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Economic Feasibility of Malaysia and Singapore-Brunei Monetary Reunion: A Scrutiny during Major Financial Crises

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Abstract

This paper attempts to assess the feasibility of Malaysia to rejoin the monetary union with Singapore and Brunei, which it left in 1973. The study scrutinizes in particular the period of two impactful financial crises in the last decades, namely, the Asian Financial Crisis in 1997 and the US subprime-caused Global Financial Crisis in 2007-2009. Assessment is made in terms of the real convergence criteria suggested by the optimum currency areas (OCA) theory and the nominal convergence criteria specified by the Maastricht Treaty. In light of the endogeneity view of convergence criteria, the relevant features of Malaysia are evaluated against those of Singapore and Brunei to infer the degree of preparedness of Malaysia to access the prevailing Singapore-Brunei monetary union. Results suggest that Malaysia could be as good a candidate as Brunei as a monetary union member with Singapore.

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1. Introduction

The Asian financial crisis and the US subprime crisis are generally acknowledged in many studies as two of the most devastating financial meltdowns in the Asian region in recent years (e.g. Boubaker, Jouini & Lahiani, 2016; Chowdhry & Goyal, 2000; Corsetti, Pesenti, & Roubini, 1999; Lee, Tucker, Wang, & Pao, 2014; Mishkin, 1999). Such massive market shake-ups provide an effectual litmus test to the economic feasibility of the Malaysia and Singapore-Brunei monetary reunion. In recent years, monetary unions in the Asian region and elsewhere have been strongly advocated by Quah (2019, 2017, 2016, 2012), and Quah and Crowley (2012). While the above studies attempt to evaluate the feasibility of monetary unions, this study intends to evaluate the resurrection of the long-defunct Malaysia-Singapore-Brunei monetary union.

The proposal for the establishment of a monetary union in the Asian region has been reverberating for over a decade. On Oct 25, 2009, at the Southeast Asian summit, Yukio Hatoyama, prime minister of Japan, suggested a common currency for East Asia, while Australian Prime Minister, Kevin Rudd, proposed a pan-Pacific economic community that would include the US. Their views are consistent with a poll of corporate executives almost a decade ago in 2002, where 43 percent of respondents favored an eventual monetary union in the region (Lincoln, 2004). A leap forward in regional collaboration actually began in May 2007, when the ASEAN[1]+3 (ASEAN plus Japan, Korea, and China) countries agreed on the "Chiang Mai Initiative," a network of bilateral swap agreements that allows the Asian countries to borrow funds from one another. The issuance of an Asian Currency Unit (ACU) was also proposed.

[1] The Association of Southeast Asian Nations (ASEAN) was founded in 1967 and had five members initially (Indonesia, Malaysia, the Philippines, Singapore, and Thailand). By 2009, it had five more members (Brunei, Myanmar, Cambodia, Laos, and Vietnam).

One key motivation behind these efforts is the continued progression towards interdependencies within the region and growing openness with the rest of the world. As the early 2000s indicate, more than half of East Asian trade is with itself, and the share of intra-regional trade within the region is comparable to that in the EU, but exceeds that of the North American Free Trade Agreement (NAFTA) (Kawai & Motonishi, 2005). Moreover, business cycles in the region have been increasingly synchronized as a result of: (1) regional proximity and growing direct trade linkages; (2) intense intra-regional competition in exports to third markets, such as the US and Japan; and (3) vulnerability to fluctuations in the yen-dollar rate (McKinnon & Schnabl, 2003). Bayoumi and Eichengreen (1994), Goto and Hamada (1994), and Kawai and Takagi (2005) even concluded that East Asia came as close as Western Europe to being a single currency area. Soo and Choong (2010) discovered that over time, the degree of segmentation experienced by some East Asian countries – particularly Hong Kong, Korea, and Singapore – has declined significantly. Recently, using the US as the reference country, Quah and Crowley (2012) managed to detect a significant rise in convergence in the region after the Asian crisis.

Despite the above, few studies have investigated the prevailing monetary union between Singapore and Brunei, which has been in place since 1967, and – more importantly – the economic prospects of Malaysia to rejoin the union, which it left in 1973. This is in light of the ever-closer ties between Singapore and Malaysia in recent years. Besides the presence of 70% of total direct investment in the manufacturing sector in Johor, a Malaysian state neighboring Singapore, Singapore has also agreed to form a 50:50 joint venture between its government investment arm with Malaysia's equivalent to undertake an iconic wellness township project in the state of Johor.[2] The impact of trade integration in the region, including Malaysia and Singapore, is likely to be strong on monetary cooperation projects (Nicolas, 2010).

[2] See The Star news online dated June 17, 2010 at http://biz.thestar.com.my/news/story.asp?file=/2010/6/17/-business/6485311&sec=business, accessed on the same date.

In another respect, in view of Singapore's macroeconomic success associated with credible monetary policies over the past two decades, as shown by various studies, including Devereux (2004), Gerlach and Gerlach-Kristen (2006), and Parrado (2004), it seems apparent that a Singapore monetary regime could be an attractive arrangement for adoption by other highly open economies, including Malaysia.

The remainder of this paper is organized as follows. The next section discusses the conceptual framework, including the background of Singapore-Brunei Monetary Union. The third section talks about the methodology, introducing the Optimum Currency Area (OCA) criteria and the sources of data. The OCA results are presented in the fourth section while the Maastricht Criteria results in the fifth. Finally, Section 6 discusses the findings and Section 7 concludes.

2. Conceptual framework

This paper attempts to assess the feasibility of Malaysia to rejoin the Singapore-Brunei monetary union in terms of the criteria suggested by the OCA theory and the nominal convergence criteria specified by the Maastricht Treaty, by comparing the characteristics of Malaysia against those of Singapore and Brunei. In some ways, this approach takes into account the endogeneity view of convergence criteria popularized by Frankel and Rose (1998). Even if the criteria are indeed endogenous, features of Malaysia that are at least as conforming as those maintained by Brunei should indicate a considerable degree of preparedness for Malaysia to join the Singapore-Brunei monetary union.

The following background for the Singapore and Brunei monetary union is extracted from Ngiam and Yuen (2001), in which some figures have been updated. Brunei and Singapore have a long history of monetary integration. In June 1967, Brunei, Malaysia, and Singapore adopted a system of free interchangeability of their respective currencies, in order to maintain strong economic and trade ties. Under this system, each country issued its own currency that was legal tender domestically, but "customary tender" in the other two countries. The banks in each country were obliged to accept, at par and without charge, the notes and coins of the other countries. In addition, the currency boards agreed to

repatriate the currencies of the other countries and to receive at par the equivalent in sterling or some other agreed currency.

In May 1973, Malaysia terminated the arrangement with Singapore. Brunei decided to continue with the arrangement with Singapore and also to terminate the arrangement with Malaysia. The monetary union between Brunei and Singapore (MUBS) allows the Brunei dollar and the Singapore dollar to be customary tender in each other's territory. It also allows the Monetary Authority of Singapore (MAS) to conduct an active exchange rate policy on behalf of both countries by managing the Singapore dollar against an undisclosed basket of currencies. Brunei operates a currency board system by fixing its exchange rate one-to-one to the Singapore dollar and by providing 100 percent backing of its currency in circulation.

