Chapter 8 Discussion and Conclusion

The earlier chapters, Chapters 6 and 7 have presented and evaluated the OCA and the Maastricht criteria findings respectively. Accordingly, this chapter comments on the key findings and concludes the thesis.

As illustrated in Figure 8.1, the first section, Section 8.1 will explain how the research questions and objectives would have been addressed in the preceding findings chapters. Section 8.2 revisits and comments on the key findings across the cluster analysis methods. Section 8.3 attempts to offer possible contributions and implications of the present study. Section 8.4 spells out the limitations of the research. Section 8.5 offers some suggestions to future scholars on ways to improve the present effort. Section 8.6 concludes the chapter.

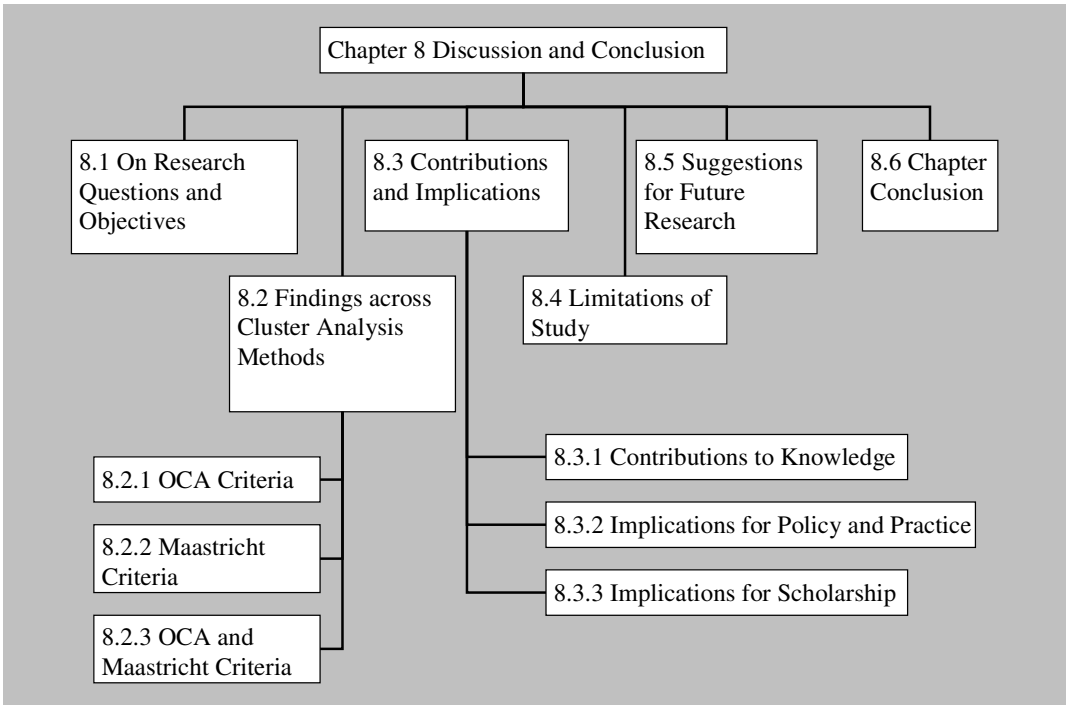

Figure 8.1 Structure of Chapter Eight

8.1 On Research Questions and Objectives

Hitherto, the paper has attempted to meet all the specific research objectives toward answering the corresponding questions, as shaded in Table 8.1. Accomplishments of the specific objectives and questions on the whole are expected to meet the main research objective and the main research question respectively.

