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An Investigation of Current Account Sustainability in Five Asean Countries

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Abstract This paper examines the current account sustainability of five countries in the Association of Southeast Asian Nations (ASEAN): Indonesia, Malaysia, the Philippines, Singapore and Thailand. The ASEAN was established in 1967 to speed up economic growth and to bring about cultural growth and progress, stability and regional peace among its member countries. Greater integration makes the issue of long-term current account sustainability of these countries critical to each other's prosperity. The paper uses the intertemporal solvency framework of Hakkio and Rush (1991) and Husted (1992) and cointegration methodology to test for a relation between exports and imports of the current account. Furthermore, we estimate this long-run relationship using dynamic OLS. The results show that Malaysia and Thailand have sustainable current account positions. Among the other countries, Singapore has a statistically significant positive relation between exports and imports, but its weakness means that Singapore continues to have a vulnerable current account position. Indonesia and the Philippines have unsustainable current account deficits. Exchange rate adjustments and macroeconomic policy reforms may be necessary to reduce vulnerabilities in external positions for these countries.

Keywords Cointegration, Current account sustainability, ASEAN, Intertemporal solvency

1. Introduction

The ASEAN (Association of Southeast Asian Nations) is comprised of 10 countries, namely Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. The emblem of the ASEAN represents unity, friendship, and solidarity, which the founding fathers envisioned when the ASEAN was first created in 1967. Its goals were to speed up economic growth and to bring about cultural growth and progress, stability, and regional peace among the ASEAN nations. Greater integration makes the issue of long-term current account sustainability of these countries critical to each other's prosperity.

The population of the ASEAN is 670.71 million, and it accounted for approximately 9 percent of the total world population in 2014, with a nominal GDP per capita of $5,593. The ASEAN countries with the highest GDP per capita are Singapore with $65,790 followed by Brunei Darussalam with $42,313. Half of the ASEAN countries have positive current account balances as a percent of GDP. These countries include: Brunei Darussalam, Malaysia, the Philippines, Singapore, and Vietnam. In 2013, all of the ASEAN countries, except Brunei Darussalam, experienced growth. According to the projections for 2019 in Table 1, all countries are expected to display growth of some sort. Overall, the 10 ASEAN countries show positive average GDP growth, which is increased significantly when the Chinese and Indian economies are included.

In 1997, ASEAN leaders adopted the ASEAN Vision 2020, wherein a peaceful and stable ASEAN community was to be established by 2020. In 2003, the leaders stated that the ASEAN community would consist of three main pillars (i.e., the ASEAN Security Community, the ASEAN Economic Community, and the ASEAN Socio-Cultural Community).

The current account balances of the 10 ASEAN countries (ASEAN-10) are driven by their trade balances. The trade, current accounts, and the Net Current Income from Abroad (NCIA) (all as a percentage of GDP) are mapped for the ASEAN countries from 2005 to 2013[1] (see Figures 1-8 in the Appendix).

This paper adds to the existing literature on current account sustainability by analyzing ASEAN countries over a time period that encompasses the 1997 Asian Financial Crisis and beyond. In contrast to previous studies (i.e., Yan (1999) and Baharumshah et al. (2003)), this analysis includes a longer post-crisis period, which conveys greater veracity to its findings. Furthermore, empirical analysis of current account sustainability in developing countries has received little attention in the literature (e.g., Milesi-Ferretti and Razin (1996), Apergis, Katrakilidis, and Tabakis (2000),

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[1] Due to a lack of available data, graphs are provided for only eight of the ASEAN countries. Specifically, Brunei Darussalam and Myanmar are omitted.

Arize (2002), Sohrabji (2009), Sissoko and Sohrabji (2010)), and studies of current account sustainability in the ASEAN are even more limited and dated (e.g., Yan (1999), Baharumshah et al. (2003)).

The remainder of the paper is organized as follows. The next section discusses relevant literature. Background on the ASEAN is presented in the third section, and the methodology of current account sustainability analysis is covered in the fourth section. The fifth section provides details about the data sample and results. Finally, the sixth section concludes.

2. Literature Review

Current account deficits and their sustainability have been extensively studied. Holman (2001) conducted an analysis of the sustainability of the United States current account deficit and found that deficits were sustainable in the near term and unlikely to cause any disruption of the economy. Mann (2002) cautioned, however, that continuing current account deficits in the United States would result in increasingly negative net international investment. However, long-term adjustment to smaller trade deficits would be possible with the implementation of appropriate policy measures.

Looking abroad, Apergis, Katrakilidis, and Tabakis (2000) revealed the presence of possible regime changes in an investigation of the current account deficit in Greece from 1960 to 1994. Their results favored the current account deficit sustainability hypothesis. Kónya (2009) empirically analyzed the current account imbalances of central European nations (e.g., Czech Republic, Hungary, and Slovenia) during the 1990-2005 timeframe and determined that the Czech Republic and Slovenia had sustainable trade imbalances.

Similarly, Sissoko and Sohrabji (2010) used 1960-2006 World Bank data to examine the current account sustainability of countries in the Eastern African Community, Economic Community of Central African States, and South African Development Community. Sissoko and Sohrabji (2010) identified a sustainable current account position for Botswana, but statistically significant weak relationships between exports and imports for Uganda, Central African Republic, Congo, Rwanda, Lesotho, and Zambia.

Analyzing the current account sustainability of three of the ASEAN nations from 1975 to 1995, Sathirathai (1997) determined that Malaysia, Thailand, and Indonesia had unsustainable deficits and noted that the deterioration in current account balances was underpinned by imports of capital goods rather than consumption goods. Guest and McDonald (1999) studied 1976-1997 data for Thailand, Singapore, Malaysia, Indonesia, and the Philippines. Their results indicated that Malaysia, the Philippines, and Thailand had sub-optimal current account ratios to GDP, while Singapore and Indonesia's ratios were above-optimal due to over-saving. Baharumshah, Lau, and Fountas (2003) tested the sustainability of current account imbalances among Indonesia, Malaysia, the Philippines, and Thailand (i.e., ASEAN-4). Using 1961-1999 data, they found that all of the sample ASEAN countries, except Malaysia, had current account deficits that were not in long-run steady state in the pre-crisis (1961-1997) era. Thus, Baharumshah et al. (2003) concluded that a persistent current account deficit might serve as a leading indicator of financial crises.

In summary, the existing literature includes largely dated analyses of current account sustainability for a mix of developing and developed countries around the world. The findings suggest sustainable current accounts in the United States, as well as, many European and African nations. However, the varying and outdated results for ASEAN countries, coupled with ongoing concerns over global economic prosperity due to contagion effects of the U.S. U.S. Great Recession, establish the relevance and importance of this study.

3. Background of the ASEAN

The ASEAN-10 is the largest regional cooperative in Asia including ten countries[2], with more than 630 million people and a combined GDP of more than $3.5 trillion in 2014. The external debt of the South Asian countries was $94.5 billion in 2010 according to the World Bank Report (2012). The ASEAN's top three principal export destinations in 2013 were China, Japan, and the United States and accounted for 12.3%, 9.4%, and 8.1%, respectively. While these three nations were also the ASEAN's principal export destinations in 2011, the shares were slightly higher. Similarly, the ASEAN's principal import sources in 2013 were China, Japan, and the United States, with shares of 14.2%, 9.6%, and 7.9%, respectively. Again, these three countries also were the ASEAN's principal import sources in 2011, but the percentages were a bit larger. As a percentage of GDP, the ASEAN-10's current account balance ranged from 2.2% in 2013 to 8.4% in 2007. The average of roughly 4.5% over the 2007-2015 period falls below the threshold of sustainability of 5% of GDP as identified by Milesi-Ferretti and Razin (1996). During 2014 and 2015, Indonesia's current account deficit was 3%, while the remainder of the ASEAN-5 nations had current account surpluses.

The debt for the ASEAN countries is calculated as a sum of the debt service of four principal years: 2000, 2005, 2010 and 2014. The percent change is also given for the same years. The total debt for the Philippines is $21,167 million U.S. dollars with percent changes of 42% between 2000 and 2005, 45% for the 2005-2010 period, and -64% from 2010 to 2014. The total debt for Thailand is $45,923 million U.S. dollars for the period. The percent change was 84% between 2000 and 2005, -42% from 2005 to 2010, and 19% for the period 2010-2014. The total debt in Malaysia is $28,167 million for the 2000-2014 period with percent changes of 73%, -50%, and 272% for the respective three periods. Indonesia has a total debt of $71,024 million and percent

[2] The ASEAN-5 countries include Indonesia, Thailand, Malaysia, the Philippines, and Vietnam.

changes of approximately 70%, 52%, and -8% for the three periods. Vietnam amasses a total debt of $6,267.2 million U.S. dollars and percent changes of approximately -49%, 118%, and 263% for the 2000-2005, 2005-2010, and 2010-2013 periods, respectively.