The MUBS is a dual-currency system in which the national currencies of Brunei and Singapore are circulated in the two countries. Although the MUBS links the two currencies to each other one-to-one, it is not a single-currency union, as there is no single common currency like the euro. Nevertheless, it is a more co-operative and binding arrangement than a pegged system such as that between the Hong Kong dollar and the US dollar and that between the Macau *pataca* and the Hong Kong dollar. Under the MUBS, Brunei and Singapore are more inclined to help each other out in times of financial stress than would be the case if Brunei were to unilaterally fix its exchange rate to the Singapore dollar.

One significant benefit of the MUBS is that it has made the Brunei and Singapore dollars more stable against all the other currencies than they otherwise would have been. This is partly because Singapore (or Brunei) can have access to the foreign reserves of the other country. A country that has substantial international liquidity through a ready source of foreign currency funds is less likely to be the object of a currency attack as its credibility in defending the exchange rate is enhanced. Singapore's success in warding off speculative attacks of its currency in September 1985 and in avoiding the worst effects of the Asian financial crisis could be due partly to the combined financial strength of the two countries rather than relying on own reserves.

In addition, MUBS has helped Singapore to retain its position as the largest supplier of goods to Brunei throughout the spillover of the US subprime crisis in the region,

accounting for about 41% of Brunei's total imports in 2009.[3] The MUBS has not resulted in a greater flow of Brunei's oil and gas to Singapore because these two commodities are traded in US dollars. Capital flows have also increased since MUBS. The amount of Bruneian dollars repatriated from Singapore to Brunei has risen steadily from a low of BND29.98 million in 1975 to a record high of BND1113.75 million in 2002.[4] These figures do not include the much larger capital flows undertaken through the banking system by way of book entries. Brunei also uses the financial services of Singapore more than other regional financial centers like Hong Kong. Brunei has also gained by linking itself to Singapore which has been highly credible in maintaining a conservative monetary policy and low inflation. In fact, since the inception of the union, the average inflation rate in Brunei has converged to the Singapore level. Their inflation rates were reasonably well correlated with a coefficient of 0.68, significant at the 5 percent level. In the meantime, two of their important neighbors, Malaysia and Thailand, have experienced higher inflation rates.

3. Methodology and data

The foundations of the optimum currency area criteria (OCA) theory were laid out by Mundell (1961) and McKinnon (1963), before being considerably refined by Kenen (1969) and Krugman (1990). The OCA theory outlines criteria under which a country can reap large benefits and/or substantially reduce the cost of joining a currency area, as summarized by Boreiko (2003, p. 315):

> The OCA theory concerns certain benefits and costs associated with adopting a single currency, which depend on the degree of convergence of the economies. The benefits are associated with economizing on exchange costs and importing the credibility of the union's central bank, thus reducing the inflationary expectations and level of inflation. As for the

[3] Data from Direction of Trade Statistics (DOTS) IMF database.

[4] Data from Brunei Currency Board website: http://www.finance.gov.bn/tt/EDITKKW/bcb/bcb_-statistic.htm, retrieved September 22, 2008.

associated costs, they are essentially the opposite of the benefits of having an independent monetary policy and exchange rate, which are useful as a means of coping with shocks that are asymmetric between the potential monetary union partners.

Following Quah and Crowley (2012), the OCA criteria investigated are trade openness, business cycle synchronization, real exchange rate variability, inflation convergence, real interest rate synchronization, export diversification, and labor market flexibility. Similar measurements of the variables have been used in the work of Quah and Crowley. Except for export diversification, the same set of criteria was used by Artis and Zhang (2002), and the efficacy of the criteria was proven when Portugal, Italy, Greece, and Spain were accurately distinguished as a group maintaining least-conforming OCA features against Germany, which reflects the distressed Eurozone members today.

To evaluate the feasibility of Malaysia in joining the Singapore-Brunei monetary union, the features of Malaysia are measured relative to Singapore, the central banker of the monetary union, and are compared to those of Brunei. Since Brunei adopts the Singapore monetary standards, attributes of Malaysia that are as good as or better than the Bruneian ones should indicate a considerable level of preparedness of Malaysia to access the Singapore-Brunei union. In addition, other neighboring ASEAN countries, namely, Thailand, Indonesia, and the Philippines, are also examined to assess the degree of preparedness of Malaysia to join the Singapore-Brunei monetary union in relation to these countries. Using these countries in the region as a point of reference is appropriate given the similarities in economic development shared by them. The data period sampled for each variable is constrained by data availability, particularly that for Brunei (see Table A, Appendix for data definitions and sources).

4. Optimum currency area criteria results

Trade openness

The OCA theory suggests that countries that trade a great deal with each other are good candidates for monetary integration, as the benefits in terms of transaction cost

savings and exchange rate certainty would be greatly enhanced (McKinnon, 1963). Accordingly, Bayoumi and Eichengreen (1997) have detected that European countries that achieved the greatest levels of bilateral trade also experienced the greatest increase in their readiness for monetary unification. Indeed, as suggested by Edison and Melvin (1990), in choosing which currency to peg to, a country should emphasize a bilateral trade criterion.

A bilateral trade intensity measure, as used by Artis and Zhang (2001, 2002), Boreiko (2003), and Nguyen (2007), is adopted here to measure a country's trade openness with the reference country. For each of the ASEAN countries i, trade openness with Singapore is measured by bilateral trade intensity, $\left(x_{i,r}+m_{i,r}\right)/\left(x_i+m_i\right)$ where x_i and m_i are the exports and imports of goods of the country, and subscript *r* indicates destination to or source from Singapore.

Figure 1 shows the chart depicting trade openness with Singapore for each of the countries for the 1980-2009 period. It is apparent that for most of the period, Singapore had been more important to Malaysia than to Brunei or other countries as a trading partner. Only for a few years circa the Asian financial crisis (i.e. 1994, 1995, 1996, and 1998) had Singapore been more important to Brunei than to Malaysia.

In the meantime, Indonesia had somewhat increased its trade linkage gradually with Singapore after a great reduction in 1985 and even surpassed the Bruneian level in recent years. Whilst Brunei, Malaysia, and Thailand had been trading less intensely with Singapore since the 1990s, Malaysia had recorded a marked increase in trade with Singapore at the tail end of the US subprime crisis in 2009. Distinctively, the Philippine trade openness with Singapore had been gradually rising over the years. Over the period, except for Malaysia, other countries had not been trading with Singapore as intensively as Brunei had, although Indonesia had higher levels of trade with Singapore than the Bruneian levels in the beginning and at the end of the period.