Table 8.1 Research questions and objectives

	Main Research Question	
	How homogenous and prepared are East Asian economies toward monetary union?	
	Main Research Objective	
	To identify and explore symmetrical groupings of East Asian economies and their level of preparedness for monetary integration across certain specific considerations.	
	Specific Research Question	Specific Research Objective
1	How would the grouping configuration differ under different monetary anchor?	To evaluate and compare the results when different monetary anchors, namely dollar, currency basket, yen, euro, and yuan anchors are alternatively assigned.
2	How different are the partitions when different sets of criteria are used?	To explore and compare the results by OCA with those by Maastricht criteria.
3	How would the results differ across different clustering methods?	To assess and compare the results by hierarchical, fuzzy, and model-based cluster analysis methods. Results are also compared with those of principal component analysis.
4	How would the arrangements vary if benefits and costs of monetary integration are treated equally?	To inspect and compare the solutions when the sum of 'benefit' OCA criteria and the sum of 'cost' OCA criteria are weighted equally.
5	How prepared are generated country clusters for exchange rate fixation and for monetary union?	To infer the degree of readiness for fixed exchange rate and for monetary union by evaluating the groupings of East Asian countries with dollarized and euroized countries respectively.
6	How dominant are some criteria in representing the rest of the criteria?	To detect and examine subsets of OCA criteria which are most representative of the rest in generating the results.
7	How important are certain criteria in producing the best partitions?	To detect and assess subsets of OCA criteria which produce the most data-fitting partitions as indicated by particular statistical measures.
8	How would the results vary over different economic periods?	To compare the results across pre-crisis, crisis, and post-crisis periods.
9	How do the findings compare with the actual HongKong-Macau and Singapore-Brunei fixed exchange rate arrangements?	To evaluate the results against the existing fixed exchange rate arrangements of HongKong-Macau and Singapore-Brunei.

To reiterate, the inspiration for the research questions of the present research originates from developments in the literature and those in practice, as pointed out in the early chapters of this report in Chapters 1, 2, and 3. As described in Chapter 4, the key components or 'ingredients' used in the analysis are the OCA and Maastricht criteria, and the alternative monetary anchors of dollar, currency basket, yen, euro, and yuan whose respective reference countries are the US, weighted-G3 (US, Japan, and Germany/EMU), Japan, Germany/EMU, and China. The methods or 'tools' used with the components to accomplish the objectives are those explained in Chapter 5 wherein the main statistical tools deployed are hierarchical cluster analysis (HCM), fuzzy cluster

analysis (FCM), and model-based cluster analysis (MBC).

The findings using OCA criteria have been delivered in Chapter 6. The chapter has addressed the research questions involving OCA criteria only, that is, all the questions except the second question.

The first research question was answered when configurations by different monetary anchor were reviewed, compared, and interpreted. The third question was met when findings by HCM, FCM, and MBC were presented and compared. The original cluster analysis solutions were also assessed against the PCA solutions.

The fourth research question was met when the original criteria and the weighted-criteria solutions were evaluated. The fifth question was addressed when the levels of preparedness of the Asian countries were measured using dollarization and euroized countries as benchmarks.

The sixth and the seventh research question were attempted when the findings from the criterion dominance and the variable selection exercise on OCA criteria were respectively examined.

The eighth research question was dealt with when results were compared and contrasted across pre-crisis, crisis, and post-crisis periods. The ninth question was addressed when specific attention was given to HongKong and Macau, and Singapore and Brunei, the pairs of economies associated with fixed exchange regimes.

In the meantime, the second question was answered when findings using Maastricht criteria were evaluated and compared with the OCA findings at the end of Chapter 7. Recall that the OCA analyses pertaining to questions four, six, and seven were not carried out using Maastricht criteria.

The solutions to the specific research questions as a whole would actually address the simply-worded main research question “How homogenous and prepared are East Asian economies toward monetary union?” Nonetheless, for the purpose of rigor from

methodological standpoint, it may be persuasive to review the results across the cluster analysis methods as a way to answer the main research question. The discussion is presented in the following section.

8.2 Findings across Cluster Analysis Methods

In general, over anchors and periods, for OCA criteria, MBC produces the greatest number of positive and higher silhouettes whilst for Maastricht criteria, HCM generates the highest silhouettes and FCM produces the greatest number of positive silhouettes. The following are the general findings over cluster analysis methods.

Findings by OCA Criteria

Here are the general findings from the original classifications involving East Asian cases only using the original unweighted OCA criteria:

- Over methods, the US, Japan, and China reference countries are associated with increasingly convergent configurations through the periods in which the configuration by the Japan reference demonstrates the greatest rise in convergence.
- Over methods and periods, the G3 reference is associated with the smallest number of clusters, and the greatest number of positive and higher silhouettes.

In view of the above, when OCA dimensions are concerned the G3 reference is consistent with relatively symmetrical and data-fitting arrangements whilst configurations by US, Japan, and China references have become increasingly symmetrical. In addition, from the HCM and MBC preparedness assessment findings, over the periods on the whole the East Asian countries are shown to be more ready for the basket peg.