According to Table 5, over the course of the 2007-2015 time period, the ASEAN-10 experienced real GDP growth rates ranging from a low of 1.1% in 2009 to a high of 7.9% in 2010. The average real GDP growth rate was about 5% over that timeframe. Looking ahead, the real GDP growth rate for the ASEAN-10 is projected to be 5.8% in 2019 after experiencing growth rates of 5.9% and 5.4% over the 2003-2007 and 2011-2013 periods, respectively. In comparison, China and India had growth rates of 11.7% and 8.8%, respectively, in the 2003-2007 timeframe followed by 8.2% and 5.5% real GDP growth, respectively, from 2011 through 2013. China and India are projected to experience real GDP growth rates of 6.6% and 6.8%, respectively, in 2019.

In Figure 1(a), Cambodia's trade balance skyrocketed from -7.5% to -2% in 2008 from the U.S. Great Recession, while the current account balance decreased from -3% to -8%. After the U.S. Great Recession, Cambodia's current account balance increased again until 2012, when it decreased. Its trade deficit increased from 2009 to 2010, and then stayed relatively constant.

In Figure 1(b), Cambodia's trade deficit increased overall, but had a sharp increase in 2008 from the U.S. Great Recession. Its NCIA gradually decreased from 1995 to 2013, but it remained relatively constant from 2005 to 2013.

In Figure 2(a), Indonesia experienced a decrease in trade balance from 5.5% to 1% in 2008 due to the U.S. Great Recession, and it continually decreased after 2009 to -2% in 2013. Its current account balance mimics the trade balance and had similar outcomes throughout the period, reaching 0% in 2005, 2008, and 2011 during the periods of recession.

In Figure 2(b), Indonesia's trade balance was high in 1979 because of a recession caused by an oil shock. There was another spike in its trade balance in 1997 from the Asian Financial Crisis. Indonesia's NCIA was lowest in 1991 due to a collapse in the Soviet Union, and it decreased again in 2001 after the September 11, 2001 terrorist attack.

In Figure 3(a), Lao PDR's trade balance was lower in 2008 from the U.S. Great Recession and rose in 2010 to its highest point of -2%. Lao PDR's current account was highest in 2006 and decreased because of the U.S. Great Recession in 2009. In Figure 3(b), Lao PDR's trade balance spiked in 1997 due to the Asian Financial Crisis and plummeted in 2008 when the U.S. Great Recession hit. After the recession, the trade deficit decreased to -2%. Lao PDR's NCIA gradually became negative after the Asian Financial Crisis, and it slowly recovered in 2010-2012.

In Figure 4(a), Malaysia's trade balance gradually decreased after the U.S. Great Recession, and its NCIA mimics the same trend from 2005 until 2013. In Figure 4(b), Malaysia's trade balance was lowest in 1983 due to a recession, and it skyrocketed in 1997 from the Asian Financial Crisis. The NCIA was relatively constant throughout the timeline.

In Figure 5(a), the Philippines' trade balance rose in 2007, just before the U.S. Great Recession, and then slowly decreased from 2009 to 2013. The Philippines' current account reached its lowest point in 2008 because of the U.S. Great Recession. In Figure 5(b), the trade balance in the Philippines was highest in 1977 due to an economic crisis and hit its low point in 1997 from the Asian Financial Crisis. The NCIA was relatively low until the Asian Financial Crisis in 1997 and then decreased again after the U.S. Great Recession in 2008.

In Figure 6(a), Singapore's trade balance decreased from 30% to 22% in 2007-2008 from the U.S. Great Recession, and recovered in 2010. Its current account balance decreased from 25% to 15% for the same reasons. In Figure 6(b), Singapore's trade balance gradually increased throughout the period with a high point in 2007 just before the U.S. U.S. Great Recession. The NCIA was relatively constant, but it was negative in 2004 from a domestic recession.

In Figure 7(a), Thailand's trade balance hit a peak in 2007 and again in 2009 when its trade balance was 11% (recovery from the U.S. Great Recession). The current account balance had the same structure, with high points in 2007 and 2009 and a low point in 2008. In Figure 7(b), Thailand's trade balance hit a peak in 1987 after a recession and spiked in 1997 from the Asian Financial Crisis. In 2008, the trade balance was 10% due to the U.S. Great Recession. Its NCIA was relatively constant throughout the graph.

In Figure 8(a), Vietnam's trade balance was lowest in 2008 due to the U.S. Great Recession and subsequently has been recovering. The current account balance was lowest in 2008 for the same reason and has been increasing since 2008. In Figure 8(b), Vietnam's trade balance was low in 1997 from the Asian Financial Crisis. The trade balance hit another low point in 2003 after the September 11, 2001 terrorist attack and again in 2008 because of the U.S. Great Recession. Vietnam's NCIA was relatively constant from 1997 until 2008 when the U.S. Great Recession hit and then decreased slightly. In 1990, the NCIA decreased quite a bit from a recession.

4. Analyzing Current Account Sustainability

The theoretical model for examining current account sustainability is based on Hakkio and Rush (1991) and Husted (1992). The theoretical model assumes that the amount that a small open economy borrows or lends in international markets equals the present value of the future trade surpluses. For intertemporal solvency, deficits incurred in the present period will be repaid by future surpluses. The expectation is that imports and other debits on the current account lead to increased exports, thus making current account deficits sustainable in the long run. Hence, the econometric equation to be estimated is given as

$$EX_t = \alpha + \beta\, IMM_t + \varepsilon_t \quad (1)$$

where *EX* are exports of goods and services and *IMM* refers to imports of goods and services, net of unilateral transfer payments and net investment income payments. Imports of goods and services net of unilateral transfer payments and net investment income payments are denoted as imports + for the rest of the paper.

If EX_t and IMM_t are cointegrated, then the long-run relationship between exports and imports can be estimated. This relationship sheds light on current account sustainability. Cointegration requires testing for stationarity. We employ several tests including Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski, Phillips, Schmid, and Shin (KPSS). If the series are integrated of order one, we can test for cointegration. Two methods for testing cointegration are used. The standard Johansen test, which employs a trace and an eigenvalue test, is first used to test for cointegration. This test assumes that the cointegrating relationship is unchanged throughout the sample period. However, it is possible that the relationship between exports and imports changes over time. To allow for that, we follow Baharumshah et al. (2003), Cook (2004), Sohrabji (2009), and Oğuş Binatlı and Sohrabji (2012) and employ the Gregory and Hansen (1996) cointegration procedure for the countries in our sample. This procedure has the advantage of endogenously determining the break point in the cointegrating relation. Gregory and Hansen (1996) consider three models with structural breaks in the cointegrating relation that we use as well. These three models are denoted as a level shift, a level shift and trend, and a regime shift. They are given as,

Model with level shift

$$EX_t = \mu_1 + \mu_2\, D_t + \beta\, IMM_t + \varepsilon_t \quad (2)$$

Model with level shift/trend

$$EX_t = \mu_1 + \mu_2\, D_t + \gamma\, t + \beta\, IMM_t + \varepsilon_t \quad (3)$$

Model with regime shift

$$EX_t = \mu_1 + \mu_2\, D_t + \beta_1\, IMM_t + \beta_2\, IMM_t\, D_t + \varepsilon_t \quad (4)$$

where $D_t = \begin{cases} 0 \; if \; t \le \tau \\ 1 \; if \; t > \tau \end{cases}$ and τ is the structural break point.

If there is cointegration between exports and imports, the long-run relationship between them can be estimated using Stock and Watson's (1993) dynamic OLS (DOLS) technique. DOLS incorporates the information regarding the structural break from the Gregory and Hansen (1996) procedure (referred to as the Gregory-Hansen test/procedure for the rest of the paper). In addition, DOLS includes lags and leads of the first difference of the regressors. Thus the estimated DOLS equation is given as

$$EX_t = \alpha + \beta\, IMM_t + \delta\left(IMM_t - IMM_\tau\right)D_t + \Phi\, d\left(L\right)\Delta\, IMM_t + \varepsilon_t \quad (5)$$

where IMM_τ is imports + at the structural break point, $\Delta\, IMM_t$ is the first difference of imports+, and $d\left(L\right)$ captures lags and leads of the first difference of the regressors.

The relationship between exports and imports+ which is captured by β sheds light on the sustainability of the current account. If the relationship between exports and imports is not statistically significant, then the current account deficit is unsustainable. If there is a statistically significant and strong relationship between exports and imports, then the current account position is sustainable. Between these two extremes, there is also the possibility of a statistically significant but weak relationship between exports and imports. If this is the case, we can conclude that while exports are growing in relation to imports, this growth may be insufficient to pay off accumulated debt. Thus, the current account position continues to be vulnerable. We present and analyze the empirical work on five sample ASEAN countries in the following section.