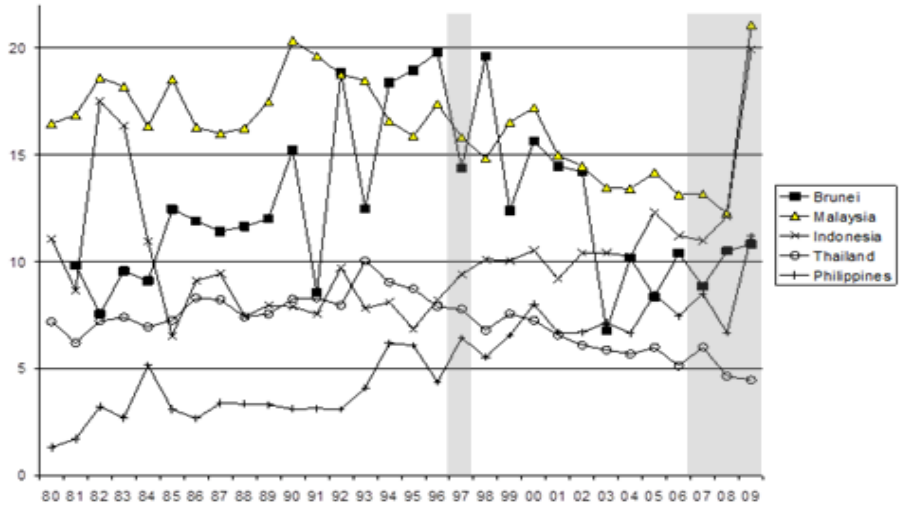


Figure 1: Trade openness with Singapore (%)

Source: See Appendix for data description.

Business cycle synchronization

It is clearly understood that when business cycles are substantially synchronized between two countries, the argument for flexible exchange rates that serve as a shock absorber to resolve asymmetric recessionary or inflationary pressures becomes largely irrelevant. In light of this, the higher the business cycle synchronization with Singapore, the stronger the argument for adopting the Singapore monetary policy.

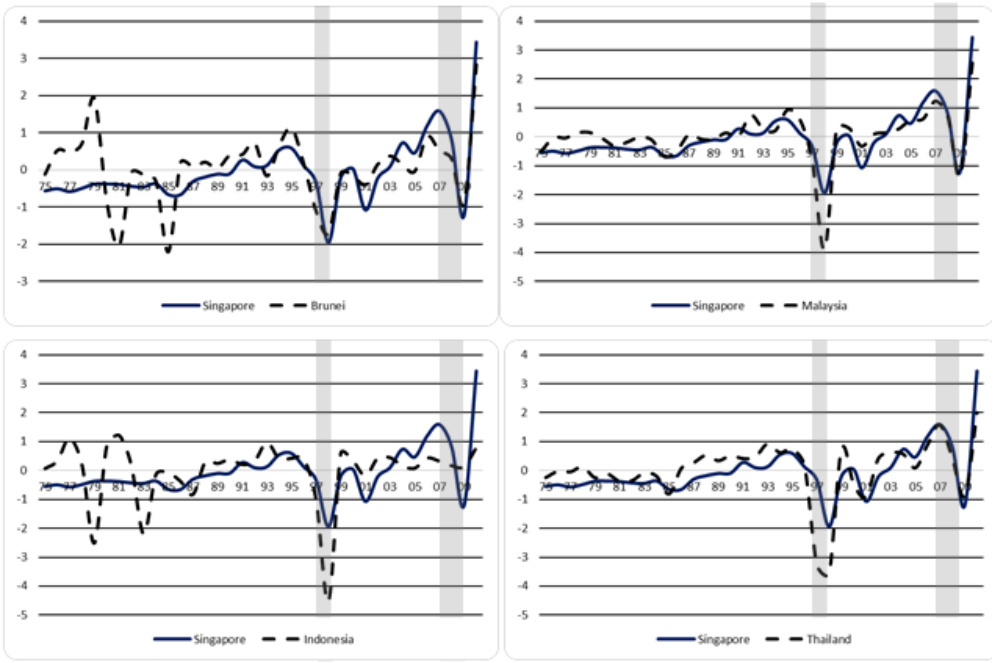
In terms of measurement, it has become popular to implement this OCA criterion according to the synchronicity of business cycles by evaluating the cyclical component of output at business cycle frequencies. In this paper, the method of Gerlach (1988) and Baxter and Stockman (1989) is adopted where cyclical components of annual real gross domestic product (GDP) series are de-trended using the Hodrick-Prescott (H-P) filter. For ease of comparison between countries, the filtered series are standardized.

Figure 2 compares the business cycle of each of the ASEAN countries with the Singapore cycle for 1974-2009. Surprisingly, although Brunei has been sharing common currencies with Singapore, its business cycle had not been as synchronous with the Singapore cycle as that demonstrated by the Malaysian, the Thai, or even the Philippine cycle. Specifically, the Malaysian cycle had closely tracked the Singapore cycle until the

late 1980s, while a noticeable divergence can be seen in 2003 when Singapore was asymmetrically severely hit by the severe acute respiratory syndrome (SARS) outbreak.

One likely reason for the divergence between Brunei and Singapore is the heavy dependence of Brunei on oil and gas exports, which made its business cycle exceptionally susceptible to fluctuations in the oil price in the late 1970s and the oil glut in the early 1980s. But then again, perhaps for the same reason, relative to Singapore, Brunei had somehow shielded itself from the Asian crisis in 1997-98, the dot-com bust and the electronics slump in 2000-01, and the US subprime financial and economic crisis in 2007-09. Nevertheless, except for the early years in the period sampled, the Bruneian cycles had been highly moderate, suggesting relatively low costs of adjusting to asymmetric shocks with Singapore.

Meanwhile, Malaysia demonstrates greater degree of business cycle symmetry with Singapore than Brunei does. This might be due to the fact that both Singapore and Malaysia had been commonly susceptible to fluctuations in foreign investment (e.g. from Japan) and global demand for electronics. The Indonesian cycle does not appear to be associated with the Singapore cycle.



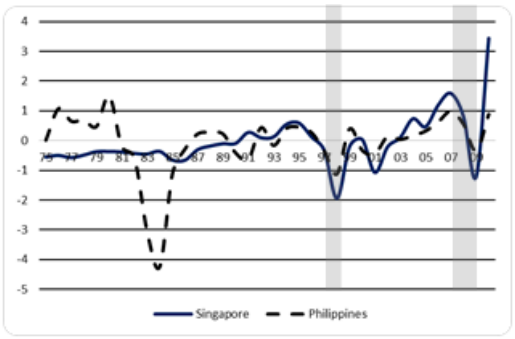


Figure 2: Standardized business cycles in comparison with the Singapore cycle.

Source: See Appendix for data description.

Real exchange rate volatility

Real exchange rate variability is a good indicator of synchronicity of economic forces between countries. The level of a country's need for real exchange rate changes is an important determining factor for joining a monetary union, because real exchange rate changes are clearly measurable and automatically give the appropriate weights to the economic forces of which they are the result (Vaubel, 1978). These economic forces pertain to inflation rates, openness, economy size, prices, wage flexibility, factor mobility, commodity diversification, goods market integration, and fiscal integration (Tavlas, 1993). Artis and Zhang (1997) suggested that low real exchange rate volatility might indicate the absence of asymmetric shocks and the presence of business cycle conformity that may strengthen the case for a currency area.