This finding seems to broadly corroborate the proposals by Kawai and Akiyama (2000), Ogawa and Ito (2002), Williamson (2005), and Kawai (2008) for an Asian

monetary bloc anchored on a basket of major currencies. In fact, the basket weights used here are those suggested by Williamson.

Findings by Maastricht Criteria

Here are the general findings from the original classifications involving East Asian cases only using Maastricht criteria:

- Over methods, the Germany/EMU reference is associated with increasingly convergent configuration while the China reference configuration demonstrates the greatest rise in convergence (between pre-crisis and post-crisis periods).
- Over methods and periods, the US and the G3 reference are compatible with the smallest number of clusters.
- Over methods and periods, the Germany/EMU reference solutions maintain the greatest number of positive and higher silhouettes.

From preparedness assessment, the US reference has been commonly associated by the three clustering methods with more prepared countries over the periods. Together with the smallest number of clusters demonstrated by the US-based solutions, the US might be a relatively prospective candidate anchor country when Maastricht conditions are concerned. Nonetheless, this is not persuasive as in other aspects listed above the US reference is not as favorable.

OCA and Maastricht Findings Compared

Here are the general findings when OCA and Maastricht results are compared:

- Over methods and anchors, OCA criteria are associated with increasingly convergent configurations across the periods.
- Over methods, periods, and anchors, OCA dimensions are related with more symmetrical arrangements.

- Over methods, periods, and anchors, Maastricht criteria are compatible with more appropriately classified solutions.

Along these lines, OCA criteria are generally associated with more convergent configurations whilst Maastricht criteria are generally related with better classifications. From assessment of preparedness, Maastricht criteria appear to be associated with more subclusters which not only indicated to be symmetrical in respect of convergence features and levels of preparedness but also which commonly present over the methods.

Based on the above cross-method findings, in sum, by the OCA criteria, the basket anchor might be relatively feasible as a monetary anchor whilst by the Maastricht criteria, the dollar anchor might be comparatively viable. Between OCA and Maastricht criteria, OCA dimensions are associated with more symmetrical solutions whilst Maastricht facets are related with more appropriately classified solutions and more prepared cases.

Amidst the mixed results, it may be appealing to revisit the country linkages which have been indicated to be robust over methods. The following subsections revisit several specific findings including subclusters of countries commonly detected by the cluster analysis methods. Since the methods employ different methodologies, the country groupings which are robust to method ought to have stronger or closer links.

Interpretations are given and comparisons with existing empirical literature are made whenever possible.[59] The section is divided into findings by OCA criteria, by Maastricht criteria, and by both OCA and Maastricht criteria.

8.2.1 OCA Criteria

Classifications

This section comments on the original groupings from the analysis involving East Asian

[59] The present study has included Asian economies such as Macau, Vietnam, Laos, Myanmar, and India which, if any, are rarely examined together with other emerging Asian economies. Hence, comparable findings from applied OCA studies involving these cases are difficult to come by.

countries only. For reference, revisit Section 6.5.1 for results using unweighted criteria and Section 6.5.2 for those using weighted criteria.

Korea-Malaysia-Taiwan, Malaysia-Philippines

Using the 7 original unweighted OCA criteria, the cross-method linkages of Korea-Malaysia-Taiwan and Malaysia-Philippines are robust over periods by the basket and the yen anchor respectively. As far as the dimensions are concerned, these two subgroupings could have been consistently symmetrical against the respective reference countries in which Malaysia might have been symmetrical with Korea and Taiwan against the weighted-G3 countries and simultaneously with the Philippines against Japan.

Related links between Korea and Malaysia can be found in other studies. For instance, implementing cluster analysis on seven macroeconomic dimensions for the period before the Asian crisis, Yuen (2000) discovered a cluster consisting of Korea, Malaysia, and Thailand. Meantime, in a cluster analysis exercise involving five OCA variables, Ibrahim (2008) was able to identify association between Korea and Malaysia for the period before the crisis when Japan was used as the reference country.

HongKong-Macau

The above stable linkages are present when the post-crisis labor variable is not included. When labor market flexibility is also considered for the post-crisis period, Hong Kong and Macau are consistently grouped together over the periods by the Japan reference. By the US or the China reference, the link between them is robust for the pre-crisis and crisis periods only. By the weighted-G3 reference, the link is robust for pre-crisis period only.

