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CHAPTER 15

MODELING EXCHANGE MARKET PRESSURE IN EAST ASIAN ECONOMIES

Evan Lau, Jenny Yong and Nurul Bariyah

ABSTRACT

This chapter model the factors behind the instability of exchange rate by using exchange market pressure (EMP) index. The authors focus first to construct the EMP and then secondly, test the interrelationship between EMP, real gross domestic product, money supply (M2), consumer price index, trade openness and share price using quarterly data in selected East Asian countries. The empirical results of this study explicitly indicate that EMP is determined by the states of other variables in most of the studied countries. Planning on the macrolevel is essential when managing and ensuring continuous monitoring of the exchange rate condition. This would translate into positive macroeconomic welfare and economic growth sustainability.

Keywords: Exchange market pressure; East Asian; exchange rate volatility; macroeconomic determinants; vector autoregression; variance decompositions; Granger causality

1. INTODUCTION

For the past two decades, we have witnessed the rising of interdependence among the East Asian economies especially after the two episodes of major crises in 1997 and 2007; the Asian financial crisis and Global financial crisis, respectively.

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Both crises have conferred bitter sweet experience to the East Asian economies where their foreign exchange markets were greatly hazard (sharp drop in trade, investment and economics performances, major capital flight and asset deflation) due to severity of currency crunch. Since then, one after another these East Asian economies have slowly emerge with better and auspicious economic reformations to promote their economic growth while maintaining their exchange rate stability.

As these economies are getting more integrated and financially liberalize into world globalization, the challenge of managing exchange rate stability has become more intensive. In addition, the risk of engaging greater degree of exchange volatility[1] becomes inevitable in the long run since managing exchange rate in these countries varies align with their national policy. The East Asian economies are gradually exposed to significant risks in controlling their exchange rate stability ever since the devaluation of Chinese yuan in August 2015. This is due to the spillover from China's economic rebalancing that trigger higher US interest rates and an appreciating USD while generate financial volatility and reducing the capital inflows.

With the issue at hand, this study aims firstly, to construct exchange market pressure (EMP) indices and secondly, model the macroeconomic determinants in explaining the volatile movements in foreign exchange market using several East Asian countries. The usage of the EMP index is due to supporting literatures such as Eichengreen, Rose, and Wyplosz (1996), Kaminsky, Lizondo, and Reinhart (1998), Siregar, Pontines, and Hussain (2010), Aizenman and Hutchison (2012), Hegerty (2013, 2018), Lau and Yong (2015), Lau, Yong, and Pasca (2018), Samba (2018) of which they discover EMP index is capable to capture currency densities as well as trace crisis symptoms sufficiently.[2]

Following the literature, number of macrovariables (real gross domestic product (GDP), consumer price index (CPI), money supply, trade openness (TR) and share prices (SP)) emerged as the important indicators which shall be included in this study.[3] TR has been added as part of the non-monetary variables that have great impact on EMP since most of the East Asian economies are heavily involved in international trade. According to Calderon, Loyaza, and Schmidt-Hebbel (2005), a higher degree of openness might serve as a source of higher exposure toward external monetary and real shocks. The inclusion of SP represents the liberalization of their financial market which attracted foreign investor. Eventually, an escalation in SP encourages investors to buy more domestic assets simultaneously selling foreign assets to obtain domestic currency will cause domestic currency appreciation. Recent study like Hegerty (2018) also includes stock prices as one of the determinant for EMP.

The remainder of this study is structured as follow. Section 2 provides the theoretical consideration of EMP and some relevant literatures. Section 3 discusses the methodology as well as the data utilized in the analysis while section 4 reports the empirical findings. Lastly, Section 5 concludes.

2. THEORY AND RELATED LITERATURES

There are two ways of measuring EMP. The first one is known as model-dependent where the concept was pioneered by Girton and Roper (1977).

Under this framework EMP is a weighted sum of changes in foreign reserves and exchange rate changes. This framework is based on the consideration that an extreme speculative depreciation pressure can be neutralized by the monetary authorities either by letting the exchange rate fall or by selling foreign reserves. Hence, this model-dependent approach consisted of two components: a bilateral exchange rate (domestic currency unit per USD) and foreign exchange reserves. Nevertheless, this model is equivalently applicable in fixed, floating as well as intermediate exchange rate arrangement where the change of exchange rate is 0 for fixed exchange rate regime, while in flexible exchange rate regime the change of international reserves is 0. As for managed float regime, the EMP is absorbed either by currency depreciation or reserves losses, or the combination of both. Hence, the specification of this model dependent is as follow:

$$\mathrm{EMP}_{GR,t} = \Delta e_t + \Delta r_t \tag{1}$$

where $\mathrm{EMP}_{GR,t}$ stands for the exchange market pressure of Girton-Roper in period of t, Δe_t is the change in exchange rate at time t, and Δr_t represents the change in the foreign reserves at time t.

The second approach is known as model independent[4] that was introduced by Eichengreen et al. (1996) and Sachs, Tornell, and Velasco (1996) whom had extended the monetary model of Girton and Roper (1977) to improve the EMP measure. They shared similar opinion where they agreed that the component of interest rate[5] should be included in the computation of the EMP index. By combining these three components (exchange rate, international reserves and interest rate) into a single index, it will become an advantage as it is model independent and is also appropriate across a wide variety of countries.

Based on the inspirations of theoretical and empirical literature on EMP, Kaminsky et al. (1998) discovered EMP index works as a warning signal indicator before currency crises transpire within the next 24 months. The signal is channel when the indicators ooze cautioning signals whenever they move beyond their thresholds. Even though there are different arguments and ideas in literature on the context of EMP, still these authors shared same motivation where Kaminsky et al. (1998), Jayaraman and Choong (2008), Siregar et al. (2010), Hegerty (2013, 2018) and Samba (2018) argued that EMP is not only defined as capturing instances of successful attacks (when a depreciation of the currency occurs) but as well as instances of unsuccessful attacks (pressure rebuffed by loss in reserves and/or rise in interest rates).

3. DATA AND METHODOLOGY

3.1 Data

Quarterly data are utilized in tracing the interactions among EMP and its determinants namely; real output (GDP), CPI, money supply (M2), TR and SP. The explanatory variables can be divided into four groups: macroeconomic development represented by GDP and CPI while SP is used to represent financial market development. As for reserve adequacy it is embodied by M2 as it measures the probable amount of liquid monetary assets that authorities can use to convert into foreign exchange while TR acts as the external shocks or determinant of reserve demand. All data are sourced from International Financial Statistics of the International Monetary Fund and the United States is used as our reference country. Due to data availability, the timespan shall be varies for the selected East Asian countries covers from: 1991 Q1–2014 Q4 for Malaysia; 1997 Q2–2014 Q4 for Hong Kong; 1997 Q1–2014 Q4 for Indonesia; 1989 Q1–2014 Q3 for Japan and Korea; 1992 Q1–2014 Q4 for Philippines; and 1996 Q4–2014 Q4 for Singapore.

