-1}) - \tfrac{1}{2} \sum_{t=1}^{T} \eta'_{t|t-1} \, f^{-1}_{t|t-1} \, \eta_{t|t-1} \tag{5}$$

which can be maximized with respect to unknown parameters of the model.

V. Modeling with MRS

To determine the structural changes endogenously, this study employ three versions of Hamilton (1989) MRS model. First, the univariate MRS model; second, the multivariate MRS model with constant transition probabilities; and third, the MRS model with TVTPs.

1. Univariate MRS Model

The univariate dynamics of credibility index explore the possibility of discrete regime shifts in the credibility index [Gómez-Puig and Montalvo(1997), Sarantis and Piard (2004)]. The model in which β_{it} depends on a two states, AR (p) MRS process of S_t is considered.

$$\beta_{it} = \phi_{0,s_t} + \phi_{1,s_t}\beta_{i,t-1} + \cdots + \phi_{p,s_t}\beta_{i,t-p} + \mu_{it} \tag{6}$$

where β_t is the credibility variable of country i, S_t (=1, 2) is governed by an unobservable discrete process (states); it provides information about the regime of economy at date t. $\mu_t \sim i.i.d.N(0,\sigma_{st}^2)$. The MRS allows the coefficient ϕ_i to switch between the two different states $S_t=1$ and $S_t=2$. The S_t is a latent dummy variable, equals either to 0 or 1, which indicates low/high credibility. Probabilities of two states can be specified as p and q, written as in a transition matrix P:

$$\begin{bmatrix} p & 1\text{-}q \\ 1\text{-}p & p \end{bmatrix}$$

The probabilities are defined as:

$$Pr[S_t = 2|S_{t-1} = 2] = p = exp\,(p_0)/(1 + exp\,(p_0)) \tag{7}$$

$$Pr[S_t = 1|S_{t-1} = 2] = (1\text{-}p) = 1 - exp\,(p_0)/(1 + exp\,(p_0)) \tag{8}$$

$$Pr[S_t = 1|S_{t-1} = 1] = q = exp\,(q_0)/(1 + exp\,(q_0)) \tag{9}$$

$$Pr[S_t = 2|S_{t-1} = 1] = (1\text{-}q) = 1 - exp\,(q_0)/(1 + exp\,(q_0)) \tag{10}$$

where p_0 and q_0 are unconstrained parameters. In the first order MRS, the probability of a particular state in period t depends only on the state in period $t\text{-}1$. It will use the MLE iterative procedure (12), to estimate model (7):

$$lnL = \sum_{t-1}^{T} ln \sum_{i=1}^{2} pr[S_{t=i}\,|\psi_{t-1}]\,(1/\sqrt{2\pi\sigma(S_t)})\,exp\,(-\mu^2\,(S_t)/(2\sigma^2\,(S_t)) \tag{11}$$

where $pr[S_{t=i}\,|\psi_{t-1}]$ denote the probability of being in state 0 or 1, in period t and ψ_{t-1} which refers to information up to time $t–1$.

2. Multivariate MRS Model

Now, considering a model in which β_{it} not only depends on S_t but also on Z_{t-j} a vector of macro-fundamentals [Dahlquist and Gray (2000), Lanzafame and Nogueira (2011), Sarantis and Piard (2004)]. Specifically,

$$\beta_{it} = \phi_{0,S_t} + \phi_{i,S_t}\beta_{i,t-p} + \gamma_{r,S_t} Z_{i,t-j} + \varepsilon_{it} \tag{12}$$

$$\beta_{it} = \phi_{0,S_t} + \phi_{i,S_t}\beta_{i,t-p} + \gamma_{1,S_t}\Delta gdpgr_{i,t-j} + \gamma_{2,S_t}\Delta ir_{i,t-j} + \gamma_{3,S_t}\Delta ur_{i,t-j} + \gamma_{4,S_t}\Delta rer_{i,t-j} + \gamma_{5,S_t}\Delta to_{i,t-j} + \varepsilon_{it} \tag{13}$$

where, S_t is governed by an unobservable two state first-order Markov chain. The ϕ_0 S_t is an intercept and the ϕ_{i,S_t} are coefficients of AR(p) term,

$$\gamma_{S_t} = (\gamma_{1,S_t}, \ldots, \gamma_{5,S_t})$$

is a vector of macro-fundamentals parameters and is also based on the state and $\varepsilon_t \sim i.i.d.N(0,\sigma_{st}^2)$. Equation (13) allows the effects of macro-fundamentals on credibility, whether symmetric or asymmetric. The transition probabilities (p and q) are defined as:

$$Pr[S_t = 2|S_{t-1} = 2, Z_t] = p_t = exp(p_0 + Z_t'p_1)/(1 + exp(p_0 + Z_t'p_1)) \tag{14}$$

$$Pr[S_t = 1|S_{t-1} = 2, Z_t] = (1-p_t) = (1-exp(p_0 + Z_t'p_1)/(1 + exp(p_0 + Z_t'p_1)) \tag{15}$$

The S_t depends on its own past values and also on Z_t. The log likelihood function will maximize with respect to $\phi_{0,1}$, $\phi_{i,1}$, $\gamma_{1,1}$, $\gamma_{2,1}$, $\gamma_{3,1}$, $\gamma_{4,1}$, $\gamma_{5,1}$,σ_1^2 and p_1 under regime 1, and $\phi_{0,2}$, $\phi_{i,2}$, $\gamma_{1,2}$, $\gamma_{2,2}$, $\gamma_{3,2}$, $\gamma_{4,2}$, $\gamma_{5,2}$, σ_2^2 and p_2 under regime 2.

3. TVTPs and Expected Duration of a Regime in a MRS Model

Unlike Hamilton's (1989) MRS model, it is assumed that transition probabilities are time varying and dependent on macro-fundamentals [Diebold, et al. (1994), Filardo (1994), Sarantis and Piard (2004)]. The TVTPs of M-state Markov switching process S_t can be written as:

$$Pr[S_{t=j}|S_{t-1} = i] = p_{ij} \qquad i, j = 1,2,\ldots, M \qquad \sum_{j=1}^{M} p_{ij} = 1 \tag{16}$$

where p_{ij} = probability of selecting regime, j is next, and presently it is in regime i.

The expected duration of regime j can be derived by the following formula.[8]

$$E(D) = 1/(1-p_{ij}) \qquad \text{where } i = j$$

The Z_{t-1} affects the likelihood of regime switches, TVTPs follow the logistic function as used by Kim and Nelson (1999).

[8] For detail derivations see Kim and Nelson (1999): 70-74.

$$P_{ij}, (Z) = Pr[S_{t=j}|S_{t-1}=i, Z_{t-1}] = (exp(\lambda_{ij,0} + Z'_{t-1}\lambda_{ij,1}))/$$
$$(1 + exp(\lambda_{ij,0} + Z'_{t-1}\lambda_{ij,1})) \qquad i = 1,2,..., M; \qquad j = 1,2,..., M-1 \qquad (17)$$

Variables Z_t help in inferencing the sign of parameters characterizing transition probability. If $\lambda_{ij,1} > 0$, then $\partial p_{ij}/\partial Z_t > 0$ which means that larger the Z_t, greater is the probability of staying in state *i – the high credibility state*. In other words $\lambda_{ij,1} > 0$ shows that a high credibility regime is more likely to be ensued by a high credibility regime; but if $\lambda_{ij,1} < 0$, a high credibility regime is more likely to be ensued by a low credibility regime.

VI. Movements of Time-Varying Credibility[9]

Figures 1 to 22[10] shows the time varying movement of beta coefficients against China, Japan and USA,[11] These figures reveal the following characteristics: (a) a threshold line is added at the value of 1.0, to easily bifurcate credibility indexes in two states (low and high); (b) an inverted y-axis scale[12] is used to easily understand that high credibility state is above the threshold line; (c) the movement of credibility wane at or close to the time of financial crises; namely, the plaza accord (1985Q4), AFC (1997-98) and 2001-02 bubbles burst GFC (2008-09). Against all anchors ASEAN5 enjoy high credibility, except Indonesia. Japan; shows high credibility and Korea show high volatility against China. Against Japan, China and Korea showed high credibility. The countries lost high credibility against Japan, due to its zero interest rate policy started after the AFC. Lanzafame and Nogueira (2011) found that Indonesia, Korea and Thailand lost credibility after AFC. Against USA, all +3 countries showed high credibility. The average credibility (see, Figures 23 to 25) of all APTCs remained high against China and USA, while against Japan they lost credibility during the period of 2000-01.

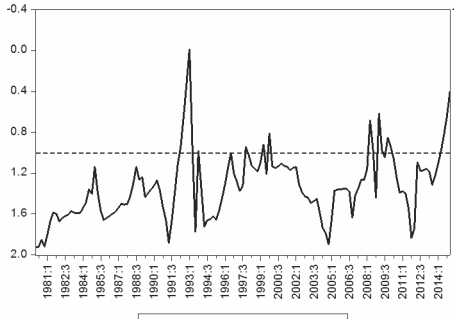

Figure 1. Indonesia: CRED_CHN

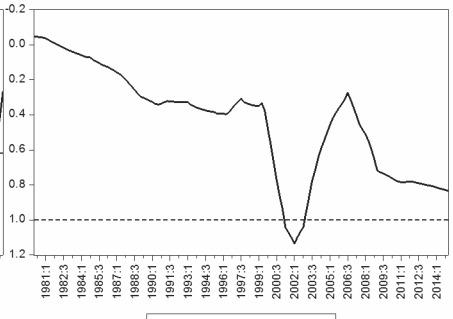

Figure 2. Japan: CRED_CHN

[9] We have not reported the graphs of BCLMV to curtail the length of paper because they take up many pages. But can be attained from the authors upon demand.

[10] All the figures 1 to 78 in the study are based on the authors own estimations.

[11] We also confirmed the time-varying property of α and β by putting the restrictions on their varianceswith the Likelihood test of restriction [Bonasia and Napolitano (2007)]; results are not reported to save space.

[12] Similar inverted scale along with threshold line has also opted by the Lanzafame and Nogueira (2011).

