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Intertemporal Approach to the Current Account: Evidence from Malaysia and Indonesia

(Pendekatan Intertemporal untuk Kedudukan Akaun Semasa: Bukti dari Malaysia dan Indonesia)

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ABSTRACT

This article presents an application of the intertemporal approach to the current account positions of Indonesia and Malaysia over the past four decades. Comparing the results for these two emerging market economies, the model performed noticeable better for Malaysia. Meanwhile, Indonesia's external imbalances revealed the followings: deficits of the mid-1980s and 1990s prior to the 1997 crisis appeared to be an unsustainable path; surpluses during the post-crisis period deviated from the 'optimal path' significantly, implying that savings had reached a level that was beyond what would be required to support full 'consumption-smoothing'; and capital movements appeared to be excessively volatile.

Keywords: Present value model; current account sustainability; consumption-smoothing; Asian crisis

ABSTRAK

Artikel ini memaparkan satu aplikasi pendekatan intertemporal terhadap kedudukan akaun semasa bagi Indonesia dan Malaysia dalam tempoh empat dekad yang lalu. Model yang diperoleh menunjukkan hasil yang lebih baik bagi data Malaysia berbanding dengandata Indonesia. Sementara itu, ketakseimbangan luar bagi Indonesia mendedahkan perkara-perkara berikut: defisit yang dialami sekitar tempoh pertengahan 1980-an dan 1990-an sebelum krisis kewangan pada tahun 1997 telah melalui satu laluan yang tidak teguh; secara signifikan, lebihan dalam tempoh pasca-krisis dengan jelas telah terkeluar daripada laluan yang optimum, menyarankan yang simpanan telah mencapai satu tahap yang melebihi daripada yang diperlukan untuk menanggung kelicinan perbelanjaan sepenuhnya; dan pergerakan modal menunjukkan kemeruapan yang berlebihan.

Kata kunci: Model nilai semasa; keteguhan akaun semasa; kelicinan perbelanjaan; krisis Asia

INTRODUCTION

Malaysia, like its neighbouring Asian countries, has relied heavily on foreign capital to support its high gross domestic investment during the last two decades or so. The investment boom of the late 1980s and 1990s was primarily led by a surge in foreign capital, mainly foreign direct investment (FDI). During the period 1989 to 1996, capital inflows to Malaysia were equivalent to 9.3% of gross domestic products (GDP). Many scholars have connected the huge influx of foreign capital to high economic growth, particularly during the periods prior to the Asian financial crisis. By comparison, in order to support the saving-investment gap over the same period, Indonesia received only moderate amounts of foreign capital (4.2% of GDP).

Figure 1 depicts the behaviour of the current account deficits as a percentage of GDP for the two countries under review. It is evident from the figure that the current account (CA) position of Malaysia has been one of deficit since 1987, and it increased markedly during the early and mid-1990s due to foreign borrowing (mainly FDI) to fill up the saving-investment gap. A noticeable aspect of Figure 1 is that Malaysia's current account deficits were larger and appeared to be more persistent in comparison to the Indonesian external positions during the period preceding the 1997-98 financial crises. The external deficits for Malaysia widened to over 3.9% of GDP in 1995 and after recording a deficit of 4.2% of GDP in 1997, the current account recorded a surplus equivalent to 14% a year later. Meanwhile, Indonesia's current account deficits were relatively small in the early 1990s, ranging well below 2.1% of its GDP. Like Malaysia, the Indonesian current

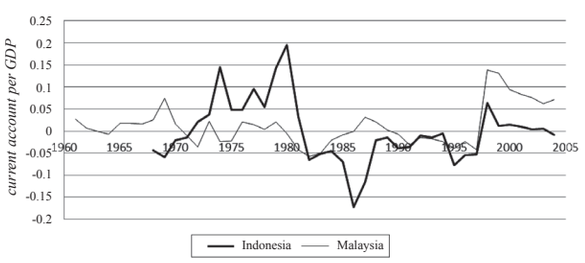

FIGURE 1. Actual Current Account Balance per GDP for Malaysia and Indonesia during 1960-2004 period

account imbalances improved significantly in the post-crisis period, averaging to about 2.6% over the period 1998 to 2004.

In the aftermath of the currency crisis, the external balance in these two countries took a sharp reversal, due mainly to the sharp fall of their currencies against the US dollar and the Japanese yen (see also Kim et al. 2009 on the issue). The current account balances in both countries moved to surpluses as their exports caught up with imports starting from 1998. We also notice that this was a typical pattern of the external balances in the other East Asian economies that were severely affected by the 1997 crisis, namely South Korea, Thailand and the Philippines. This begs the question: Should the external deficits recorded in the early and mid-1990s be a cause for concern to policy makers and foreign lenders? In other words, should governments intervene (using fiscal and/or monetary tightening) to alter the dynamic path of domestic investment and consumption in order to reduce the size of their private debts? Several scholars have argued that the faster a current deficit is deemed to be unstable, the sooner the relevant authorities can adopt appropriate corrective measures so that potentially damaging self-correcting measures such as large currency depreciation and the associated macroeconomic outcomes can be avoided. One is tempted to speculate the answer to this question because the size of the deficits during the period prior to the financial crisis, which was of the order of 2-10% of the GDP. Specifically, the 1997 currency crisis was associated with the sustainability of the external balance.