5. Data and Results

The purpose of this paper is to analyze current account sustainability in the ASEAN countries. Due to an insufficient number of observations for other nations, we focus on five ASEAN countries including Indonesia, Malaysia, the Philippines, Singapore, and Thailand. We use annual data between the 1960s and 2014. The sample period varies depending on data availability (carefully noted in tables with results). The relation between exports and imports+ is estimated using the methodology previously discussed. The exports series includes export of goods and services, and imports + includes import of goods and services net of unilateral transfer payments and net investment income payments. Following the literature, this paper uses real exports and real imports + as a percentage of real GDP (base year of 2000) referred to as ***RXY*** and ***RMMY*** for the remainder of the paper. All data is available from the World Bank.

The first step is to test for nonstationarity of the two series. Results of the three unit root tests are presented in Table 7. In general, we find that the series are integrated of order one in levels and are stationary in first differences for all countries in the sample in keeping with the results of Baharumshah et al. (2003). Nelson and Plosser (1982) aver that most macroeconomic time series are difference stationary processes. Thus, we can test for cointegration between exports and imports. As noted earlier, we use two cointegration tests, the Johansen test and the Gregory-Hansen test.

Table 1. Real GDP Growth of Southeast Asia, China and India (Annual percentage change)

COUNTRY	2013	2019*	2003-07	2011-13	2015-19*
ASEAN-10 COUNTRIES					
- ASEAN 5 COUNTRIES					
INDONESIA	5.8	6.3	5.5	6.2	6.0
MALAYSIA	4.7	5.6	6.0	5.2	5.6
PHILIPPINES	7.2	6.3	5.7	5.9	6.2
THAILAND	2.9	4.6	5.6	3.2	4.1
VIETNAM	5.4	5.8	7.2	5.6	5.7
BRUNEI DARUSSALAM	-1.8	1.9	1.7	0.9	1.6
CAMBODIA	7.5	7.3	10.6	7.3	7.1
LAO PDR	8.0	7.7	7.1	8.1	7.6
MYANMAR	7.5	7.8	-	6.9	7.8
SINGAPORE	3.9	3.6	7.9	4.1	3.5
TWO LARGE ECONOMIES IN THE REGION					
CHINA	7.7	6.6	11.7	8.2	6.8
INDIA	5.0	6.8	8.8	5.5	6.7
AVERAGE OF ASEAN-10 COUNTRIES	5.2	5.8	5.9	5.4	5.6
AVERAGE OF EMERGING ASIA	6.5	6.5	9.5	7.0	6.5

Notes: The cut-off date of the data is 6 October 2014. Emerging Asia denotes ASEAN-10 countries plus China and India. ASEAN-5 includes Indonesia, Malaysia, Thailand, the Philippines, and Vietnam.
Source: OECD Development Centre, MPF-2015 (Medium-term projection framework). For more information on MPF, please see www.oecd.org/dev/asiapacific/mpf.
**Projection*

Table 2. Countries by GDP (Nominal – 2014)

COUNTRY	POPULATION (in millions)	GDP NOMINAL (millions of USD)	GDP NOMINAL (per capita USD)	GDP PPP (millions of USD)	GDP PPP (per capita USD)
WORLD	7,450.00	97,598,942	13,100	119,344,057	16,000
UNITED STATES	331.39	21,101,368	63,676	21,101,368	63,676
EUROPEAN UNION	509.25	19,754,593	38,800	19,713,269	38,710
CHINA	1,394.88	14,941,148	10,711	22,641,047	16,231
INDIA	1,277.05*	2,049,501	2,049	7,375	5,855
JAPAN	125.42	5,930,147	47,281	5,619,492	44,804
SOUTH KOREA	51.42	1,729,880	33,644	2,270,913	44,167
ASEAN	**670.71**	**3,751,171**	**5,593**	**5,612,921**	**8,369**

Source: Wikipedia, the free encyclopedia. The information was last modified 2 May 2015.
**Population for India from 2015.*

Table 3. ASEAN Countries by GDP (Nominal – 2014)

COUNTRY	POPULATION (in millions)	GDP NOMINAL (millions of USD)	GDP NOMINAL (per capita USD)	GDP PPP (millions of USD)	GDP PPP (per capita USD)
INDONESIA	266.15	1,251,875	4,638	2,033,577	7,533
MALAYSIA	32.59	538,028	16,417	788,912	24,072
PHILIPPINES	107.63	522,271	4,757	732,138	6,669
THAILAND	65.94	491,520	7,023	959,722	13,712
SINGAPORE	5.99	378,191	65,790	483,686	84,142
VIETNAM	97.10	240,185	2,780	565,091	5,919
MYANMAR	71.75	96,891	1,325	197,972	2,707
CAMBODIA	16.19	26,392	1,614	68,039	4,160
LAOS	6.93	18,898	2,493	36,157	4,769
BRUNEI	0.44	18,890	42,313	31,496	70,549

Source: Wikipedia, the free encyclopedia. The information was last modified 2 May 2015.

Table 4. Asian and Pacific Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment (Annual percent change, unless noted otherwise)

	REAL GDP			CONSUMER PRICES[1]			CURRENT ACCOUNT BALANCE[2]			UNEMPLOYMENT[3]		
		Projections			Projections			Projections			Projections	
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
ASIA	**5.6**	**5.6**	**5.5**	**3.2**	**2.6**	**2.8**	**1.6**	**2.4**	**2.2**	**…**	**…**	**…**
ADVANCED ASIA	**1.6**	**2.2**	**2.4**	**2.2**	**1.2**	**1.6**	**2.2**	**3.1**	**2.8**	**3.8**	**3.9**	**3.9**
JAPAN	-0.1	1.0	1.2	2.7	1.0	0.9	0.5	1.9	2.0	3.6	3.7	3.7
KOREA	3.3	3.3	3.5	1.3	1.5	2.5	6.3	7.1	5.2	3.5	3.6	3.5
AUSTRALIA	2.7	2.8	3.2	2.5	2.0	2.3	-2.8	-4.0	-3.7	6.1	6.4	6.2
TAIWAN PROVINCE OF CHINA	3.7	3.8	4.1	1.2	0.7	1.3	12.3	12.4	11.7	4.0	4.0	4.0
SINGAPORE	2.8	3.0	3.0	1.0	0.0	1.7	19.1	20.7	18.8	2.0	2.0	2.0
HONG KONG SAR	2.3	2.8	3.1	4.4	3.2	3.4	1.6	2.0	2.2	3.2	3.2	3.1
NEW ZEALAND	3.2	2.9	2.7	1.2	0.8	2.1	-3.5	-4.8	-5.2	5.4	5.3	5.2
EMERGING & DEVELOPING ASIA	**6.8**	**6.6**	**6.4**	**3.5**	**3.0**	**3.1**	**1.3**	**2.1**	**2.0**	**…**	**…**	**…**
CHINA	7.4	6.8	6.3	2.0	1.2	1.5	2.0	3.2	3.2	4.1	4.1	4.1
INDIA	7.2	7.5	7.5	6.0	6.1	5.7	-1.4	-1.3	-1.6	…	…	…
ASEAN-5	**4.6**	**5.2**	**5.3**	**4.7**	**4.1**	**4.2**	**1.3**	**1.1**	**0.6**	**…**	**…**	**…**
INDONESIA	5.0	5.2	5.5	6.4	6.8	5.8	-3.0	-3.0	-2.9	6.1	5.8	5.6
THAILAND	0.7	3.7	4.0	1.9	0.3	2.4	3.8	4.4	2.4	0.8	0.8	0.8
MALAYSIA	6.0	4.8	4.9	3.1	2.7	3.0	4.6	2.1	1.4	2.9	3.0	3.0
PHILIPPINES	6.1	6.7	6.3	4.2	2.1	2.8	4.4	5.5	5.0	6.8	6.2	6.0
VIETNAM	6.0	6.0	5.8	4.1	2.5	3.2	5.4	4.8	4.9	2.5	2.5	2.5
EMERGING ASIA[5]	6.8	6.6	6.4	3.4	2.9	3.0	1.4	2.2	2.1	…	…	…

Note: Data for some countries are based on fiscal years.
[1]Movements in consumer prices are shown as annual averages.
[2]Percent of GDP.
[3]Percent. National definitions of unemployment may differ.
[5]Emerging Asia comprises the ASEAN-5 (Indonesia, Malaysia, Philippines, Thailand, and Vietnam) economies, China and India.
Source: International Monetary Fund, April 2015.