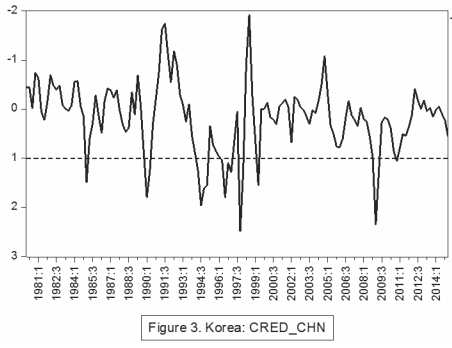

Figure 3. Korea: CRED_CHN

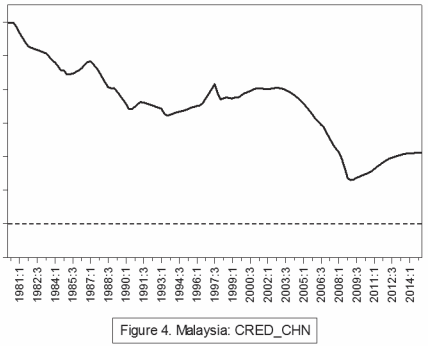

Figure 4. Malaysia: CRED_CHN

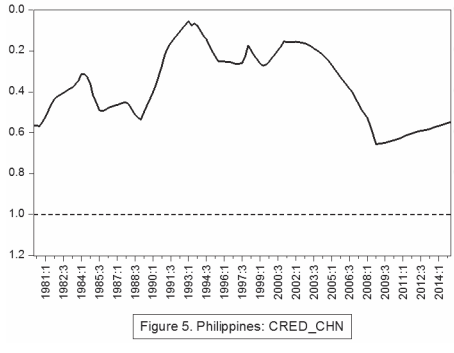

Figure 5. Philippines: CRED_CHN

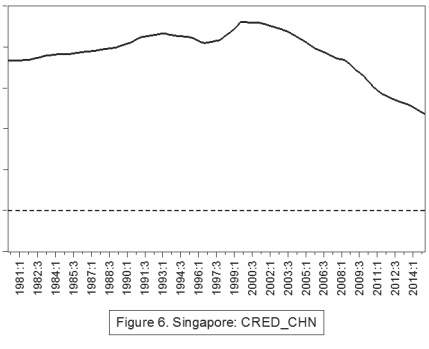

Figure 6. Singapore: CRED_CHN

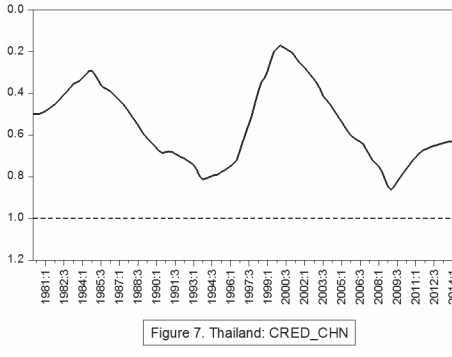

Figure 7. Thailand: CRED_CHN

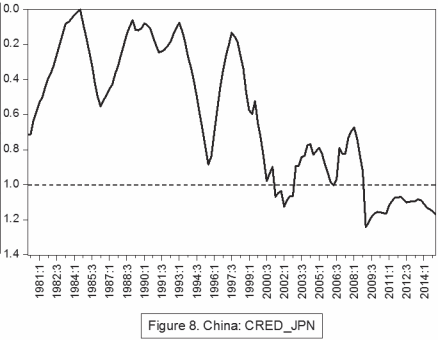

Figure 8. China: CRED_JPN

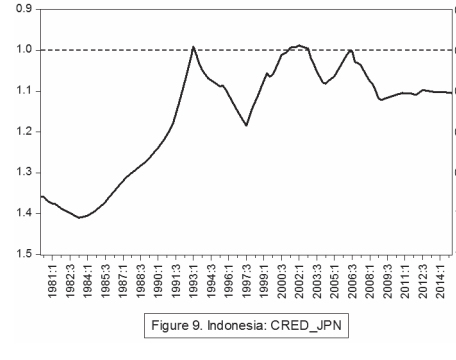

Figure 9. Indonesia: CRED_JPN

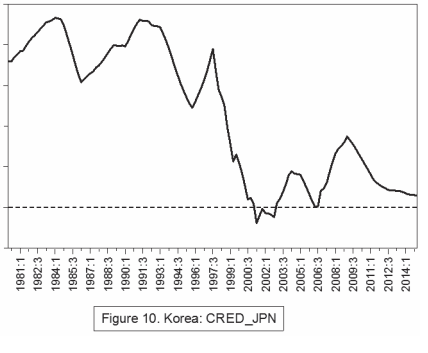

Figure 10. Korea: CRED_JPN

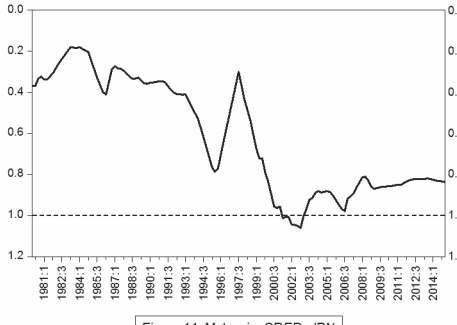

Figure 11. Malaysia: CRED_JPN

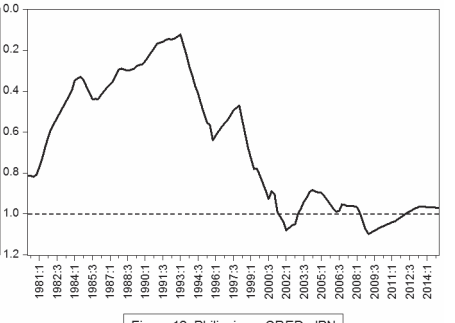

Figure 12. Philippines: CRED_JPN

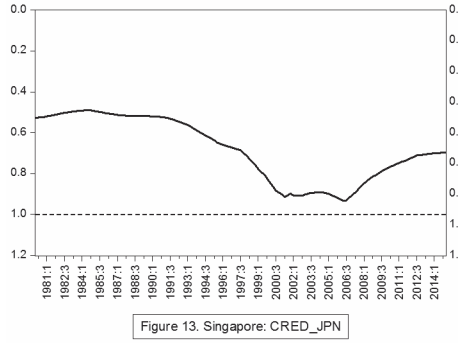

Figure 13. Singapore: CRED_JPN

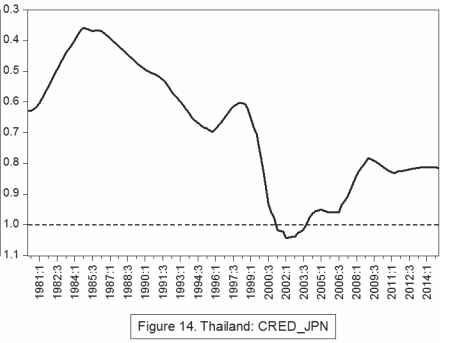

Figure 14. Thailand: CRED_JPN

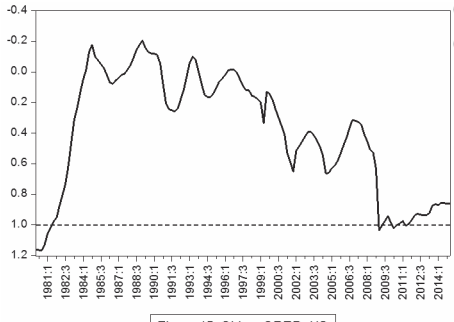

Figure 15. China: CRED_US

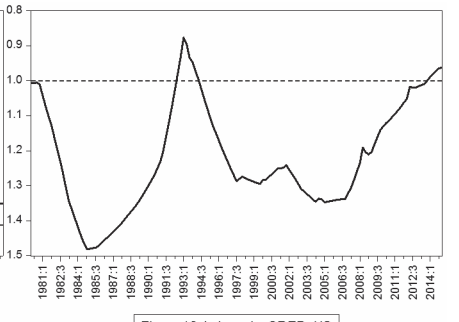

Figure 16. Indonesia: CRED_US

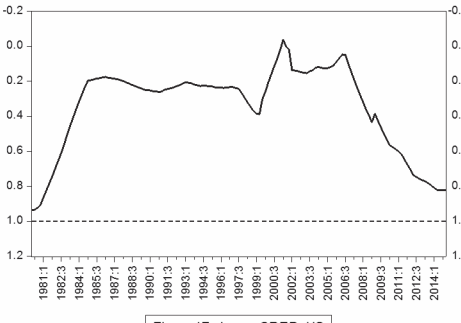

Figure 17. Japan: CRED_US

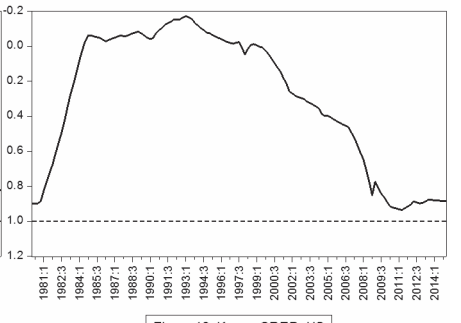

Figure 18. Korea: CRED_US

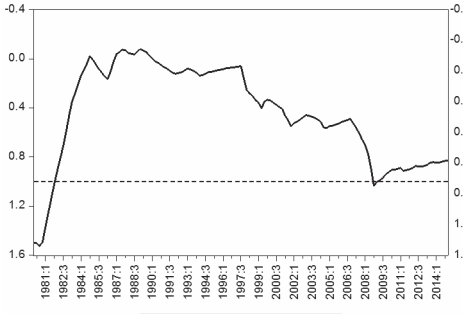

Figure 19. Malaysia: CRED_US

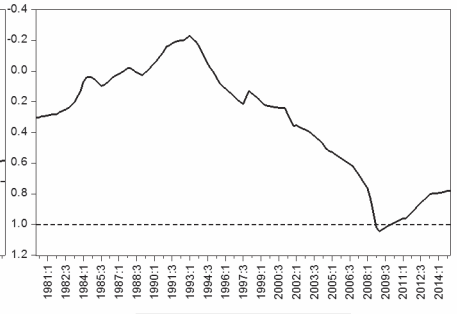

Figure 20. Philippines: CRED_US

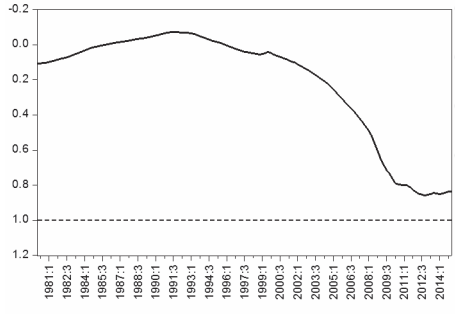

Figure 21. Singapore: CRED_US

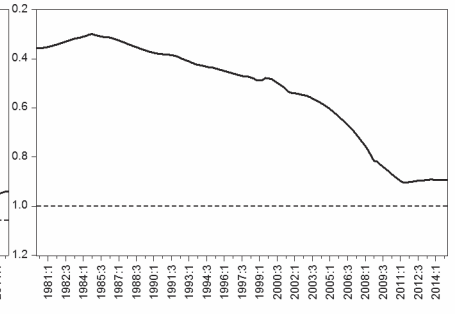

Figure 22. Thailand: CRED_US

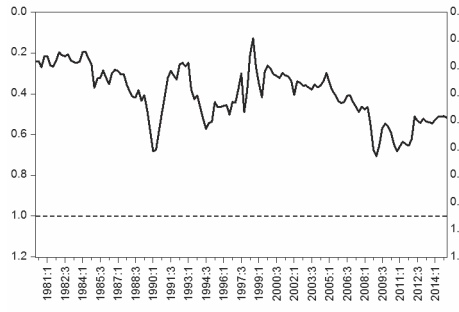

Figure 23. Average Credibility of ASEAN+3_CHN

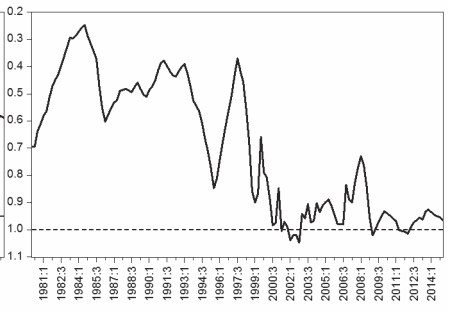

Figure 24. Average Credibility of ASEAN+3_JPN

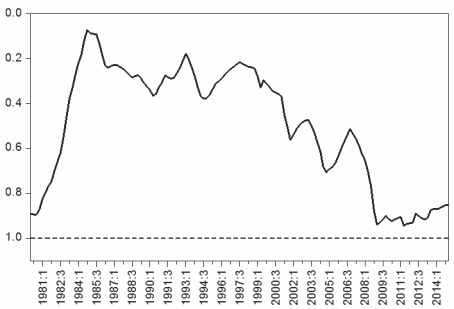

Figure 25. Average Credibility of ASEAN+3_US

Figures 26 to 34 shows the APTCs sentiments[13] against anchors.[14] The regional sentiments of ASEAN5 and Korea are high against China, while low against Japan and USA. Japan shows high sentiments against China. The sentiments of all +3 countries against USA are lowest. Average sentiments of ASEAN with inclusion of BCLMV, becomes high against Japan and USA vis-à-vis China. It indicates that larger countries are not much integrated with China as compare to smaller countries.

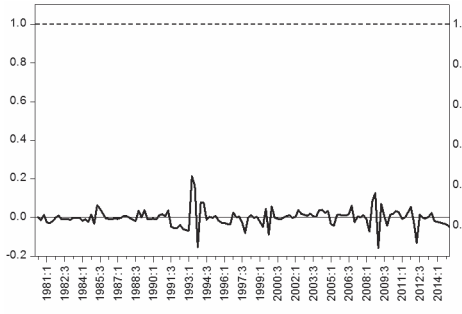

Figure 26: Average Sentiments of ASEAN5_CHN

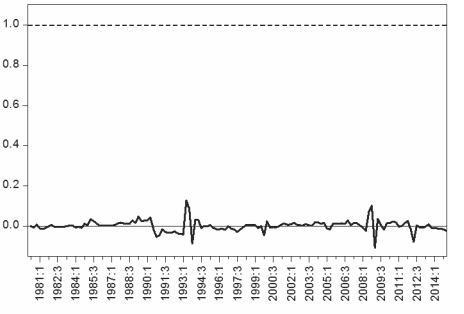

Figure 27: Average Sentiments of ASEAN_CHN

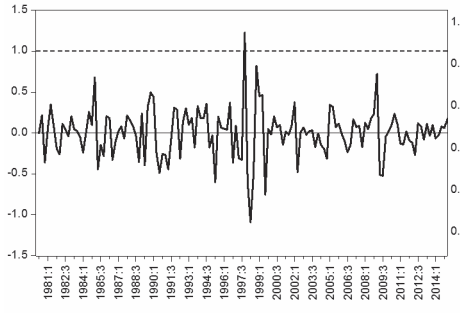

Figure 28: Average Sentiments of JPN_KOR against CHN

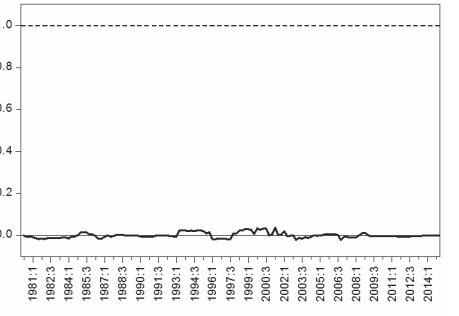

Figure 29: Average Sentiments of ASEAN5_JPN

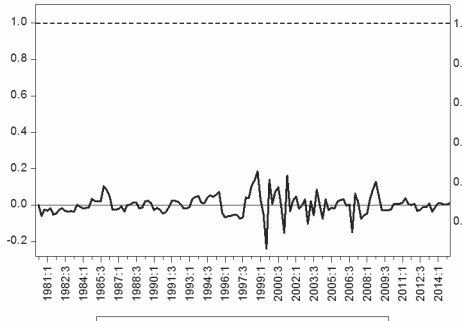

Figure 30: Average Sentiments of ASEAN_JPN

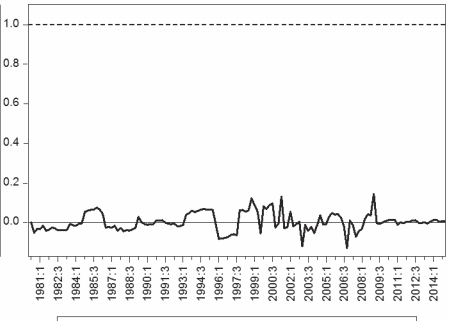

Figure 31: Average Sentiments of CHN_KOR against JPN

[13] These are first difference of credibility indexes ($\Delta\beta_i=\beta_{i,t-2}-\beta_{i,t-1}$, likewise Bonasia and Napolitano (2007) whocalculated this to find the market sentiments of pension reforms in Australia and Iceland.

[14] We here plotted only the average sentiments instead of individual country sentiments to save space.

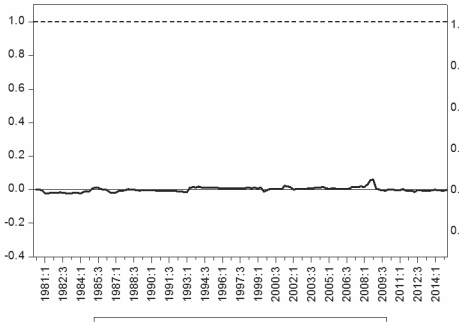

Figure 32: Average Sentiments of ASEAN5_US

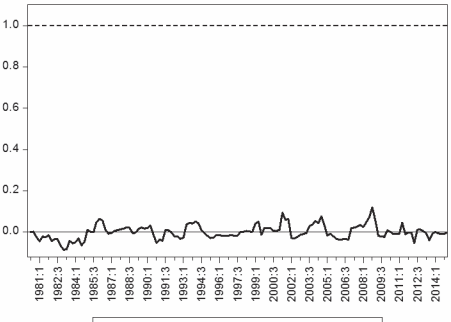

Figure 33: Average Sentiments of ASEAN_US

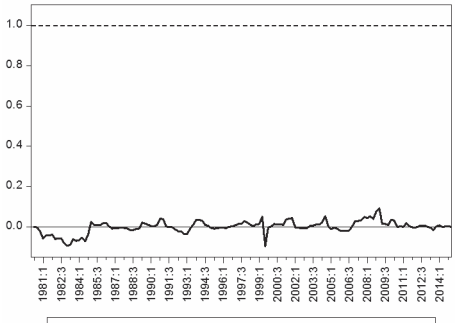

Figure 34: Average Sentiments of CHN_JPN_KOR against US

VII. Dynamics of Univariate MRS Model

Estimates of static univariate MRS model of all APTCs are given in Tables 2 to 4. It examined the results on basis of following characteristics: (a) the AR terms are added in both regimes to obtain spherical residuals; (b) there is significant difference in mean and variance of both regimes; (c) the two diverse regimes of credibility are determined on the basis of mean values [$\phi_{0,1}$ and $\phi_{0,2}$ in Equation (13)];[15] (d) it is assumed that there are two states in all MRS models, whereas all others are determined with the data in hand;[16] (e) the log likelihood values are reasonably high; (f) the Durbin-Watson and Ljung-Box Q-statistic shows that residuals are white noise. Against China, the regime 2 (see, Table 1) is more credible for Indonesia, Japan, Philippine and Thailand, while regime 1 is more credible for Korea, Malaysia, and Singapore. The transition probabilities (p_{11} and p_{22}) of being in high credibility regime are lower for all countries (less than 10 quarters); and it indicates less persistent credibility against China.

[15] The large mean value signifies a low credible regime, whereas a small value signifies high credible regime [Sarantis and Piard (2004)]. The negative value of mean indicates the weakening of interest rate against the anchor rate.

[16] The estimation of total number of regimes in MRS models is not easy due to the existence of unidentified nuisance coefficients under the linear H0 [Bonasia and Napolitano (2007), Krolzig (1997)]. Many formal procedures are available [Ang and Bekaert (2002)]. Davies (1987), Hansen (1992), to estimate the number of regimes in MRS models, however, all these are computationally demanding [Garcia (1998). Nevertheless, the procedure suggested by Psaradakis and Spagnolo (2003) is relatively less computationally demanding. They suggested the AIC criterion to find the number of states in MRS models based on their Monte Carlo experimentations.