Although this is not the first paper to address the issue on current account sustainability, we found that the empirical evidence reported in the past literature is at best mixed (see for e.g., Kim et al. 2009; Lau et al. 2006; Ostry 1997; Summers 2000; Corsetti et al. 1999; Guest & McDonald 1999). Numerous theoretical and empirical studies have indicated that the financial crises in the 1990s, such as the Mexican crisis of 1994 and the Asian financial crisis of the 1997 were preceded by a deteriorating current account and/or investor panic (Kaminsky & Schmukler 1999; Miyakoshi 2000, amongst others). However, the high correlation between current account deficits and currency crisis observed in the late 1990s need not necessarily constitute a causal link between the two. In other words, problems in external balances do not always precede a currency crisis. Singapore, another ASEAN member, is a case in point, where the country recorded current account deficits every year from 1970 to 1985. These deficits over an extended period of time were never a problem to the domestic policymakers and as such, no stabilization or structural reform were undertaken to correct the imbalances during that period (Ostry 1997). This is also in line with Sachs (1981) argument that stressed a deficit is not an issue in itself as long as a window for new investment opportunities exists. Indeed, more recent studies have indicated that the threshold level for sustainability may varies from one country to another depending on the country characteristics and the type and purpose of external borrowing. Bosworth puts it, "... although the Asian crisis countries had surprisingly large current-account deficits, the capital inflows were associated with high investment, not consumption" (Radelet & Sachs 1998: 81).

This study is motivated by the evolution of Indonesia's and Malaysia's current account deficits – the recurring current account deficits and the apparent close link between the size of the current account and economic crisis, including the 1997 financial crisis. Specifically, the primary goal of this article is to investigate the usefulness of the intertemporal (consumption-smoothing) model by demonstrating its ability to closely track the evolution of the actual current account balances. According to this present value model (PVM), a country's current account is essentially the result of rational consumption – saving and investment decisions of agents within the economy. In the absence of distortion (or market failures) the outcome of the current account should not be a matter of concern to the relevant authorities, regardless of its size or sign.

For the purpose mentioned above, we estimated the consumption-smoothing current account path using a vector autoregressive (VAR) model and established it as the "benchmark" path, and to validate the theoretical restriction implied by the intertemporal current account model by using an array of formal statistical tests. Additionally, as in the past literature, the optimal size and volatility of the current account imbalances were computed in order: (1) to determine whether the current account satisfy the external solvency condition; and (2) to assess the extent to which these two ASEAN countries may borrow and lend from global capital markets. The latter is also employed by earlier authors to indicate the degree of capital mobility for the country under investigation.

The optimality and excessiveness of the external account for the two emerging economies were examined using data obtained over the four decades that ended in 2004. Hence, we extended the earlier work of Ostry (1997) and Hussein and de Mello (1999), among others by extending the data to include the post-1997 period, where the current accounts from the two countries moved into surplus after a sharp fall in domestic currencies around 1998, and have been in surplus since then (see also Kim et al. 2009).

To highlight our major empirical results, we find that there is little evidence to support the view that the size of the current account was the major cause of the recent crisis for the case of Malaysia. Also, all of the empirical evidence suggests that the restrictions implied by the consumption-smoothing could not be rejected in its application to the Malaysian data. However, some of the restrictions implied by the model, including "no excessive volatility" of foreign capital flows were rejected for the Indonesia's case. This finding by itself suggests that capital mobility in Indonesia is not perfect. All in all, the empirical results revealed that there may be less scope of optimal consumption-smoothing and international risk-pooling for the case of Indonesia, even during the post-crisis period.

The rest of this paper is organised as follows: the consumption-smoothing approach to the current account and the key econometric implications of the model are presented in Section 2. The empirical results of the study are presented and discussed in Section 3, and in Section 4 we present a summary and conclusion of the results of the investigation.

THEORETICAL FRAMEWORK

The theoretical model on the intertemporal approach to the current account developed in Sachs (1982) and Ghosh (1995), amongst others, provides a useful framework to address some of the important issues relating to external balance in a small open economy like that of Malaysia and Indonesia. We have selected these two countries for this study because the underlying assumptions of the model are more likely to be satisfied. The model predicts that a country's current account will be in deficit (surplus) whenever the national cash flow – defined as output minus investment minus government spending – is expected to rise (fall) overtime. The optimum external borrowing generated by the model serves as a benchmark against which the actual current account may be judged. For example, if the actual current account exceeds the optimum series generated by the intertemporal current account model, it is said to be excessive. The model treats the current account balance as the end product of forward looking savings and investment decisions and predicts that the transitory shocks to output are primarily reflected in national saving while aggregate consumption is smoothed.

A brief review of the literature will reveal that the model has been applied in a series of papers to calculate the optimal and determine the sustainability a country's current account. Examples of the application of the model include Kim et al. (2006) based on data from New Zealand, Adedeji (2001) on Nigerian data, Agénor et al. (1999) on French data, Apergis et al. (2000) on Greece data, Bergin and Sheffrin (2000) on Australian, Canadian, and United Kingdom data, and Cashin and McDermott (1998) on Australian data. In the context of ASEAN countries, only a few researchers in the literature would be found and include Guest (1999), Guest and McDonald (1999), Hussein and de Mello(1999), Ostry (1997), Milesi-Ferretti and Razin (1996) and more recently Baharumshah and Ismail (2012). The following discussion demonstrates and highlights some important aspects and econometric implications of the theoretical model when applied to countries under study.