3.2 Methodology

Standard time-series econometric analysis will be applied in this study ranging from stationarity test, cointegration analysis, vector autoregression (VAR) and post-sample Variance Decompositions (VDCs). Hence, the empirical model is formulated as follow:

$$\mathrm{EMP}_{\mathrm{EG},t} = \alpha_0 + \alpha_1 \mathrm{GDP}_t + \alpha_2 \mathrm{M2}_t + \alpha_3 \mathrm{CPI}_t + \alpha_4 \mathrm{TR}_t + \alpha_5 \mathrm{SP} + \varepsilon_t \qquad (2)$$

where $\mathrm{EMP}_{\mathrm{EG}}$ denotes exchange market pressure of Eichengreen et al. (1996) approach, GDP is real gross domestic product, M2 represents money supply, CPI is consumer price index, SP is share prices index and TR is the ratio of trade openness, α's represents slope coefficients and ε is error term.

As a preliminary step in our empirical investigation, unit root and cointegration tests have been established. For the unit root test, we apply the Dickey and Fuller (ADF) (1979) and Kwiatkowski, Phillips, Schmidt, and Shin (KPSS, 1992) tests to determine the univariate properties of the time-series data.

Having established the stationarity of the variables, we adopted the popular Johansen and Juselius (JJ, 1990) method as an investigation of long-run cointegrating relation among variables. This test utilizes two likelihood ratios to test statistics for the number of cointegrating vectors: the trace test and the maximum eigenvalue test. As it becomes the norm in the empirical time-series econometrics estimation, details of the JJ test were not presented here, but interested readers could refer to the original article regarding its implementation. Once uncovering the cointegration properties of the variables, we proceed to the estimation of VAR model to unveil the causality interplay between these variables.[6] As for the lag order of VAR, it is chosen such that the error terms are serially uncorrelated. We then proceed with the post-sample estimation of VDCs where the system partitioned the variance of the forecast error of variables defined in Equation (2) into proportions attributable to shocks in each variable in the system including its own.

3.3 The Measurement of EMP

This study adopts the extended version of EMP by Eichengreen et al. (1996) due to its major advantage as this index applicable in the case of all exchange rate regimes. In most existing literatures, EMP*EG* index has mostly used as the dependent variable in the econometric applications to investigate the determinants of speculative pressure in the foreign exchange market.[7]

$$\mathrm{EMP}_{\mathrm{EG},h,t} = \frac{1}{\sigma_e}\left(\frac{\Delta e_{h,t}}{e_{h,t}}\right) - \frac{1}{\sigma_r}\left(\frac{\Delta r_{h,t}}{r_{h,t}} - \frac{\Delta r_{\mathrm{US},t}}{r_{\mathrm{US},t}}\right) + \frac{1}{\sigma_i}\left(\Delta i_{h,t} - i_{\mathrm{US},t}\right) \quad (3)$$

where $\mathrm{EMP}_{\mathrm{EG},h,t}$ is the exchange market pressure index of Eichengreen for country h in period of t; $e_{i,t}$ the units of country currency per USD in period t; σ_e the standard deviation of the relative change in the exchange rate $\left(\frac{\Delta e_{h,t}}{e_{h,t}}\right)$; $r_{h,t}$ the foreign reserves of country h in period t; and σ_r the standard deviation of the difference between relative changes in foreign reserves in country h and the reference country $\left(\frac{\Delta r_{h,t}}{r_{h,t}} - \frac{\Delta r_{\mathrm{US},t}}{r_{\mathrm{US},t}}\right)$; $i_{h,t}$ the nominal interest rate for country h in period t; $i_{\mathrm{US},t}$ the nominal interest rate for reference country in period t; σ_i the standard deviation of the nominal interest rate differential $\left(\Delta i_{h,t} - i_{\mathrm{US},t}\right)$.

4. EMPIRICAL RESULTS

A prior step to our empirical analysis is to determine the stationarity property of the variables; we subject each times series to ADF, Phillips–Perron and KPSS unit root tests. The results provided strong evidence that EMP is *I*(0) series while the rest of the variables contain a unit root (they are non-stationary in level forms). Accordingly, the results are consistent with the argument by Pontines and Siregar (2008) as they also found that the computed EMP indices for their studied countries are also *I*(0) variables. Hence, this study shall proceed to VAR analysis in level as JJ (1990) cointegration is no longer suitable to examine the existence of long-run relationships among the variables.[8] Having tested for unit root, this study proceeds to VAR in levels to examine the direction of causality among these variables. The results reported in Table 1 are summarized as follow:

Malaysia

It is evident from Table 1 that money supply and CPI are the cause of real GDP (M2 → GDP; CPI → GDP). Results also indicate that M2 is granger causal for CPI, TR and SP (M2 → CPI; M2 → TR; M2 → SP) while CPI is found to be granger causal for TR and SP (CPI → TR; CPI → SP). In addition, unidirectional causality is observed from TR to SP, SP to GDP and GDP to CPI. As shown in the results, EMP is found to be influenced by TR (TR → EMP). Meanwhile, unidirectional relationships are found from TR to EMP, M2 to EMP and SP to EMP.

Table 1. VAR Granger Causality.