TABLE 1
Estimates of Univariate MRS against China

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
Regime 1								
$\phi_{0,1}$	0.3498	0.0005	0.0089	-0.0002	0.0109	–	0.0179	0.0396
	(0.0073)	(0.1679)	(0.1014)	(0.1850)	(0.0223)	–	(0.014)	(0.2577)
β_{t-1}	0.6966	1.9753	1.7057	1.9833	1.8867	–	1.8384	0.7940
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)	(0.0000)
β_{t-2}		-0.9754	-0.732	-0.9828	-0.9078	–	-0.872	-0.2456
		(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)	(0.0230)
σ_1^2	0.0862	2.4E-06	3.2E-04	1.1E-07	1.4E-04	–	5.8E-04	0.0596
P11 Duration	0.8247	0.7514	0.7578	0.518	0.6051	–	0.6496	0.8816
	5.7031	4.0224	4.128	2.0747	2.5323	–	2.8541	8.4427
Regime 2								
$\phi_{0,2}$	0.2081	0.0066	0.001	0.0006	9.10E-06	–	0.0008	0.1364
	(0.0001)	(0.1249)	(0.0655)	(0.4934)	(0.9923)	–	(0.016)	(0.2214)
β_{t-1}	0.8562	1.5501	2.0059	1.9074	2.0056	–	1.9194	0.7987
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)	(0.0000)
β_{t-2}		-0.5609	-1.0078	-0.9086	-1.0052	–	-0.9196	-0.2063
		-0.0003	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)	(0.1531)
σ_2^2	3.6E-03	2.9E-04	2.5E-06	1.5E-06	4.2E-06	–	2.3E-06	0.5634
P22 Duration	0.8507	0.636	0.8087	0.5897	0.7627	–	0.774	0.8405
	6.6975	2.7475	5.2285	2.4373	4.2138	–	4.4254	6.2705
Diagnostics								
DW-stat	1.9047	1.8588	2.1306	1.9934	1.7417	–	2.2429	1.9697
SIC	-0.5883	-6.9599	-6.8328	-9.5106	-7.2148	–	-6.7414	1.6430
AIC	-0.7564	-7.1711	-7.0439	-9.7217	-7.4259	–	-6.9525	1.4319
Log Likelihood	60.948	508.388	499.55	685.66	526.1	–	493.2	-89.517
Q (2)	3.2602	5.2904	1.08	0.7189	3.3355	–	2.5912	0.2641
	(0.196)	(0.071)	(0.583)	(0.698)	(0.189)	–	(0.274)	(0.876)
Q (4)	4.2906	6.6027	5.3136	3.3156	10.488	–	13.061	0.8825
	(0.368)	(0.158)	(0.257)	(0.506)	(0.033)	–	(0.011)	(0.927)
Q (6)	5.0822	7.9609	5.3604	12.57	23.021	–	20.093	3.0342
	(0.533)	(0.241)	(0.498)	(0.050)	(0.001)	–	(0.003)	(0.805)
Q (8)	7.1121	9.3837	6.0103	17.732	31.31	–	21.05	3.7946
	(0.525)	(0.311)	(0.646)	(0.023)	(0.000)	–	(0.007)	(0.875)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

TABLE 2
Estimates of Univariate MRS against Japan

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Regime 1				
$\phi_{0,1}$	0.0155	-0.0022	-0.0021	0.0069	0.0136	-0.0023	–	0.0004
	(0.0000)	(0.0064)	(0.0359)	(0.4143)	0.0000	(0.5376)	–	(0.7619)
β_{t-1}	1.4859	1.992	1.9842	1.7674	1.2265	1.3468	–	1.9982
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)
β_{t-2}	-0.5001	-0.9881	-0.981	-0.7764	-0.2439	-0.452	–	-0.999
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)
σ_1^2	1.5E-06	4.3E-06	5.3E-06	0.000033	9.8E-07	0.00011	–	0.000028
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)
P11 Duration	0.9368	0.6707	0.6289	0.4869	0.9313	0.8247	–	0.7497
	15.8260	3.0370	2.6947	1.9491	14.5600	5.7040	–	3.9960
				Regime 2				
$\phi_{0,2}$	0.0094	0.0168	0.0118	3.91E-05	0.0034	0.0508	–	0.0205
	(0.2605)	(0.0530)	(0.1373)	(0.8680)	(0.4737)	(0.0006)	–	(0.0923)
β_{t-1}	1.7413	1.3819	1.5155	1.9879	1.8969	1.3033	–	1.2401
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)
β_{t-2}	-0.7498	-0.4031	-0.5318	-0.9878	-0.9013	-0.3544	–	-0.2676
	(0.0000)	(0.0008)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	–	(0.0662)
σ_2^2	0.000076	0.00077	0.00072	1.5E-07	0.000068	0.0035	–	0.0015
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)
P22 Duration	0.9688	0.6676	0.6296	0.7473	0.9736	0.9429	–	0.5453
	32.017	3.0083	2.7001	3.9569	37.877	17.527	–	2.1994
				Diagnostics				
DW-stat	1.9791	1.8502	2.2564	2.2959	2.2804	2.0728	–	2.1567
SIC	-7.263	-5.6509	-5.5999	-9.842	-7.2018	-2.8855	–	-5.1403
AIC	-7.4729	-5.862	-5.8109	-10.053	-7.4129	-3.0966	–	-5.3514
Log Likelihood	529.44	417.41	413.86	708.69	525.19	225.22	–	381.92
Q (2)	0.5479	3.2557	0.6399	1.34	0.319	2.9359	–	13.433
	(0.760)	(0.196)	(0.726)	(0.512)	(0.853)	(0.230)	–	(0.001)
Q (4)	2.4621	3.6617	0.9664	11.614	10.034	4.2297	–	14.432
	(0.651)	(0.454)	(0.915)	(0.020)	(0.040)	(0.376)	–	(0.006)
Q (6)	2.4622	3.9827	2.3288	16.257	16.006	5.8895	–	15.849
	(0.873)	(0.679)	(0.887)	(0.012)	(0.014)	(0.436)	–	(0.015)
Q (8)	2.8475	13.724	3.9865	23.07	17.711	11.682	–	46.816
	(0.944)	(0.089)	(0.858)	(0.003)	(0.024)	(0.166)	–	(0.0000)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

TABLE 3
Estimates of Univariate MRS against USA

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Regime 1				
$\phi_{0,1}$	0.0261	-0.0004	0.0019	0.0024	0.0024	0.0399	0.0088	0.0074
	(0.005)	(0.803)	(0.460)	(0.272)	0.000	(0.295)	(0.450)	(0.529)
β_{t-1}	1.8295	1.9719	1.7002	1.9033	1.6235	1.0799	1.3192	0.5704
	(0.000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0136)
β_{t-2}	-0.8507	-0.9701	-0.7039	-0.9062	-0.6265	-0.1028	-0.3511	0.4029
	(0.000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.6731)	(0.0346)	(0.0740)
σ_1^2	0.00014	0.000059	0.00032	0.000041	9.2E-07	0.0135	0.0012	0.00073
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
P11	0.9519	0.7503	0.6404	0.8781	0.9718	0.6012	0.4874	0.1631
Duration	20.788	4.0055	2.7808	8.2027	35.564	2.5077	1.9508	1.1949
				Regime 2				
$\phi_{0,2}$	-0.0012	0.0122	-0.0013	9.39E-05	-0.0012	0.0026	-0.0002	0.0017
	(0.5629)	(0.1951)	(0.0004)	(0.4701)	(0.3947)	(0.4849)	(0.7388)	(0.0679)
β_{t-1}	1.7244	1.6055	2.0162	2.0100	1.7792	1.7951	1.9710	1.9755
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
β_{t-2}	-0.7257	-0.6342	-1.0146	-1.0102	-0.7750	-0.8079	-0.9710	-0.9784
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0662)
σ_2^2	1.6E-06	0.0017	2.1E-06	1.2E-06	0.000011	0.0006	7.6E-06	0.0079
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
P22	0.8608	0.5459	0.5702	0.9448	0.9741	0.9219	0.8164	0.9034
Duration	7.1819	2.2019	2.3266	18.129	38.717	12.807	5.4473	10.349
				Diagnostics				
DW-stat	2.1688	2.1178	1.7525	1.9824	2.0245	2.3033	2.5095	2.53
SIC	-6.6162	-4.7286	-6.2451	-9.0459	-9.2159	-3.3122	-6.506	-5.8803
AIC	-6.8273	-4.9398	-6.4562	-9.2569	-9.427	-3.5233	-6.7171	-6.0914
Log Likelihood	475.04	353.31	458.71	653.36	665.18	254.87	476.84	433.35
Q (2)	0.7943	3.3667	3.7103	0.0979	1.6617	3.7339	24.360	16.578
	(0.672)	(0.186)	(0.156)	(0.952)	(0.436)	(0.155)	(0.000)	(0.000)
Q (4)	3.1145	4.1204	8.8825	1.9027	4.1204	6.6409	29.35	17.291
	(0.539)	(0.390)	(0.064)	(0.754)	(0.390)	(0.156)	(0.000)	(0.002)
Q (6)	6.9027	4.6454	9.7253	7.8485	4.6985	7.5852	29.425	17.566
	(0.330)	(0.590)	(0.137)	(0.249)	(0.583)	(0.270)	(0.000)	(0.007)
Q (8)	7.8506	5.9311	9.8122	9.3004	5.4127	8.5207	34.93	18.378
	(0.448)	(0.655)	(0.278)	(0.318)	(0.713)	(0.384)	0.000	(0.019)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

Against Japan, regime 1 (see Table 2) is highly credible for China, Korea, Malaysia, and Philippines, while regime 2 is more credible for Indonesia, Singapore and Thailand. The transition probabilities of being in high credibility are fairly stable, only for Indonesia and Thailand with average durations of 32.0 and 37.9 quarters, respectively.

Against USA, regime 2 (see Table 3) is highly credible for all countries except Malaysia. The transition probabilities of being in high credibility state are fairly stable only for China, Singapore, Thailand, and Korea with average duration of 12.8, 18.1, 38.7, and 10.3 quarters, respectively.

VIII. Multivariate Asymmetric Effects (MAEs) of Macro-Fundamentals on Credibility

The effects of macro-fundamentals on credibility are examined by the following characteristics: (a) all fundamentals through time are expected to effects on level of credibility asymmetrically; (b) it is considered that heteroskedasticity issue is in both states; (d) the AR terms (as common regressors for both regimes) are incorporated in all models to overcome serial correlation; (f) the models are estimated with different lag combinations (maximum 3 lags) of all macro-fundamentals.[17] Here, only significant estimates are explained. Against China, regime 1 (see Table 4) is highly credible for Indonesia, Japan, Malaysia, Singapore, and Thailand, while regime 2 is credible for rest of the countries. The transition probabilities show that high credibility regime is not persistent for all the countries (average duration less 10 quarters). The GDP growth rate is significant for Japan (0.0004, 5%), Korea (0.0545, 1%), and Thailand (0.0014, 5%) in high regime, while for Indonesia (-0.0067, 10%), Korea (-0.1728, 1%), Malaysia (0.00027, 10%) and Philippines (0.00025, 5%) it is in low regime. The positive sign indicates that increase in GDP reduces the credibility. The inflation is significant for Philippines (0.0021, 5%) and Singapore (0.0004, 1%) in high state while for Japan (0.0185, 10%), Korea (0.7220, 1%) it is in low state. The inflation is mostly significant in low state [Sarantis and Piard (2004)]. The positive sign indicates negative effect on credibility due to growing inflationary pressure. The unemployment effect on credibility is significant for Philippines (0.00255, 1%) in high regime while for Korea (0.8736, 1%), Singapore (-0.0006, 1%) and Thailand (0.0015, 1%) it is in low regime. The higher unemployment, significantly deteriorate the credibility and vice versa [Knot, et al. (1998)]. The real exchange rate effect on credibility is significant for Japan (-0.0002, 5%), Korea (0.0316, 1%), and Singapore (-0.0001, 1%) in high regime, while for Indonesia (5648.9, 1%), and Thailand (-0.4508, 10%) it is in low regime. The positive sign indicates a loss of external competitiveness. The trade openness effect on credibility is significant for Malaysia (0.00122, 1%) in high regime, while it is in low regime for Indonesia (0.0098, 1%), and Singapore (-000018, 1%).

[17] We at first estimated the model with 1 variable and keep on increasing the variables to get all possible combinations 2, 3, 4, and 5 variables with appropriate lags along with the convergence in the MRS process. In other words, we used all fundamentals in first difference form with up to three lags, for the experimentation, to pick out best combinations of variables and lags.

TABLE 4

MAEs of MRS Estimates against China

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
β_{t-1}	0.8447	1.9724	1.8813	2.0010	1.9188	–	1.9010	0.8143
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0000)
β_{t-2}		-0.9746	-0.8893	-1.002	-0.9251	–	-0.9033	-0.2019
		(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0029)
				Regime 1				
$\phi_{0,1}$	0.1791	-0.00053	0.0041	6.0E-05	0.0031	–	0.0017	0.4369
	(0.0012)	(0.8667)	0.0000	(0.6380)	(0.1564)		(0.0158)	(0.0009)
ΔGDP_{t-1}						–	0.0004	-0.1728
							(0.0324)	(0.0151)
ΔGDP_{t-2}	-0.0067	-8.2E-05	0.00025	1.9E-05		–		
	(0.6992)	(0.9441)	(0.0392)	(0.3856)				
ΔGDP_{t-3}					0.0014	–		
					(0.0424)			
ΔP	-0.0038					–		0.722
	(0.6387)							0.0000
ΔP_{t-1}			0.00024	0.0004	0.0019		0.0005	
			(0.2248)	(0.0002)	(0.1685)		(0.2923)	
ΔP_{t-2}		0.00205				–		
		(0.5259)						
$\Delta REER$	-201.53		0.00015			–	-0.0002	
	(0.8749)		(0.1345)				(0.0585)	
$\Delta REER_{t-1}$		0.00060						
		(0.4436)						
$\Delta REER_{t-2}$				-0.0001		–		-0.0179
				(0.0000)				(0.2921)
$\Delta REER_{t-3}$					0.4216	–		
					(0.5777)			
$\Delta topen$	0.0044	0.00122				–	0.0003	0.0324
	(0.5399)	(0.0333)					(0.8655)	(0.3083)
$\Delta topen_{t-1}$				-1.8E-5	2.8E-05	–		
				(0.0001)	(0.9209)			
$\Delta topen_{t-2}$			7.2E-06			–		
			(0.8111)					
ΔUN		0.00037	-3.5E-06			–		0.8736
		(0.9687)	(0.9864)					(0.0038)
ΔUN_{t-1}					0.0041	–		
					(0.3338)			
ΔUN_{t-2}						–	0.0019	
							(0.2567)	
ΔUN_{t-3}				-3.9E-05		–		
				(0.5763)				
σ_1^2	0.0726	0.00036	1.8E-06	8.2E-08	0.00012	–	5.1E-06	0.1423
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	–	(0.0000)	(0.0000)
P11	0.8663	0.5963	0.9572	0.5994	0.7695	–	0.8091	0.1825
Duration	7.4807	2.4771	23.3410	2.4965	4.3381	–	5.2385	1.2233

Continue ....