Considers a small open economy represented by a single agent who can borrow and lend freely in international capital markets at the fixed world real interest rate, *r*. Then, the identity that links net foreign asset accumulations, that is the current account, to the economy's saving-investment balance and constitutes the economy's dynamic budget constraint faced by the representative agent, can be captured by the following current account identity:

$$CA_t \equiv B_{t+1} - B_t = Y_t + rB_t - C_t - I_t - G_t \tag{1}$$

where Y_t is real output or GDP, B_t is the beginning of period real net stock of outstanding foreign assets (debts if negative), Y_t+rB_t is real gross national product (GNP), rB_t is the interest income on the outstanding stock of net foreign assets, I_t is the real investment, G_t is real government consumption, and CA_t is the real current account balance which equals real GNP minus real private and public expenditure, $C+I+G$. On taking period t conditional expectations of the variables in Eq. (1) and recursively eliminating the future values of the stock of net foreign liabilities it can be shown that the following household budget constraint can be derived;

$$-(1+r)B_t = \sum_{j=0}^{\infty} \left(\frac{1}{1+r}\right)^j E_t \left(Y_{t+j} - C_{t+j} - I_{t+j} - G_{t+j}\right)$$
$$+ \lim_{T\to\infty} \left(\frac{1}{1+r}\right)^T E_t \left(-B_{t+T+1}\right) \tag{2}$$

Setting the country's budget processes to be externally solvent imposes the *no Ponzi* scheme condition and this external solvency requires that the $\lim_{T\to\infty} \left(\frac{1}{1+r}\right)^T E_t \left(-B_{t+T+1}\right)$. If the condition is satisfied, the discounted value of the expected future stock of debt converges to zero as the time horizon approaches infinity. Then Eq. (2) would imply that;

$$-(1+r)B_t = \sum_{j=0}^{\infty} \left(\frac{1}{1+r}\right)^j E_t \left(Y_{t+j} - C_{t+j} - I_{t+j} - G_{t+j}\right)$$
$$\equiv \sum_{j=0}^{\infty} \left(\frac{1}{1+r}\right)^j E_t TB_{t+j} \tag{3}$$

This meansthat the current outstanding real stock of debt, $-(1 + r)\, B_t$, must be equal to the present value of current and expected future trade balance surpluses *TB*, which can also be defined as real GDP minus real private and public expenditure.

By accepting the intertemporal budget constraint, the description of the mechanism that gives rise to current account imbalances requires an explanation of the way the components of aggregate expenditure and output are determined. Thus,we further assume that the agent with rational expectations maximizes lifetime utility is:

$$\sum_{j=0}^{\infty} \beta^j E_t \{u(C_{t+j})\} \tag{4}$$

In Eq. (4), β is the subjective discount factor, E_t is the conditional expectations operator based on the information set of the representative agent at period *t*, and *C* is the private consumption. The utility function *u(C)* is instantaneous, strictly increasing in *C* and strictly concave. For a small open economy, investment should be undertaken until the marginal product of capital equals the world interest rate, thus resulting in

an investment rule that is independent of consumption. The small country assumption allows for the separation between consumption and investment decisions. This suggests that optimal consumption C_t^* can be chosen independently of investment and output decisions. In particular, using a quadratic utility function in a form of $u(C) = C - \frac{a_0}{2}C^2$: , where $a_0 > 0$. Kim et al. (2006) derived the optimal path for consumption by maximizing Eq. (4) subject to the budget constraint as given by Eq. (3). By various mathematical manipulations, they arrived at the following expression for optimal consumption C_t^*:

$$C_t^* = \frac{r}{\theta}\left\{B_t + \frac{1}{1+r}E_t\left[\sum_{j=0}^{\infty}(1+r)^{-j}\left(Y_{t+j} - I_{t+j} - G_{t+j}\right)\right]\right\} + \left(\frac{-\alpha}{r}\right) \quad (5)$$

where $\alpha = \frac{1}{a_0}\left[1 - \frac{1}{\beta(1+r)}\right]$ and $\theta = \frac{\beta(1+r)r}{\beta(1+r)^2-1}$. The optimal consumption level C_t^* can be decomposed into the consumption smoothing part and the consumption-tilting part: if $\theta < 1$(given $\beta\ (1 + r) > 1$, the representative household (nation) is consuming more than the permanent cash flow; that is, it tilts consumption towards the future. It should be noted that there are no consumption tilting dynamics if $\theta = 1$, and consumption equals the country's permanent cash flow. In the absence of consumption tilting, the optimal consumption level becomes;

$$C_t^S = r\left\{B_t + \frac{1}{1+r}E_t\left[\sum_{j=0}^{\infty}(1+r)^{-j}\left(Y_{t+j} - I_{t+j} - G_{t+j}\right)\right]\right\} \quad (6)$$

where C_t^Sdenotes consumption-smoothing component of the optimal consumption. This is the annuity value of the representative's total discounted wealth net of investment and government consumption. The consumption-tilting component is the difference between the optimal level of consumption and its smoothing component. Thus, the relationship between the optimal level of consumption and its smoothing component can be represented as follows:

$$C_t^S = \theta C_t^* + \frac{a\theta}{r}. \quad (7)$$

The consumption-smoothing component of the current account is defined as;

$$CA_t^{S*} = Y_t + rB_t - I_t - G_t - C_t^S = Y_t + rB_t - I_t - G_t - \theta C_t^* - \frac{a\theta}{r}. \quad (8)$$

Substituting Eq. (6) into Eq. (8) yields;

$$CA_t^{S*} = Y_t + rB_t - I_t - G_t - r\left\{B_t + \frac{1}{1+r}E_t\left[\sum_{j=0}^{\infty}(1+r)^{-j}\left(Y_{t+j} - I_{t+j} - G_{t+j}\right)\right]\right\}$$

$$= Z_t - \frac{r}{1+r}\sum_{j=0}^{\infty}(1+r)^{-j}E_tZ_{t+j} \quad (9)$$

where $Z=Y-I-G$ is the net output (also termed as the national cash outflow) and by rearranging the terms on the right-hand side, Eq. (9) yields:

$$CA_t^{S*} = -\sum_{j=1}^{\infty}(1+r)^{-j}E_t\left(\Delta Z_{t+j}\right) \quad (10)$$

This expression links the current account balance to the expectation of future discount changes in net output. It reveals that the consumption-smoothing component of the current account is in deficit when the present discounted value of future net output changes is positive, and vice versa. The model also implies that the consumption-smoothing component of the current account itself should incorporate all information on future net output changes. Eq. (10) can be viewed as a country's net cash flow. If the representative agents expect the national cash flow to increase (fall) in the future, they will increase (reduce) current consumption and this will give rise to a current account deficit (surplus).

