CURRENT ACCOUNT AND FINANCIAL ACCOUNT: PUSH OR FINANCE?

Evan Lau [ψ], Nelson Fu, Swee-Ling Oh and Audrey Liwan

Universiti Malaysia Sarawak, Malaysia

Abstract
The purpose of this paper is to empirically investigate the causality pattern between current account (CA) with the components in financial account (FA) for the four crisis-affected Asian countries of Indonesia, Korea, the Philippines and Thailand. The sample periods are divided into two non-overlapping sub-periods namely; pre-crisis (1987Q1 – 1996Q4) and post-crisis (1997Q1 –2006Q4). Empirical results clearly suggest that CA Granger causes FA in these countries for the two sampling periods. Observations imply that causality patterns differ for each of the FA components with CA.

Keywords: Current account; Financial account; Asian-4; Causality.

JEL Classification Codes: F21; F32; F41; C32.

1. Introduction

Theoretical argument relying upon the intertemporal theory suggests that capital flowing either in or out serves financially to fill the gap between domestic investments and savings or the current account. The evidence from the currency crisis of the late 1990s points to the fact that persistent current account deficit closely relates to the flows of capital. It was argued that when capital is not mobile, the CA Granger causes the FA while a trend reversal occurs when the capital is being mobile (Wong and Carranza, 1999). Basically, this reflective mirror effect that had somewhat occurred during the years prior to the 1997 Asian financial crisis when flows of capital served to force the current accounts of crisis-affected countries into deficits. Evidently, this is a result through the outburst of the rapid globalization and the liberalization of the capital markets. Given the importance of the sound macroeconomics fundamental in the economy, it is an essential need to identify important variable that influences the performance of an economy.

Plausibly, the question as to whether the two accounts are independent or being closely link in the four crisis-affected Asian countries does arise. Simply to attempt the question, the key objective of this paper serves as a forefront that determines the causality between FA and CA of the four crisis-affected countries (Indonesia, Korea, the Philippines and Thailand: Asian-4). We split the whole sample period into two sub-samples of pre-crisis (1987Q1-1996Q4) and post-crisis (1997Q1-2006Q4) to investigate any disparities among the empirical regularities obtained. In this sense, we are concern on the instability of the CA with the reference to the capital movements in these countries. These countries seem to have experienced large and growing CA deficits prior to the 1997 Asian financial crises and have swung into large surpluses during the post-crisis period. Countries such as Singapore and Taiwan were irrelevant, thus excluded for this study mainly because they revealed CA surpluses for most of the sample period under investigation. Besides, we segregated the FA into three sub-components of foreign direct investment (FDI), portfolio investment (PI) and other investment (OI). The causal direction between these variables may provide constructive information and policymaking guide as to which of the composition of capital flows may be able to offset the deficit in current account.

To accomplish the objective, we relied on several time-series econometric methods. Rigorous systematic statistical tests of cointegration and causality tests are extended in this present work in order to ascertain the robustness of the empirical findings in relation to the link between these variables. Based on the study on

[ψ] Corresponding author. Evan Lau. Department of Economics, Faculty of Economics and Business, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia. Email: lphevan@feb.unimas.my

these countries, the experimental revelation henceforth contributes to the debatable yet scarce in literature topic of the financial account-current account, particularly for developing economies.

As such, the structure of this paper follows. Section 2 describes the econometric strategy and data description adopted in the paper. Section 3 reports the empirical findings, while concluding remarks and the implications for empirical research is presented in Section 4.

2. Data sources and empirical strategy

Data sources

In this study, we split the sample period into two non-overlapping sub-periods of the pre-crisis (1987Q1-1996Q4) and the post-crisis era (1997Q1-2006Q4). The data were gathered from various issues of International Financial Statistics (IFS), published by the International Monetary Fund (IMF). The variables employed in the study are the current account (CA) current account, financial account (FA), foreign direct investment (FDI), portfolio investment (PI) and other investment (OI). All the variables are expressed as ratio of the nominal Gross Domestic Product (GDP) form in order to account for the economy's growth. For consistency and countries comparison, we express all the variables into one common currency of US dollar.