Dependent	GDP	M2	CPI	TR	SP	EMP
Variable			Wald (χ^2 Statistics)			
Malaysia ($k = 6$)						
GDP	–	6.138	10.980	3.721	3.670	9.175
		(0.408)	(0.089)*	(0.714)	(0.721)	(0.164)
M2	18.289	–	14.262	16.448	21.157	11.374
	(0.006)**		(0.027)**	(0.012)**	(0.002)**	(0.078)*
CPI	21.978	1.762	–	18.779	14.985	10.482
	(0.001)**	(0.940)		(0.005)**	(0.020)**	(0.106)
TR	3.667	7.207	3.948	–	14.573	15.030
	(0.722)	(0.302)	(0.684)		(0.023)**	(0.020)**
SP	12.326	1.673	8.902	9.048	–	11.860
	(0.055)*	(0.947)	(0.179)	(0.171)		(0.065)*
EMP	4.451	8.008	7.621	11.995	2.427	–
	(0.616)	(0.238)	(0.267)	(0.062)*	(0.877)	
Hong Kong ($k = 6$)						
GDP	–	50.244	16.837	9.702	12.007	7.903
		(0.000)**	(0.010)**	(0.138)	(0.062)*	(0.245)
M2	10.905	–	5.518	6.467	14.458	4.621
	(0.091)*		(0.479)	(0.373)	(0.025)**	(0.593)
CPI	5.569	59.702	–	7.180	5.236	9.613
	(0.473)	(0.000)**		(0.305)	(0.514)	(0.142)
TR	19.381	26.835	2.198	–	5.516	5.215
	(0.004)**	(0.000)**	(0.901)		(0.480)	(0.517)
SP	33.778	12.318	17.747	27.337	–	1.754
	(0.000)**	(0.055)*	(0.007)**	(0.000)**		(0.941)
EMP	16.832	27.013	5.698	9.001	3.860	–
	(0.010)**	(0.000)**	(0.458)	(0.174)	(0.696)	
Indonesia ($k = 3$)						
GDP	–	70.786	16.191	53.778	9.789	18.717
		(0.000)**	(0.001)**	(0.000)**	(0.021)**	(0.000)**
M2	0.989	–	8.585	5.448	6.647	5.998
	(0.804)		(0.035)**	(0.142)	(0.084)*	(0.112)
CPI	22.269	34.430	–	34.150	3.849	2.880
	(0.000)**	(0.000)**		(0.000)**	(0.616)	(0.411)
TR	0.049	0.501	7.201	–	3.849	1.419
	(0.997)	(0.919)	(0.066)*		(0.278)	(0.701)
SP	0.315	0.566	1.528	32.167	–	1.569
	(0.957)	(0.904)	(0.676)	(0.000)**		(0.666)
EMP	0.903	1.609	1.031	2.025	4.859	–
	(0.825)	(0.658)	(0.794)	(0.567)	(0.182)	
Japan ($k = 6$)						
GDP	–	7.451	4.178	20.505	5.250	1.353
		(0.281)	(0.653)	(0.002)**	(0.512)	(0.969)
M2	8.387	–	4.471	10.883	1.459	7.973
	(0.211)		(0.613)	(0.092)*	(0.962)	(0.240)
CPI	21.469	5.813	–	13.006	4.052	2.480
	(0.002)**	(0.444)		(0.043)**	(0.670)	(0.871)
TR	5.734	13.103	6.650	–	5.853	4.168
	(0.454)	(0.041)**	(0.354)		(0.440)	(0.654)
SP	12.251	4.323	9.689	6.914	–	5.970
	(0.057)*	(0.633)	(0.138)	(0.329)		(0.427)
EMP	4.167	11.905	4.837	4.744	2.840	–
	(0.654)	(0.064)*	(0.565)	(0.577)	(0.829)	

Table 1. (*Continued*)

Dependent	GDP	M2	CPI	TR	SP	EMP
Variable			Wald (χ^2 Statistics)			
Korea ($k = 5$)						
GDP	–	7.871	23.000	2.452	7.537	11.110
		(0.164)	(0.000)**	(0.784)	(0.184)	(0.049)**
M2	9.201	–	2.438	20.004	7.454	7.638
	(0.101)		(0.786)	(0.001)**	(0.189)	(0.177)
CPI	0.959	2.722	–	3.671	2.072	7.996
	(0.967)	(0.743)		(0.600)	(0.839)	(0.157)
TR	13.625	3.708	14.867	–	7.103	4.813
	(0.018)**	(0.592)	(0.011)**		(0.213)	(0.439)
SP	3.302	10.709	6.074	5.930	–	7.793
	(0.654)	(0.058)*	(0.299)	(0.313)		(0.168)
EMP	8.116	6.930	2.341	9.356	3.454	–
	(0.150)	(0.226)	(0.800)	(0.096)*	(0.630)	
Philippines ($k = 5$)						
GDP	–	5.947	5.564	5.947	5.946	3.608
		(0.311)	(0.351)	(0.312)	(0.312)	(0.607)
M2	10.370	–	6.474	7.061	7.061	5.490
	(0.065)*		(0.263)	(0.216)	(0.216)	(0.359)
CPI	9.704	2.645	–	29.258	29.258	2.767
	(0.084)	(0.755)		(0.000)	(0.000)**	(0.736)
TR	3.180	9.659	7.974	–	4.920	2.493
	(0.672)	(0.086)*	(0.158)		(0.426)	(0.778)
SP	3.643	4.707	2.219	4.920	–	7.366
	(0.602)	(0.453)	(0.818)	(0.426)		(0.195)
EMP	6.759	7.756	4.231	2.978	2.978	–
	(0.239)	(0.170)	(0.517)	(0.703)	(0.703)	
Singapore ($k = 4$)						
GDP	–	3.512	7.857	11.665	10.065	1.659
		(0.476)	(0.097)*	(0.020)**	(0.039)	(0.798)
M2	6.892	–	3.530	2.991	3.895	1.144
	(0.142)		(0.473)	(0.559)	(0.421)	(0.887)
CPI	2.119	2.548	–	6.928	4.602	0.148
	(0.714)	(0.636)		(0.140)	(0.331)	(0.997)
TR	7.918	7.090	14.809	–	16.144	0.532
	(0.095)*	(0.131)	(0.005)**		(0.003)**	(0.970)
SP	8.183	4.657	2.746	5.406	–	2.327
	(0.085)*	(0.324)	(0.601)	(0.248)		(0.676)
EMP	8.829	3.218	7.130	2.799	5.796	–
	(0.066)*	(0.522)	(0.129)	(0.592)	(0.215)	

Note: The χ^2 statistic is used to test the joint significance of the lagged values of the other lagged endogenous variables in each equation and also for joint significance of all other lagged endogenous variables in each equation of the model. Figures in parentheses are the *p*-value.
Significant levels at **5 percent and *10 percent, respectively. The *k* is the lag length.

Hong Kong

The results show that TR, SP and EMP do granger cause GDP. Similarly, all the variables except for SP are found to be granger cause to M2 (GDP → M2; CPI → M2; TR → M2; EMP → M2). Meanwhile, unidirectional relationships are also found running from GDP to CPI, SP to CPI, TR to SP, M2 to SP, M2 to GDP and SP to GDP (GDP → CPI; SP → CPI; TR → SP; M2 → SP; M2 → GDP; SP → RDP) and SP also granger cause M2 (SP → M2). The test results suggest that in EMP is not influenced by these determinants.

Indonesia

For Indonesia, unidirectional relationship exists from GDP to M2, GDP to TR, CPI to TR, SP to TR and GDP to SP (GDP → M2; GDP → TR; CPI → TR; SP → TR; GDP → SP). Bidirectional relationships also detected between CPI and GDP (CPI ↔ GDP) and CPI and M2 (CPI ↔ M2). Nevertheless, real GDP is the cause of EMP (GDP → EMP), TR is the cause of CPI (TR → CPI) and M2 is deemed as the cause of SP (M2 → SP).