This consideration led the existing literature to estimate an unrestricted (vector autoregressive) VAR in ΔZ_{t+j} and CA_{t+j}^S, where $CA_{t+j}^S$is the actual consumption-smoothing component of the current account:

$$CA_t^S = Y_t + rB_t - I_t - G_t - \theta C_t \ - \frac{a\theta}{r}$$
$$= Z_t + rB_t - \theta C_t \ - \frac{a\theta}{r}. \quad (11)$$

It is worth noting that if Z_t is $I(1)$, then, under the null hypothesis that $CA_{t+j}^S = CA_{t+j}^{S*}$, Eq. (10) implies that CA_t^S must be an $I(0)$ process. This means that the left-hand side of Eq. (11) is also an $I(0)$ (a stationary process). Therefore, if $Z+rB$ and C are both $I(1)$, then θ and $\theta\alpha/r$ may be obtained from the co-integrating regression of $Z+rB$ and C.

For the VAR estimation, it was necessary to define a way to de-trend the actual current account and derive the consumption-smoothing component. Thus the VAR model could be conveniently written as;

$$\begin{bmatrix}\Delta Z_{t+j} \\ CA_{t+j}^S\end{bmatrix} = \begin{bmatrix}\psi_{11} & \psi_{12} \\ \psi_{21} & \psi_{22}\end{bmatrix}\begin{bmatrix}\Delta Z_{t+j-1} \\ CA_{t+j-1}^S\end{bmatrix} + \begin{bmatrix}\varepsilon_{1t+j} \\ \varepsilon_{2t+j}\end{bmatrix}, \quad (12)$$

where ε_1 and ε_2 are disturbance terms with a conditional mean of zero, and where ΔZ and CA^S are now expressed as deviations from the unconditional means. Making use of the matrix in Eq. 13 below;

$$E_t\begin{bmatrix}\Delta Z_{t+j} \\ CA_{t+j}^S\end{bmatrix} = \begin{bmatrix}\psi_{11} & \psi_{12} \\ \psi_{21} & \psi_{22}\end{bmatrix}^j\begin{bmatrix}\Delta Z_t \\ CA_t^S\end{bmatrix}, \quad (13)$$

and substituting Eq. (12) and Eq. (13) into Eq. (10) led to the estimate of the model implied consumption-smoothing component of the current account, or simply the optimal current account as shown by Eq. 14;

$$CA_t^{S*} = -\sum_{j=1}^{\infty}(1+r)^{-j}[1 \quad 0]\begin{bmatrix}\psi_{11} & \psi_{12}\\ \psi_{21} & \psi_{22}\end{bmatrix}^j\begin{bmatrix}\Delta Z_t\\ CA_t^S\end{bmatrix}$$
$$= -[1 \quad 0](1+r)^{-1}\Psi(I-(1+r)^{-1}\Psi)^{-1}\begin{bmatrix}\Delta Z_t\\ CA_t^S\end{bmatrix}$$
$$= [\Phi_{\Delta z} \quad \Phi_{CA}]\begin{bmatrix}\Delta Z_t\\ CA_t^S\end{bmatrix}. \qquad (14)$$

There were two important hypothesis tests that needed to be undertaken to validate the present research. The first hypothesis concerns the role of the current account as a signal of future changes in the national cash flow. This hypothesis is equivalent to testing whether the current account Granger-causes changes in the national cash flow: thus, if the present value model described in Eq. (10) is true, then today's current account should reflect the agents' expectations about future movements in the national cash flow. This hypothesis can be formally be tested by estimating the model using the following equation:

$$\Delta Z_t = \pi + \alpha\Delta Z_{t-1} + \beta CA_{t-1}^s + \varepsilon_t \qquad (15)$$

and testing whether β is negative and statistically significant. This will be the case if the model is true and agents use more information than simply lagged changes in the national cash flow to forecast future changes in the national cash flow.

The second test was to justify the validity of the present value model (as described by Eq. (10)), which is also called the orthogonality test. Eq. (10) holds if and only if $E_{t-1}[CA_t^{S*} - \Delta Z_t - (1+r)CA_{t-1}^{S*}] = 0$. Therefore, if the model is correct, so that the estimated optimal consumption-smoothing current account, CA^{S*}, and the actual consumption-smoothing component of the current account, CA^S, are equal, then $R_t = CA_t^{S*} - \Delta Z_t - (1+r)CA_{t-1}^{S*}$ should be statistically uncorrelated with lagged values ΔZ of and CA^S series. This restriction can also be tested by constructing R_t using the following regression equation;

$$R_t = \pi + \theta_1 CA_{t-1}^s + \theta_2 \Delta Z_{t-1} + v_t \qquad (16)$$

and testing the null hypothesis H_0: $\theta_1=\theta_2=0$. The rejection of the null hypothesis in favour of the alternative hypothesis provides evidence against the present value model.