Unit root and stationary testing procedures

We applied the ADF (see Said and Dickey, 1984), DFGLS (see, Elliott *et al*., 1996) and KPSS (Kwiatkowski *et al*., 1992) testing principles to test the existence of unit root for the variables under investigations. The ADF and DFGLS tests for non-stationary (unit root) null against the alternative of stationary (no unit root). While, KPSS examined the level (□□) or trend stationarity (□□) against the alternative of a unit root. The application of this methodology is by now becoming common in the literature of time series econometrics. These tests are also available in the manual of *Eviews* (see http://www.eviews.com).

Cointegration procedure

The system-based cointegration procedure developed by Johansen and Juselius (1990) is adopted in this paper. One advantage of this approach is that the estimation procedure does not depend on the choice of normalization and it is much more robust than Engle-Granger test (see Gonzalo, 1994). Phillips (1991) also documented the desirability of this technique in terms of symmetry, unbiasedness and efficiency. Their test utilizes two likelihood ratio (LR) test statistics for the number of cointegrating vectors: namely the trace test and the maximum eigenvalue test. The Johansen procedure is well known in the time series literature and the detail explanation are not presented here.

Granger causality tests: vector error correction model (VECM)

If cointegration is detected, then the Granger causality must be conducted in vector error correction model (VECM) to avoid problems of misspecification. Otherwise, the analyses may be conducted as a standard first difference vector autoregressive (VAR) model. VECM is a special case of VAR that imposes cointegration on its variables where it allows us to distinguish between short run and long run Granger causality. The relevant error correction terms (ECTs) must be included in the VAR to avoid misspecification and omission of the important constraints. In this study, the five-dimensional VECM system as follows:

$$\Delta CA_t = \alpha_0 + \sum_{i=1}^{m} \beta_{1,i}\Delta CA_{t-i} + \sum_{i=1}^{n} \beta_{2,i}\Delta FA_{t-i} + \sum_{i=1}^{p} \beta_{3,i}\Delta FDI_{t-i} + \sum_{i=1}^{q} \beta_{4,i}\Delta PI_{t-i} + \sum_{i=1}^{r} \beta_{5,i}\Delta OI_{t-i} + \mu_1 ECT_{t-1} + \zeta_{1t} \quad (1a)$$

$$\Delta FA_t = \delta_0 + \sum_{i=1}^{m} \phi_{1,i}\Delta CA_{t-i} + \sum_{i=1}^{n} \phi_{2,i}\Delta FA_{t-i} + \sum_{i=1}^{p} \phi_{3,i}\Delta FDI_{t-i} + \sum_{i=1}^{q} \phi_{4,i}\Delta PI_{t-i} + \sum_{i=1}^{r} \phi_{5,i}\Delta OI_{t-i} + \mu_2 ECT_{t-1} + \zeta_{2t} \quad (1b)$$

$$\Delta FDI_t = \chi_0 + \sum_{i=1}^{m} \gamma_{1,i}\Delta CA_{t-i} + \sum_{i=1}^{n} \gamma_{2,i}\Delta FA_{t-i} + \sum_{i=1}^{p} \gamma_{3,i}\Delta FDI_{t-i} + \sum_{i=1}^{q} \gamma_{4,i}\Delta PI_{t-i} + + \sum_{i=1}^{r} \gamma_{5,i}\Delta OI_{t-i} + \mu_3 ECT_{t-1} + \zeta_{3t} \quad (1c)$$

$$\Delta PI_t = \eta_0 + \sum_{i=1}^{m} \rho_{1,i} \Delta CA_{t-i} + \sum_{i=1}^{n} \rho_{2,i} \Delta FA_{t-i} + \sum_{i=1}^{p} \rho_{3,i} \Delta FDI_{t-i} + \sum_{i=1}^{q} \rho_{4,i} \Delta PI_{t-i} + + \sum_{i=1}^{r} \rho_{5,i} \Delta OI_{t-i} + \mu_4 ECT_{t-1} + \zeta_{4t} \quad (1d)$$