Figure 3 displays the real exchange rate movements against the Singapore dollar for each of the countries for 1981-2009. Change in real exchange rate is represented by the log-difference of the annual real bilateral exchange rates against Singapore, where the deflator is relative consumer prices. It is clear that the real Brunei dollar rates have hardly moved over the period, even during the early 1980s oil glut and the 1997-98 Asian financial crisis, consistent with its currency board system anchored on the Singapore dollar. Interestingly, even without an explicit currency peg, the real rate of the Malaysian *ringgit* had been very stable when compared to those of other ASEAN currencies.

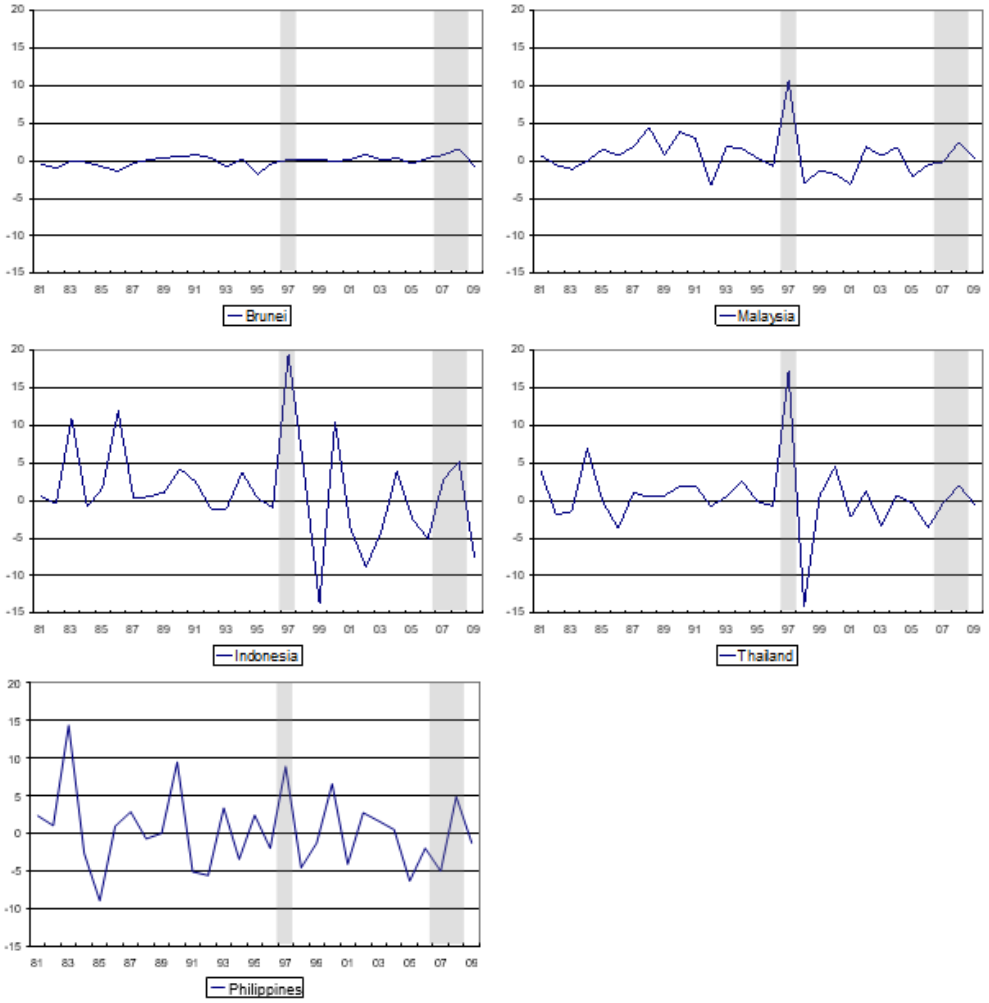


Figure 3: Real exchange rate movements against Singapore dollar

Source: See Appendix for data description.

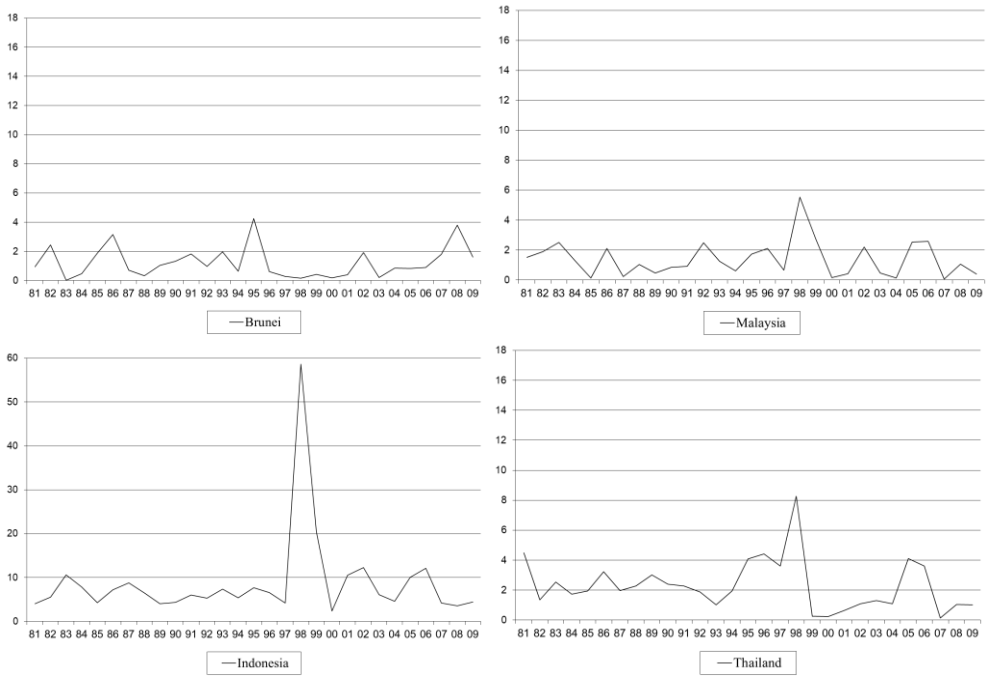
Inflation convergence

The traditional OCA literature originated during the era of 'fix-price' economics, so introducing inflation convergence as a criterion could be regarded simply as an appropriate normalization (Artis & Zhang, 2001). Since similar inflation rates result from similarities in monetary and fiscal policy stances and economic structure, the cost of joining a currency area is presumably low when inflation rates are similar across members (Nguyen, 2007). Convergence in inflation also reflects similarity in the degree of trade union aggressiveness and labor costs, which could mean a lesser need for flexibility in nominal exchange rates to

adjust current account imbalances (Fleming, 1971). Moreover, convergence of inflation rates is the central theme of the Maastricht Treaty criteria and a prerequisite prior to accession into the European Economic and Monetary Union (EMU).

This criterion is measured by the absolute inflation differential, $|x_i - x_r|$ where x_i and x_r are the rates of inflation in country i and Singapore, respectively. The absolute value is used since the magnitude is of concern here.

Figure 4 collects the inflation differentials of the countries with Singapore for 1981-2009. Clearly, inflation in Malaysia is as convergent as that of Brunei with Singapore, wherein significant divergence is only seen during the Asian financial crisis, but not the during the later subprime crisis spillover from the US. Quite the opposite, the greatest divergence in inflation from the Singapore level is maintained by Indonesia and the Philippines.