Table 5. Recent ASEAN-10 Economic Indicators

RECENT ECONOMIC INDICATORS:	2007	2008	2009	2010	2011	2012	2013	2014(a)	2015(b)
GDP (US$bn) (current prices):	1,309.4	1,522.2	1,502.6	1,950.6	2,255.5	2,381.8	2,456.8	2,474.5	2,529.4
GDP PPP (Int'l $bn):	2.621.4	2,798.5	2,869.2	4,915.3	5,255.6	5,666.7	6,050.2	6,419.8	6,808.3
GDP PER CAPITA (US$):	2,287	2,622	2,555	3,111	3,781	3,942	4,014	3,991	4,027
GDP PER CAPITA PPP (Int'l $):	4,578	4,821	4,878	8,345	8,810	9,378	9,886	10,355	10,840
REAL GDP GROWTH (% change y-o-y):	6.6	4.2	1.1	7.9	4.8	5.8	5.1	4.4	4.9
CURRENT ACCOUNT BALANCE (US$m):	110,033	67,624	107,559	104,111	112,773	56,727	53,704	78,805	74,590
CURRENT ACCOUNT BALANCE (% GDP):	8.4	4.4	7.2	5.3	5.0	2.4	2.2	3.2	2.9
INFLATION (% change y-o-y):	4.2	8.8	2.4	4.0	5.4	3.8	4.3	4.2	3.6

(a) all recent data subject to revision
(b) IMF forecast
Source: Compiled by the Market Information and Research Section, DFAT, using the latest data from the ABS, the IMF and various international resources.

Table 6. ASEAN's Global Merchandise Trade Relationships[1]

ASEAN'S PRINCIPAL EXPORT DESTINATIONS			
		2011	2013
1	China	15.1%	12.3%
2	Japan	13.1%	9.4%
3	United States	11.2%	8.1%
4	Hong Kong (SAR of China)	8.7%	6.9%
5	Republic of Korea	5.6%	4.0%
6	Australia	4.4%	3.7%
ASEAN'S PRINCIPAL IMPORT SOURCES			
		2011	2013
1	China	17.1%	14.2%
2	Japan	14.4%	9.6%
3	United States	10.6%	7.9%
4	Republic of Korea	7.9%	5.5%
5	United Arab Emirates	4.2%	3.8%
9	Australia	2.8%	1.9%

[1]ASEAN Extra-Trade
Source: Compiled by the Market Information and Research Section, DFAT, using the latest data from the ABS, the IMF and various international resources.

To conduct the Johansen test for cointegration, it is necessary to determine the number of lags, *k*, in the underlying VAR. We use several measures for testing lag length including likelihood ratio tests (LR), Akaike information criterion (AIC), and Schwarz criterion (SC). Based on these criteria, we find the appropriate lag length for each country.

Using this lag length information, the Johansen cointegration test is conducted for no cointegrating equations, as well as, for up to one cointegrating equation. Since data is limited for the countries in the sample (ranging from 40 years to 55 years), this paper employs the small sample correction of Reinsel and Ahn (1988). According to this methodology, the trace and eigenvalue statistics are multiplied by $(T - pk)/T$ where T is the sample size, p is the number of variables, and k is the number of lags. The adjusted results of the trace and eigenvalue tests are presented in Table 8. The Johansen cointegration test results indicate cointegration for Indonesia, the Philippines, and Thailand, but not for Malaysia and Singapore. Baharumshah et al. (2003) obtained similar findings for Indonesia, Thailand, and Malaysia.

Table 7. Unit Root Tests

	ADF	PP	KPSS
Indonesia (1960 – 2014)			
RXY	-0.04[0]	-0.04(2)	2.86E+09*(5)
ΔRXY	-1.23*[0]	-1.23*(1)	1.47E+08*(0)
RMMY	-0.18[0]	-0.18(3)	2.13E+09*(4)
ΔRMMY	-1.00*[0]	-1.00*(1)	9.9(1)
Malaysia (1960 – 2014)			
RXY	-0.5[0]	-0.05(3)	3.89E+09*(6)
ΔRXY	-1.00*[0]	-1.00*(3)	1.50E+08*(3)
RMMY	-0.05[0]	-0.05(5)	3.13E+09*(5)
ΔRMMY	-0.99*[0]	-0.99*(7)	1.42E+08*(7)
Philippines (1960 – 2014)			
RXY	-0.03[1]	-0.06(7)	1.19E+09*(5)
ΔRXY	-1.36*[0]	-1.36*(9)	5.8*(16)
RMMY	0.004[1]	-0.02(5)	2.18E+09*(6)
ΔRMMY	-1.40*[0]	-1.40*(3)	1.32E+08*(6)
Singapore (1975 – 2014)			
RXY	-0.06[0]	-0.06(1)	1.18E+10*(5)
ΔRXY	-1.10*[0]	-1.10*(3)	5.94E+08*(3)
RMMY	-0.09[0]	-0.09(2)	9.92E+09*(5)
ΔRMMY	-1.33*[0]	-1.33*(3)	4.65E+08*(5)
Thailand (1960 – 2014)			
RXY	-0.03[0]	-0.03(19)	3.51E+09*(5)
ΔRXY	-1.27*[0]	-1.27*(40)	1.70E+08*(53)
RMMY	-0.13[0]	-0.11(9)	3.02E+09*(5)
ΔRMMY	-1.05*[0]	-1.05*(27)	107E+08**(31)

*Notes: The null hypothesis for ADF and PP tests is that the series is nonstationary while the null hypothesis for KPSS is that the series is stationary. All tests are conducted assuming a constant and trend. Numbers in brackets for ADF test denote lag (maximum lags were set at 3 and lag length is determined using AIC). Numbers in brackets for PP and KPSS correspond to lag truncation parameter determined by Newey-West criteria. * and ** indicate rejection of the null hypothesis at 1% and 5% level of significance, respectively. Eviews 7.2 or better is used to obtain the estimates.*

Table 8. Johansen Test Results for Cointegration between *RXY* and *RMMY*

	Lags	**No. of CE(s)**	**Trace Value**	**Eigenvalue**
Indonesia (1960 – 2014)	[1]	None	16.30*	11.50
	[1]	At most 1	4.80*	4.80*
Malaysia (1960 – 2014)	[1]	None	10.56	8.32
	[1]	At most 1	2.24	2.24
Philippines (1960 – 2014)	[1]	None	26.03*	21.63*
	[1]	At most 1	4.41*	4.41*
Singapore (1975 – 2014)	[1]	None	6.75	5.55
	[1]	At most 1	1.20	1.20
Thailand (1960 – 2014)	[1]	None	30.02*	26.52*
	[1]	At most 1	3.50	3.50

*Notes: Lag length of the underlying VAR was determined by AIC and SC. The null hypothesis is that there is no cointegration. * indicates rejection of the null hypothesis at 5% level of significance. Eviews 7.2 or better is used to obtain the estimates.*

As noted earlier, the Johansen test assumes there is no change in the cointegrating relation, which might result in an inability to reject the null hypothesis of no cointegration. To allow for a structural break, this paper also uses the Gregory-Hansen procedure. Results for this test, including the break point for each of the models, are presented in Table 9. In this case, all countries, except Malaysia, show evidence of cointegration with a break for at least one of the models and in some cases for two models, which is consistent with the results of Baharumshah et al. (2003). Comparing the Johansen test results with the Gregory-Hansen test results reveals that our sample countries, with the exception of Malaysia, experienced improvement in their trade positions assuming a break point. Baharumshah et al. (2003) reached similar conclusions with a smaller sample size (i.e., ASEAN-4 over the 1961-1999 period).

Table 9. Gregory-Hansen Test Results for Cointegration between *RXY* and *RMMY*

	Level Shift	Level Shift/Trend	Regime Shift
Indonesia (1967 – 2014)	-20.45 [4] 2002	-3.87 [4] 2002	-4.79* [4] 2003
Malaysia (1960 – 2014)	-27.04 [1] 1996	-4.07 [1] 1996	-4.55 [1] 1995
Philippines (1960 – 2014)	-33.52 [1] 1981	-4.95* [1] 1981	-4..87* [1] 1981
Singapore (1975 – 2014)	-36.44 [0] 1993	-5.61* [0] 1993	-5.01* [0] 2003
Thailand (1960 – 2014)	-26.87 [1] 1998	-4.18 [1] 1998	-4.82* [1] 1999

*Notes: The table provides Gregory-Hansen cointegration results for all three models. The table reports the t-statistic, lag length (in square brackets) and the endogenously determined break period for all countries. The null hypothesis is that there is no cointegration. * and ** indicate rejection of the null at 1% and 5% level of significance, respectively. Rats 7.3 or better is used to run the Gregory-Hansen test.*