$$\Delta PI_t = \lambda_0 + \sum_{i=1}^{m} \tau_{1,i} \Delta CA_{t-i} + \sum_{i=1}^{n} \tau_{2,i} \Delta FA_{t-i} + \sum_{i=1}^{p} \tau_{3,i} \Delta FDI_{t-i} + \sum_{i=1}^{q} \tau_{4,i} \Delta PI_{t-i} + \sum_{i=1}^{r} \tau_{5,i} \Delta OI_{t-i} + \mu_5 ECT_{t-1} + \zeta_{5t} \quad (1e)$$

where Δ is the lag operator, $\alpha_0, \delta_0, \chi_0, \eta_0, \lambda_0, \beta's, \phi's, \gamma's, \rho's$ and $\tau's$ are the estimated coefficients, m, n, p, q and r are the optimal lags of the series current account (*CA*), financial account (*FA*), foreign direct investment (*FDI*), portfolio investment (*PI*) and other investment (*OI*), $\zeta_{it}'s$ are the serially uncorrelated random error terms while $\mu_1, \mu_2, \mu_3, \mu_4$ and μ_5 measure a single period response to a departure from equilibrium of the dependent variable. Take for example, to test whether FA does not Granger cause movement in CA, $H_0 : \beta_2, i = 0$ for all i and $\mu_1 = 0$ in Equation (1a). The rejection implies that FA causes CA. From Equation (1a) simply states that the F-test or Wald χ^2 of the explanatory variables (in first differences) indicates the short run causal effects ($H_0 : \beta_2, i = 0$ for all i) while the long run causal ($\mu_1 = 0$) relationship is implied through the significance of the lagged ECT that contains the long run information. Similarly, to test that CA does not Granger cause movement in FA the null hypothesis $H_0 : \phi_2, i = 0$ for all i and $\mu_2 = 0$ in Equation (1b).

3. Empirical results

Non-stationarity and stationarity tests

For this purpose, we conduct two unit root and one stationary tests discuss earlier on the five series and their first differences in order to dicriminating the conclusion of stationarity and non-stationarity of these series. The results of ADF, DFGLS and KPSS tests suggest the existence of unit root or nonstationarity in level or *I(1)* for these five variables. The findings that all the variables have the same order of integration allowed us to proceed with the Johansen cointegration analysis. The results hold true for both the pre and the post crisis period.

Cointegration test

From Panel A, Table 1, the null hypothesis of no cointegrating vector (r=0) was soundly rejected at 5 percent significance level for all the countries. On the basis of these test results, we can interpret that there is a significant long run relationship among these five variables [CA, FA, FDI, PI, and OI] in Asian-4 countries for the sample period during the pre-crisis era. In other words, there is at least on stochastic trend shared among the five variables in the system for Korea, Indonesia, the Philippines and Thailand.

Interestingly, we also found similar results in Table 2, where a unique cointegrating vector existed in the post-crisis period. The results of cointegration tests suggest that the Johansen procedure is not sensitive to the sampling period. We view this strong relationship between current account and financial account as partly due to the growing intra-regional trade and investments in the Asian region (see Bosworth and Collins, 1999). Notice that both the computed λ-max and trace statistics exceed their critical values. Therefore, rejecting the null hypothesis of no cointegration between the *I* (1) variables implies that the five variables [CA, FA, FDI, PI and OI] do not drift apart in the long run.

VECM results: pre-crisis

Results for the pre-crisis period as depicted in Table 2 may be summarized as follow. First, the short run channel of causality from FDI to OI is active in the system at 5 per cent significance level for Indonesia, Philippines and Thailand. Second, the results indicate that there is a unidirectional relationship running from PI to FDI and OI in the short run for Korea. This confirms that the FDI and OI are endogenous because it may be explained by other variables in the system, again suggesting that the monetary authorities in Korea cannot fully control the FA. Third, the PI significantly influences the FDI and CA at 5 per cent level for the Philippines. Only in Indonesia, a short run causal relationship is found running from FDI to PI.