Japan

The VAR results conclude that there are causal relationships running from CPI to GDP, TR to M2, GDP to TR and CPI to TR (CPI → GDP; TR → M2; GDP → TR; CPI → TR). Meanwhile, SP is found to be granger causal for GDP (SP → GDP) and TR is influenced by CPI (CPI → TR). Similar to Hong Kong's VAR results, there is also unidirectional relationship running from EMP to M2 (EMP → M2) for Japan.

Korea

Causal relationships are running from TR to GDP and M2 to TR. Results also indicate that, both GDP and TR do granger cause CPI (GDP → CPI; TR → CPI) at 5 percent significant level. Besides that, the null hypothesis of non-causality from SP to M2 and EMP to TR are soundly rejected at 10 percent of significance. Meanwhile, EMP is found to be influenced by GDP (GDP → EMP).

Philippines

For the Philippines, CPI granger cause TR unidirectional relationships are found running from M2 to GDP, CPI to GDP, TR to M2 and M2 to EMP (M2 → GDP; CPI → GDP; TR → M2; M2 → EMP). Hence, the Philippines shares similar situations with Malaysia where EMP is influenced by M2 (M2 → EMP).

Singapore

The results in Table 1 show that GDP do granger cause TR and SP (GDP → TR; GDP → SP). Besides that, short-run causal relationships also found running from TR to CPI and TR to SP. Meanwhile, TR, SP and EMP are found to be granger causal for GDP (RD → GDP; SP → GDP; EMP → GDP). Lastly, unidirectional causal relation is also found existing from GDP to CPI.

These results were further strengthened by the out-of-sample "unanticipated" impact of a variable on its dependent variables and simultaneously on itself, which is reported in Table 2. The major highlights from the VDCs are as follow:

Malaysia

Looking at Table 2, the results show that CPI is the most interactive variable in the system. The VDCs show that approximately 83 percent of the forecast error variance for CPI can be explained by GDP (9 percent), M2 (64 percent), TR (2 percent), SP (2 percent) and EMP (7 percent) at the end of the 24 quarter time horizons. Moreover, CPI is also noted as the most endogenous variable as it appeared as the recipient of shocks originating from other variables in the system. It is also clear that in terms of the own shock being explained, M2 appeared to be the most exogenous in the system with over 84 percent of variances being explained by its own innovations. Besides that the results show that M2 do influence GDP, TR and SP in the long run as we witnessed gradual percentage increase in the forecast error variance of TRD and SP being explained by the innovations in M2 and the impacts took place after 4-quarter horizon. Meanwhile, looking at the interactions between EMP and other macroeconomic variables, we observed that about 34–36 percent of EMP forecast variance is explained by innovations in M2 at 4- and 12-quarter horizons. Thus, this result shows that shocks in money supply have effects on EMP in the short run as well as long run which also enhance the causal relationship (M2 → EMP) we found earlier in Table 1. On the other hand, innovations in GDP, CPI, TR and SP also explain quite substantial fractions of EMP forecast error variance, namely 10 percent, 9 percent, 15 percent and 14 percent of the EMP variations, respectively, at the 24-quarter horizon.

Hong Kong

EMP and SP are identified as the most exogenous variables in the entire forecast horizon. Besides that the VDCs results also implies that nearly 90 percent of the forecast error variance for M2 variable can be explained by EMP (15 percent), GDP (34 percent), CPI (10 percent), TR (9 percent) and SP (22 percent) at the end of the 24-quarter time horizons making it is the most endogenous variable in the system. Following the forecast error variance of EMP, we witnessed a gradual percentage increase in the forecast error variance being explained by the innovations in TR and SP after 8-quarter horizon while the remaining variables impact tend to go to 0. We found that EMP becomes more interconnected with other macroeconomic variables in the longer period of time.

Indonesia

The VDCs results in Table 2 show that GDP is the most exogenous variable for Indonesia with only about 36 percent of its forecast variance being explained by the remaining variables in the entire forecast horizon. Apart from that the VDCs imply that there are two endogenous variables, namely CPI and TR, as they emerged as the recipient of shocks originating from the other macroeconomic variables in the system where nearly 75 percent and 80 percent of their forecast error variance can be explained other variables, respectively. It is also noteworthy at the end of 24-quarter horizon, 24 percent of EMP forecast error variance is attributable to innovations in GDP while 12 percent was from SP impact.

Japan

For Japan, SP holds the highest exogeneity among the variables as 70 percent of forecast variance is being explained itself in the entire forecast horizon. Meanwhile, GDP and TR found to be the most interactive variable in the system as VDCs indicate that nearly 87 percent of forecast error variance is being explained by the rest of the variables. In addition, it is also upheld that GDP and TR are the most endogenous variables in the system. It is also worth noting that in shorter horizon, changes in EMP is largely due to the movement M2 but the effect of M2 on EMP appears to become weaker as the time horizon increases. However, the VDCs shows that the effect of SP on EMP tends to grow stronger as the time horizon increases (11 percent at 24 horizon).

Korea

It can be seen that most of the shocks in CPI (78 percent) and EMP (76 percent) originating from other macroeconomic variables making them the most endogenous variables in the entire 24-quarter horizon. For instance, innovations in CPI can be explained for 40 percent by GDP, 14 percent by M2, 4 percent by TR, 17 percent by SP and 3 percent by EMP. Innovations in EMP can be explained for 18 percent by GDP, 45 percent by M2, 3 percent by CPI, 4 percent by TR and 7 percent by SP. Furthermore, GDP and SP are found to be the exogenous variables in the system with about 43 percent and 38 percent of their forecast variance being explained by the remaining variables in the entire forecast horizon.

Philippines

SP is relatively the leading variable, being the most exogenous of all as 69 percent of variation in SP is explained by its own shock after the 24-quarter horizon. Besides that EMP is the most endogenous variable as it appeared as the recipient of shocks initiating from other macroeconomic variables in the system for the Philippines. Hence, by the end of the 24-quarter horizon almost 71 percent of the changes in EMP can be explained by GDP (5 percent), M2 (17 percent), CPI (3 percent), TR (4 percent) and SP (43 percent) by the end of the time horizon. Nevertheless, we could see that SP has a greater impact on EMP which later followed by M2. In addition, the VDCs results also show that the effect of SP on M2 tends to grow stronger as the time horizon increases.