Table 10. Dynamic OLS Results

Country	**Diagnostic test results**					**DOLS/DGLS estimation results**		
	LM test (p-value)	White test (p-value)	RESET test (p-value)	Jarque-Bera test (p-value)	Chow test (p-value)	Adjusted R^2	β (SE)	H_a : β<1 t-statistic
ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN)								
Indonesia	28.366** (0.00)	5.090* (0.01)	0.896** (0.00)	5.906 (0.05)	10.472** (0.00)	0.969	-0.2** (0.004)	5.538*
Malaysia	69.359** (0.00)	21.686** (0.00)	1.416** (0.00)	8.017* (0.02)	38.248** (0.00)	0.999	-0.002 (0.169)	1.417
Philippines	34.756** (0.00)	2.538 (0.09)	0.813** (0.00)	12.292** (0.00)	39.000** (0.00)	0.993	-0.8* (0.125)	-3.952*
Singapore	7.081** (0.00)	4.299* (0.02)	1.118** (0.00)	4.743 (0.09)	8.090** (0.00)	0.999	0.1* (0.005)	3.004*
Thailand	37.482** (0.00)	8.781** (0.00)	0.873** (0.00)	6.671* (0.04)	71.944** (0.00)	0.981	0.4 (0.325)	-0.994

*Notes: For each country the break period from the Gregory-Hansen procedure was used in the dynamic OLS estimation. The lag and lead length for differenced RMMY terms were determined by AIC and SC. The appropriate lag/lead length was 1 for all countries. The table reports estimation results and diagnostic tests including LM (serial correlation), White (heteroskedasticity), RESET (stability), Jarque-Bera (normality), and Chow (stability) tests. The null hypotheses are of no serial correlation, homoskedasticity, stability and normality, respectively. * and ** denote rejection of the null hypothesis at 1% and 5% level of significance, respectively. If the LM test showed evidence of serial correlation, dynamic GLS was used in the estimation. If the White test revealed evidence of heteroskedasticity, heteroskedasticity-consistent standard errors were used. Rats 7.3 or better is used to run the diagnostic tests and to obtain the DOLS/DGLS estimates.*

Given this information, we can estimate the long-run relation between exports and imports+ using dynamic OLS according to equation (5). The lag length for the differenced *RMMY* terms is determined by AIC and SC. The regression is tested for serial correlation, heteroskedasticity, non-normality, stability, and a structural break in the data. All results are reported in Table 10. These results show diagnostic problems for certain countries. If the LM test showed evidence of serial correlation, we used dynamic GLS. This was the case for all five sample countries. Heteroskedasticity was a concern for all sample countries, except the Philippines, which we corrected by using heteroskedasticity-consistent standard errors. All nations, with the exceptions of Indonesia and Singapore, failed the normality test, and all five countries failed the RESET stability test due to the presence of a structural break in 1997 following the Asian Financial Crisis. Chow test results confirm that all five countries experienced structural breaks in 1997.

We find a positive relation between exports and imports+ only for Singapore and Thailand, which is to be expected since we also found evidence of cointegration. Our results show that the positive relation between exports and imports+ is statistically significant only for Singapore, which indicates that exports in this nation grow in response to increasing imports and other debits. However, we reject the null of $\beta \geq 1$ in favor of the alternative $\beta < 1$ (Table 10) for Singapore, which indicates that its current account position is unsustainable over the sample period. Thus, while debits are not a drain on the economy in Singapore, import growth outpaces export growth, making it difficult for Singapore to close its trade gap. As a result, Singapore may be in jeopardy in the future unless necessary adjustments are made.

There is a negative statistically significant relationship between exports and imports + for Indonesia and the Philippines. We reject the null of $\beta \geq 1$ in favor of the alternative $\beta < 1$ (Table 10) for Indonesia and the Philippines, which suggests that their current accounts are not sustainable over the sample period. Therefore, Indonesia and the Philippines are importing without adding sufficiently to their export bases. In contrast, Malaysia and Thailand have negative and positive relations between exports and imports+, respectively, but their coefficients are statistically insignificant. Furthermore, we do not reject the null of $\beta \geq 1$ in favor of the alternative $\beta < 1$, which indicates that Malaysia and Thailand's current account positions are sustainable over the sample period.

Overall, three of the sample countries suffer from weak current account positions. While the current account position for Singapore is problematic, it is less of a concern than for Indonesia and the Philippines. Based on our model, we thus conclude that Indonesia, the Philippines, and Singapore have current account positions that are unsustainable over the sample period. Thus, import growth has outpaced exports, and it has been an uphill battle for these three countries to close their trade gaps. Our results suggest a need for reform in order to improve current account positions in Indonesia, the Philippines, and Singapore. In the following section, we draw lessons for reforms based on a comparative analysis of the experiences of our sample countries.

6. Conclusions

This paper analyzes the current account sustainability of five ASEAN countries including Indonesia, Malaysia, the Philippines, Singapore, and Thailand. We examine the relationship between exports and imports including net interest and transfer payments (imports+) for these countries using the intertemporal solvency framework, cointegration methodology, and dynamic OLS estimation. We find evidence of cointegration between exports and imports+ for all countries except Malaysia. In the case of Singapore, we only find cointegration when we allow for a structural break indicating a positive shift in the trade positions of this nation.

Our estimation of the relation between exports and imports+ shows a statistically significant positive relation for Singapore. Guest and McDonald (1999) note that Singapore had over-saved in the 1976-1997 timeframe more than the other ASEAN countries in our sample. However, only Malaysia and Thailand have *sustainable* current account positions. Guest and McDonald (1999) found that Malaysia and Thailand ran below-optimal current account balances due to over-investing in the 1976-1997 period. Ostry and Robinson (1997) caution that reducing current account deficits over time will minimize the associated risks even in the face of sustainable external positions. While Singapore continues to exhibit vulnerability in the current account due to a weak relation between exports and imports+, the concerns for Indonesia and the Philippines are much more acute. We find the relation between exports and imports+ is negative and statistically significant for these countries, which indicates unsustainable current account positions. Guest and McDonald (1999) revealed that the Philippines had been under-saving while Indonesia had over-saved in the 1976-1997 period.

Long-run current account deficits are indicative of macroeconomic imbalances, such as excessive spending by the government or private sector, inefficient investment, or overvaluation of the currency, which portend serious problems for a nation. If these current account deficits are large and ongoing, domestic interest rates may rise relative to foreign interest rates and thereby saddle future generations with higher debt service payments and reduced standards of living. Furthermore, Kaminsky, Lizondo, and Reinhart (1998), Yan (1999), Edwards (2001), and Baharumshah et al. (2003) point out that significant current account imbalances may propagate currency crises. Baharumshah et al. (2003) assert that a failure to address such external imbalances could ultimately result in an exchange rate collapse, because foreign investors will be reluctant to finance these deficits in the long run. Milesi-Ferretti and Razin (1996) and Yan (1999) note ability-to-pay and willingness-to-lend constraints under these circumstances. These observations are particularly salient for the ASEAN nations following the Asian Financial

Crisis in mid-1997.

Given the integrated global nature of modern-day financial markets, countries with large current account deficits may fall victim to exogenous market sentiment shocks. Yan (1999) cites evidence that nations may suffer due to the plights of nearby countries. The ongoing worldwide concern over the recent slowdown in China's economic activity and its potential impact on the vitality of other economies is indicative of the gravity of these contagion effects. Thus, the unsustainable current account positions suggested by this analysis for Indonesia and the Philippines, and to a lesser extent Singapore, may merit policy responses, such as exchange rate regime shifts and/or tighter macroeconomic policies, to avoid a crisis. In that vein, Yan (1999) argues that the International Monetary Fund and other international organizations play a pivotal role in achieving recovery from currency crises.