Fourth, we found that CA Granger cause FA in all these countries. This may be interpreted when CA is in deficit (surplus) FA needs to be in surplus (deficit). In other words, the fragility of the influx of capital flows could be control by the performance in CA. Fifth, the error-correction term (ECT) is significant at the significant level of 5 per cent and the burden of short run endogenous adjustment is beared by CA in the Asian-4 countries. Notice that the error correction term (ECT) carries the correct sign (negative) and is relatively small. For instance, in Indonesia and Thailand the speed of adjustment as measured by the ECT coefficient is 0.03 that need about 33.3 quarters to adjust to the long run equilibrium due to the short run adjustments. On the other hand, Korea and Philippines, speed of adjustment as measured by the ECT coefficient is 0.04 that need about 25 quarters to adjust to the long run equilibrium due to the short run adjustments. The directions of causal relations from Table 2 are graphically summarized in Appendix A.

Table 1: Cointegration results

A: Pre-crisis (1987Q1 – 1996Q4)					
Hypothesis H_0	H_A	Indonesia $k = 1, r = 1$	Korea $k = 1, r = 1$	Philippines $k = 1, r = 1$	Thailand $k = 1, r = 1$
λ – max					
r = 0	r = 1	39.441*	34.154*	45.777*	37.105*
r ≤ 1	r = 2	26.407	22.861	17.151	24.561
r ≤ 2	r = 3	19.461	9.838	13.311	12.627
r ≤ 3	r = 4	12.319	2.785	6.558	8.586
r ≤ 4	r = 5	1.849	1.364	2.981	1.219
Trace					
r = 0	r = 1	93.162*	69.004*	85.778**	84.101*
r ≤ 1	r = 2	46.701	36.849	40.001	46.994
r ≤ 2	r = 3	29.312	13.988	22.851	22.432
r ≤ 3	r = 4	14.169	4.149	9.538	9.805
r ≤ 4	r = 5	1.849	1.364	2.981	1.219
B: Post-crisis (1997Q1 –2006Q4)					
		$k = 1, r = 1$	$k = 1, r = 1$	$k = 1, r = 1$	$k = 1, r = 1$
λ – max					
r = 0	r = 1	42.633*	52.065*	46.324*	38.088*
r ≤ 1	r = 2	26.314	23.386	14.693	18.205
r ≤ 2	r = 3	19.934	13.312	13.561	12.265
r ≤ 3	r = 4	13.609	3.619	4.507	6.318
r ≤ 4	r = 5	0.439	0.364	0.189	2.095
Trace					
r = 0	r = 1	93.932*	92.748*	79.276*	76.972*
r ≤ 1	r = 2	46.201	40.683	32.951	38.883
r ≤ 2	r = 3	28.983	17.297	18.258	20.678
r ≤ 3	r = 4	14.049	3.984	4.697	8.413
r ≤ 4	r = 5	0.439	0.364	0.189	2.095

Notes: k is the lag length and *r* is the cointegrating vector(s). Critical values for both the trace and maximum eigenvalue tests are tabulate in Osterwald-Lenum (1992, Table 1, pp. 468). Asterisk (*) denote the statistically significance at 5 per cent level.