TABLE 4 *(Continued)...*

MAEs of MRS Estimates against China

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Regime 2				
$\phi_{0,2}$	0.2344	0.00124	0.0019	0.0004	0.0048	–	0.0027	0.0863
	(0.0000)	(0.0083)	(0.3387)	(0.3534)	(0.0002)		(0.5682)	(0.0397)
ΔGDP_{t-1}						–	0.0022	0.0545
							(0.5150)	(0.0004)
ΔGDP_{t-2}	-0.0067	0.00027	-0.0012	0.0002		–		
	(0.0579)	(0.0601)	(0.2989)	(0.2507)				
ΔGDP_{t-3}					-4.6E-05	–		
					(0.4997)			
ΔP	0.00101					–		-0.0552
	(0.2728)							(0.1484)
ΔP_{t-1}			0.0021	-0.0002	-0.0002	–	0.0185	
			(0.0442)	(0.7142)	(0.6276)		(0.0861)	
ΔP_{t-2}		0.00016				–		
		(0.5370)						
$\Delta REER$	5648.9		0.00073			–	0.0003	
	(0.0000)		(0.1261)				(0.8240)	
$\Delta REER_{t-1}$		0.000076				–		
		(0.4503)						
$\Delta REER_{t-2}$				0.0003		–		0.0316
				(0.4324)				(0.0002)
$\Delta REER_{t-3}$					-0.4508	–		
					(0.0005)			
$\Delta topen$	0.0098	-4.3E-05				–	-0.0062	0.0027
	(0.0000)	(0.1314)					(0.6120)	(0.8076)
$\Delta topen_{t-1}$				0.000018	0.000067	–		
				(0.5696)	(0.2195)			
$\Delta topen_{t-2}$			-0.00018			–		
			(0.3794)					
ΔUN		-2.6E-05	0.00255			–		-0.0996
		(0.9136)	(0.0249)					(0.1217)
ΔUN_{t-1}					0.0015	–		
					(0.0087)			
ΔUN_{t-2}						–	0.0152	
							(0.5326)	
ΔUN_{t-3}				-0.0006		–		
				(0.1007)				
σ_2^2	0.00085	2.8E-06	0.0002	0.000012	3.9E-06		0.00075	0.0928
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0000)
P22	0.7369	0.7744	0.9551	0.6784	0.8552	–	0.6435	0.7855
Duration	3.8013	4.4326	22.2870	3.1093	6.9038	–	2.8053	4.6618

Continue ....

TABLE 4 *(Continued)...*

MAEs of MRS Estimates against China

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Diagnostics				
DW-stat	2.0211	2.0104	2.2483	2.0009	1.8552	–	2.0452	1.9704
SIC	-0.1097	-6.7174	-6.662	-9.1336	-7.0277	–	-6.0857	1.7789
AIC	-0.4599	-7.1125	-7.0916	-9.554	-7.4503	–	-6.5083	1.3585
Log Likelihood	42.369	483.87	425.77	586.46	457.57	–	401.99	-62.832
Q (2)	1.0364	5.8604	0.0246	1.1292	2.3947	–	1.621	0.1165
	(0.596)	(0.053)	(0.988)	(0.569)	(0.302)		(0.445)	(0.943)
Q (4)	1.1991	7.0968	3.9194	5.0634	7.3245	–	9.6052	0.4039
	(0.878)	(0.131)	(0.417)	(0.281)	(0.120)		(0.048)	(0.982)
Q (6)	4.7764	7.6848	8.3988	13.241	9.4848	–	15.762	2.8288
	(0.573)	(0.262)	(0.210)	(0.039)	(0.091)		(0.015)	(0.830)
Q (8)	8.8019	10.59	8.4024	15.165	14.281	–	17.153	3.6084
	(0.359)	(0.226)	(0.395)	(0.056)	(0.046)		(0.029)	(0.891)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

Figures 35 to 41 shows the multivariate smooth probabilities[18] (MSPs) of high credible state of all APTCs against China. There is a strong evidence that all macroeconomic variables brings many veers in movement of transition probabilities in most countries, excluding Philippines. Against Japan, regime 1 (see Table 5) is highly credible for Malaysia, Singapore, and Thailand while regime 2 is credible for all the other countries. The transition probabilities show that high credibility regime is fairly persistent for Malaysia and Singapore with average durations of 13.82 and 20.47 quarters, respectively. The effect of GDP growth rate on credibility is significant for China (0.03311, 10%) and Thailand (0.0014, 5%) in high regime, while in low regime China is (-0.00566, 5%) and Thailand is (-4.2E-05, 5%). The Inflation is significant for Indonesia (0.0004, 1%), Korea (-0.0046, 1%), and Philippines (0.0015, 1%) in high regimes, while Indonesia (-0.0005, 10%) and Korea (-0.0090, 5%) are in low regime. The positive value exerts negative effect on credibility, due to growing inflationary pressures.

The effects of unemployment rate on credibility is significant for China (0.18418, 1%), Korea (-0.0192, 1%), Malaysia (0.0067, 5%), and Philippines (0.0017, 1%) in high regime, while in low regime it is also significant (0.0046, 5%) for Philippines. The positive sign indicates that such countries are experiencing tough monetary policies to enhance the credibility against Japan.The real exchange rate is significant for Korea (0.0007, 5%), Malaysia (-0.0008, 1%) and Singapore (0.0002, 5%) in high regime, while for China (0.00094, 10%), Indonesia (96.6015, 10%), Philippines (-0.0022, 10%) and Thailand (0.2732, 1%) in low regime. The positive sign of exchange rate indicates

[18] We reported them because these are estimated using the entire sample information.

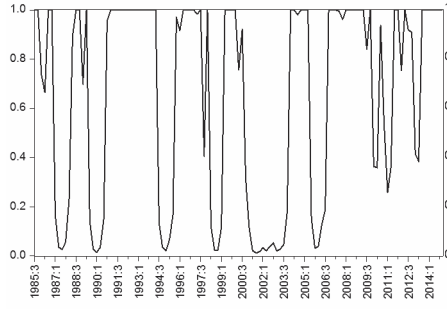

Fig 35: MSPs of the High Credible State: Indonesia_CHN

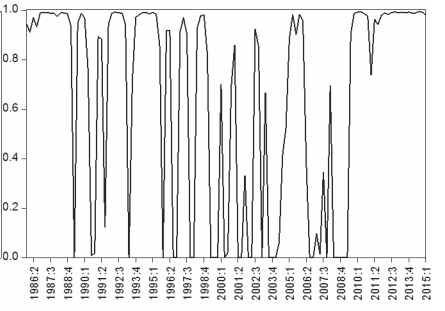

Fig 36: MSPs of the High Credible State: Japan_CHN

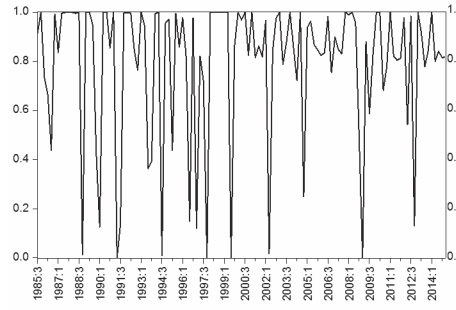

Fig 37: MSPs of the High Credible State: Korea_CHN

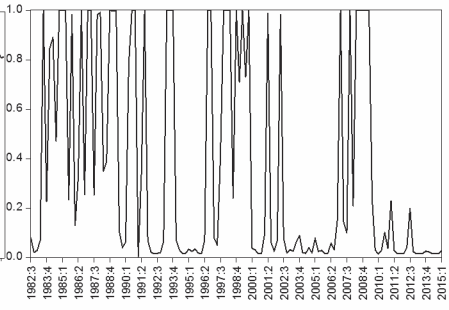

Fig 38: MSPs of the High Credible State: Malaysia_CHN

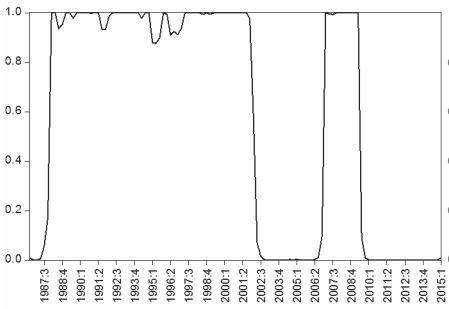

Fig 39: MSPs of the High Credible State: Philippines_CHN

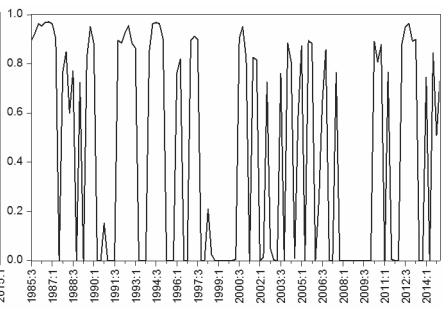

Fig 40: MSPs of the High Credible State: Singapore_CHN

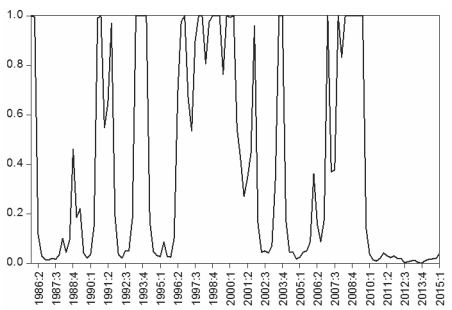

Fig 41: MSPs of the High Credible State: Thailand_CHN

TABLE 5

MAEs of MRS Estimates against Japan

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
β_{t-1}	1.6615	1.7751	1.8607	1.8651	1.8259	1.8553	–	1.4173
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)
β_{t-2}	-0.6765	-0.7761	-0.867	-0.8697	-0.8303	-0.8675	–	-0.4775
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0090)
				Regime 1				
$\phi_{0,1}$	0.0173	0.0019	-0.0002	0.003	0.0036	0.01411	–	0.0531
	(0.0000)	(0.2667)	(0.9722)	(0.0001)	(0.0392)	(0.0222)		(0.0000)
ΔGDP_{t-1}	0.0003			0.000036	0.0014	-0.00566	–	-0.0026
	(0.5546)			(0.3152)	(0.0484)	(0.0351)		(0.1446)
ΔGDP_{t-2}		6.6E-05					–	
		(0.8526)						
ΔGDP_{t-3}			0.0044				–	
			(0.1966)					
ΔP						0.00063	–	
						(0.6550)		
ΔP_{t-1}			0.0018	-0.0002			–	-0.009
			(0.4916)	(0.1504)				(0.0348)
ΔP_{t-2}		0.0011					–	
		(0.2385)						
ΔP_{t-3}	-0.0005				0.0008		–	
	(0.0657)				(0.5824)			
$\Delta REER$	96.6015					0.00094	–	
	(0.0791)					(0.1002)		
$\Delta REER_{t-1}$				0.0002			–	0.0007
				(0.0170)				(0.2684)
$\Delta REER_{t-2}$		-0.0008	-0.0022		0.4358		–	
		(0.0086)	(0.0818)		(0.5675)			
$\Delta topen$		-5.5E-05	0.00013				–	
		(0.6207)	(0.7739)					
$\Delta topen_{t-1}$	-0.0001						–	-3.8E-05
	(0.5648)							(0.9635)
$\Delta topen_{t-2}$				0.000023		-0.00092	–	
				(0.0106)		(0.1816)		
$\Delta topen_{t-3}$					0.0006		–	
					(0.0077)			
ΔUN		0.0067	0.0046			-0.01114	–	
		(0.0581)	(0.0553)			(0.8674)		
ΔUN_{t-2}					-0.0011		–	-0.0079
					(0.6936)			(0.1113)
σ_1^2	8.8E-05	2.5E-05	8.1E-04	6.8E-07	1.1E-04	5.6E-04	–	7.1E-04
P11	0.9207	0.9276	0.7027	0.9512	0.8531	0.9358	–	0.9768
Duration	12.618	13.821	3.3638	20.471	6.8083	15.570	–	43.100

Continue ....

TABLE 5 *(Continued)...*

MAEs of MRS Estimates against Japan

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Regime 2				
$\phi_{0,2}$	0.0166	0.002	-0.0024	0.0036	0.0037	-0.0066	–	0.0046
	(0.0000)	(0.6401)	(0.0309)	(0.0069)	(0.0000)	(0.7825)		(0.0902)
ΔGDP_{t-1}	-0.0002			0.0003	-4.2E-05	0.03311	–	0.0007
	(0.1999)			(0.4432)	(0.0000)	(0.0994)		(0.2317)
ΔGDP_{t-2}		-0.0003					–	
		(0.8255)						
ΔGDP_{t-3}			0.00013				–	
			(0.5129)					
ΔP						-0.0022	–	
						(0.8807)		
ΔP_{t-1}			0.0015	-0.0022			–	-0.0046
			(0.0000)	(0.1967)				(0.0034)
ΔP_{t-2}		-0.0003					–	
		-0.6086						
ΔP_{t-3}	0.0004				-0.0001		–	
	(0.0000)				(0.4769)			
$\Delta REER$	0.9863					0.00889	–	
	(0.8856)					(0.3874)		
$\Delta REER_{t-1}$				-0.0008			–	0.0007
				(0.2236)				(0.0345)
$\Delta REER_{t-2}$		0.0006	6.4E-05		0.2732		–	
		(0.5145)	(0.6921)		-0.0001			
$\Delta topen$		0.0018	-0.00019				–	
		(0.0013)	(0.0011)					
$\Delta topen_{t-1}$	-0.0002						–	-0.0014
	(0.0228)							(0.0350)
$\Delta topen_{t-2}$				9.8E-05		0.00237	–	
				(0.2198)		(0.4143)		
$\Delta topen_{t-3}$					-3.7E-05		–	
					(0.1981)			
ΔUN		0.005	0.0017			0.18418	–	
		(0.6379)	(0.0076)			(0.0000)		
ΔUN_{t-2}					-6.3E-05		–	-0.0192
					(0.8806)			(0.0060)
σ_2^2	1.7E-06	0.0008	8.8E-06	29.E-05	1.6E-06	0.0110	–	5.9E-05
P22	0.9144	0.9182	0.7598	0.9149	0.8689	0.865	–	0.9308
Duration	11.680	12.219	4.1629	11.753	7.6255	7.4094	–	14.443

Continue ....

TABLE 5 *(Continued)*

MAEs of MRS Estimates against Japan

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Diagnostics				
DW-stat	2.0945	2.2249	2.5131	2.3919	2.1858	2.5184	–	1.8279
SIC	-7.1491	-4.9786	-5.2316	-8.8775	-7.2593	-2.5383	–	-4.1434
AIC	-7.5248	-5.3736	-5.6636	-9.2512	-7.6819	-2.9776	–	-4.5638
Log Likelihood	459.96	369.97	340.83	566.45	471.24	183.26	–	289.54
Q (2)	0.5885	0.1158	3.1716	0.7514	0.7856	3.1524	–	1.2177
	(0.745)	(0.944)	(0.205)	(0.687)	(0.675)	(0.207)		(0.544)
Q (4)	2.0095	1.4594	6.7485	4.9443	9.7183	5.6236	–	1.8276
	(0.734)	(0.834)	(0.150)	(0.293)	(0.084)	(0.229)		(0.767)
Q (6)	2.2072	2.3497	10.461	6.5218	11.365	5.9789	–	3.5123
	(0.900)	(0.885)	(0.107)	(0.367)	(0.123)	(0.426)		(0.742)
Q (8)	2.4579	5.5584	13.531	7.278	12.545	8.6576	–	12.036
	(0.964)	(0.697)	(0.095)	(0.507)	(0.129)	(0.372)		(0.150)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

a loss of external competitiveness. The trade openness is significant for Indonesia (-0.0002, 5%), Korea (-0.0014, 5%), Philippines (-0.00019, 1%) and Singapore (2.3E-05, 1%) in high regime, while for Malaysia (0.0018, 1%) and Thailand (0.0006, 1%) it is in low regime.

Figures 42 to 48 show the MSPs of high credible states of APTCs against Japan. The Chinese MSPs stayed around 1 during the first mid half of 2000s. The movement of Indonesia is high credible and the state MSPs shows few veers. Korea experienced a complete vanishing of probability of being in high credibility state after AFC. Malaysia lost its high credibility state in pre- and post-AFC periods. Singapore's MSPs stayed closer to 1 for longer period, before AFC. Thailand MSPs show few veers but stayed closer to zero after AFC.