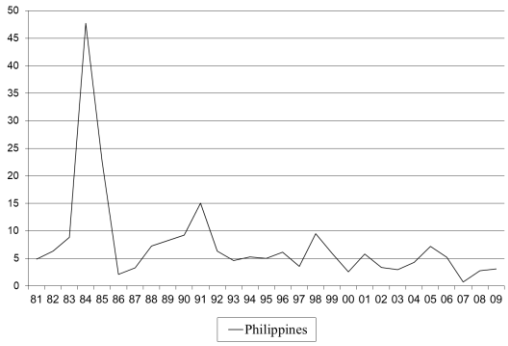


Figure 4: Inflation differentials with Singapore (%)

Real interest rate synchronization

Though not listed as one of the criteria based on the traditional OCA theory (Tavlas, 1993), this factor is indicated by a 'revealed preference' argument (Artis & Zhang, 2001). If the monetary policy of a candidate country historically has differed little from that of the reference country, the cost of relinquishing monetary independence is accordingly low, so that synchronization in real interest rates may be interpreted as an indicator of coordination in monetary policy. The more synchronous the real interest rate cycle to that of Singapore, the more coordinated the monetary policy. To ensure consistency across countries, the annual lending rate, consumer price index (CPI) inflation, and 1998-2009 data are used, and for comparability between countries, the filtered series are normalized. De-trending is accomplished by applying the H-P filter as in the synchronization in the business cycle criterion.

Figure 5 compares each of the countries' interest rate cycles with the Singapore cycle for 1998-2009. Overall, it appears that except for Indonesia, the cycles had been more synchronous with the Singapore cycle since 2007. This could be due to symmetric responses in the capital markets to the global-scale subprime financial crisis.

Though the Bruneian cycle is somewhat augmented for the first half of the period in relation to the Singapore cycle, it nevertheless is the most convergent to the Singapore cycle as far as other ASEAN countries are concerned, broadly supporting its currency board with the Singapore dollar. Malaysia does not appear to be more convergent with Singapore than that of any other country.

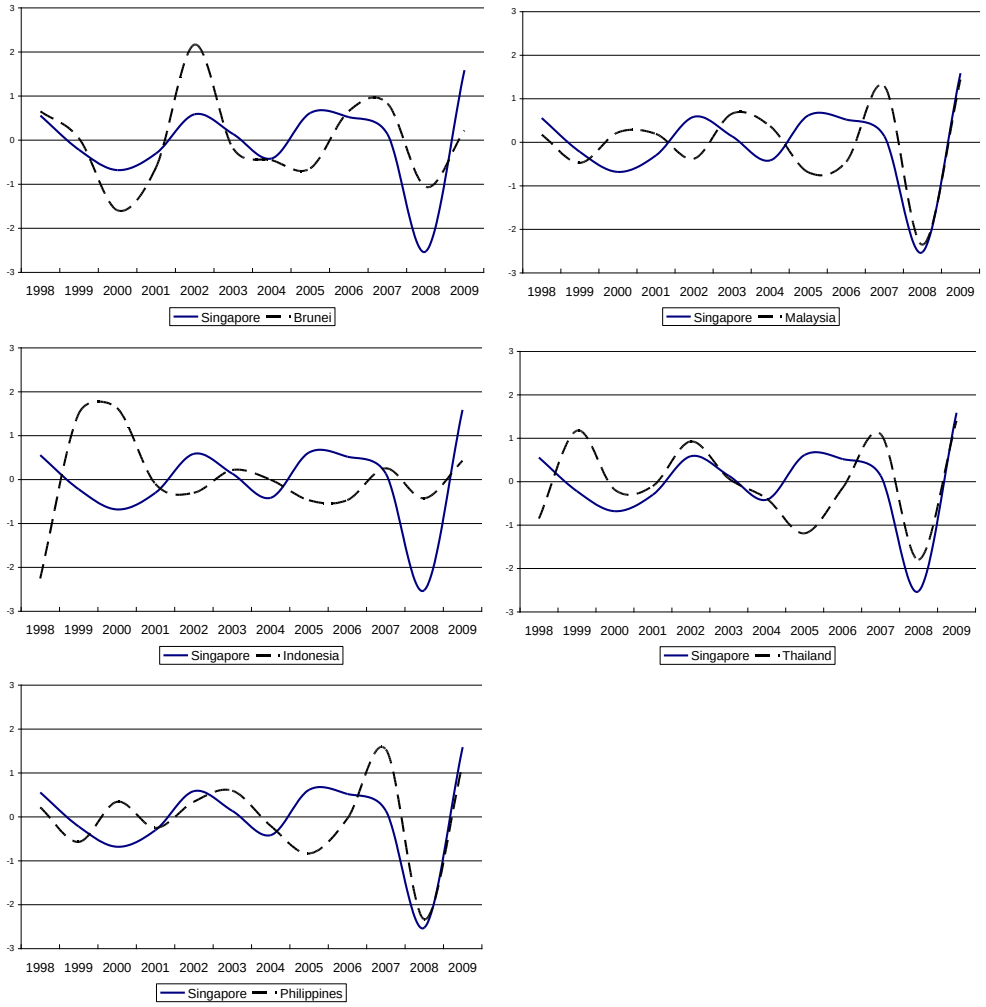


Figure 5: Standardized real interest rate cycles in comparison with Singapore cycle

Source: See Appendix for data description.

Trade diversification

If shocks to the export sector are independent and the country produces a sufficiently large variety of different goods, the law of large numbers will come into play, and total production will not suffer much (Kenen, 1969). Thus, it is easier to fix the currency value in a diversified economy than to fix that of a specialized economy. Nguyen (2007) focused on the degree of export diversification, which is measured by the inverse of the period average of the annual Herfindahl index, a popular indicator of the degree of specialization. The Herfindahl index is computed as:

$$H = \sum_{i=1}^{n} s_i^{\,2}$$

where s_i is share of the export of product *i*, and n is the number of products exported. This paper employs a more comprehensive diversification index, which is maintained by the United Nations Conference on Trade and Development (UNCTAD). The index, which is a modification from the Finger-Kreinin measure (Finger & Kreinin, 1979), takes into account both the diversification levels of export and import:

$$S_j = \frac{\sum_i |h_{ij} - h_i|}{2}$$

where h_{ij} is the share of product *i* in total exports or imports of country or country group *j*, and h_{ij} is the share of product i in total world exports or imports. The degree of diversification ranges from 0 to 1, where the higher value implies more substantial divergence from the global trend.

Since data of individual export products are unavailable, annual export data according to the first-digit sub-industries of the United Nation's Standard International Trade Classification (SITC) Revision 2 are used, as shown in Table 1.

Table 1: United Nation's Standard International Trade Classification (SITC) Revision 2

Code	Product type
0	Food and live animals.
1	Beverages and tobacco.
2	Crude minerals, inedible, except fuels.
3	Mineral fuels, lubricants, and related materials.
4	Animal and vegetable oils, fats and waxes.
5	Chemicals and related products.
6	Manufactured goods classified chiefly by material.
7	Machinery and transport equipment.
8	Miscellaneous manufactured articles.
9	Commodities and transactions not classified elsewhere.