Table 2: Granger causality based on VECM (pre-crisis)

Dependent variable	χ^2 – statistics (*P* – value)					Coefficients [t-statistics]
	ΔCA	ΔFA	ΔFDI	ΔPI	ΔOI	ECT
Indonesia						
ΔCA	-	0.42 (0.81)	0.67 (0.71)	2.04 (0.35)	0.72 (0.69)	-0.03 [-3.71]*
ΔFA	9.01 (0.00)*	-	1.33 (0.51)	0.77 (0.67)	0.49 (0.78)	-0.01 [-1.31]
ΔFDI	0.31 (0.85)	0.31 (0.85)	-	0.26 (0.87)	1.04 (0.59)	-0.01 [-1.23]
ΔPI	0.92 (0.62)	1.97 (0.37)	9.97 (0.00)*	-	3.65 (0.05)*	-0.01 [-1.41]
ΔOI	2.03 (0.36)	0.16 (0.92)	9.11 (0.00)*	2.84 (0.24)	-	0.21 [0.59]
Korea						
ΔCA	-	1.67 (0.43)	0.17 (0.91)	0.21 (0.89)	1.53 (0.14)	-0.04 [-3.81]*
ΔFA	3.94 (0.05)*	-	2.41 (0.31)	1.91 (0.38)	0.03 (0.98)	0.23 [0.43]
ΔFDI	1.39 (0.49)	2.48 (0.28)	-	5.82 (0.03)*	2.97 (0.22)	-0.17 [-0.51]
ΔPI	0.21 (0.89)	2.34 (0.31)	2.59 (0.27)	-	1.13 (0.56)	-0.21 [-0.81]
ΔOI	1.91 (0.38)	0.42 (0.81)	0.66 (0.21)	6.95 (0.03)*	-	0.01 [1.99]
Philippines						
ΔCA	-	0.61 (0.12)	1.22 (0.54)	5.21 (0.04)*	2.08 (0.35)	-0.04 [-3.68]*
ΔFA	9.77 (0.00)*	-	2.55 (0.27)	0.63 (0.72)	0.42 (0.81)	-0.46 [-0.71]
ΔFDI	0.09 (0.95)	2.51 (0.28)	-	9.52 (0.00)*	0.21 (0.89)	0.01 [1.15]
ΔPI	1.97 (0.37)	2.01 (0.36)	2.85 (0.24)	-	0.49 (0.78)	0.01 [1.21]
ΔOI	0.45 (0.79)	0.24 (0.88)	9.81 (0.00)*	0.92 (0.63)	-	0.39 [0.56]
Thailand						
ΔCA	-	0.37 (0.82)	1.99 (0.36)	0.77 (0.67)	0.34 (0.83)	-0.03 [-3.41]*
ΔFA	3.78 (0.05)*	-	0.47 (0.78)	2.33 (0.31)	2.61 (0.27)	-0.12 [-0.61]
ΔFDI	1.43 (0.48)	2.18 (0.21)	-	1.41 (0.49)	0.85 (0.65)	0.01 [1.19]
ΔPI	0.85 (0.65)	2.13 (0.21)	2.05 (0.35)	-	1.71 (0.42)	-0.23 [-0.54]
ΔOI	2.19 (0.33)	0.93 (0.62)	9.48 (0.00)*	0.34 (0.84)	-	-0.01 [-1.51]

Notes: All variables are in first differences with the exception of the lagged error-correction terms (ECT). Figures in the parentheses, ( ) are the *P*-value and [ ] are the t-statistics. The χ^2 statistics tests the jointly significance of the lagged values of the independent variables. Asterisk (*) denote the statistically significance at 5 per cent level.

VECM results: post-crisis

Results for the post-crisis are tabulated in Table 3. Here, we found clear evidence of significant short-term unidirectional causality from PI to OI for Philippines. Moreover, for Philippines, the result reveals that CA leads to enhancement of OI indirectly (CA → FDI → OI). Short run causality running from CA to OI was also detected in Korea and Thailand. This finding indicates that CA contains leading information for the OI is in line with Bosworth and Collins (1999) and Yan (2005, 2007) who find significant linkages among these variables [CA and OI]. Further, PI Granger causes FDI in Korea suggesting that they are indeed complementary processes (Bosworth and Collins, 1999).

For Indonesia, the result reveals that FDI leads to CA both directly (FDI → CA) as well as indirectly (FDI → PI → CA) through PI. This supports the views of Kaminsky and Schmukler (2003, pp. 24) that implies the FDI inflow can control deficit in CA. Also, FDI inflow significantly influences the OI. As in Table 2, we also found consistent evidence that CA causes FA in all these countries.