Against USA, regime 1 (see Table 6) is highly credible for Indonesia, Korea and Malaysia, while regime 2 is credible for rest of the countries. The transition probabilities show that high credibility regime is on average persistent of just 10 quarters in all APTCs. The influence of GDP growth rate on credibility is significant for China (-0.1964, 1%), Korea (-0.0287, 1%), Philippines (0.0326, 1%), Singapore (-0.0008, 1%), and Thailand (-0.0006, 5%)in high regime, while Japan (-0.0143, 10%) and Thailand (6.6E-05, 5%) are in low regime. The GDP growth has significant impact on credibility in most countries, against USA. Inflation rate is significant for Korea (0.0269, 1%), Malaysia (-0.0085, 1%), Philippine (0.0136, 1%) and Thailand (-0.0011, 1%) in the high regime, while Indonesia (-0.0060, 5%), Japan (0.0495, 10%), and Malaysia (0.01378, 1%) are in low regime, however the positive sign indicates inflationary pressures.

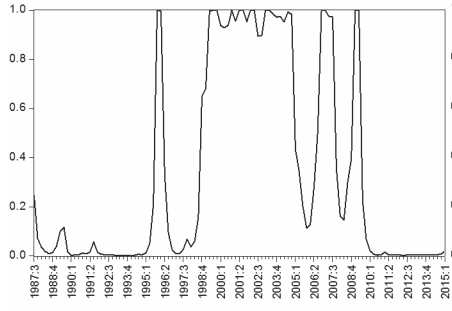

Fig 42: MSPs of the High Credible State: China_JPN

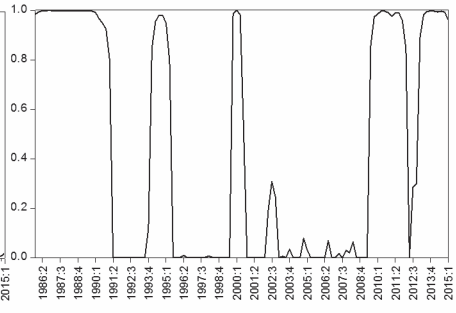

Fig 43: MSPs of the High Credible State: Indonesia_JPN

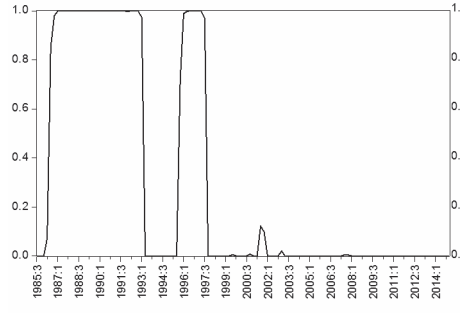

Fig 44: MSPs of the High Credible State: Korea_JPN

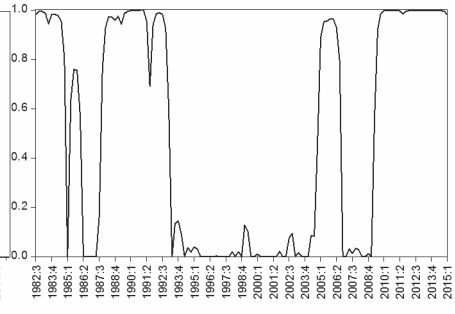

Fig 45: MSPs of the High Credible State: Malaysia_JPN

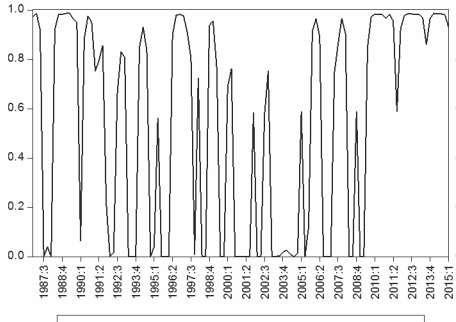

Fig 46: MSPs of the High Credible State: Philippines_JPN

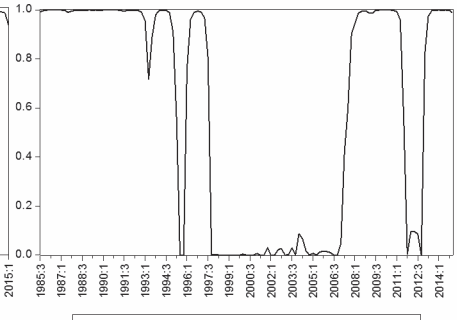

Fig 47: MSPs of the High Credible State: Singapore_JPN

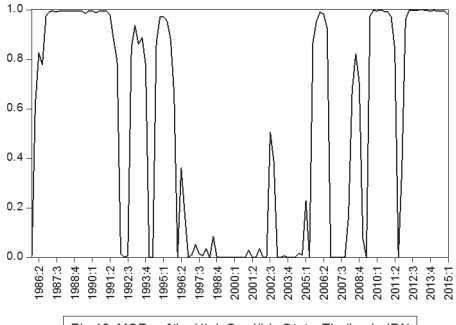

Fig 48: MSPs of the High Credible State: Thailand_JPN

TABLE 6

MAEs of MRS Estimates against USA

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
β_{t-1}	1.9821	1.6019	1.9646	2.0239	1.9059	1.7262	1.9595	1.7791
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
β_{t-2}	-0.9839	-0.6068	-0.9635	-1.0246	-0.9062	-0.7345	-0.9573	-0.7798
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
	Regime 1							
$\phi_{0,1}$	0.0015	0.0029	9.3E-05	0.0002	0.0007	0.0041	0.0048	-0.0462
	(0.6540)	(0.0778)	(0.9142)	(0.3340)	(0.0254)	(0.3606)	(0.6748)	(0.0000)
ΔGDP_g			-3.4E-06			0.0034		
			(0.9911)			(0.1447)		
ΔGDP_{t-1}	0.0001	0.00067					-0.0143	
	(0.5530)	(0.3085)					(0.0876)	
ΔGDP_{t-2}				3.5E-06	6.6E-05			-0.0287
				(0.9615)	(0.0227)			(0.0000)
ΔP			9.7E-05	-0.0002		0.0009		0.0269
			(0.7729)	(0.2604)		(0.5375)		(0.0016)
ΔP_{t-1}		-0.0085					0.0495	
		(0.0000)					(0.0962)	
ΔP_{t-2}					1.8E-05			
					(0.8748)			
ΔP_{t-3}	7.3E-05							
	(0.2097)							
$\Delta REER$	-7.6097	-0.0004	8.5E-05			-0.0003	-0.0079	
	(0.5742)	(0.3021)	(0.6618)			(0.6323)	(0.0062)	
$\Delta REER_{t-2}$				-9.9E-05	-0.0788			-0.0024
				(0.2381)	(0.0484)			(0.0003)
$\Delta topen$			7.3E-05				0.0261	0.0081
			(0.2701)				(0.3163)	0.0000
$\Delta topen_{t-1}$				-2.5E-05	-1.3E-05	0.0006		
				(0.0173)	(0.4773)	(0.5375)		
$\Delta topen_{t-2}$		0.00016						
		(0.3070)						
$\Delta topen_{t-3}$	5.9E-05							
	(0.3843)							
ΔUN		0.0017	0.00051			0.0964		
		(0.6609)	(0.2031)			(0.1061)		
ΔUN_{t-1}				4.0E-05	0.0002		-0.0129	
				(0.8182)	(0.4072)		(0.8065)	
ΔUN_{t-2}								-0.0666
								(0.0000)
σ_1^2	9.5E-06	7.6E-05	2.9E-05	1.0E-06	7.8E-07	7.3E-04	0.0015	1.1E-04
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
P11	0.8852	0.8869	0.8696	0.8711	0.9344	0.9572	0.4878	0.5145
Duration	8.7094	8.8399	7.6664	7.7569	15.237	23.363	1.9522	2.0598

Continue ....

TABLE 6 *(Continued)...*

MAEs of MRS Estimates against USA

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Regime 2				
$\phi_{0,2}$	0.0047	0.0037	-0.0046	-0.0003	0.000082	-0.1364	-0.0009	0.0024
	(0.4232)	(0.5491)	(0.0931)	(0.8240)	(0.9284)	(0.0070)	(0.2950)	(0.0161)
ΔGDP_g			0.0326			-0.1964		
			(0.0000)			(0.0000)		
ΔGDP_{t-1}	-0.0045	-0.00137					4.9E-5	
	(0.1174)	(0.5499)					(0.8540)	
ΔGDP_{t-2}				-0.0008	-0.0006			0.0002
				(0.0036)	(0.0443)			(0.7022)
ΔP			0.0136	-8.8E-05		0.0422		0.0009
			(0.0000)	(0.9570)		(0.3715)		(0.2915)
ΔP_{t-1}		0.01378					0.0004	
		(0.0033)					(0.6075)	
ΔP_{t-2}					-0.0011			
					(0.0669)			
ΔP_{t-3}	-0.0060							
	(0.0238)							
$\Delta REER$	267.52	-0.0038	0.0051			-0.0427	0.0002	
	(0.1356)	(0.0083)	(0.0000)			(0.0491)	(0.0522)	
$\Delta REER_{t-2}$				0.0007	1.2015			-4.6E-05
				(0.5476)	(0.0001)			(0.7858)
$\Delta topen$			-0.0025				-0.0015	
			(0.0000)				(0.3572)	
$\Delta topen_{t-1}$				0.0002	0.00014	-0.0121		
				(0.0584)	(0.2391)	(0.0224)		
$\Delta topen_{t-2}$		-0.0008						-4.6E-05
		(0.3622)						(0.7858)
$\Delta topen_{t-3}$	0.0014							-3.4E-06
	(0.2515)							(0.9886)
ΔUN		-0.0401	0.0119			0.9208		
		(0.0504)	(0.0000)			(0.1496)		
ΔUN_{t-1}				-0.0022	0.0027		0.0019	
				(0.0266)	(0.0754)		(0.4543)	
ΔUN_{t-2}								-0.0004
								(0.7746)
σ_2^2	0.0004	0.0011	5.3E-05	3.2E-05	1.4E-05	0.0086	1.5E-05	5.6E-05
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
P22	0.5887	0.7928	0.1551	0.7491	0.7701	0.5548	0.9018	0.9501
Duration	2.4310	4.8264	1.1836	3.9855	4.3492	2.2464	10.184	20.030

Continue ....

TABLE 6 *(Continued)*

MAEs of MRS Estimates against USA

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
	Diagnostics							
DW-stat	2.1462	1.8711	2.1179	2.0847	2.1925	2.2641	2.7380	2.0441
SIC	-6.6646	-4.5839	-6.1133	-8.5386	-9.4694	-3.0251	-6.1969	-5.7267
AIC	-7.0403	-4.9789	-6.5429	-8.9590	-9.8897	-3.4620	-6.6172	-6.1471
Log Likelihood	431.38	344.12	394.22	551.06	606.44	211.87	411.73	383.75
Q (2)	4.1854	0.4829	4.0006	0.0441	1.6188	4.0549	8.1427	5.1161
	(0.123)	(0.785)	(0.135)	(0.978)	(0.445)	(0.132)	(0.017)	(0.077)
Q (4)	5.7312	0.631	5.4707	4.815	4.636	6.4325	11.211	5.5426
	(0.220)	(0.960)	(0.242)	(0.307)	(0.327)	(0.169)	(0.024)	(0.236)
Q (6)	5.9319	1.5596	7.2418	13.962	5.1067	7.3884	12.074	5.6233
	(0.431)	(0.955)	(0.299)	(0.030)	(0.530)	(0.286)	(0.060)	(0.467)
Q (8)	6.7228	10.239	8.4416	14.855	7.1522	8.1402	12.581	6.0013
	(0.567)	(0.249)	(0.392)	(0.062)	(0.520)	(0.420)	(0.083)	(0.647)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

The effect of unemployment rate on credibility is significant for Korea (-0.0666, 1%), Philippines (0.0119, 1%), Singapore (-0.0022, 5%) and Thailand (0.0027, 10%) in high regime while for Malaysia (-0.0401, 5%) is in low regime. The positive value indicates weakening credibility. The real exchange rate effect on credibility is significant for China (-0.0427, 5%), Japan (0.0002, 10%), Korea (-0.0024, 1%), Philippine (0.0051, 1%) and Thailand (-0.0788, 1%) in the high regime, while Japan (-0.0079, 1%), Malaysia (-0.0038, 1%), and Thailand (-0.0788, 5%) are in low regime. The positive sign indicates a loss of external competitiveness. The effect of openness on credibility is significant for China (-0.0121, 5%), Korea (0.0081, 1%), Philippine (-0.0025, 1%), and Singapore (0.0002, 10%) in high regime, while Singapore (-2.5E-05, 10%) is in low regime.

Figures 49 to 56 show the MSPs of the high credible state of all APTCs against USA. The movement of Chinese MSPs stayed till AFC closer to zero, thereafter it shows high swings. The Indonesia MSPs shows many veers but stayed closer to 1. Japan MSPs stayed closer to 1 before AFC and thereafter became highly instable. Korea shows complete vanishing of the high state MSPs at most times. Malaysia lost its high credibility state for longer time in the post AFC periods. The high credibility MSPs of Philippine and Singapore stayed closer to zero for most times. Thailand's MSPs show few veers. Against USA, the MSPs of APTCs shows few veers, against Japan and China.