ACKNOWLEDGEMENTS

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Appendix

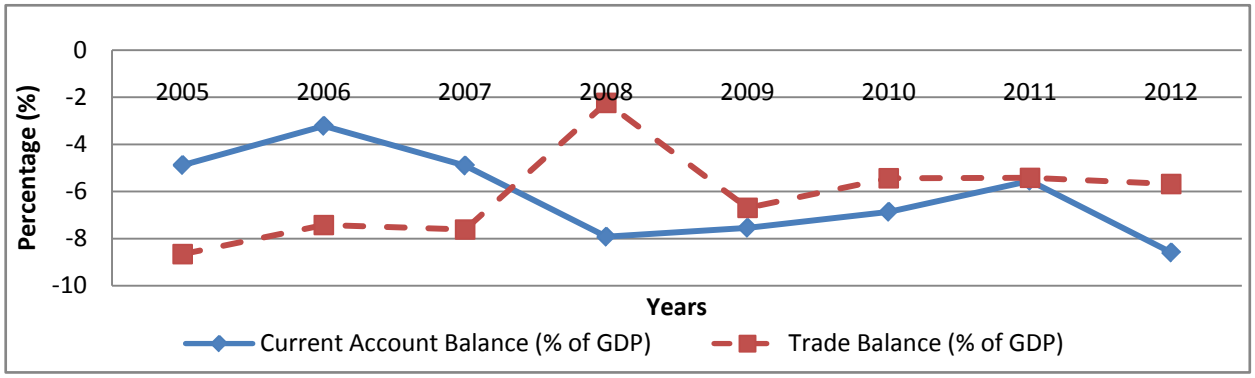

Figure 1(a). Trade and Current Account as a Percentage of GDP for Cambodia

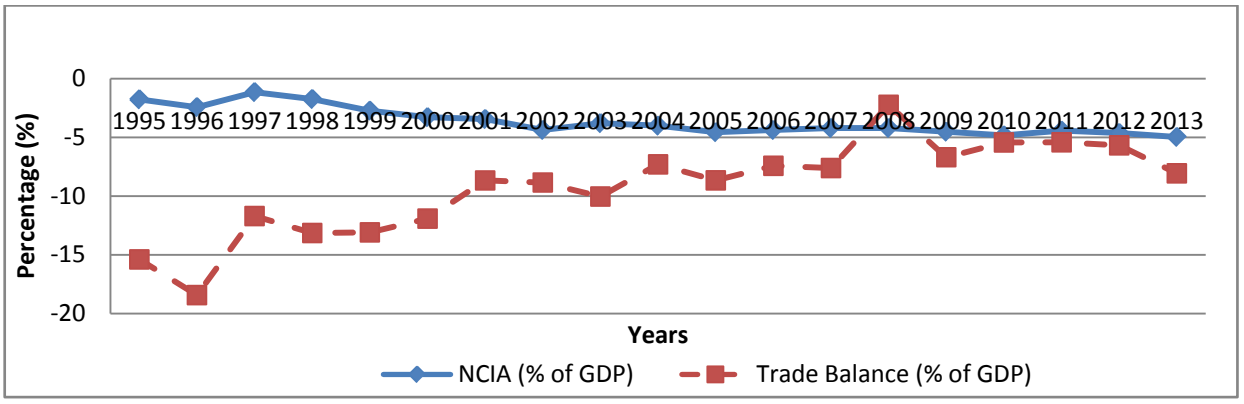

Figure 1(b). Trade and NCIA as a Percentage of GDP for Cambodia

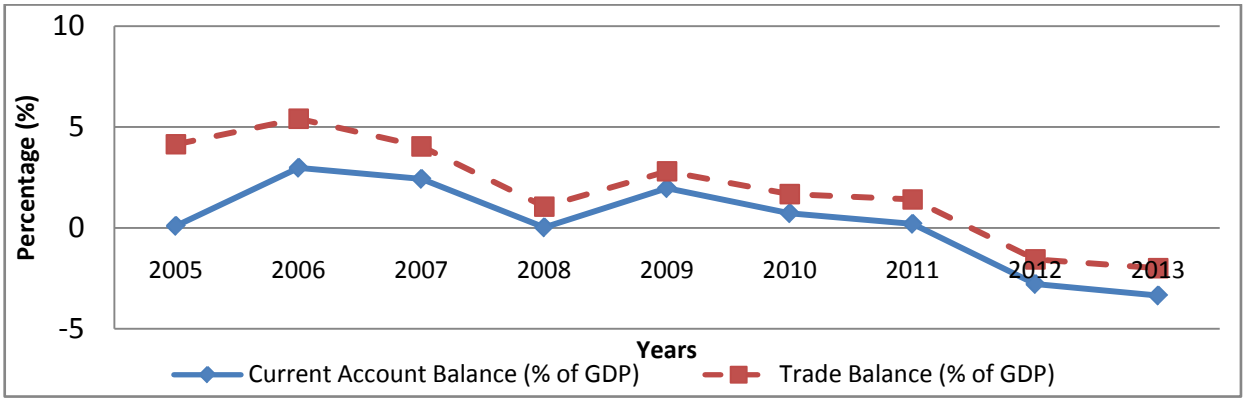

Figure 2(a). Trade and Current Account as a Percentage of GDP for Indonesia

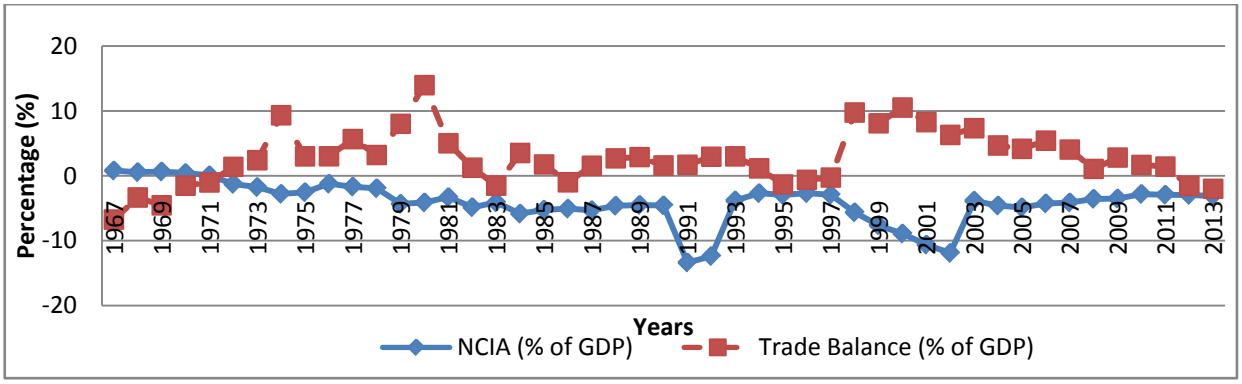

Figure 2(b). Trade and NCIA as a Percentage of GDP for Indonesia

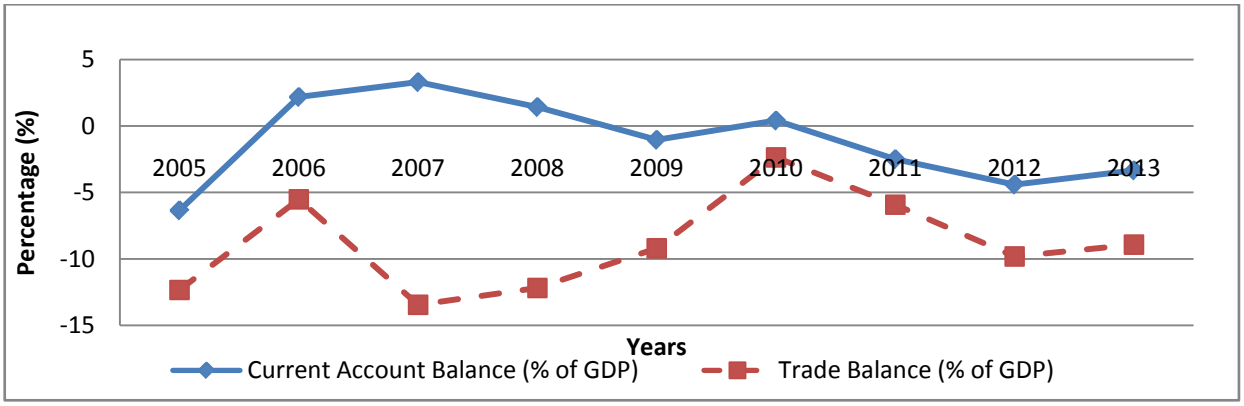