The CA equation is the only variable in the system where the ECT (t-statistics) is statistically significant at 5 per cent significance level and contains the correct sign (negative)[1]. This suggests that CA solely bears the brunt of short run adjustment to bring about the long run equilibrium in Asian-4 countries. The ECT coefficient suggests that 5 per cent of the adjustment is completed in a quarter in which Korea and the

[1] As Rao (2007) notes, the coefficient of ECT should have negative sign.

Philippines need approximately 20 quarters to adjust to the long run equilibrium. In Indonesia and Thailand, however, 25 quarters is needed for the adjustment to complete in the long run equilibrium. Comparatively, the adjustment seems to be much rapid in the post-crisis period for all the countries than observed in the pre-crisis (see Table 3). Appendix B summarizes the graphical representation of the causal relations from Table 3.

Table 3: Granger causality based on VECM (post-crisis)

Dependent variable	χ^2 – statistics (P – value)					Coefficients [t-statistics]
	ΔCA	ΔFA	ΔFDI	ΔPI	ΔOI	ECT
Indonesia						
ΔCA	-	0.51 (0.77)	4.98 (0.04)*	7.07 (0.02)*	0.09 (0.95)	-0.04 [-3.41]*
ΔFA	4.25 (0.05)*	-	1.21 (0.54)	2.56 (0.27)	1.85 (0.39)	-0.18 [-0.38]
ΔFDI	0.68 (0.19)	0.02 (0.99)	-	0.15 (0.92)	2.33 (0.31)	0.01 [1.46]
ΔPI	1.93 (0.38)	0.94 (0.62)	9.08 (0.00)*	-	1.56 (0.35)	-0.36 [-0.84]
ΔOI	0.48 (0.78)	1.88 (0.39)	9.79 (0.00)*	1.15 (0.56)	-	-0.18 [-0.52]
Korea						
ΔCA	-	0.42 (0.81)	1.46 (0.48)	2.34 (0.31)	0.47 (0.78)	-0.05 [-8.18]*
ΔFA	9.67 (0.00)*	-	2.01 (0.36)	2.42 (0.29)	0.42 (0.81)	0.27 [0.97]
ΔFDI	0.99 (0.61)	1.11 (0.57)	-	9.19 (0.00)*	2.01 (0.36)	-0.84 [-0.03]
ΔPI	1.94 (0.21)	1.46 (0.48)	2.21 (0.33)	-	0.83 (0.65)	-0.01 [-1.33]
ΔOI	9.33 (0.00)*	0.81 (0.66)	1.44 (0.48)	0.81 (0.67)	-	0.45 [0.77]
Philippines						
ΔCA	-	1.21 (0.54)	0.44 (0.81)	0.09 (0.95)	0.51 (0.77)	-0.05 [-5.32]*
ΔFA	7.67 (0.01)*	-	0.47 (0.78)	1.54 (0.46)	2.96 (0.22)	-0.00 [-0.03]
ΔFDI	7.39 (0.01)*	0.42 (0.81)	-	0.88 (0.64)	0.99 (0.61)	-0.19 [-0.68]
ΔPI	2.21 (0.33)	2.01 (0.36)	2.56 (0.27)	-	0.81 (0.66)	0.01 [1.56]
ΔOI	1.12 (0.56)	2.96 (0.22)	4.33 (0.05)*	3.99 (0.05)*	-	-0.42 [-0.82]
Thailand						
ΔCA	-	1.85 (0.39)	2.93 (0.23)	6.38 (0.04)*	0.65 (0.72)	-0.04 [-3.69]*
ΔFA	3.88 (0.05)*	-	1.53 (0.46)	0.09 (0.95)	1.46 (0.48)	-0.01 [-1.94]
ΔFDI	1.95 (0.37)	0.44 (0.81)	-	0.42 (0.81)	0.42 (0.81)	-0.01 [-1.35]
ΔPI	0.81 (0.66)	0.65 (0.72)	2.01 (0.36)	-	2.58 (0.27)	-0.18 [-0.93]
ΔOI	8.35 (0.00)*	1.84 (0.39)	2.96 (0.22)	0.51 (0.77)	-	-0.29 [-0.45]