Singapore

The VDCs results deemed GDP as the leading variable since it depends less than other variables at the end of the time horizons. Meanwhile, the VDCs result also shows that CPI and SP are endogenous since both needs almost 79 percent of innovations to be explained by the rest of the variables. It is noted that more than 40 percent and 15 percent of M2 and GDP forecast error variance is attributable to the innovations in CPI after 8-quarter horizon. As for the forecast error variance in SP, we find that most of the shocks are mostly coming from GDP (20 percent), M2 (31 percent) and TR (17 percent) by the end of the time horizons. As for the innovations in EMP, we noted that changes in EMP are largely due to the movements in GDP and M2.

Table 2. Decomposition of Variance.

	Percentage of Forecast Variance Explained by Innovations in:					
	ΔGDP	ΔM2	ΔCPI	ΔTRD	ΔSP	ΔEMP
Malaysia						
Relative variance in ΔGDP						
1	*100.000*	0.000	0.000	0.000	0.000	0.000
4	*50.711*	34.989	3.835	0.685	9.047	0.733
8	*30.676*	51.586	3.803	1.124	9.086	3.725
12	*24.666*	54.368	4.485	1.773	6.969	7.739
24	*19.658*	56.789	6.720	2.412	4.826	9.595
Relative variance in ΔM2						
1	0.000	*100.000*	0.000	0.000	0.000	0.000
4	2.103	*96.533*	0.187	0.190	0.866	0.121
8	0.961	*89.619*	0.238	4.054	0.971	4.157
12	0.926	*86.461*	0.527	3.904	2.098	6.084
24	0.931	*83.624*	2.068	2.523	2.014	8.840
Relative variance in ΔCPI						
1	2.652	2.065	*95.283*	0.000	0.000	0.000
4	2.026	2.408	*86.798*	0.820	5.114	2.835
8	5.025	9.277	*73.401*	1.151	6.484	4.661
12	8.507	34.124	*45.102*	2.758	6.224	3.286
24	8.596	63.763	*17.011*	1.610	2.444	6.577
Relative variance in ΔTRD						
1	0.194	0.000	3.412	*96.395*	0.000	0.000
4	0.874	7.495	20.816	*69.255*	0.476	1.085
8	2.548	30.102	17.286	*42.744*	1.318	6.002
12	7.528	43.250	11.833	*27.546*	1.464	8.379
24	10.106	48.030	8.607	*21.662*	3.765	7.831
Relative variance in ΔSP						
1	3.370	11.714	1.026	2.871	*81.019*	0.000
4	9.021	44.373	5.896	1.189	*39.289*	0.233
8	5.039	59.690	5.422	3.528	*22.881*	3.441
24	5.827	59.125	4.399	4.476	*18.871*	7.303
Relative variance in ΔEMP						
1	3.441	44.862	3.910	0.450	5.689	*41.648*
4	10.289	36.510	8.195	8.407	5.363	*31.237*
8	9.148	33.159	9.677	10.639	11.388	*25.989*
12	8.645	34.513	9.693	13.790	10.413	*22.946*
24	10.262	31.282	8.943	15.181	13.665	*20.668*
B. Hong Kong						
Relative variance in ΔGDP						
1	*100.000*	0.000	0.000	0.000	0.000	0.000
4	*53.077*	1.463	5.592	8.554	30.767	0.547
8	*46.881*	6.914	8.868	7.736	25.075	4.525
12	*43.557*	7.882	8.358	7.514	28.662	4.027
24	*29.189*	6.258	15.176	6.126	34.832	8.419
Relative variance in ΔM2						
1	1.235	*98.765*	0.000	0.000	0.000	0.000
4	4.493	*35.672*	29.747	9.398	2.182	18.509
8	40.854	*16.157*	12.511	9.575	11.243	9.661
12	42.552	*13.082*	12.353	13.908	9.152	8.953
24	34.062	*10.179*	10.313	9.128	21.588	14.729

Table 2. (*Continued*)

	Percentage of Forecast Variance Explained by Innovations in:					
	ΔGDP	ΔM2	ΔCPI	ΔTRD	ΔSP	ΔEMP
Relative variance in ΔCPI						
1	0.168	1.555	*98.277*	0.000	0.000	0.000
4	22.098	8.639	*51.616*	7.019	8.837	1.791
8	34.232	4.868	*39.739*	7.886	11.246	2.028
12	38.236	3.620	*34.504*	12.102	9.446	2.092
24	37.097	3.184	*34.749*	11.647	8.335	4.987
Relative variance in ΔTRD						
1	4.068	8.123	1.115	*86.694*	0.000	0.000
4	43.046	5.027	5.155	*34.295*	9.954	2.522
8	28.329	11.725	9.225	*28.408*	13.759	8.553
12	27.604	9.239	7.642	*23.704*	24.304	7.508
24	24.725	6.630	19.533	*18.562*	22.196	8.353
Relative variance in ΔSP						
1	22.039	4.615	2.393	3.722	*67.231*	0.000
4	18.737	5.023	9.364	6.542	*59.240*	1.095
8	20.148	8.905	14.266	5.837	*49.181*	1.663
24	20.572	7.270	16.836	7.510	*41.742*	6.070
Relative variance in ΔEMP						
1	0.205	2.390	0.097	2.816	6.701	*87.791*
4	7.559	4.121	1.844	10.787	9.515	*66.174*
8	6.970	6.196	6.789	15.283	14.610	*50.151*
12	7.585	6.619	7.584	18.089	13.770	*46.352*
24	8.642	6.812	8.368	17.859	15.259	*43.059*
C. Indonesia						
Relative variance in ΔGDP						
1	*100.000*	0.000	0.000	0.000	0.000	0.000
4	*88.348*	7.456	1.829	0.393	0.170	1.805
8	*74.172*	12.361	7.420	1.481	0.306	4.260
12	*71.987*	11.340	11.210	1.186	0.246	4.032
24	*63.754*	12.772	16.764	1.514	1.824	3.372
Relative variance in ΔM2						
1	6.384	*93.616*	0.000	0.000	0.000	0.000
4	28.891	*66.675*	2.507	0.575	0.583	0.770
8	31.796	*61.160*	3.382	1.704	0.952	1.006
12	35.019	*56.891*	4.378	1.568	1.184	0.960
24	36.550	*51.533*	7.357	1.699	1.764	1.097
Relative variance in ΔCPI						
1	13.998	0.729	*85.273*	0.000	0.000	0.000
4	19.911	16.224	*59.772*	1.699	0.517	1.876
8	21.724	33.147	*35.601*	5.088	2.105	2.335
12	21.689	32.359	*31.726*	6.440	5.715	2.071
24	27.718	30.021	*25.210*	6.319	7.495	3.236
Relative variance in ΔTRD						
1	0.400	18.591	2.202	*78.808*	0.000	0.000
4	26.159	8.573	5.948	*27.917*	29.483	1.920
8	22.620	8.801	6.391	*21.835*	30.836	9.517
12	22.348	9.165	6.591	*20.436*	29.249	12.210
24	23.325	9.511	6.488	*19.852*	28.776	12.048