Hence, Hong Kong and Macau which have begun their fixed dollar pegs since 1980s are not indicated to share common OCA criteria against US for the post-crisis

period. Instead, results by the three clustering methods commonly suggest that these Chinese territories could have constantly shared common OCA criteria vis-à-vis Japan over the periods.

HongKong-Singapore, Australia-NewZealand

Different from the above linkages, HongKong-Singapore and Australia-NewZealand are not linkages which are consistently present over the periods. Nevertheless, when the post-crisis labor criterion is also included, these links are robust over all anchors for the post-crisis period. Besides, Australia-NewZealand also obtains very high group silhouettes by the US reference. Even when criteria weighting is used, Australia-NewZealand still stays over all reference countries, except only the Japan reference.

In Sato, Zhang, Allen (2009), Hong Kong and Singapore were indicated to share long-run co-movements of real output with the US for almost the past three decades and in Nguyen (2007) Hong Kong and Singapore were signified to have shared similar OCA dimensions in the period after the crisis.

As for Australia and New Zealand, based on a dataset spanning over three recent decades, Bacha's (2008) VAR study was able to demonstrate that these close neighbors maintain significantly synchronous business cycles, similar inflation levels, and policy congruence.

China-HongKong, China-Vietnam

Since China is a reference country for this study, China and Hong Kong, and China and Vietnam are in effect robust over all anchors in the post-crisis 7V and post-crisis 8V solutions respectively. This implies that the respective pairs of countries could have shared parallel OCA dimensions against each of the reference countries in the post-crisis period. This may not be surprising since Hong Kong has reunited with China since 1997 whilst both China and Vietnam have begun to be significantly more open

economically with US, Japan, and Europe since the Asian crisis.

Since the labor variable is added in the post-crisis 8V analysis, the finding may also imply that China had been substantially parallel with Vietnam but different from Hong Kong in the labor market flexibility dimension.

Indeed, based on similar data period, Kawai and Motonishi (2005) were able to find that demand and supply shocks in China and Vietnam had been as significantly correlated as those in the EU.

Singapore-Brunei

Singapore and Brunei which share common currencies in practice are shown to share parallel OCA features by the US and the Japan reference in the crisis period only.

Preparedness Assessment

While the above linkages are robust in the findings involving Asian cases only, the following linkages are robust even when benchmark countries are present.

To recap, dollarization and euroized cases are inserted into the analysis to suggest the degrees of preparedness for dollarization and for monetary union respectively amongst the East Asian economies. Asian countries which share the same grouping in the Asian-only and Asian-plus-benchmark solutions should be relatively symmetrical in respect of the OCA dimensions and the level of preparedness.

Some noteworthy linkages which possess those features are commented here. For complete results, revisit Section 6.5.3. When weighted criteria are used, no cross-method linkages may be noteworthy.

Korea-Malaysia

By the US reference, Korea and Malaysia are signified to robustly (over methods) maintain symmetrical OCA features and levels of preparedness for pre-crisis and crisis periods but not for post-crisis period. However, their degree of preparedness might have

faded in the crisis period as they are associated with the highly prepared benchmarks in the pre-crisis solution (most post-dollarization and all EMU cases) but in the crisis period solution, they are only connected with less-prepared benchmarks (pre-dollarization and pre-euro cases).

HongKong-Singapore

The inferences made for Korea and Malaysia may also apply to Hong Kong and Singapore that are indicated to share common OCA features and level of preparedness for the pre-crisis and post-crisis periods by the US reference when the post-crisis labor dimension is also included. In the pre-crisis setting, Hong Kong and Singapore are linked with almost all post-dollarization benchmarks and all post-euro benchmarks but related with mostly pre-dollarization benchmarks in the post-crisis setting.

In light of the above, Hong Kong and Singapore could have been symmetrical in those aspects but their level of preparedness might have been stronger before the Asian crisis.