Source: Nguyen (2007).

The diversification indices for 1995-2010 are presented in Figure 6. Obviously, Brunei is the least diversified economy. This should not come as a surprise, since it is a small economy that derives about half of its income from oil and gas exports. Additionally, its diversification level has remained highly stable over the years. Furthermore, the diversification level of Singapore had also been relatively low. For Singapore, Malaysia, Thailand, and the Philippines, their diversification levels in general had been declining since early in the period, except only in 2004 or 2005, where there had been an abrupt rise. Quite the opposite is true for Indonesia, the country with the largest land area, as it has displayed the highest – and rising – level of export variety since the late 1980s.

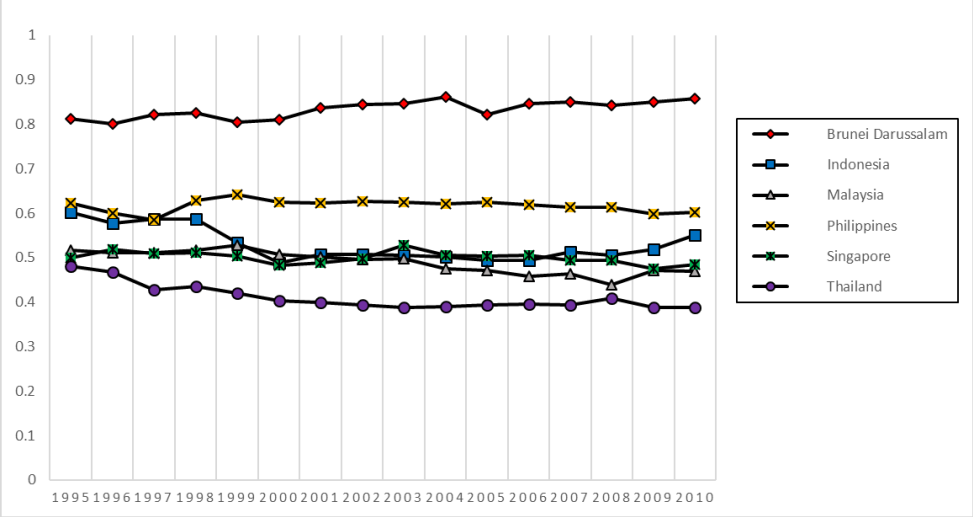


Figure 6: Export diversification indices

Source: See Appendix for data description.

Labor market flexibility

Ingram (1962) and Kenen (1969) suggested that domestic labor market flexibility is equally important to transnational labor mobility (Mundell, 1961) to maintain employment in the face of shocks. Thus, for any economy, the higher the flexibility of the labor markets, the greater the ability to recover from any unemployment shocks, so the greater the feasibility of entering a monetary union. One measure of the rigidity of labor markets that has been used (Artis & Zhang, 2001, 2002) in the literature is a ranking measure of the

severity of employment protection legislation (EPL). In the same vein, in this paper, an equivalent measure, the average of the indices indicating rigidity by the Doing Business Project (see Table 2) by the World Bank, is used to measure labor market flexibility. The lower the indices, the greater the flexibility (see Botero et al., 2003). Furthermore, following Ngiam and Yuen (2001), unemployment rate is used as another indicator to reflect flexibility in the labor markets.

Table 2: Indices indicating labor market rigidity

	Index	Definition
1	Difficulty of hiring	Difficulty of hiring a new worker.
2	Rigidity of hours	Restrictions on expanding or contracting the number of working hours.
3	Difficulty of firing	Difficulty and expense of dismissing a redundant worker.
4	Nonwage labor cost	Nonwage worker remuneration in percent of salary.
5	Firing cost	Cost of a redundant worker, expressed in weeks of wages.

Source: Botero, Djankov, La Porta, Lopez-de-Silanes, & Schleifer (2003).

Figure 7 presents the labor market rigidity indices for 2007-10. Immediately, one can see that Brunei and Singapore maintain the lowest indices, indicating the highest degree of labor flexibility, followed by Thailand, Malaysia, and the Philippines. The Indonesian labor market is the most rigid.

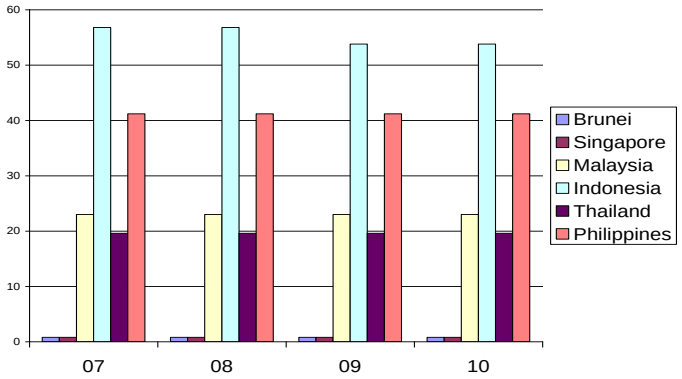


Figure 7: Labor market rigidity indices

Source: See Appendix for data description.

Note: Data prior to 2007 not available.

Figure 8 plots the unemployment rates for 1984-2009, where available. Indonesia and the Philippines maintain the greatest unemployment rates, signifying the highest degree of labor market rigidity as indicated by the rigidity index. Vis-à-vis Brunei and Singapore, since 1996, the Malaysian unemployment rate had been lower than the Bruneian and the Singapore rate, before converging to those rates in recent years. Since the early 1990s, the Thai rate has been lower than those of Singapore and Brunei.

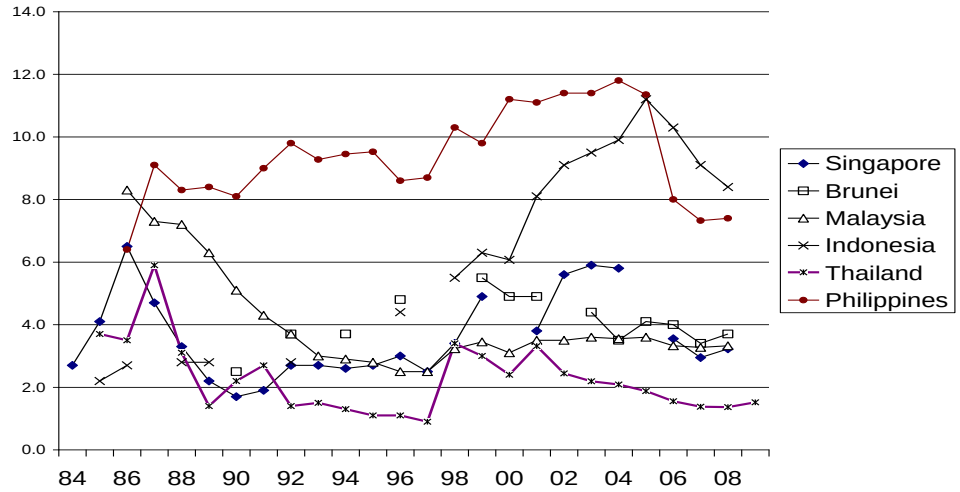


Figure 8: Unemployment rates (%)

Source: See Appendix for data description.