The two statistical tests mentioned above did not provide any indication of how well the model fits the actual data. Therefore to this end, we estimated the corresponding bivariate VAR model and used the results from the model to generate the optimal current account. A comparison of the estimated optimal values with the actual values of the current account should provide an indication of how well the intertemporal current account model performs.

EMPIRICAL RESULTS

Annual data covering the period 1960 to 2004 was utilized in our empirical analysis. For the 1960-1999 period, the annual series of private consumption (*C*), domestic investment (*I*), and gross national product (*Y+rB*), all are GDP ratios and were derived from their respective ratios to the GDPs obtained from Heston, Summers and Aten's *Penn World Table* published by the

TABLE 1. Test for Unit Roots

Test	Indonesia		Malaysia	
	Level	First difference	Level	First difference
Augmented Dickey-Fuller Test (ADF)				
C	-1.1302	-6.5502***	-3.2999*	-6.5905***
Z	-1.5012	-7.7892***	-1.5067	-5.2838***
Z+rB	-0.2135	-9.0369***	-1.3965	-5.6141***
CA	-3.5446**	-6.4950***	-3.3127*	-7.2628***
Phillips Perron Test (PP)				
C	-1.2883	-6.5596***	-3.2999*	-7.4109***
Z	-1.5012	-7.7892***	-1.5067	-5.2838***
Z+rB	-0.3751	-9.0369***	-1.3966	-5.6141***
CA	-3.5866**	-9.4960***	-3.3127*	-7.2628***
KPSS Test				
C	4.1426***	0.1105	0.5903***	0.0323
Z	3.4375***	0.0591	2.0489***	0.0445
Z+rB	10.0510***	0.0785	2.2844***	0.0439
CA	0.0792	0.1021	0.8025***	0.0275
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Z	-1.5012	-7.7892***	-1.5067	-5.2838***
Z+rB	-0.2135	-9.0369***	-1.3965	-5.6141***
CA	-3.5446**	-6.4950***	-3.3127*	-7.2628***

Notes: In all of tests, we assume that the data has a constant but with no (linear) trend. All the lags values and bandwidths are determined by Eviews-5. The lags for the ADF test and the PP test are chosen based on the SIC, while the bandwidths for KPSS tests are based on Newey-West by using Bartlett kernel. The *, ** and *** indicate that the statistics are significant at 10%, 5% and 1% levels, respectively.

University of Pennsylvania's Center for International Comparison. The series for current account to GDP ratio (*CA*), was computed from the identity (*Y*+*rB*)-(*C*+*I*+*G*), while the series of national cash flow to GDP ratio (*Z*), was calculated as *Z*=*Y*-*I*-*G*. It follows that *rB* = *CA*-(*Y*-*C*-*I*-*G*), where *rB* is interest income on the outstanding stock of net foreign assets to GDP ratio, which in turn enabled us to construct the needed *Z*+*rB* series. For the 2000-2004 period, private consumption, domestic investment, gross national product and the GDP series were obtained from the IMF's *International Financial Statistics*, and the current account balances were taken from the Asian Development Bank's Key Indicators 2005.Finally, for simplicity, the world interest rate *r*, was set at 4% per annum, a value typically used for this type of study.

We commenced the analysis by performing standard unit roots tests for all the series under investigation (*C*, *Z*, *Z*+*rB* and *CA*), first on levels and then on their first differences. To this end, we applied the standard Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. Since the conventional unit root test are themselves subjected to low power and therefore unable to reject the nonstationary null in small sample, we also applied the tests advocate by Kwiatkowski et al. (1992). The test which is better known as the KPSS (Kwiatkowski-Phillips-Schmidt-Shin) test, unlike its predecessor, takes stationarity as the null hypothesis. For Indonesia, results from the all three univariate tests suggest that the current account *CA,* is a stationary variable while the other variables in the model appear as an *I*(1) process at the usual significance levels. As shown in Table 1, similar findings based on the same unit root tests could also lead to the same conclusion as in the case of Malaysia. Specifically, the current account variable *CA,* is an *I*(0) process while *Z, Z*+*rB* and *CA* may be characterized as *I*(1) variables. A recent paper by Lau and Baharumshah (2005), Lau et al. (2006) present statistical evidence which suggests that the current account of most of the Asian countries are mean reverting, meaning that there is no evidence of insolvency of the external balances. Andreosso-O'Callaghan and Kan (2007) also found that the current account deficit for Indonesia prior to the 1997 crisis was in fact on a sustainable path. In all, these results reveal that the current account in both countries appears to be solvent, at least from the long-term perspective. What this means is that the current account deficits observed in the 1990s are temporary (not persistent) and hence on sustainable path.

Next, we estimated the unrestricted VAR model of and $CA^S$and the results of the fitted model are summarized in Table 2. As mentioned earlier, the present value model implies that current account should 'Granger-cause' future changes in the net output (or changes in national cash flow). For Indonesia, the slope coefficient of in Eq. (15), β, carries the expected negative (-0.1682) but is not statistically significant at 5% level. Thus, the null hypothesis of no Granger-causality running from current account to national cash flow (net output) cannot be rejected by the data. Turning to Malaysia, we observe that β is negative (-0.3667) and significant at the 5% level. In this case, the null hypothesis of no Granger causality is easily rejected by the data. The distinguishing feature of this finding is that it supports the proposition that today's current account reflects agents' expectations about future movements in the national cash flow, and therefore in consonance with that predicted by the present-valued model (Otto 2003). It is worth pointing out that the ability of the current account to forecast future changes in national cash flows is only a weak (less stringent) condition implied by the present value model. The evidence presented in earlier studies in the literature seems to show mixed results.