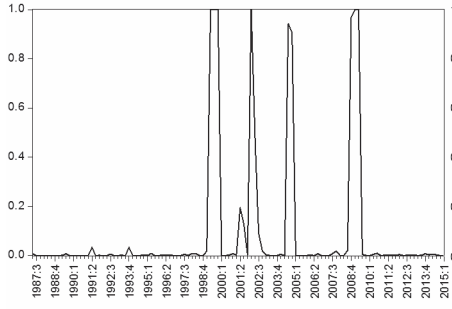

Fig 49: MSPs of the High Credible State: China_US

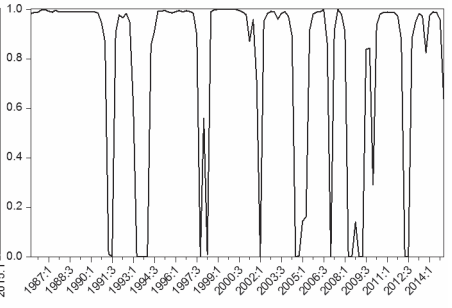

Fig 50: MSPs of the High Credible State: Indonesia_US

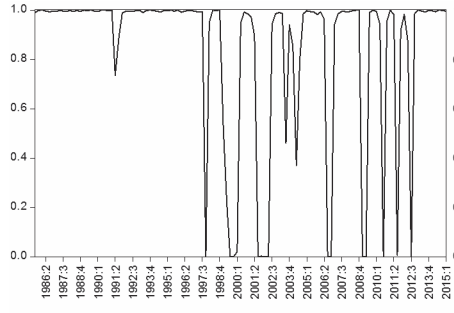

Fig 51: MSPs of the High Credible State: Japan_US

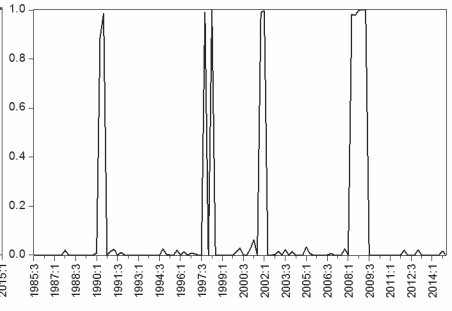

Fig 52: MSPs of the High Credible State: Korea_US

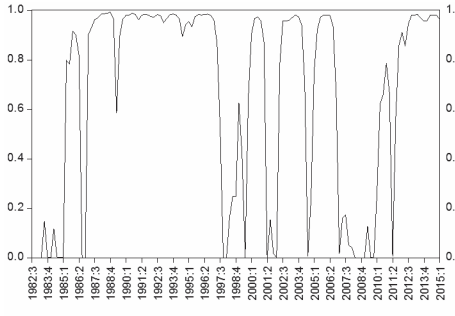

Fig 53: MSPs of the High Credible State: Malaysia_US

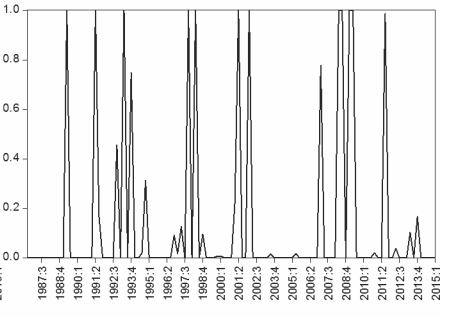

Fig 54: MSPs of the High Credible State: Philippines_US

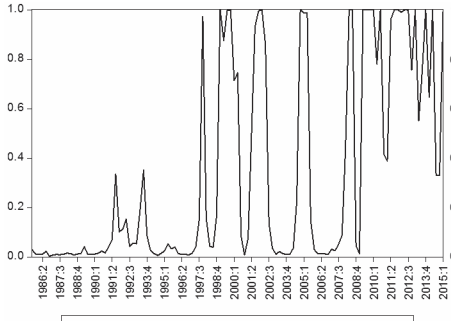

Fig 55: MSPs of the High Credible State: Singapore_US

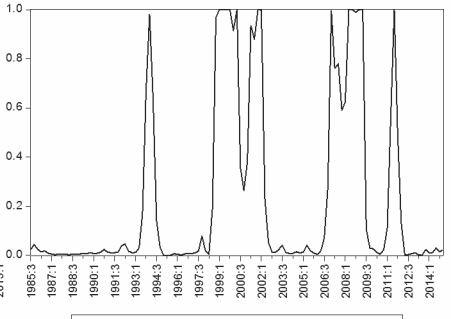

Fig 56: MSPs of the High Credible State: Thailand_US

IX. Asymmetric Effects of Macro-Fundamentals on TVTPs

This section analyse the potential impact of macro-fundamentals on TVTPs of MRS models [see, Diebold, et al.(1994); Filardo(1994); Kim and Nelson(1999). We considered that when an economy is in a low credibility regime, it indicates worsening of macro-fundamentals[19] which may possibly lengthen the probability of staying in the low credibility regime. Contrary, if an economy is in a high credibility regime, the deterioration of macro-fundamentals perhaps lowers the probability of remaining in the high credibility regime [Sarantis and Piard(2004)]. Moreover, macro-fundamentals exert asymmetric effect on TVTPs in most cases. The given explanation is only of significant variables. Against China, the estimates of means (see Table 7) shows that regime 1 is highly credible for Indonesia, Japan, Korea, Philippine, and Singapore, while regime 2 is highly credible for other countries.

The effect GDP growth rate on TVTPs is significant in high credibility state for Indonesia (-0.9717, 10%), Philippine (0.0270, 10%) and Singapore (1.5232, 10%); whereas, in low credibility it is significant for Malaysia (0.5192, 10%) and Thailand (0.941, 5%). In comparison to the multivariate MRS model, GDP of Indonesia, Philippine, and Thailand impacts the level of credibility, while in Malaysia and Singapore it causes switching between the two regimes. The effect of inflation on TVTPs is significant for Indonesia (-0.54, 10%), Japan (3.46, 10%), and Singapore (3.72, 10%) in high regime; whereas, in low regime it is significant for Korea (2.24, 10%) and Malaysia (1.59, 5%). Inflation in Singapore and Japan effects the level of credibility whereas, in Indonesia, Korea and Malaysia, it causes shifts between the two credibility regimes.

The unemployment impact on TVTPs is significant for Korea (4.15, 10%) in high regime, while for Japan (5.54, 5%) it is in low regime. In Japan and Korea unemployment causes shifts between the two credibility regimes. The exchange rate effect on TVTPs in Japan is significant (at 10%) in both regimes, 0.2773 in high, while -0.1668 in low regimes; similarly, it is significant in low regime for Korea (-0.5779, 10%). The exchange rate of Japan and Korea causes the switching in the regimes of credibility. Trade openness influence the TVTPs significantly, in Indonesia (0.4640, 10%), Japan (-3.4968, 5%), Korea (0.1875, 10%) and Thailand (-0.1541, 10%) in high credibility regime, while in Korea (-0.1541, 10%), Malaysia (-0.0999, 5%), Philippine (0.5973, 10%), Singapore (-0.2075, 10%), and Thailand (0.1875, 10%),it is in low credibility regime. In comparison to the multivariate MRS model, it causes the switching in the regimes of credibility of all countries except Indonesia.

[19] It means increasing unemployment, exchange rate appreciation, inflation, decrease in GDP growth rate etc.

TABLE 7

Multivariate TVTPs Estimates against China

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
β_{t-1}	0.9601	1.9475	1.9787	1.9434	1.9501	–	1.8985	0.883
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0000)
β_{t-2}	-0.152	-0.9497	-0.9809	-0.9438	-0.9557	–	-0.8999	-0.2324
	(0.0515)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0002)
				Regime 1				
$\phi_{0,1}$	0.1892	0.001	0.0005	0.0001	0.0042	–	0.0011	0.0819
	(0.0328)	(0.2008)	(0.8434)	(0.6532)	(0.0000)		(0.8501)	(0.4291)
σ_1^2	0.1273	0.000011	0.00033	6.1E-07	3.1E-06	–	0.00096	0.5346
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0000)
P11-C	2.3755	2.5876	1.7532	2.0349	1.5031	–	0.9257	5.7201
	-0.0378	-0.0001	-0.0012	-0.1065	-0.0203		-0.1425	-0.0426
P11ΔGDP_{t-1}		0.5192		1.5232		–		
		(0.0518)		(0.0866)				
P11ΔGDP_{t-2}	-0.9717					–		
	(0.0874)							
P11ΔGDP_{t-3}			0.0270		0.9410	–	-0.8030	
			(0.9121)		(0.0291)		(0.1525)	
P11ΔP					-0.9566	–		
					(0.1475)			
P11ΔP_{t-1}	-0.5382					–		
	(0.0828)							
P11ΔP_{t-2}		1.5954		3.7238		–	3.4645	
		(0.0421)		(0.0911)			(0.0909)	
P11ΔP_{t-3}			0.4091			–		-0.0751
			(0.2771)					(0.9136)
P11Δ$REER$		0.2075				–	0.2773	
		(0.1468)					(0.0676)	
P11Δ$REER_{t-1}$	26810					–		
	(0.3766)							
P11Δ$REER_{t-2}$				-0.9002		–		-0.4681
				(0.3788)				(0.1762)
P11Δ$REER_{t-3}$			0.1122			–		
			(0.2573)					
P11Δ$topen$					0.1875	–		
					(0.0680)			
P11Δ$topen_{t-1}$						–	-3.4968	
							(0.0450)	
P11Δ$topen_{t-2}$	0.464	-0.0999	-0.0587	0.1139		–		
	(0.0995)	(0.0329)	(0.3681)	(0.1645)				
P11Δ$topen_{t-3}$						–		0.7999
								(0.0686)
$P11\Delta UN_{t-1}$						–	-1.5529	4.1453
							(0.6216)	(0.0741)
$P11\Delta UN_{t-2}$		1.5179		0.7607		–		
		(0.3039)		(0.3151)				
Mean-TVTP	0.7658	0.8207	0.8129	0.6224	0.6726	–	0.6042	0.9008
SD-TVTP	0.2673	0.2301	0.1429	0.4161	0.3343	–	0.3315	0.2223

Continue ....

TABLE 7 *(Continued)*

Multivariate TVTPs Estimates against China

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Regime 2				
$\phi_{0,2}$	0.2661	0.0004	0.0011	0.0005	0.0018	–	0.0015	0.0880
	(0.0002)	(0.9228)	(0.0217)	(0.3949)	(0.3934)		(0.0463)	(0.0025)
σ_2^2	0.007	0.00056	0.000002	0.000014	0.00015	–	7.2E-06	0.0374
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)	(0.0000)
P21-C	-6.7454	13.816	-6.7947	-1.1035	-0.0232	–	-2.0099	-3.7387
	(0.1418)	(0.9463)	(0.0418)	(0.1576)	(0.9580)		(0.0001)	(0.0043)
P21ΔGDP_{t-1}		74.478		-0.2558		–		
		(0.9368)		(0.1687)				
P21ΔGDP_{t-2}	-1.867					–		
	(0.2205)							
P21ΔGDP_{t-3}			-3.6077		-0.1132	–	0.3918	
			(0.0584)		(0.3897)		(0.2188)	
P21ΔP					0.1627	–		
					(0.6137)			
P21ΔP_{t-1}	-2.8059					–		
	(0.1511)							
P21ΔP_{t-2}		-246.55		-0.762		–	0.4547	
		(0.9354)		(0.4968)			(0.4689)	
P21ΔP_{t-3}			-0.5378			–		2.2449
			(0.5148)					(0.0615)
P21Δ$REER$		45.416				–	-0.1668	
		(0.9367)					(0.0595)	
P21Δ$REER_{t-1}$	-79781.9					–		
	(0.2362)							
P21Δ$REER_{t-2}$				0.2282		–		-0.5779
				(0.6325)				(0.0543)
P21Δ$REER_{t-3}$			-1.6923			–		
			(0.1101)					
P21Δ$topen$					-0.1541	–		
					(0.0668)			
P21Δ$topen_{t-1}$						–	0.5427	
							(0.7778)	
P21Δ$topen_{t-2}$	1.6258	34.531	0.5973	-0.2075		–		
	(0.1691)	(0.9368)	(0.0733)	(0.0632)				
P21Δ$topen_{t-3}$						–		-0.6450
								(0.0906)
$P21\Delta UN_{t-1}$						–	5.5454	-0.1415
							(0.0237)	(0.9200)
$P21\Delta UN_{t-2}$		-98.132		-1.1354		–		
		(0.9372)		(0.1251)				
Mean-TVTP	0.8445	0.5205	0.7719	0.6058	0.5282	–	0.8128	0.8445
SD-TVTP	0.3146	0.5003	0.3882	0.3529	0.226	–	0.1896	0.2958

Continue ....

TABLE 7 *(Continued)*

Multivariate TVTPs Estimates against China

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Diagnostics				
DW-stat	2.3055	2.0896	2.2813	2.0306	1.7814	–	2.1673	2.0925
SIC	-0.2691	-6.5603	-6.5929	-8.9766	-7.0329	–	-6.0709	1.7552
AIC	-0.6428	-6.9553	-6.9748	-9.397	-7.3599	–	-6.4912	1.3816
Log Likelihood	54.246	473.57	417.05	577.12	451.91	–	404.23	-66.204
Q (2)	3.9801	1.8121	1.3481	0.1303	0.2217	–	0.6062	0.5184
	(0.137)	(0.404)	(0.510)	(0.937)	(0.638)		(0.739)	(0.772)
Q (4)	6.4476	2.4547	2.6059	5.1780	3.0579	–	7.7013	2.8604
	(0.168)	(0.653)	(0.626)	(0.270)	(0.217)		(0.103)	(0.581)
Q (6)	7.3420	2.7849	3.0054	9.5368	11.6020	–	10.3370	3.5714
	(0.290)	(0.835)	(0.808)	(0.146)	(0.071)		(0.111)	(0.734)
Q (8)	8.3212	7.5554	3.4790	12.5990	14.1900	–	12.2780	4.2966
	(0.403)	(0.478)	(0.901)	(0.126)	(0.077)		(0.139)	(0.829)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

Figures 57 to 63 show the high credibility state TVTPs of MRS model of APTCs against China. The movement of Indonesia TVTPs are highly volatile. Japanese TVTPs show many veers of Korean TVTPs most of the time stay in high credible state; decays are at or close to four financial crises. Malaysian TVTPs show many decays with clear impact of plaza accord, AFC and GFC. The Philippines show few veers in TVTPs with sharp decays. Singapore and Thailand show many veers in TVTPs and indicates that likelihood of switching is high from tranquil regime to a crisis regime and vice versa in all APTCs. Against Japan, the estimates of means (see Table 8) shows that regime 1 is highly credible for China, Indonesia, Malaysia, Philippines, Singapore, and Thailand, while regime 2 is credible for all the other countries.

The GDP growth rate effect on TVTPs is only significant for Korea (-0.9056, 5%) and Philippine (-0.6967, 10%) in low credibility regime. The negative sign indicates that increase in changes in GDP lowers the probability of remaining in a particular regime. Korean results are in line with the multivariate MRS model that GDP impacts the level of credibility while Philippines GDP causes switching between the two regimes. Inflation is significant for China (1.0053, 1%), Philippines (-1.0084, 10%), and Singapore (4.0381, 10%) in high regime, while for China (-1.7650, 1%), Malaysia (-7.9027, 10%), and Singapore (0.9031, 10%) it is in low regime. The results of TVTPs model is in line with multivariate MRS model that inflation affects the level of credibility in all countries.