Taking the rigidity index and unemployment rate findings together, Malaysia and Thailand most likely possess more flexible labor markets than those in Singapore and Brunei.

5. Maastricht treaty criteria results

In addition to the real convergence criteria suggested by the OCA theory, this paper also examines the nominal convergence criteria specified by the Maastricht Treaty, which has laid down a set of conditions to be fulfilled by countries aspiring to participate in the EMU.

As explained by Artis and Zhang (2002), the Maastricht criteria can be regarded as concentrating on the single issue of 'stability orientation,' recognized in inflation achievement, fiscal policy stance, and exchange rate behavior. The Maastricht criteria for nominal convergence specify that an aspiring country must have an inflation rate of not more than 1.5 percentage points above that of the average inflation rate of the three members with the lowest inflation, and nominal long-term interest rate not more than 2 percentage points above that of the average rate of the three members with the lowest interest rates.. Furthermore, the treaty requires that the exchange rate must have been stable within the (±15%) Exchange Rate Mechanism bounds for at least two years. As regards fiscal policy, the budget deficit should be no higher than 3% of the GDP, and public debt less than 60% of the GDP.

These preconditions serve several purposes (Bayoumi & Mauro, 2001). The requirement that inflation rates and interest rates converge in the run-up to the EMU was primarily aimed at avoiding large real exchange rate changes once nominal rates were locked irreversibly. The fiscal and debt criteria were designed to avoid negative spillovers from the fiscal imbalances of individual members to other members through pressures for an undue relaxation of monetary policy or even a bailout of a government.

Due to data constraints, the public debt criterion is not investigated here. Since Singapore is the reference country here, the exchange rate, interest rate, and inflation criteria are measured relative to Singapore. The inflation differential with Singapore has already been discussed earlier in the preceding OCA criteria section. Movement in nominal exchange rates is represented by the log-difference of annual nominal bilateral exchange rates against the Singapore dollar. For the interest rate criterion, the lending rate is used to ensure consistency across countries. The budget deficit criterion is computed as originally stipulated.

Figure 9 depicts the government budget balance as a percentage of GDP of the countries for the 1981-2008 period. Positive values indicate a surplus, and negative values indicate a deficit. In general, the balances of the countries had been rising until around the Asian crisis. They subsequently declined, and then picking up in recent years. Singapore and Brunei have recorded budget surpluses for most of the years sampled. For Malaysia,

its government expenditures have been more than its receipts for virtually all the years under consideration and have recently been the least balanced amongst the countries.

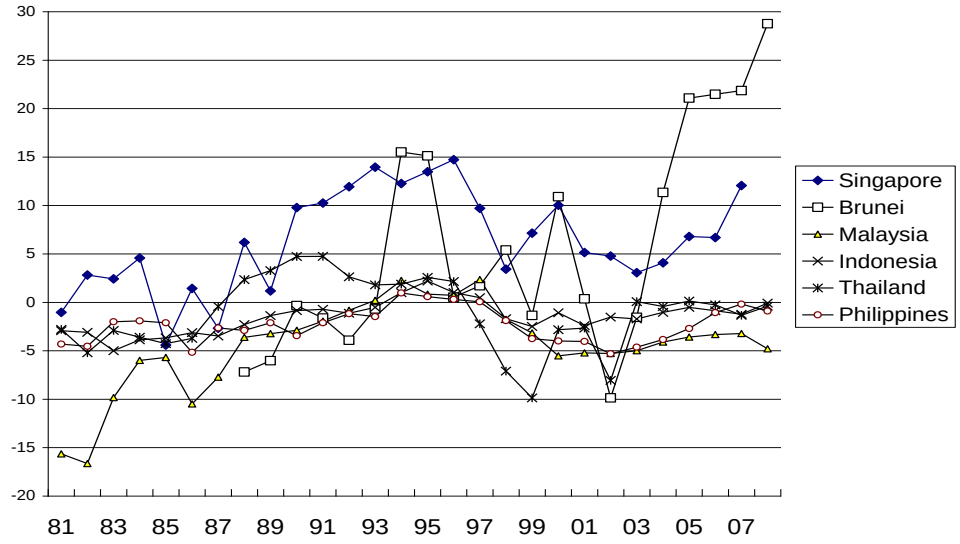


Figure 9: Government budget balances (% of GDP)

Source: See Appendix for data description.

Figure 10 portrays the nominal exchange rate variations of each country against the Singapore dollar for 1982-2009. As expected, since Brunei fixes its currency with Singapore, its nominal rate is absolutely stable. Although Malaysia does not have a formal exchange rate arrangement with Singapore, its nominal rate is also highly stable with Singapore in comparison to those of Indonesia, Thailand, and the Philippines.

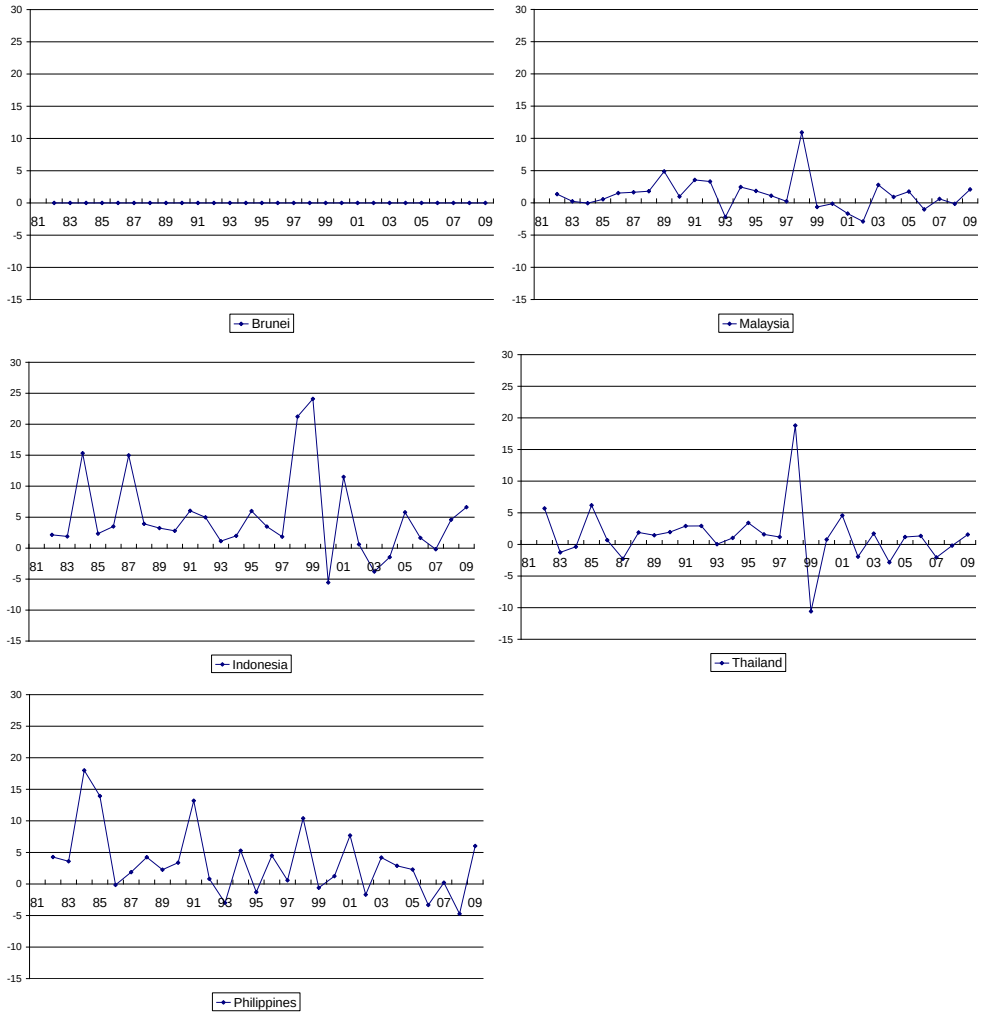


Figure 10: Nominal exchange rate movements against Singapore dollar (%)

Source: See Appendix for data description.