Notes: All variables are in first differences with the exception of the lagged error-correction terms (ECT). Figures in the parentheses, ( ) are the *P*-value and [ ] are the t-statistics. The χ^2 statistics tests the jointly significance of the lagged values of the independent variables. Asterisk (*) denote the statistically significance at 5 per cent level.

4. Concluding remarks

Applying the standard time series estimation, this paper empirically examined the causality relationship between CA and FA in the four Asian crisis-affected countries. The purpose is to identify the source of imbalance in one account (current or financial) to the other. We also include the data from the 1997 crisis to examine the disparities in the empirical regularities for these countries. From the empirical examination, we found evidence supportive of long run cointegration relationship between CA and FA for all the countries in both periods.

In the causality analysis, we observed different pattern for each of the FA components with CA in which the short-term and long-term inflows of capital (such as FDI, portfolio investment and other investment) provide different economic consequences to the CA. For instance, invariant of the sampling period, CA Granger causes FA suggesting that CA can be used as the control policy variable for the flows of capital in these countries. Therefore, the innovation of CA (whether deficit or surplus) would be important

information for the liberalization and globalization of FA. Another possible explanation would be that a higher CA deficit increases the probability of a capital flow (PI and OI) contraction (see, Edwards, 2007). As noted in the causality experiment, the decomposed component of FA may be a substitute or complementary to one or the other. For example, PI Granger causes FDI in Korea while FDI cause CA IN Indonesia. These results further weaken the causal relationship from FA to CA, a possible explanation of their absence of causality.

The practical solution for this issue lies in the combination of different sources of policy options that includes the monetary, fiscal policies, monitoring of the short-term capital and exchange rate stabilization policies. Also, strengthening reformation and surveillance of the financial system is necessary for the success of the adjustment process. This study also provides ample warning that the pace and sequence of financial account components should not be overlooked.

Acknowledgement
The authors would like to thank Universiti Malaysia Sarawak (UNIMAS) for the research funding of this research. All remaining flaws are the responsibility of the authors.

References

Bosworth, B. and Collins, S. (1999) Capital flows to developing economies: Implications for saving and investment. *Brookings Papers on Economic Activity*, 1, 143–180.

Elliott, G., Rothenberg, T.J. and Stock, J.H. (1996) Efficient tests for an autoregressive unit root. *Econometrica*, 64, 813-836.

Edwards, S. (2007) Capital controls, capital flow contractions and macroeconomic vulnerability. *Journal of International Money and Finance*, 26, 814-840.

Gonzalo, J. (1994) Five Alternative Methods of Estimating Long Run Equilibrium Relationships. *Journal of Econometrics,* 60, 203-233.

Johansen, S. and Juselius, K. (1990) Maximum likelihood estimation and inference on cointegrating with applications for the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169-210.

Kaminsky, G.L. and Schmukler, S.L. (2003) Short-run pain, long-run gain: The effects of financial liberalization. *IMF Working Paper No. 34*.

Kwiatkowski, D., Phillips, P.C.B., Schmidt, P. and 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.

Osterwald-Lenum, M. (1992) A note with quartiles of asymptotic distribution of the maximum likelihood cointegration rank test statistics, *Oxford Bulletin of Economics and Statistics*, 53, 461–472.

Phillips, P.C.B. (1991) Optimal Inference in Cointegrated Systems, *Econometrica,* 59, 283-306.

Rao, B.B. (2007) Estimating Short and Long-Run Relationships: A Guide for the Applied Economist, *Applied Economics*, 39, 1613-1625.