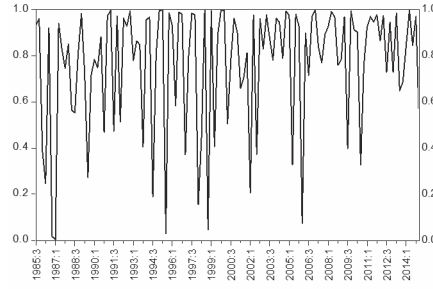

Fig 57. Multivariate TVTPs of the High Credible State: Indonesia_CHN

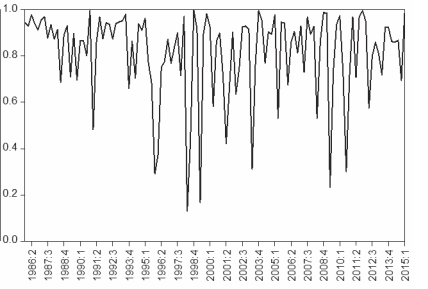

Fig 58: Multivariate TVTPs of the High Credible State: Japan_CHN

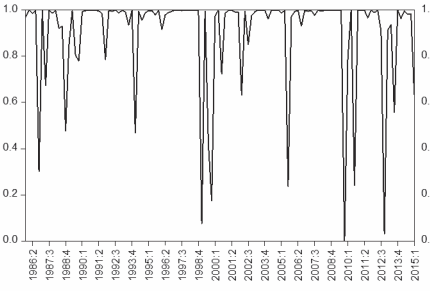

Fig 59: Multivariate TVTPs of the High Credible State: Korea_CHN

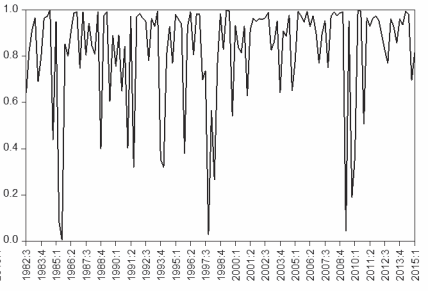

Fig 60: Multivariate TVTPs of the High Credible State: Malaysia_CHN

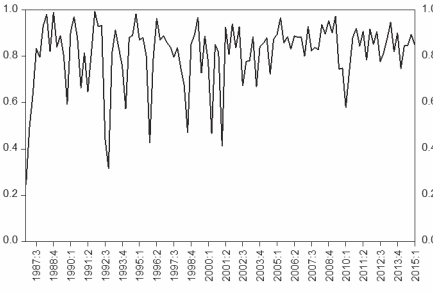

Fig 61: Multivariate TVTs of the High Credible State: Philippines_CHN

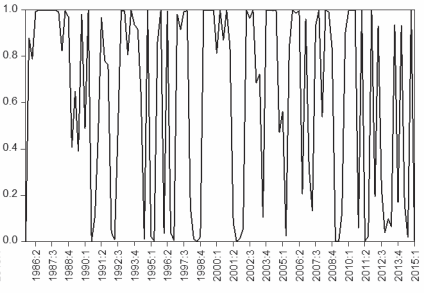

Fig 62: Multivariate TVTPs of the High Credible State: Singapore_CHN

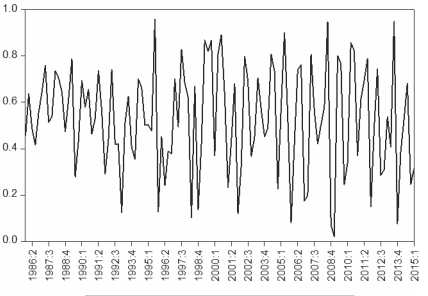

Fig 63. Multivariate TVTPs of the High Credible State: Thailand_CHN

TABLE 8

Multivariate TVTPs Estimates against Japan

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
β_{t-1}	1.8982	1.7572	1.9657	1.9772	1.8657	1.8739	–	1.8720
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)
β_{t-2}	-0.9009	-0.7573	-0.9635	-0.9774	-0.8685	-0.8802	–	-0.875
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)
				Regime 1				
$\phi_{0,1}$	0.0020	-0.0005	-0.0016	1.4E-05	0.0023	0.0042	–	0.0025
	(0.6306)	(0.6852)	(0.1493)	(0.9910)	(0.0498)	(0.7766)		(0.1420)
σ_1^2	1.2E-05	7.4E-06	8.5E-06	4.5E-05	5.9E-06	0.0096	–	4.3E-05
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)
P11-C	2.9729	2.6613	0.7462	-0.4736	5.1559	5.0366	–	2.8343
	(0.0289)	(0.0079)	(0.1309)	(0.5757)	(0.0407)	(0.0001)		(0.0003)
P11ΔGDP_g							–	-0.9056
								(0.0173)
P11ΔGDP_{t-1}	-0.7000	0.9388					–	
	(0.1580)	(0.1785)						
P11ΔGDP_{t-3}			0.4161	-0.3142	-0.0666		–	
			(0.1510)	(0.3831)	(0.8246)			
P11ΔP_{t-2}					0.1782	1.0053	–	1.0435
					(0.8707)	(0.0043)		(0.1769)
P11ΔP_{t-3}	0.6820	1.2378	-1.0084	4.0381			–	
	(0.1810)	(0.2790)	(0.0735)	(0.0675)				
P11Δ*REER*		0.3840			16.202		–	
		(0.1562)			(0.9648)			
P11Δ$REER_{t-1}$			0.4127	-0.6601		-0.0819	–	
			(0.0287)	(0.2332)		(0.1994)		
P11Δ$REER_{t-3}$							–	0.3557
								(0.0269)
P11Δ$topen_{t-1}$			0.0026	-0.1627			–	-0.1269
			(0.9539)	(0.1005)				(0.3634)
P11Δ$topen_{t-2}$	-0.3016				-0.3498		–	
	(0.1833)				(0.0772)			
P11Δ$topen_{t-3}$		-0.3870				0.1828	–	
		(0.1476)				(0.0856)		
*P11*ΔUN_{t-1}					-1.6724		–	
					(0.2539)			
*P11*ΔUN_{t-2}		-12.150		2.2008			–	-1.2301
		(0.0464)		(0.0533)				(0.4190)
Mean-TVTP	0.8675	0.6933	0.6223	0.4812	0.9472	0.9495	–	0.8249
SD-TVTP	0.2168	0.3869	0.3243	0.4001	0.1394	0.1497	–	0.2725

Continue ....

TABLE 8 *(Continued)*

Multivariate TVTPs Estimates against Japan

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Regime 2				
$\phi_{0,2}$	0.0078	0.0022	-0.0007	0.0002	0.0027	0.0072	–	0.0016
	(0.2349)	(0.5156)	(0.8924)	(0.4101)	(0.3746)	(0.1223)		(0.8362)
σ_2^2	0.0004	0.0008	0.0012	2.1E-07	0.0002	0.0003	–	0.0023
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)		(0.0000)
P21-C	101.5	-7.4051	-0.5845	-1.3858	-4.1284	-8.7204	–	-130.99
	(0.9926)	(0.0422)	(0.3056)	(0.0003)	(0.1171)	(0.0000)		(0.9695)
P21ΔGDP_{t-1}	-53.377	0.2743					–	122.64
	(0.9925)	(0.1558)						(0.9696)
P21ΔGDP_{t-3}			-0.6967	-0.0313	-0.6764		–	
			(0.0968)	(0.7750)	(0.3341)			
P21ΔP_{t-1}							–	
P21ΔP_{t-2}					0.7856	-1.765	–	69.718
					(0.4420)	(0.0007)		(0.9700)
P21ΔP_{t-3}	12.784	-7.9027	-0.1235	0.9031			–	
	(0.9926)	(0.0746)	(0.7410)	(0.1009)				
P21Δ*REER*		1.5644			2182.68		–	
		(0.0990)			(0.9973)			
P21Δ$REER_{t-1}$			-0.1229	-0.0436		1.1955	–	
			(0.3652)	(0.8355)		(0.0002)		
P21Δ$REER_{t-3}$							–	21.237
								(0.9697)
P21Δ$topen_{t-1}$			0.1245	0.0388			–	-14.464
			(0.1248)	(0.1719)				(0.9707)
P21Δ$topen_{t-2}$	-73.545				-0.0763		–	
	-0.9924				(0.4869)			
P21Δ$topen_{t-3}$		0.3878				0.3641	–	
		(0.0499)				(0.0364)		
*P21*ΔUN_{t-1}					-2.3419		–	
					(0.3746)			
*P21*ΔUN_{t-2}		2.4004		0.4069			–	29.271
		(0.2601)		(0.3087)				(0.9768)
Mean-TVTP	0.2542	0.8422	0.6058	0.7669	0.8939	0.9365	–	0.7712
SD-TVTP	0.4373	0.3165	0.3029	0.1534	0.2359	0.1834	–	0.4219

Continue ....

TABLE 8 *(Continued)*

Multivariate TVTPs Estimates against Japan

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
	Diagnostics							
DW-stat	2.2497	2.1045	2.5718	2.3971	2.3424	2.7493	–	2.4622
SIC	-7.1428	-4.986	-5.2975	-9.4015	-7.1696	-2.7217	–	-4.648
AIC	-7.4698	-5.381	-5.6794	-9.8219	-7.5899	-3.0615	–	-5.0684
Log Likelihood	458.45	370.46	342.56	602.40	469.60	185.44	–	319.57
Q (2)	1.1688	0.5824	5.4424	5.6916	1.2368	0.6334	–	0.7471
	(0.557)	(0.747)	(0.066)	(0.058)	(0.539)	(0.729)		(0.688)
Q (4)	1.4624	0.8041	12.798	9.4351	5.279	0.7364	–	2.1233
	(0.833)	(0.938)	(0.012)	(0.051)	(0.260)	(0.947)		(0.713)
Q (6)	2.054	1.5309	15.442	9.4638	5.5981	3.2814	–	3.0163
	(0.915)	(0.957)	(0.017)	(0.092)	(0.470)	(0.773)		(0.807)
Q (8)	6.9838	1.558	20.281	14.262	7.1843	5.0329	–	14.574
	(0.538)	(0.992)	(0.009)	(0.027)	(0.517)	(0.754)		(0.068)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

The unemployment effect on TVTPs are significant for Malaysia (-12.15, 5%) and Singapore (2.2008, 5%) in high credibility regime. In Malaysia unemployment causes shift between two credibility regimes. The real exchange rate effects on TVTPs is significant for Philippine (0.4127, 5%) in high regime, while for China (1.1955, 1%), Korea (0.3557, 5%), Malaysia (1.5644, 10%) it is in low state. The exchange rate of China, Malaysia and Philippine cause switching in regimes of the credibility, while for Korea, it depends on the level of credibility. The effect of trade openness on TVTPs is significant for China (0.1828, 10%), Singapore (-0.1627, 10%), and Thailand (-0.3498, 10%) in high state, while for China (0.3641, 5%) and Malaysia (0.3878, 5%), it is in low state. The openness causes the switching in the regimes of credibility of Cambodia, China, and Singapore, while for Malaysia, Myanmar, and Thailand it affects the level of credibility.

Figures 64 to 70 show the high credibility state TVTPs of MRS model of all APTCs against Japan. The Chinese TVTPs veers are less relative against Japan vis-à-vis Japan against China. The Chinese TVTPs shows that GFC impact is more severe to AFC effect. The Indonesia high credible state TVTPs show large decays around dot-cum-bubble and GFC. The crises effects are clear for Korea and Malaysia, Philippine and Singapore. And Thailand's TVTPs are highly stable with few veers at crises. Against USA, the estimates of means (see Table 9) shows that regime 1 is highly credible for China, Indonesia, Malaysia, Singapore, and Thailand, while regime 2 is credible for other countries.

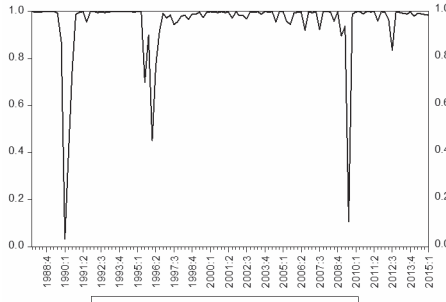

Fig 64. Multivariate TVTP of the High Credible State: China_JPN

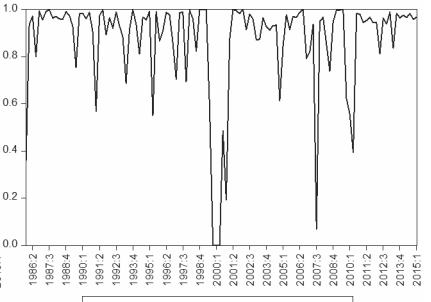

Fig 65. Multivariate TVTPs of the High Credible State: Indonesia_JPN

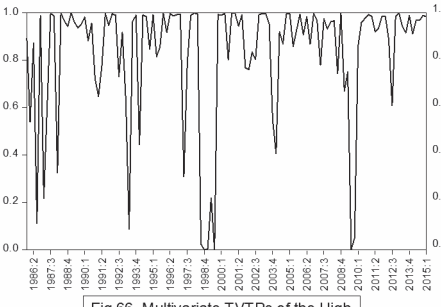

Fig 66. Multivariate TVTPs of the High Credible State: Korea_JPN

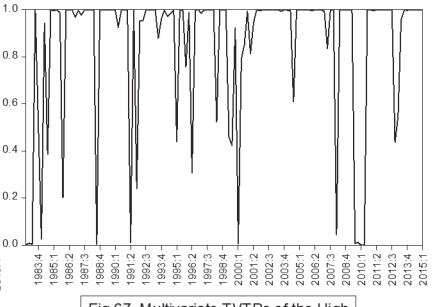

Fig 67. Multivariate TVTPs of the High Credible State: Malaysia_JPN

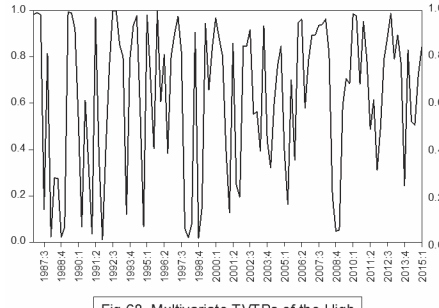

Fig 68. Multivariate TVTPs of the High Credible State: Philippines_JPN

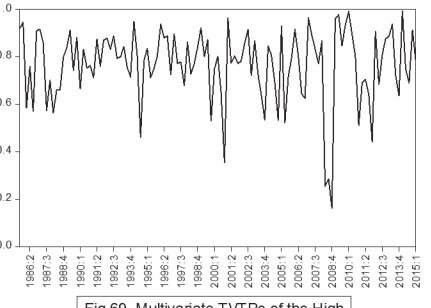

Fig 69. Multivariate TVTPs of the High Credible State: Singapore_JPN

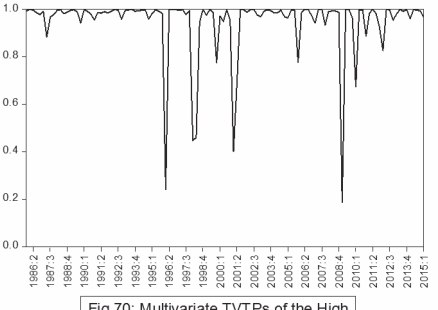

Fig 70: Multivariate TVTPs of the High Credible State: Thailand_JPN

TABLE 9

Multivariate TVTPs Estimates against USA

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
β_{t-1}	1.983	1.8019	1.9647	1.9715	1.8468	1.693	1.9363	1.9019
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
β_{t-2}	-0.9843	-0.8059	-0.9628	-0.9711	-0.8446	-0.7019	-0.9364	-0.9045
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
				Regime 1				
$\phi_{0,1}$	0.0013	0.0018	0.0004	1.8E-05	-0.0012	0.0028	0.0052	0.0018
	(0.3036)	(0.8806)	(0.9617)	(0.9882)	(0.1810)	(0.4780)	(0.7823)	(0.0415)
σ_1^2	1.3E-06	0.0031	0.0011	4.0E-05	1.7E-05	0.0006	0.0042	4.0E-05
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
P11-C	1.0097	2.7415	-1.128	9.7642	3.4656	3.9618	1.8282	2.7908
	(0.0042)	(0.2810)	(0.3886)	(0.1001)	(0.0736)	(0.0009)	(0.1229)	(0.0001)
P11ΔGDP_{t-1}		0.7152	0.2308					
		(0.2850)	(0.7952)					
P11ΔGDP_{t-2}								-0.0145
								(0.9494)
P11ΔGDP_{t-3}	-0.1008			1.4802	0.4527	1.2548	2.7697	
	(0.5923)			(0.1650)	(0.2452)	(0.0277)	(0.0326)	
P11ΔP_{t-1}				-7.4255				
				(0.1985)				
P11ΔP_{t-2}								-0.0266
								(0.9737)
P11ΔP_{t-3}	0.0708	4.8845	0.0624		-0.9455	-0.0269	1.1866	
	(0.3514)	(0.2096)	(0.8932)		(0.1813)	(0.9157)	(0.6952)	
P11$\Delta REER$		1.1448						
		(0.2840)						
P11$\Delta REER_{t-1}$	0.493							
	(0.9990)							
P11$\Delta REER_{t-2}$			-0.1087	1.576			-0.2475	
			(0.6041)	(0.2029)			(0.4157)	
P11$\Delta REER_{t-3}$						0.0719		0.5171
						(0.4516)		(0.0240)
P11$\Delta topen_{t-1}$		0.7817		0.0207		-0.2406		
		(0.2830)		(0.9078)		(0.0941)		
P11$\Delta topen_{t-2}$	-0.1929		-0.2059				-4.2072	
	(0.0636)		(0.3036)				(0.1907)	
P11$\Delta topen_{t-3}$					-0.2566			-0.0973
					(0.2563)			(0.4676)
$P11\Delta UN_{t-1}$				2.1685			4.1519	
				(0.3622)			(0.5062)	
$P11\Delta UN_{t-2}$						6.6012		
						(0.5737)		
Mean-TVTP	0.7173	0.6148	0.3062	0.9129	0.8632	0.9253	0.6369	0.8544
SD-TVTP	0.1717	0.4223	0.2745	0.2485	0.2219	0.1276	0.3824	0.2468

Continue ....