Figure 11 compares the lending rate differentials with Singapore for 1998-2009. While the Bruneian lending rate is the most convergent with the Singapore rate, the Malaysian rate is also comparably convergent, especially in recent years. Meanwhile, the Philippine rate was quite convergent toward the Singapore level in 2007, but has since begun to diverge. Interestingly, the least convergent Thai and Indonesian rates have closely tracked each other over the years.

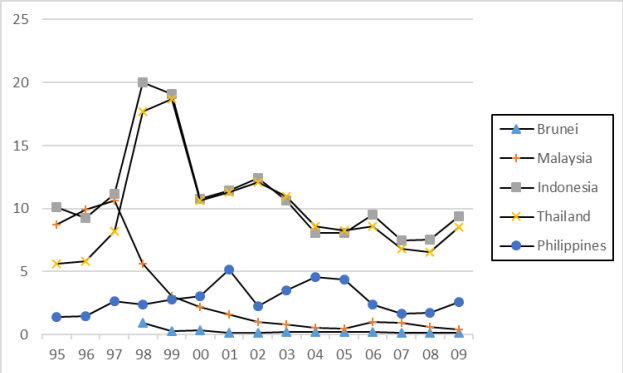


Figure 11: Lending rate differentials with Singapore (%)

Source: See Appendix for data description.

6. Discussion

The previous sections have assessed the degree of conformity of Malaysia toward joining the Singapore-Brunei monetary union in terms of the OCA and Maastricht criteria, using Singapore, Brunei, and other neighboring countries as a benchmark. Since Singapore sets the monetary standards for its monetary integration with Brunei, Singapore was set as the reference country in the analysis. Direct comparisons with Brunei – a country with a prevailing monetary union arrangement with Singapore – could to some extent overcome the endogeneity problem of the OCA approach. Since financial crises can easily hinder economic cooperation, special attention is given to the last two severe crisis periods. Based on these measures, the following findings, giving emphasis to the crisis periods, have been obtained.

With respect to trade openness, Malaysia is the most conforming amongst the ASEAN countries, including Brunei. In terms of business cycle symmetry, Malaysia is better than Brunei and other countries and is as good as Thailand. Regarding real exchange rate stability, Malaysia is less conforming than Brunei, but more conforming than other countries. With respect to inflation convergence, Malaysia is as good as Brunei and more conforming than the rest of the countries. Concerning real interest rate cycle symmetry, Malaysia is no better than any other country. In export diversification, Malaysia is better than Brunei, but not as good as Thailand or Indonesia. With respect to labor market flexibility, the labor

market in Malaysia is less flexible than those in Singapore and Brunei, but the unemployment rate in Malaysia is at least as low as that in Singapore or Brunei.

In addition to the OCA criteria, the Maastricht conditions of Malaysia were also assessed. Pertaining to the government budget balance, Malaysia is less conforming than Brunei and other countries. In terms of nominal exchange rate stability, Malaysia is better than Indonesia, Thailand, and the Philippines. As regards convergence in interest rates, Malaysia is as conforming as Brunei and more conforming than other countries.

Amongst the dimensions considered – except for real interest rate cycle symmetry and government budget balance – even during the crisis periods, Malaysia has shown considerably conforming attributes, at least as good as those of Brunei or other ASEAN countries, to join the Singapore-Brunei monetary union. This broadly supports the robust Singapore-Malaysia linkage identified by Nguyen (2007), when several OCA dimensions and the Asian crisis were considered. It also corroborates Bacha (2008), who found that Singapore and Malaysia had been highly symmetrical in business cycle, inflation level, and economic policy in the long run. Moreover, as shown by Kawai (2008), Singapore, Brunei, and Malaysia are deeply integrated in terms of trade, FDI, and other economic activities.

7. Conclusion

Despite the above discussion, from a political perspective, it is still a significant challenge for Malaysia to eschew its national monetary policies to subscribe to the Singapore standards. Hence, future research should look at the political end of the issue. But then again, in the face of destabilizing global shocks, it has become increasingly advantageous to adopt credible and stable policies, such as those of Singapore. The economy of Malaysia has shown to be quite susceptible to external shocks (Ho, Tew, and Mansur, 2013). Thus, it is important to keep such shocks in check. Shocks on the ASEAN economies are viably scrutinized with the external vulnerability monitoring index proposed by Estrada Ruiz, Diwa, and Ho (2018).

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Appendix

Table A Data Definitions and Sources[1]

Country	Trade[2]	GDP, GDP deflator[3]	Exchange rate[4], CPI[5]	Interest rate Period	Export structure[6]	Employing workers index[7]	Unemployment rate	Budget balance[8]
Indonesia	80-09	74-09	81-09	Lending rate 98-09	88-05	07-10	85-86, 88-89, 92, 96, 98-08	81-08
Malaysia	80-09	74-09	81-09	Lending rate 98-09	88-05	07-10	86-08	81-08
Philippines	80-09	74-09	81-09	Lending rate 98-09	88-05	07-10	86-08	81-08
Singapore	80-09	74-09	81-09	Lending rate 98-09	88-05	07-10	84-99, 01-04, 06-08	81-07
Thailand	80-09	74-09	81-09	Lending rate 98-09	88-05	07-10	85-09	81-08
Brunei	81-09	74-09	81-09	Lending rate 98-09	88-05	07-10	90, 92, 94, 96, 99-01, 03-08	88-08

Notes:

1. Series are from IMF-IFS database except stated otherwise. Sampled periods are selected as such to ensure greatest degree of consistency over countries.
2. Trade series are from IMF-DOTS database.
3. GDP for gross domestic product. GDP deflator is used to compute real GDP.
4. Original exchange rate series are rates against the US dollar; exchange rates against the Singapore dollar are derived assuming triangular arbitrage. CPI is needed to compute real exchange rate.
5. CPI for consumer prices index.
6. Export structure data for 1981–2000 are extracted from NBER World Trade Flows database, whereas data for 2001-2005 are taken from International Trade Statistics, International Trade Center UNCTAD/WTO website, retrieved April 08, 2008, from http://www.intracen.org/tradstat/sitc3-3d/indexre.htm
7. Data are sourced from the World Bank Group: Doing Business website. Retrieved June 08, 2010, from http://message.worldbank.org/external/external_error.htm
8. Sourced from ADB database.