TABLE 2. Unrestricted VAR Model Parameters of Δ*Z* and *CA*

Country	Variable	ΔZ_t	CA_t
Indonesia	ΔZ_{t-1}	-0.1766	-0.2116
		(0.1587)	(0.1493)
		[-1.1127]	[-1.4175]
	CA_{t-1}	-0.1682	0.6202
		(0.1360)	(0.1279)
		[-1.2371]	[4.8506]
Malaysia	ΔZ_{t-1}	0.3994	0.1784
		(0.1573)	(0.1438)
		[2.5397]	[1.2405]
	CA_{t-1}	-0.3667	0.6347
		(0.1393)	(0.1273)
		[-2.6334]	[4.9854]

Notes: The standard errors and *t*-statistics are given in the bracket ( ) and [ ] parentheses, respectively.

Our next test involved regressing $R_t = CA_t^{S*} - \Delta Z_t - (1+r)CA_{t-1}^{S*}$ on CA_{t-1}^{S} and ΔZ_{t-1}. The results of the regression are presented in Table 3. We observed that the coefficients of ΔZ_{t-1} were all insignificant for both countries, indicating that R_t is orthogonal to both Δ*Z* and. Additionally, the null hypothesis: H_0: $\theta_1=\theta_2=0$ is rejected by the data using a standard Wald test. The Wald statistic for the joint test is χ^2 with 2 degrees of freedom. As shown in Table 3, the computed χ^2-statistics are 0.0001 [*p*-value = 0.9999] and 0.0114 [*p*-value = 0.9887] for Indonesia and Malaysia, respectively. Failure to reject the null hypothesis in this case suggests that R_t is uncorrelated with the lagged values of Δ*Z* and ΔCA^S, and hence is consistent with the present value model of the current account. The empirical support of the strong implication of the model implies that consumers in the two ASEAN countries had little difficulty in smoothing consumption through borrowing and lending. Put differently, there is no evidence to confirm that consumers faced liquidity constraint, even during the period of economic difficulties.

To further shed insight on the explanatory ability of the model, we plotted the time profile of the optimal path of the current account along with its actual series as usually done in the literature. As we can observe from the plot in Figure 2, although the results from the Granger causality

TABLE 3. The Estimated Regression Model for R_t

Coefficient	Estimated Value	Std. Error	t-Statistic	*p*-value
Indonesia				
π	0.0006	0.0042	0.1380	0.8909
θ_1	-0.0009	0.1346	-0.0059	0.9954
θ_2	0.0018	0.1160	0.0152	0.9880
Malaysia				
π	0.0046	0.0022	2.0817	0.0438
θ_1	-0.0022	0.0325	-0.0691	0.9453
θ_2	0.0093	0.0615	0.1507	0.8810

Wald test: $H_0: \theta_1 = \theta_2 = 0$

Country	F-statistic	p-value
Indonesia	0.0001	0.9999
Malaysia	0.0114	0.9887

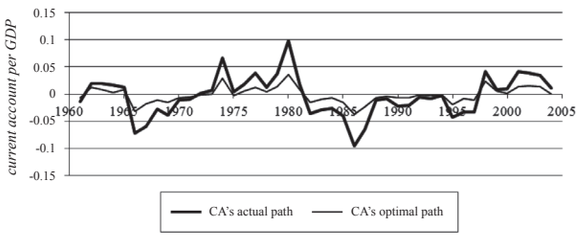

FIGURE 2. Comparison of Indonesia's Actual and Optimal Paths of the Current Account (CA) for 1960-2004 Period

test casts doubt on the validity of the present value model to the Indonesian data, the predicted values seem to adequately capture the direction of the movement of the actual path of the current account variable throughout the period. Also the deviation between the optimal and actual current account variable provides an informal evidence of either excessive borrowing for consumption purposes or excessive savings. Furthermore, it can be observed from the time profile of the two current account series that Indonesia was in the period of excessive borrowing during the economic recession of the mid-1980s as well as in the mid-1990s (see Figure 2). Although the deviations from the optimum path were significant during these periods, they were only temporary, as is evident from the unit root test. Finally, the prediction of the VAR model appears to support the emerging consensus that the financial crisis of the late 1990s contributed to the current account surplus and the "global saving glut" (Gruber & Kamin 2007).

The actual and optimal consumption-smoothed current accounts for Malaysia are presented in Figure 3. Visual inspection of Figure 3 shows that the predicted plot of the optimal consumption-smoothed current account follows and tracks the actual observation data at the major turning points for most of the sample period, except a brief period in the 1980s (when the economy took a sharp fall due to the commodity crisis). In addition, we find that the correlation between the optimal consumption and the actual data of the current account (0.96) to be highly

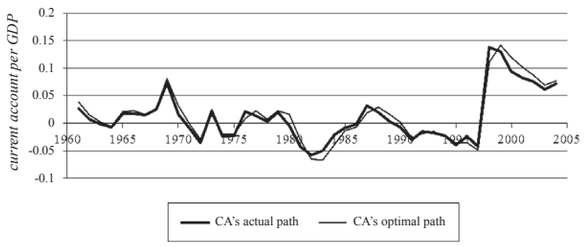

FIGURE 3. Comparison of Malaysia's Actual and the Optimal Paths of the Current Account (CA) for 1960-2004 Period

correlated over the entire sample period. The post-1998 period marked a new turn in the evolution of the external balance. The shift into surplus during the recent years reflects a substantial increase in exports (with import falling) due to a sharp depreciation of real effective exchange rates. Thus, the simple model captures not only the statistical aspects but also the important economic events in the ASEAN region, including the recent saving glut due to the financial crisis.