Table 2. (*Continued*)

	Percentage of Forecast Variance Explained by Innovations in:					
	ΔGDP	ΔM2	ΔCPI	ΔTRD	ΔSP	ΔEMP
Relative variance in ΔSP						
1	6.806	18.754	0.268	0.317	*73.855*	0.000
4	3.988	11.789	2.091	9.804	*66.649*	5.678
8	5.430	11.539	2.035	9.708	*58.018*	13.270
24	21.498	13.742	3.932	7.188	*41.723*	11.917
Relative variance in ΔEMP						
1	1.088	12.092	0.509	1.112	16.360	*68.840*
4	18.199	9.287	2.777	1.718	12.381	*55.638*
8	23.108	15.150	2.642	2.003	11.477	*45.620*
12	24.410	15.141	2.598	2.003	11.735	*44.113*
24	24.375	15.211	2.613	2.066	11.732	*44.003*
Japan						
Relative variance in ΔGDP						
1	*100.000*	0.000	0.000	0.000	0.000	0.000
4	*64.330*	7.159	22.089	0.276	2.711	3.435
8	*29.392*	7.224	57.213	0.608	2.750	2.813
12	*20.323*	5.977	55.397	4.615	11.494	2.195
24	*13.168*	4.251	53.175	9.694	15.857	3.855
Relative variance in ΔM2						
1	1.134	*98.866*	0.000	0.000	0.000	0.000
4	4.318	*83.398*	0.424	10.822	0.203	0.836
8	5.942	*62.849*	1.568	19.271	3.859	6.513
12	5.399	*51.541*	1.427	23.699	9.083	8.853
24	9.678	*38.826*	13.221	21.740	7.836	8.699
Relative variance in ΔCPI						
1	0.724	4.792	*94.485*	0.000	0.000	0.000
4	3.866	3.458	*85.535*	0.560	6.094	0.487
8	3.226	4.342	*65.221*	8.953	17.784	0.475
12	2.950	5.061	*57.108*	15.035	18.601	1.244
24	5.704	9.389	*47.787*	15.860	19.299	1.961
Relative variance in ΔTRD						
1	18.348	2.202	10.882	*68.567*	0.000	0.000
4	37.156	7.638	27.744	*20.809*	4.006	2.646
8	21.224	10.209	51.657	*10.086*	4.180	2.644
12	15.600	7.121	57.436	*10.205*	7.603	2.035
24	9.503	4.103	57.570	*12.600*	12.816	3.408
Relative variance in ΔSP						
1	5.548	5.314	0.105	0.001	*89.031*	0.000
4	7.745	8.252	4.344	3.511	*75.848*	0.300
8	6.032	8.844	3.300	5.583	*75.388*	0.853
24	6.906	9.502	4.254	7.557	*70.221*	1.559
Relative variance in ΔEMP						
1	0.020	23.072	1.129	5.658	1.969	*68.153*
4	0.604	19.200	2.573	8.129	3.185	*66.308*
8	4.634	17.214	3.285	7.798	7.919	*59.150*
12	4.647	16.149	6.519	7.844	8.827	*56.014*
24	4.420	15.374	7.888	8.326	11.362	*52.630*

Table 2. (*Continued*)

	Percentage of Forecast Variance Explained by Innovations in:					
	ΔGDP	ΔM2	ΔCPI	ΔTRD	ΔSP	ΔEMP
Korea						
Relative variance in ΔGDP						
1	*100.000*	0.000	0.000	0.000	0.000	0.000
4	*60.349*	32.257	0.781	5.385	0.187	1.042
8	*52.167*	31.639	0.770	8.412	3.375	3.637
12	*51.439*	26.750	2.935	7.105	5.705	6.066
24	*57.052*	18.957	6.108	7.470	6.361	4.052
Relative variance in ΔM2						
1	5.147	*94.853*	0.000	0.000	0.000	0.000
4	6.806	*86.336*	0.058	1.461	3.233	2.107
8	7.073	*61.601*	0.474	4.693	22.381	3.777
12	6.579	*55.005*	2.079	4.522	27.647	4.169
24	9.900	*46.988*	3.682	4.200	31.674	3.556
Relative variance in ΔCPI						
1	0.015	0.164	*99.822*	0.000	0.000	0.000
4	6.398	16.329	*58.471*	8.131	6.109	4.561
8	21.114	13.039	*45.061*	7.666	7.154	5.967
12	28.769	17.756	*33.824*	5.604	9.761	4.286
24	40.099	14.427	*22.181*	3.484	16.497	3.312
Relative variance in ΔTRD						
1	1.038	60.028	5.752	*33.183*	0.000	0.000
4	6.738	34.735	9.950	*41.166*	1.949	5.462
8	6.899	36.866	7.436	*37.192*	3.825	7.783
12	6.554	36.353	6.831	*35.835*	7.249	7.177
24	6.767	35.316	6.445	*33.834*	10.749	6.889
Relative variance in ΔSP						
1	12.917	24.289	0.039	0.010	*62.745*	0.000
4	7.824	34.289	0.625	6.294	*50.817*	0.150
8	11.651	25.415	0.997	4.635	*55.976*	1.326
24	9.256	19.793	2.666	3.629	*62.738*	1.919
Relative variance in ΔEMP						
1	3.514	62.068	0.451	3.329	0.648	*29.990*
4	21.679	45.735	1.624	2.424	1.308	*27.230*
8	19.241	45.286	2.544	3.278	5.328	*24.322*
12	18.445	45.230	2.918	3.569	5.861	*23.978*
24	18.245	44.852	3.026	3.664	6.548	*23.665*
Philippines						
Relative variance in ΔGDP						
1	*100.000*	0.000	0.000	0.000	0.000	0.000
4	*78.932*	1.326	9.844	2.365	5.509	2.025
8	*65.417*	8.561	11.963	1.985	8.877	3.196
12	*57.252*	14.324	9.541	2.551	12.802	3.530
24	*52.630*	19.190	6.129	2.692	17.273	2.085
Relative variance in ΔM2						
1	1.649	*98.351*	0.000	0.000	0.000	0.000
4	1.708	*84.363*	1.475	1.421	10.138	0.895
8	2.064	*53.676*	3.351	6.571	33.817	0.521
12	3.244	*45.848*	2.868	6.243	41.105	0.691
24	8.639	*41.538*	2.729	6.096	39.612	1.385

Table 2. (*Continued*)