Figure 3(a). Trade and Current Account as a Percentage of GDP for Lao PDR

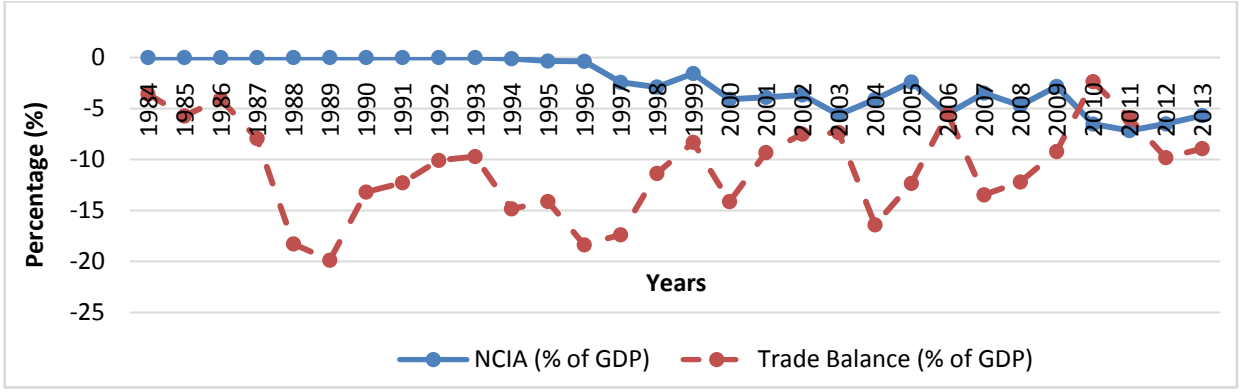

Figure 3(b). Trade and NCIA as a Percentage of GDP for Lao PDR

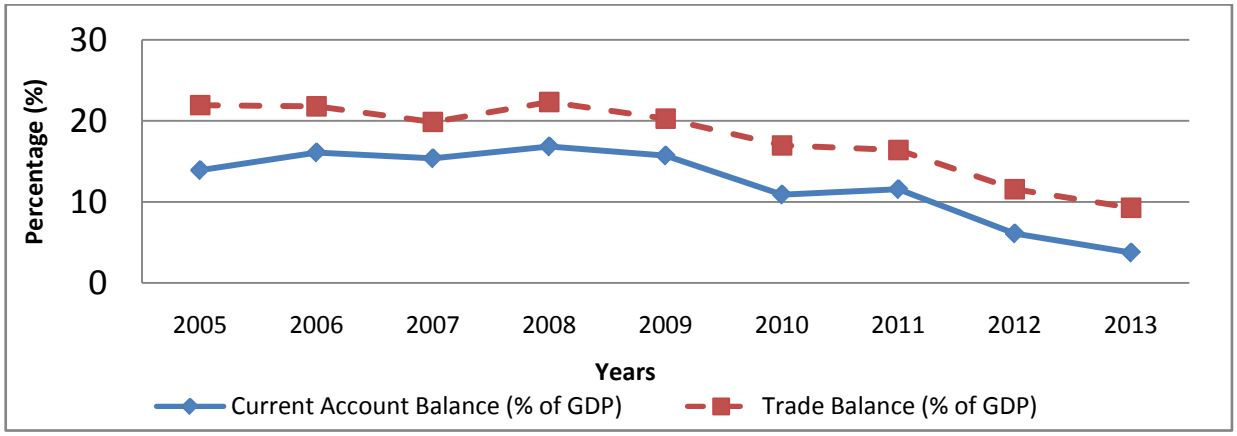

Figure 4(a). Trade and Current Account as a Percentage of GDP for Malaysia

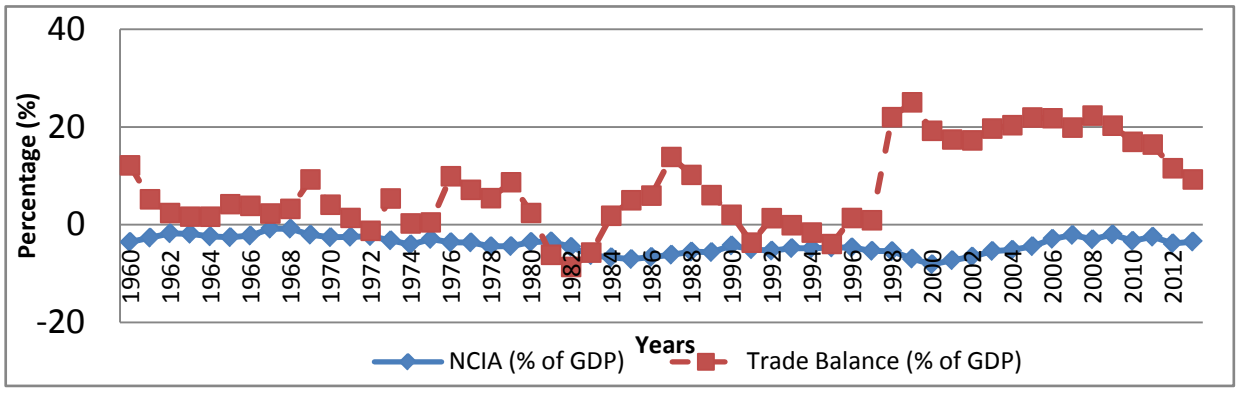

Figure 4(b). Trade and NCIA as a Percentage of GDP for Malaysia

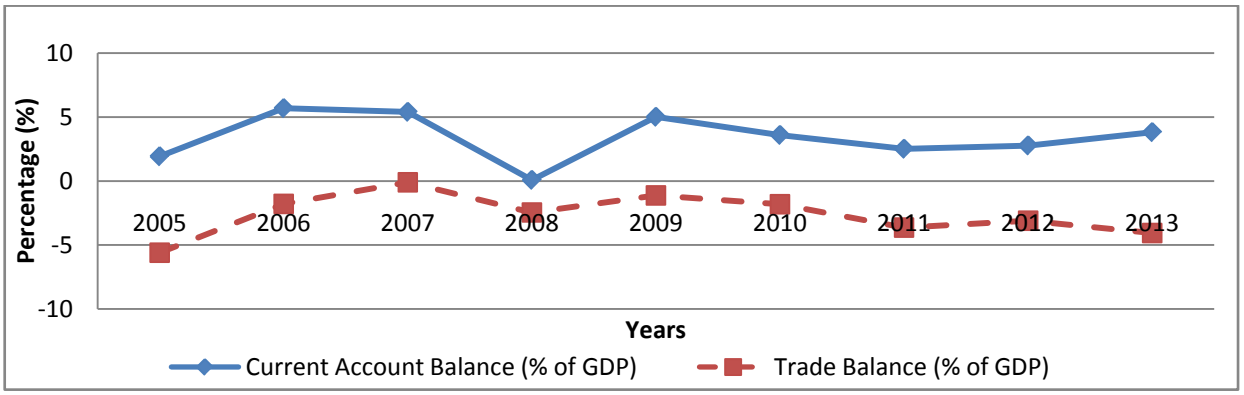

Figure 5(a). Trade Balance and Current Account as a Percentage of GDP for Philippines