In order to check the statistical significance of the deviation between the actual and the estimated paths of the current accounts of both countries, we construct the two-standard deviation bands of the estimated models by simulation using the @RISK software. To this end, we assumed that each data point was random with a triangular-shape probability distribution function. Relying on Monte-

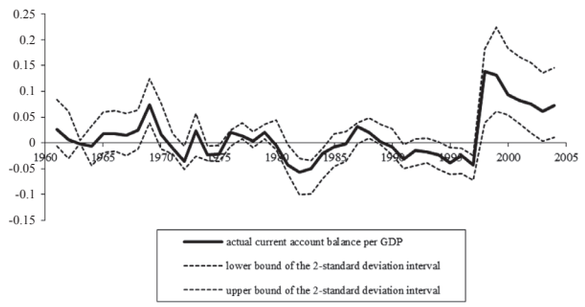

FIGURE 4.Two-Standard Deviation Bounds for the Estimated Model and the Malaysia's Actual Current Account (1960-2004)

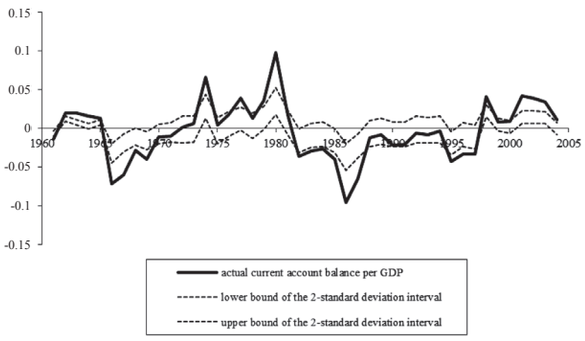

FIGURE 5.Two-Standard Deviation Bounds for the Estimated Model and the Indonesia's Actual Current Account (1960-2004)

Carlo sampling methods, we simulated the data 5000 times, and a series of estimated current account values is generated for each interaction. We then estimated the standard deviation for each data point using the result of the simulation.

The two-standard deviation bands of the estimated current account paths for both countries are presented in Figure 4 and Figure 5. Interestingly, almost all of the observations for the actual current account balance fall within the two-standard deviation band for the case of Malaysia. On the other hand, several sub-periods of the Indonesian actual current account series do not fall within the two-standard deviation band, especially for the periods of 1962-1969, 1979-1987 and 1995-1998. While the results confirm the robustness of the estimated model of the Malaysian current account balance, a similar conclusion cannot be made for Indonesia. Therefore, it appears that these results obtained from the simple model do not support the validity of the present value model for the Indonesian data.

ON THE EXCESS VOLATILITY OF INTERNATIONAL FINANCIAL CAPITAL FLOW

Another important aspect relating to the external account relates to the issues of 'excess volatility' of international financial capital flow. To investigate the issues of 'excess volatility' of international financial capital flow, a formal comparison of the variance of the current account derived from the intertemporal model with the variance of the actual current account would indicate the extent to which a country may borrow (lend) freely from the global financial markets (subjected to a no-Ponzi game condition) at world interest rates (Ghosh 1995; Agénor et al. 1999). From another perspective, this ratio provides an indication as to whether foreign capital flows in the host country are appropriately utilized for consumption-smoothing purposes. We formally tested the null hypothesis of equal variances between the actual and the optimal paths of the current account as predicted by the consumption smoothed model. Rejection of the null hypothesis would imply that there is potential of excess volatility in foreign financial capital flows.

As shown in Table 4, the results obtained from the *F*-test, the Bartlett test, the Siegel-Tukey test, the Levene test and the Brown-Forsythe test, all indicate that the null hypothesis was rejected at the 5 percent significance level for Indonesia. The result reveals the possibility of 'excess volatility' in (foreign) financial capital flows and hence possibly inappropriate utilization of these flows for domestic consumption purposes. It also suggests that speculative factors are major driving forces behind foreign capital inflows in the countries reviewed. The null hypothesis as shown in Table 4 cannot be rejected for Malaysia, implying that the economy was receiving sufficient capital inflows to ensure consumption-smoothing during the period of the investigation.

TABLE 4.Test for Equality of Variances between the Actual and the Optimal Paths of the Current Account

Method	test statistic [p-value] Indonesia	Malaysia
F-test	06.5777 [0.0000]	1.1496 [0.6497]
Siegel-Tukey	04.5357 [0.0000]	0.4799 [0.6313]
Bartlett	33.1731 [0.0000]	0.2063 [0.6497]
Levene	22.1940 [0.0000]	0.1103 [0.7407]
Brown-Forsythe	22.1546 [0.0000]	0.1656 [0.6851]

To provide a better picture and understanding, we computed the volatility of the actual and the optimal paths of the current account. To accomplish this, we applied the Box-Jenkins procedure to obtain the appropriate ARMA representation of both series, and calculated the measure of volatility in terms of the square of the fitted residuals from the estimated ARMA representation. The volatility of the current account for both countries is displayed graphically in Figures 6 and 7. Consistent with the empirical results of the equal variance test, these figures showed that the actual path of Indonesia's current account is more volatile than the optimal path, while for Malaysia the difference in the volatility series is hardly noticeable.The greater volatility by the actual current account in the early sample period is hardly surprising given that capital controls were in place. Overall, our findings suggest that the financial regulation still remain a fair characteristic in Indonesian economy. This is also in line with our earlier studies