	Percentage of Forecast Variance Explained by Innovations in:					
	ΔGDP	ΔM2	ΔCPI	ΔTRD	ΔSP	ΔEMP
Relative variance in ΔCPI						
1	17.194	0.126	*82.680*	0.000	0.000	0.000
4	18.854	0.568	*74.427*	5.435	0.411	0.305
8	15.281	4.694	*67.899*	8.270	2.461	1.396
12	17.508	8.615	*60.469*	8.282	3.584	1.542
24	23.562	21.327	*38.492*	6.172	8.881	1.566
Relative variance in ΔTRD						
1	0.744	2.717	1.137	*95.402*	0.000	0.000
4	18.024	1.901	29.954	*45.442*	4.613	0.067
8	15.651	7.217	27.663	*40.955*	7.216	1.298
12	14.145	9.410	22.735	*36.471*	16.067	1.173
24	13.881	9.008	20.452	*35.685*	18.966	2.007
Relative variance in ΔSP						
1	0.025	18.517	4.688	1.388	*75.383*	0.000
4	2.122	7.151	3.022	2.902	*83.450*	1.354
8	2.917	11.543	2.605	3.375	*75.334*	4.226
24	6.100	14.306	2.890	3.727	*68.877*	4.100
Relative variance in ΔEMP						
1	1.010	8.181	0.654	2.425	35.228	*52.502*
4	3.118	8.046	1.960	2.098	42.807	*41.970*
8	4.864	18.618	2.183	3.825	37.980	*32.529*
12	4.522	17.357	2.224	3.773	42.887	*29.236*
24	4.878	17.346	2.439	4.008	42.523	*28.806*
Singapore						
Relative variance in ΔGDP						
1	*100.000*	0.000	0.000	0.000	0.000	0.000
4	*75.202*	8.870	1.820	2.661	5.760	5.688
8	*64.593*	14.243	1.995	10.173	4.052	4.945
12	*65.454*	11.406	1.599	13.462	4.073	4.006
24	*64.057*	8.332	6.160	14.820	3.758	2.873
Relative variance in ΔM2						
1	2.701	*97.299*	0.000	0.000	0.000	0.000
4	12.018	*81.792*	3.026	0.509	2.158	0.497
8	18.266	*71.470*	5.397	1.121	3.391	0.355
12	26.132	*63.463*	4.968	2.339	2.656	0.442
24	37.447	*46.067*	4.622	8.992	2.169	0.704
Relative variance in ΔCPI						
1	0.550	0.816	*98.634*	0.000	0.000	0.000
4	17.743	14.992	*60.761*	2.196	1.153	3.156
8	16.813	41.511	*34.559*	3.730	0.570	2.817
12	15.172	50.399	*29.554*	2.215	0.869	1.792
24	21.730	52.730	*20.868*	2.701	0.755	1.216
Relative variance in ΔTRD						
1	8.106	0.779	0.999	*90.115*	0.000	0.000
4	17.024	1.191	0.669	*67.708*	8.785	4.622
8	21.013	1.246	8.285	*56.772*	7.686	4.998
12	16.173	11.428	11.845	*50.117*	6.512	3.925
24	10.734	32.154	21.051	*29.794*	3.852	2.415

Table 2. (*Continued*)

	Percentage of Forecast Variance Explained by Innovations in:					
	ΔGDP	ΔM2	ΔCPI	ΔTRD	ΔSP	ΔEMP
Relative variance in ΔSP						
1	11.097	13.850	1.552	0.021	*73.481*	0.000
4	20.830	35.109	0.858	0.376	*37.138*	5.690
8	16.768	35.604	2.325	15.160	*25.488*	4.655
24	19.658	31.070	6.734	17.091	*21.245*	4.201
Relative variance in ΔEMP						
1	13.897	28.788	0.463	0.398	4.364	*52.091*
4	18.337	26.119	0.563	1.463	6.851	*46.668*
8	17.920	25.854	0.634	3.070	7.774	*44.748*
12	17.829	26.643	0.689	3.484	7.646	*43.709*
24	17.657	26.660	1.333	3.968	7.599	*42.783*

Note: The columns in italic represent the impact of their own shock.

5. CONCLUSION

By utilizing the time-series techniques, we empirically disclosed the "causes" behind the volatility of exchange rate. The VAR results have deemed that in Malaysia, EMP is granger causal by M2, SP and TR (M2 → EMP; SP → EMP; TR → EMP). Both Indonesia and Korea's VAR results show that GDP do influence EMP (GDP → EMP). Besides that M2 also found to be granger cause EMP (M2 → EMP) for Philippines. Furthermore, EMP is also found to be granger cause M2 for countries like Hong Kong and Japan; and RDP for Hong Kong and Singapore. From Table 2, the most exogenous variable in the system is M2 for Malaysia, while EMP and SP for Hong Kong while in Korea and Philippines, EMP is purely an endogenous variable. Looking at the interactions between EMP and the explanatory variables, it is clear that M2, GDP and SP play crucial roles in affecting EMP in most of the studied countries.

One direct policy initiative is firstly, by controlling the elements (interest rate and/or domestic credit) in managing EMP. When exchange market experience severe selling pressure, the monetary authorities could choose to lower interest rate. With this move it would attract foreign capital into the country that causes the foreign reserves to increase would eventually stabilized the exchange market. Secondly, price stability also plays an important role as the determinants of EMP especially in Indonesia where the empirical findings show that CPI granger cause EMP. Aizenman and Hutchison (2012) and Feldkircher, Horvath, and Rusnak (2014) emphasized that there is significant role of inflation in explaining differences in EMP across countries especially during the crisis period. Hence, in overcoming the adverse financial shocks, the government should turn to price stabilization as an option.

Thirdly, macroeconomic adjustments are crucial to determine the degree of intervention needed by a country in managing EMP volatility. Based on the empirical findings, GDP was found to be the most exogenous variable for Indonesia, Korea, and Singapore. In order to decrease the pressure in the exchange rate market, it is important to boost up the economic growth through monetary policies because lower economic growth may feed devaluation expectations which will lead to pressure on the domestic currency. Meanwhile, M2 was found to be the most exogenous variable and tends to affect EMP in Malaysia. Hence, policy-makers can start by maintaining a tight control of the money supply since excessive money supply in the market will pressure the currencies. Policy-makers, therefore, should consider these macroeconomic planning when managing their exchange rate. Surely, strong and stable monetary authorities are inevitable to ensure the continuous monitoring of the exchange rate condition for these countries. This would translate into positive macroeconomic welfare and economic growth sustainability.