Said, E.S. and Dickey, D.A. (1984) Testing for unit roots in autoregressive-moving average models of unknown order. *Biometrika,* 71, 599-607.

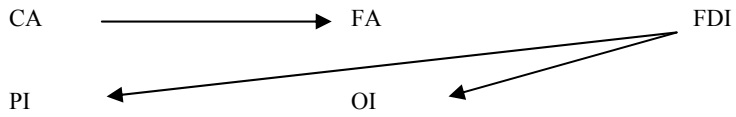
Wong, C. H. and Carranza, L. (1999) Policy responses to external imbalances in emerging market economies: Further empirical results. *IMF Staff Papers*, 46, 225–238.

Yan, H.D. (2005) Causal relationship between the current account and financial account. *International Advances in Economic Research*, 11, 149-162.

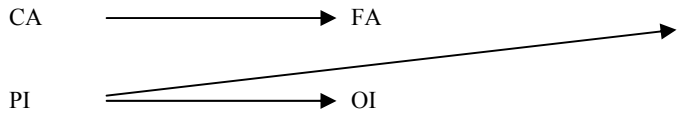
Yan, H.D. (2007) Does capital mobility finance or cause a current account imbalance? *Quarterly Review of Economics and Finance*, 47, 1-25.

Appendix A: Short run lead-lag linkages summarized from VECM (pre-crisis)

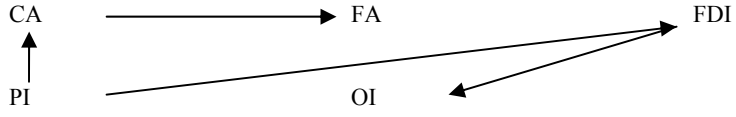
Indonesia



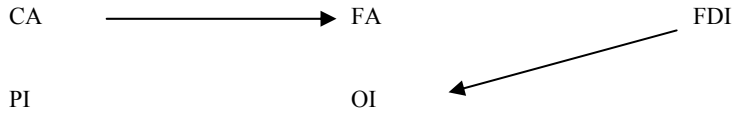
Korea



Philippines



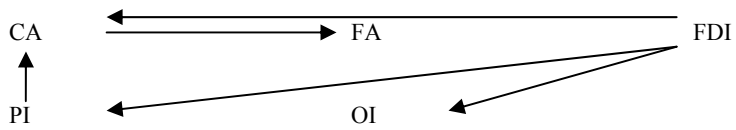
Thailand



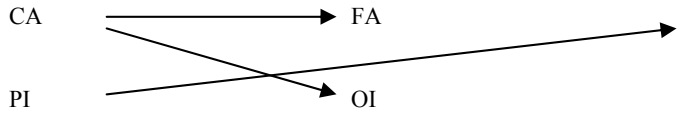
Notes: X→Y indicates that changes in X contain leading information for changes in Y (i.e. changes in X Granger causes changes in Y, or changes in Y lags or is influenced by changes in X). X←Y implies the reverse.

Appendix B: Short run lead-lag linkages summarized from VECM (post-crisis)

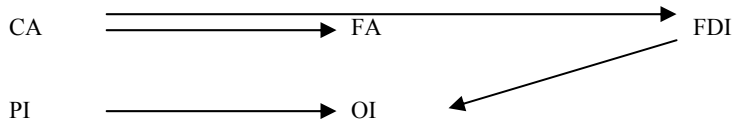
Indonesia



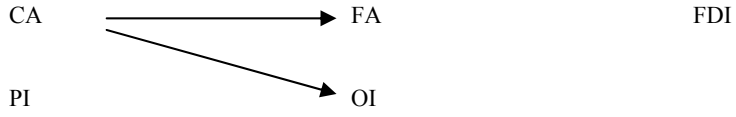
Korea



Philippines



Thailand



Notes: X→Y indicates that changes in X contain leading information for changes in Y (i.e. changes in X Granger causes changes in Y, or changes in Y lags or is influenced by changes in X). X←Y implies the reverse.