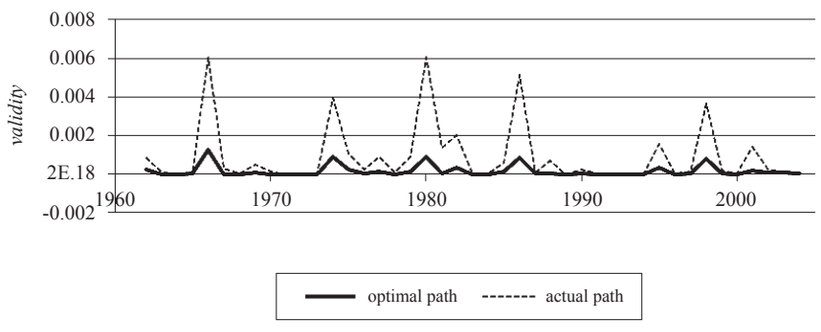

FIGURE 6.The Volatilities of the Actual and the Optimal Paths of Indonesia's Current Account (1960-2004)

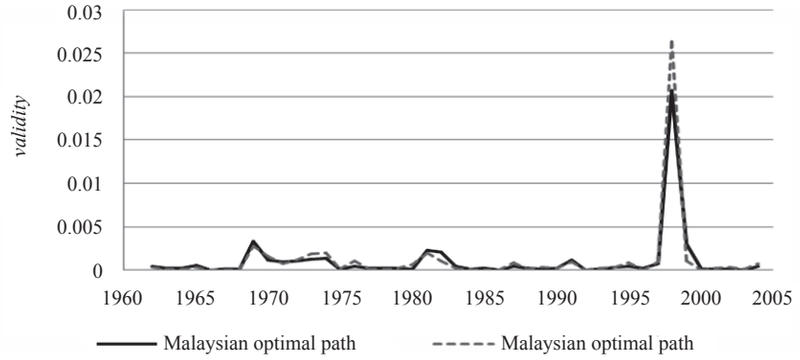

FIGURE 7. The Volatilities of the Actual and the Optimal Paths of Malaysia's Current Account 1960-2004

that discovered the retention coefficient from savings-investment regression is quite high for Indonesia (0.76) using recent data.

CONCLUSIONS

The importance of the implications and appropriate policy responses on the amount and persistence of current account deficits has received considerable attention by researchers, economists and policymakers even before the crisis of the 1990s. From the ASEAN perceptive, the concern has been heightened by the substantial increase in the current account deficits during the early and mid-1990s. The present paper contributes to this debate by examining the external solvency and the optimality of the intertemporal consumption-smoothing in relation to current account drawn from two individual country studies, namely Malaysia and Indonesia.

In general, we observed that all the restrictions implied by the basic intertemporal model were easily satisfied when applied to Malaysia's case: Malaysia's current account and was consistent with optimum consumption-smoothing, the solvency condition was easily met, and there was no evidence to show that there was excess volatility in capital inflows. These findings are consistent with optimal smoothing for the full sample period. All in all, the results show that the actual consumption-smoothed current account path is within the one standard-deviation band until the second half of the 1990s. Therefore, it is reasonable to conclude that the present value model fits the data reasonably well and that Malaysia's external balances were used to smooth consumption optimally. This means that the fluctuations in the current account are the outcome of consumption smoothing pattern. It also implies that Malaysia had little difficulty in the past in smoothing consumption through borrowing and lending during events involving exogenous shocks.

Focusing on Indonesia's current account imbalances, the picture drawn from the simple model is not obvious. The statistical evidence failed to reject the following hypothesis: a) the current account does not Granger-cause changes in national cash inflows; and b) variance of the actual current account is not equal to the optimum consumption-smoothing current account. We noted that this variance ratio test is a joint test of the assumption of high degrees of capital mobility and the validity of the intertemporal model (Ghosh 1995; Kim et al. 2006). The evidence also failed to reject the hypothesis that) the consumption smoothing component of the current account predicted by the model lies outside the two standard deviation band of the current account balance in most of the sampling periods.

We also found that for Malaysia the actual current accounts were more volatile than the optimal movements predicted by the consumption-smoothing model, hence suggesting high degrees of capital mobility between Malaysia and the global financial markets. Indeed, we did not find any systematic tendency for the actual current account movements to be smaller than the optimum movements, as would be the case if there were effective barriers to affect international capital mobility. It is possible that our empirical finding suggests that Malaysia's capital control implemented over 1998-2005 (June) was ineffective during the brief period in the post-crisis era. We noted that despite the capital control in place during the period 1998-2003, a recent study based on real interest parity, revealed that Malaysia's capital market is integrated with the world's major capital markets, namely the US and Japan (see Baharumshah et al. 2005, 2008; Holmes et al. 2011).

As for Indonesia, it is clear that in the years preceding the crisis, the actual current account has been smaller than the optimal current account, as predicted by the consumption-smoothing model. Indeed, this finding reflects excessive savings rather than excessive consumption. Unlike the case of Malaysia, we found statistical evidence to support the hypothesis that speculative factors were driving capital movements in Indonesia especially, during the period prior to the 1997 currency crisis (actual movements more volatile than predicted movements). The actual current account deficits were greater than the optimal current account deficit during these periods. In the post-1998 period, the actual current account balance exceeded the optimal current account balance (excessive

savings), which in turn, suggested that capital inflow has been less desirable in Indonesia. Finally, the model appears to work well for Malaysia, even though capital controls were implemented during the post-crisis period. In view of the poor results of the intertemporal model when applied to the Indonesia's situation, it is suggested that improvement in terms of both the methodology and model would be required in any future investigations. The work of Bergin and Sheffrin (2000) and others suggests that better results and a stronger support for the application of the intertemporal model could be obtained if the effect of the exchange rate is included in the model. This is consistent with the view that the VAR approach adopted in the current study to validate the restriction implied by the theoretical model is not robust to omitted variables. Finally, we hope that empiricist will revisit the data with more refine models and statistical techniques.

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