TABLE 9 *(Continued)*

Multivariate TVTPs Estimates against USA

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
				Regime 2				
$\phi_{0,2}$	0.0019	0.0022	-0.0004	0.0002	-6.5E-05	0.0204	-0.0002	-0.0006
	(0.5704)	(0.2432)	(0.5937)	(0.2016)	(0.8722)	(0.5929)	(0.8234)	(0.9621)
σ_2^2	0.0004	0.0002	0.000021	1.2E-06	6.2E-07	0.0221	2.9E-05	0.0023
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
P21-C	-0.1663	-5.6451	-2.0882	-8.1689	-4.3517	0.9477	-5.0365	0.9716
	(0.7190)	(0.0035)	(0.0003)	(0.0107)	(0.0117)	(0.6312)	(0.0009)	(0.3649)
P21ΔGDP_{t-1}		0.4379	-0.6383					
		(0.1006)	(0.0422)					
P21ΔGDP_{t-2}								1.5951
								(0.1001)
P21ΔGDP_{t-3}	-0.1841			0.359	-0.9989	1.1783	-0.1753	
	(0.5426)			(0.4368)	(0.0792)	(0.4916)	(0.7492)	
P21ΔP				3.4789				
				(0.0254)				
P21ΔP_{t-1}								-4.9741
								(0.1195)
P21ΔP_{t-2}	0.0073	-1.5193	0.7039		-1.3258	1.1613	3.2765	
	(0.9511)	(0.0821)	(0.0630)		(0.1357)	(0.3563)	(0.0447)	
P21Δ$REER$		-0.466						
		(0.0163)						
P21Δ$REER_{t-1}$	-20103.6							
	(0.5642)							
P21Δ$REER_{t-2}$			-0.2549	-0.725			-0.1277	
			(0.1007)	(0.1009)			(0.5476)	
P21Δ$REER_{t-3}$						2.4222		-0.2877
						(0.0832)		(0.2497)
P21Δ$topen_{t-1}$		-0.6625		-0.314		0.5202		
		(0.0174)		(0.0259)		(0.2658)		
P21Δ$topen_{t-2}$	0.0372		-0.0452				-4.7769	
	(0.6145)		(0.4075)				(0.2741)	
P21Δ$topen_{t-3}$					0.0878			0.3729
					(0.4974)			(0.2381)
$P21\Delta UN$				1.7038			9.8021	
				(0.2357)			(0.0650)	
$P21\Delta UN_{t-2}$						-64.161		
						(0.1191)		
Mean-TVTP	0.5174	0.8935	0.8082	0.9176	0.8852	0.4287	0.9327	0.4061
SD-TVTP	0.1319	0.234	0.2492	0.2147	0.2394	0.4416	0.1742	0.4022

Continue ....

TABLE 9 *(Continued)*

Multivariate TVTPs Estimates against USA

Parameters	ASEAN5					+3		
	IDN	MYS	PHL	SGP	THA	CHN	JPN	KOR
	Diagnostics							
DW-stat	2.3264	2.1701	1.8532	1.9457	2.2864	2.7001	2.8685	2.8061
SIC	-7.1419	-4.5784	-6.1133	-8.5388	-9.2261	-2.9336	-5.9938	-5.6327
AIC	-7.5156	-4.9296	-6.4952	-8.9591	-9.5531	-3.3705	-6.4141	-6.0064
Log Likelihood	463.18	338.89	389.47	551.07	582.41	206.75	399.64	373.38
Q (2)	8.6798	0.7214	1.3765	0.5776	2.1742	0.2385	2.5794	7.1113
	(0.013)	(0.697)	(0.502)	(0.749)	(0.337)	(0.888)	(0.108)	(0.068)
Q (4)	9.0896	1.3612	2.2552	3.2689	6.8491	2.4677	4.4681	7.1358
	(0.059)	(0.851)	(0.689)	(0.514)	(0.144)	(0.650)	(0.107)	(0.129)
Q (6)	9.1477	5.8939	2.4886	5.2846	10.209	4.3383	10.744	8.1437
	(0.165)	(0.435)	(0.870)	(0.508)	(0.116)	(0.631)	(0.097)	(0.228)
Q (8)	9.424	6.0787	3.0529	6.1475	12.658	5.681	10.753	10.772
	(0.308)	(0.638)	(0.931)	(0.631)	(0.124)	(0.683)	(0.150)	(0.215)

Note: The p-values are in the parentheses.
Source: Authors own estimate.

The GDP growth rate effects on TVTPs is significant for China (1.2548, 5%), Korea (1.5951, 10%), and Philippines (-0.6383, 5%) in high regime, while for Japan (2.7697, 5%), Malaysia (0.4379, 10%), and Thailand (-0.9989, 10%) it is in low regime. In comparison to the multivariate MRS model in Korea and Thailand, GDP growth rate impacts the level of credibility, while in China, Japan, Malaysia, and Philippines it causes switching between the two regimes.

The inflation affect TVTPs significantly in Japan (3.2765, 5%), and Philippine (0.7039, 10%) in high regime while for Malaysia (-1.5193, 10%), and Singapore (3.4789, 5%) in low regime. For Japan, Malaysia, and Philippine inflation effects level of credibility while for Singapore it causes shifts between two credibility regimes. The unemployment effect on TVTPs is only significant for Japan (9.8021, 5%) in high credibility regime; moreover, it cause shifts between the two credibility regimes. The real exchange rate effect on TVTPs is significant for Philippines (-0.2549, 10%) in high regime, while for China (2.4222, 10%), Korea (0.5171, 5%), Malaysia (-0.4660, 5%), and Singapore (-0.7250, 10%) it is in low regime. In China, Korea, Malaysia, and Singapore it causes the switching in regimes of credibility, while in Philippines it affects the level of credibility. Trade openness effect on TVTPs is significant for China (-0.2406, 5%) and Indonesia (-0.1929, 10%) in high regime, while for Malaysia (-0.0999, 5%) and Singapore (-0.3140, 5%) it is in low regime. The openness causes the switching in regimes of credibility of all countries except Malaysia.

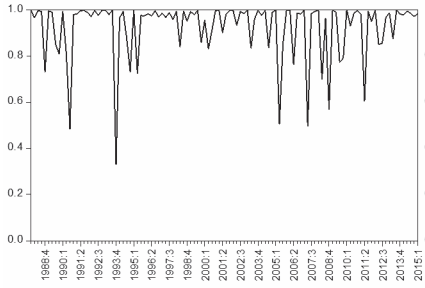

Fig 71. Multivariate TVTPs of the High Credible State: China_US

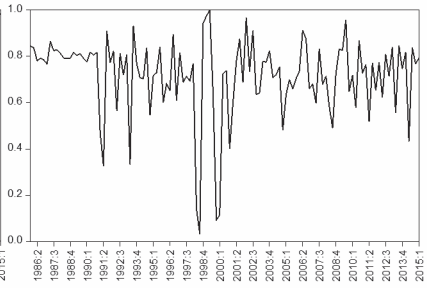

Fig 72. Multivariate TVTPs of the High Credible State: Indonesia_AMU_US

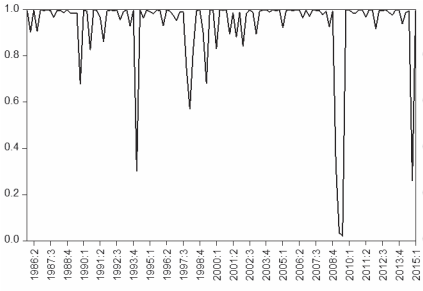

Fig 73. Multivariate TVTPs of the High Credible State: Japan_US

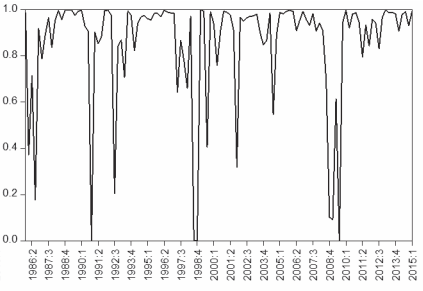

Fig 74. Multivariate TVTPs of the High Credible State: Korea_US

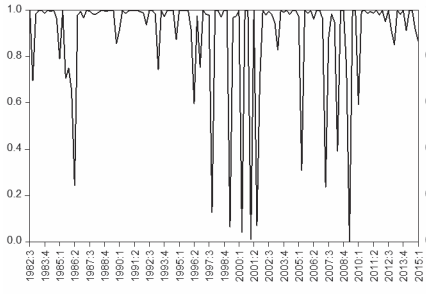

Fig 75. Multivariate TVTPs of the High Credible State: Malaysia_US

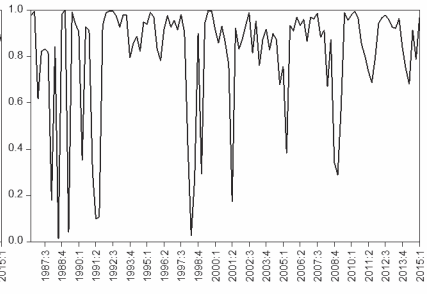

Fig 76. Multivariate TVTPs of the High Credible State: Philippines_US

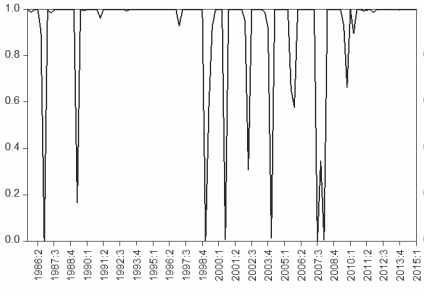

Fig 77. Multivariate TVTPs of the High Credible State: Singapore_US

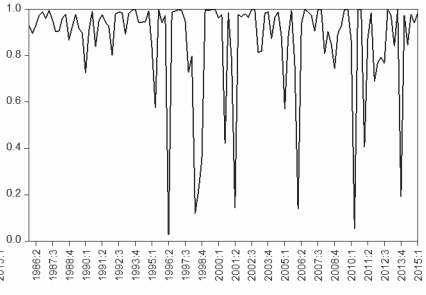

Fig 78. Multivariate TVTPs of the High Credible State: Thailand_US

Figures 71 to 78 show the high credibility state TVTPs of MRS model of APTCs against USA. The Chinese high credibility state TVTPs show sharp decay in early 1990s and in mid 2000s. The Indonesian TVTPs are highly volatile; however, sharp decay is apparent around AFC. The Japanese GFC decay in TVTPs outweighs the AFC and early 1990s slump. Korean TVTPs, most of the time stays in high credible state with sharp declines at crises. Malaysian TVTPs of high credibility state are highly volatile but the volatility clustering are in post AFC and pre-GFC periods. Philippines, Singapore and Thailand show many veers in TVTPs with clear crises impacts.

X. Conclusions and Policy Implications

This study endeavoured to find the association between monetary credibility and macro-fundamentals in APTCs, keeping in view their efforts to formulate the monetary union. Three potential economies that could play an anchor country role were considered in monetary union, e.g., China, Japan and USA. Table 10 and 11 shows the summary of significant effect of macro-fundamentals on credibility and TVTPs, respectively. The outcomes concluded are as follows:

- The GDP growth rate seems mostly significant in high regime against USA as vis-à-vis China and Japan. The least significant country is Japan.
- The inflation is significant, mostly in high credibility regime against USA. Inflation effects on TVTPs are more significant against China and USA.
- The unemployment is mostly significant in high credibility regime. Unemployment association of APTCs are more with China and USA.
- The exchange rate is mostly significant in low regime against Japan while mostly it is high in credibility regime against China and USA. Exchange rate association of most of the APTCs are with Japan.
- The trade openness seems significant in high regime for most countries against all the three anchors. However the openness association of these countries are strongest against USA.
- Mostly macro-fundamentals are significant driving factor of TVTPs between the two credibility regimes. The most switching in credibility regimes are evidenced in case of trade openness, followed by exchange rate and inflation.

The suggested policy implications are:

1. This study is empirically very extensive, but the outcomes for Japan and China are less significant vis-à-vis against USA. Therefore, USA could relatively be an ideal choice of anchors for APTCs (also supported by Nusair(2012), Sun and Simons(2011). However, the economic situation in the region has been changing rapidly; the Chinese trade linkages are emerging with APTCs while Japanese are

TABLE 10

Asymmetric Effect of Macro-fundamentals on Credibility

	Countries	China					Japan					USA				
		GDP	INF	UN	ER	TO	GDP	INF	UN	ER	TO	GDP	INF	UN	ER	TO
ASEAN5	IDN	L			L	L		H/L		L	H		L			
	MYS	L				H			H	H	L		H/L	L	L	
	PHL	L	H	H				H	H	L	H	H	H	H		H
	SGP		H	L	H	L				H	H	H		H	H/L	H/L
	THA	H		L	L		H/L			L	L	H	H	H		
+3	CHN						H/L		H	L		H			H	H
	JPN	H	L		H							L	L		H/L	
	KOR	H/L	L	L	H			H/L	H	H	H	H	H	H	H	H

Source: Authors own estimates.

TABLE 11

Asymmetric Effect of Macro-fundamentals on TVTPs

	Countries	China					Japan					USA				
		GDP	INF	UN	ER	TO	GDP	INF	UN	ER	TO	GDP	INF	UN	ER	TO
ASEAN5	IDN	H	H*			H										H*
	MYS	L*	L*			L*		L	H*	L*	L	L*	L		L*	L
	PHL	H				L*	L*	H		H*		H*	H		H	
	SGP	H*	H			L		H/L	H		H*		L*		L*	L*
	THA	L				H/L*					H	L				
+3	CHN							H/L		L*	H/L*	H*			L*	H*
	JPN		H	L*	H/L*	H*						H*	H	H*		
	KOR		L*	H*	L*	H/L*	L			L		L			L*	

*means that a particular variable causes switching in the regimes of the credibility.
Source: Authors own estimates.

waning after AFC [Quah and Crowley(2012b)]. The Japanese economy is showing sign of recovery since beginning of 2002 and if it becomes successful in achieving the high growth path and more FTAs with APTCs; it will improve its participation in the regional of trade integration. However, at present Japan is not in a strong position to become a dominant player in making Monetary Union. This situation will prevail as long as China maintains its current economic rise in the region [Shirono (2009)].

2. It is evident that all APTCs are crises prone economies. Therefore, uncertainty in global financial system is a binding force in fortifying the regional financial cooperation pKatada(2008)].
3. The weights of US$ in the Asian Monetary Unit are higher. If China and APTCs raise their basket weights on the yen instead of the US$, their basket weights

could be increased. The APTCs requires progressive decrease in US$ weights and increase their own trade shares weights in the currency basket to increase its worth.

4. It is less feasible for all APTCs to form a uniform monetary union, therefore, it's better to start a sub-group of APTCs, also suggested byBacha(2008), Lee and Koh(2012),Sun and Simons(2011), Zhang,et al.(2004). This sub-group could be ASEAN5+3.
5. The Chinese and Japanese role is very important in evolving mutual economic and political cooperation, among APTCs. Korea could also assist, as a mediator in nurturing a mutual political cooperation between the two countries.

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