NOTES

1. Large fluctuations of the exchange rate are an important issue in policy considerations for countries concerned with the sustainability of external imbalances, and for export-oriented economies. Exchange rate fluctuations might have a substantial effect on financial stability via numerous macro channels, including destabilizing balance sheet effects (Aizenman & Binici, 2015).
2. Customarily, central banks shall resort to interest rate adjustment and foreign reserve movement as the policy instruments to regulate the exchange rate instability. Hence, there is a possible risk of engaging currency crises as Eichengreen et al. (1996) claimed that currency crises are not necessarily defined as a sudden devaluation of the domestic currency instead they are defined as instances of extreme speculative pressure in the exchange market that do not necessarily result in a devaluation of the currency. This is because even if the Central Bank succeeds in fending off a speculative attack, the resulting loss in foreign exchange reserves or increase in interest rates disrupts the economy.
3. The inclusion of real gross domestic product, consumer price index and money supply because these monetary variables are mostly found to have significant impact on EMP in the literatures (see Gochoco-Bautista & Bautista, 2005; Gracia & Malet, 2007; Khan, 2010).
4. Refer to Lau and Yong (2015) and Lau et al. (2018) for much understanding as the authors have further discuss the differences and theory behind the computation of EMP based on Eichengreen et al. (1996), Weymark (1995), Sachs et al. (1996) and Kaminsky et al. (1998) framework.
5. Eichengreen, Rose, and Wyplosz (1994) argued that the interest rate hikes were also central bank's response to speculative attacks.
6. Generally, there are three altering ways of specifying a VAR when the considered time series are known to be non-stationary. The VAR can be specified in pure differences, it can be specified in levels without imposing any restrictions, or it can be specified as a vector error correction model to allow for the existence of cointegration (Clarke & Mirza, 2006; Ramaswamy & Slok, 1998).
7. See, for instance, Tanner (2000) and Gochoco-Bautista and Baustista (2005).
8. However, the results of JJ cointegration test are made available upon request from the author.

REFERENCES

Aizenman, J., & Binici, M. (2015). Exchange market pressure in OECD and emerging economies: Domestic vs. external factors and capital flows in the old and the "New Normal". *Journal of International Money and Finance*, *66*(c), 65–87.

Aizenman, J., & Hutchison, M. M. (2012). Exchange market pressure and absorption by international reserves emerging markets and fear of reserve loss during the 2008–09 crisis. *Journal of International Money and Finance*, *31*(5), 1076–1091.

Calderon, C., Loyaza, N., & Schmidt-Hebbel, K. (2005). *Does openness imply greater exposure?* World Bank Policy Research Working Paper No. 3733. The World Bank, Washington, DC.

Clarke, J. A., & Mirza, S. (2006). A comparison of some common methods for detecting Granger noncausality. *Journal of Statistical Computation and Simulation*, *76*(3), 207–231.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for auto regressive time series with a unit root. *Journal of the American Statistical Association*, *74*, 1057–1072.

Eichengreen, B., Rose, A. K, & Wyplosz, C. (1994). *Speculative attacks on pegged exchange rates: An empirical exploration with special references to the European monetary system*. National Bureau of Economic Research, NBER Working Paper Series No. 4898.

Eichengreen, B., Rose, A., & Wyplosz, C. (1996). Contagious currency crises: first tests. *Scandinavian Journal of Economics*, *98*, 436–484.

Feldkircher, M., Horvath, R., & Rusnak, M. (2014). Exchange market pressures during the financial crisis: A Bayesian model averaging evidence. *Journal of International Money and Finance*, *40*, 21–41.

Girton, L., & Roper, D. (1977). A monetary model of exchange market pressure applied to the postwar Canadian experience. *American Economic Review*, *67*, 537–548.

Gochoco-Bautista, M. S., & Bautista, C. C. (2005). Monetary policy and exchange market pressure: The case of the Philippines. *Journal of Macroeconomics*, *27*, 153–186.

Hegerty, S. W. (2013). Principal component measures of exchange market pressure: Comparisons with variance-weighted measures. *Applied Financial Economics*, *23*(18), 1483–1495.

Hegerty, S. W. (2018). Exchange market pressure, stock prices, and commodity prices east of the Euro. *Journal of Economics and Management*, *31*(1), 74–94.

Jayaraman, T., & Choong, C. K. (2008). Exchange market pressure in a small Pacific Island country: A study of Fiji: 1975–2005. *International Journal of Social Economics*, *35*, 985–1004.

Johansen, S., & Juselius, K. (1990). Maximum likehood estimation and inference on cointegration: With application to the demand for money. *Oxford Bulletin of Economics and Statistics*, *52*, 169–210.

Kaminsky, G. L., Lizondo, S., & Reinhart, C. M. (1998). Leading indicators of currency crises. International Monetary Fund, Working Paper No. 79.

Khan, I. N. (2010). *Exchange Market Pressure Index in Pakistan*. State Bank of Pakistan, Working Paper Series No. 35.

Kwiatkowski, D., Phillips, P. C. B., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root. How sure are we that economic time series have a unit root? *Journal of Econometrics*, *54*, 159–178.

Lau, E., & Yong, J. (2015). Tracing and modelling exchange rate volatility in Malaysia. *Actual Problems of Economics*, *169*(7), 356–365.

Lau, E., Yong, J., & Pasca, P. (2018). Tracing exchange rate volatility in Cambodia, Laos, Myanmar and Vietnam (CLMV). *Electronic Journal of Applied Statistical Analysis*, *11*(1), 168–184.

Pontines, V., & Siregar, R. (2008). Fundamental pitfalls of exchange market pressure-based approaches to identification of currency crises. *International Review of Economics and Finance*, *17*, 345–365.

Ramaswamy, R., & Slok, T. (1998). The real effects of monetary policy in the European Union: What are the differences. *IMF Staff Paper*, *45*, 374–396.

Sachs, J., Tornell, A., & Velasco, A. (1996). Financial crises in emerging markets: The lessons from 1995. *Brookings Papers on Economic Activity, Economic Studies Program, The Brookings Institution*, *27*(1), 147–216.

Samba, M. C. (2018). Exchange market pressure in the Central African Economic and Monetary Community (CAEMC) Area: Empirical assessment of the macroeconomic determinants. *International Economic Journal*, *32*(3), 470–482.

Siregar, R., Pontines, V., & Hussain, N. M. (2010). *The US sub-prime crises and extreme exchange market pressures in Asia*. The South East Asian Central Banks (SEACEN), Staff Paper No. 75.

Tanner, E. (2000). Exchange market pressure and monetary policy: Asia and Latin America in the 1990s. *MF Staff Papers*, *47*(3), 311–333.

Weymark, D. N. (1995). Estimating exchange market pressure and the degree of exchange market intervention for Canada. *Journal of International Economics*, *39*, 273–295.