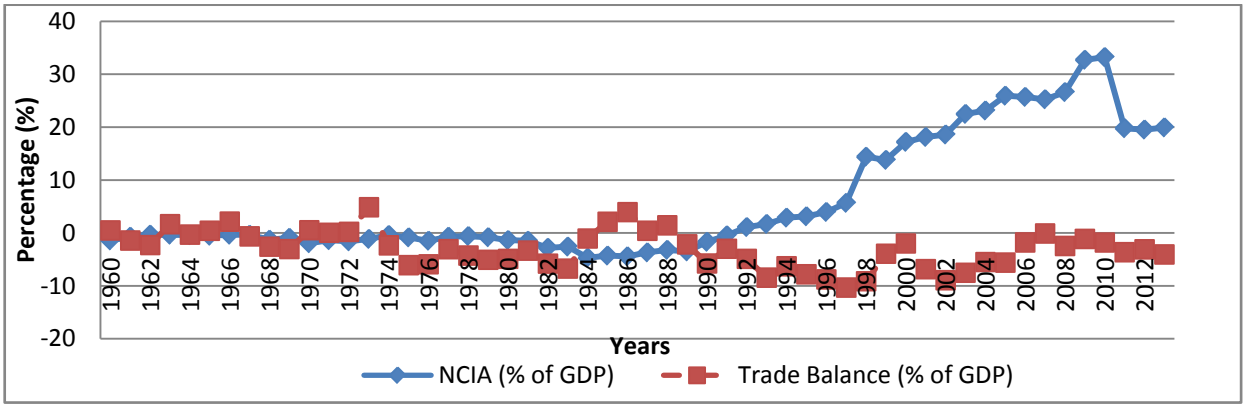

Figure 5(b). Trade Balance and NCIA as a Percentage of GDP for Philippines

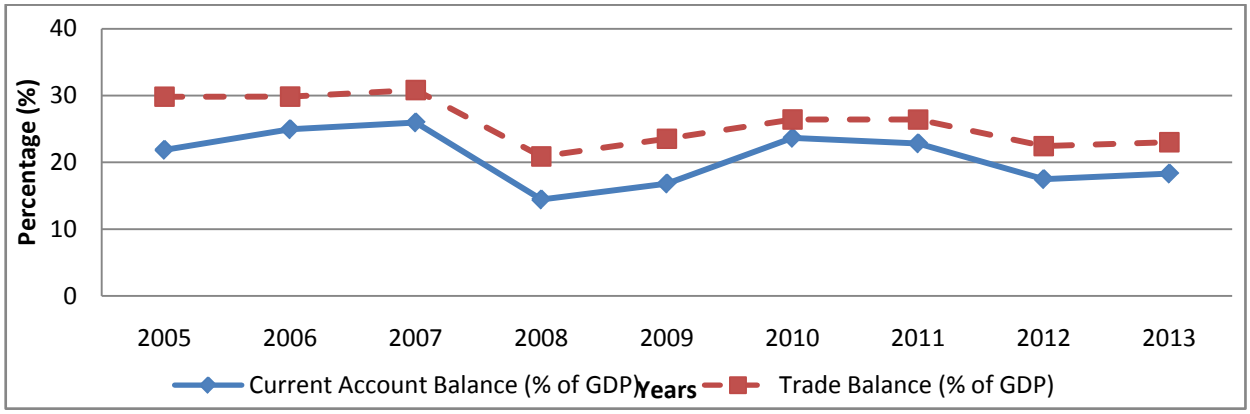

Figure 6(a). Trade and Current Account as a Percentage of GDP for Singapore

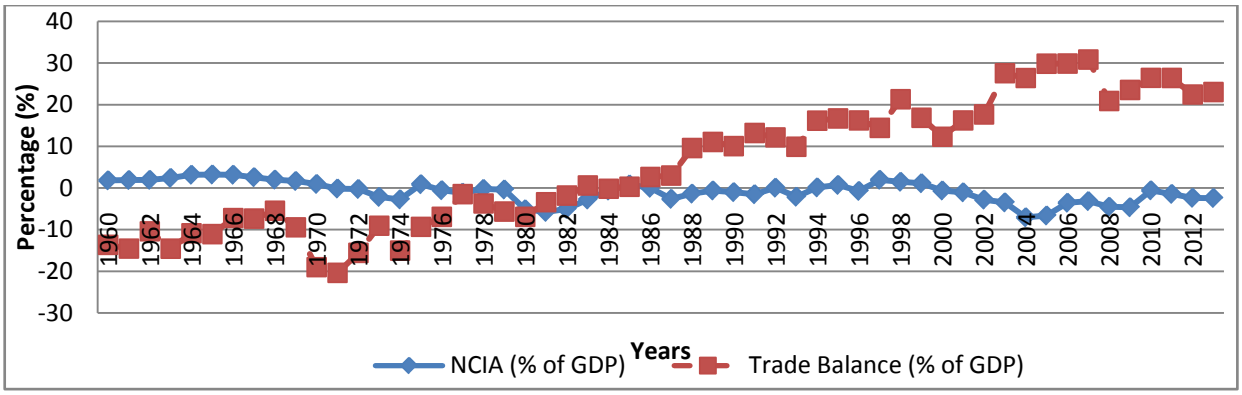

Figure 6(b). Trade and NCIA as a Percentage of GDP for Singapore

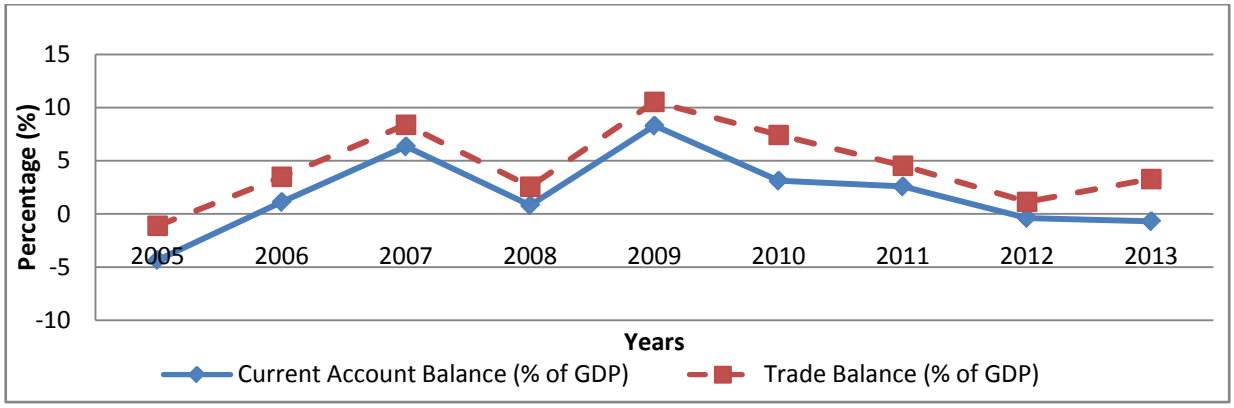

Figure 7(a). Trade and Current Account as a Percentage of GDP for Thailand

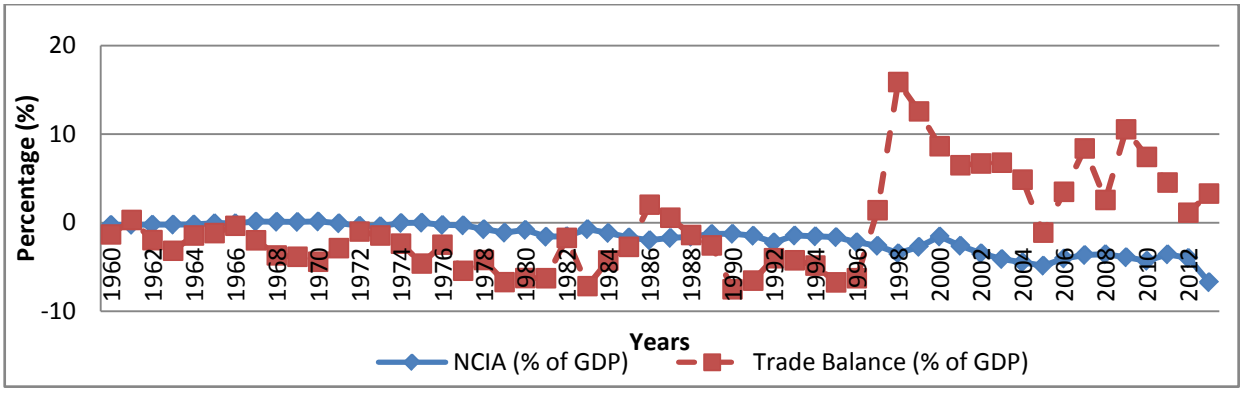

Figure 7(b). Trade and NCIA as a Percentage of GDP for Thailand

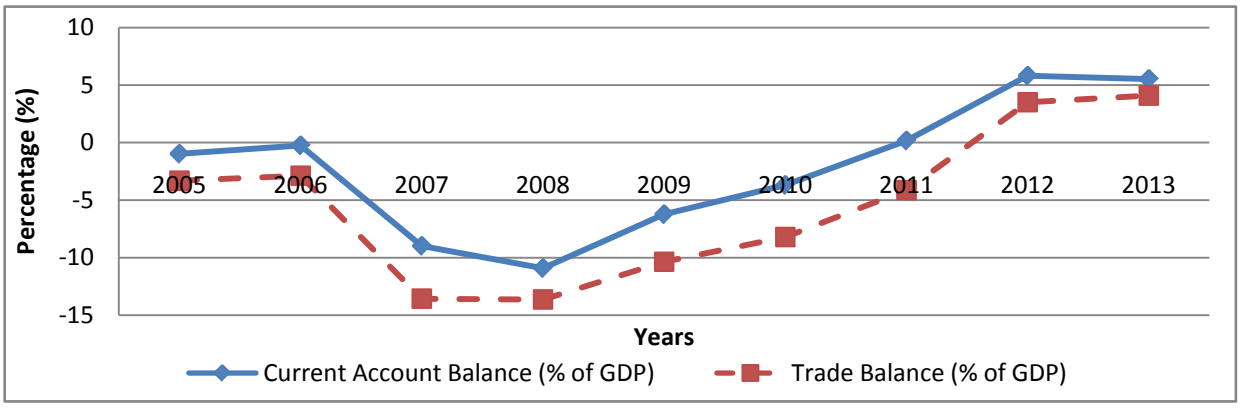

Figure 8(a). Trade and Current Account as a Percentage of GDP for Vietnam

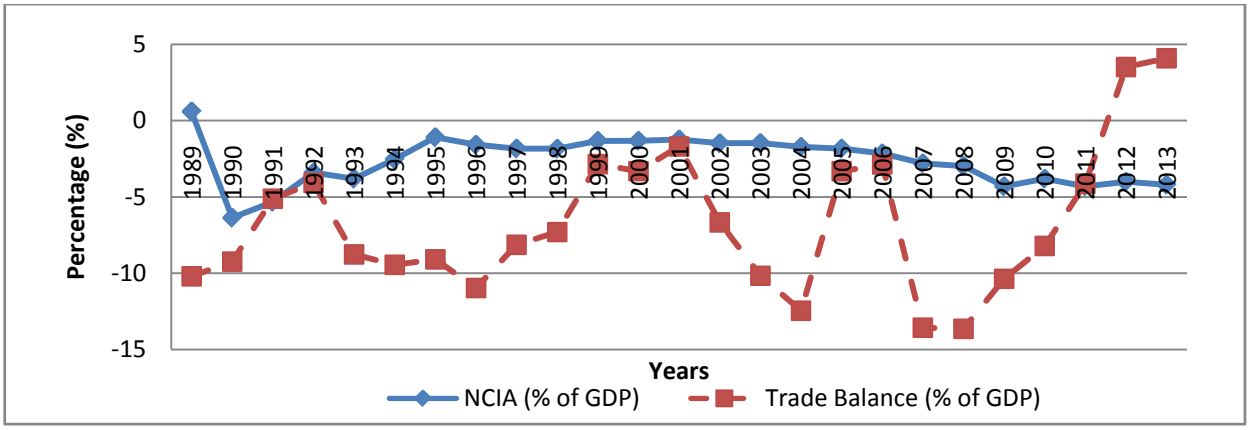

Figure 8(b). Trade and NCIA as a Percentage of GDP for Vietnam

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