A number of other studies have also pointed out several common features maintained by Hong Kong and Singapore. Using pre-crisis data, Eichengreen and Bayoumi (1999) discovered, amongst others, that the levels of bilateral exchange rate variability between these two economies due to asymmetric output disturbances, dissimilarity of export composition, strength of bilateral trade, and economic size have approached the Western European levels. In studies covering pre-crisis and crisis periods, the supply shocks of Hong Kong and Singapore were detected to be significantly correlated (Ngiam & Yuen, 2001) and their speeds of adjustment to supply disturbances were shown to be faster than those in Western Europe even when the size of disturbances was larger than those in Europe (Bayoumi & Mauro, 2001).

Hong Kong and Singapore were also suggested to share features of a small open economy before the crisis (Yuen, 2000) and similar OCA features after the crisis

(Nguyen, 2007). In the long-run, their real output movements were found to be significantly correlated with that of the US (Sato, Zhang, & Allen. 2009).

Vietnam and India

When the labor criterion is also considered, the results suggest that Vietnam and India might have been symmetrical in the OCA features and degree of readiness against each of the reference countries except for the G3 reference in the post-crisis period. Their degree of preparedness in that period could be high as they are associated with almost all highly prepared benchmarks (post-dollarization and/or post-euro cases).

Criterion Dominance

The subsets of criteria signified to be relatively dominant in molding the cluster solutions have been different by method. In spite of this, the following OCA criteria are commonly indicated by the three clustering methods as dominant by at least three of the monetary anchors. No criterion is consistently dominant over anchors or periods. For complete results of criterion dominance, refer Section 6.6.1.

For pre-crisis period, real interest rate cycle synchronicity which serves as a proxy for monetary policy coordination is suggested to be dominant by all reference countries except for the Germany/EMU reference. For crisis period, business cycle symmetry and interest rate cycle symmetry are relatively dominant by the US, the Germany/EMU, and the China reference.

In the post-crisis findings, export diversification is comparatively dominant by the US, the G3, and the China references. Note that this criterion is not measured in relation to a reference. Therefore, it appears to imply that reference-dependent criteria are less dominant for the post-crisis period when compared to previous periods.

In sum, the interest rate criterion appears to be relatively representative of the rest of the criteria for pre-crisis and crisis periods whereas the export dimension seems to be

comparatively dominant for the post-crisis period.

Variable Selection

The following OCA criteria are compatible with most appropriately classified solutions by the standards of the validation indexes associated with the cluster analysis methods. The degree of importance of the variables is gauged by the number of times a variable is needed to produce the 'best' partitions across periods. It is found that for different reference country, relatively important variables are different. For complete results of variable selection, revisit Section 6.6.2.

By the US reference, volatility in real bilateral exchange rate is the most important variable; by the G3 reference, trade openness; by the Japan reference, external indebtedness; by the Germany/EMU reference, export diversification; and by the China reference, inflation convergence and real exchange rate variability.

Notice that by the Japan and the Germany/EMU reference, the most important variables are not measured against a reference.

8.2.2 Maastricht Criteria

Classifications

This section discusses the common findings over methods involving the East Asian cases only. For reference, revisit Section 7.5.1. Recall that exercises using weighted criteria are not performed with Maastricht criteria. In the cross-method findings, there are linkages which are indifferent to reference country but none are also robust to period.

Nevertheless, since Singapore and Brunei, and Hong Kong and Macau do share similar exchange rate policies in practice (as mentioned in Chapter 2), the following discusses the linkages involving these pairs of economies.

Singapore-Brunei

Interestingly, Singapore and Brunei are placed in the same grouping over all reference countries and methods for the post-crisis period but not for any of the preceding periods.

Recall that for post-crisis period also, Singapore is linked with Hong Kong over reference countries and methods by the OCA criteria when labor criterion is also considered. Based on both the OCA and Maastricht findings, it can be inferred that in the post-crisis period, Singapore might have shared parallel Maastricht features with Brunei but similar OCA features with Hong Kong.

HongKong-Macau

Hong Kong and Macau which implement effective dollar pegs in practice share the same grouping robustly for all anchors in the pre-crisis setting except for yuan anchor and for all anchors in the crisis period setting. Thus, these small territories could have been symmetrical in the dimensions in pre-crisis and crisis periods, consistent with their parallel exchange rate polices, but not in the post-crisis period.

Interestingly, for the post-crisis period also, Macau shares the same grouping with Singapore and Brunei by each of the reference countries except for the Germany/EMU reference. Along this line, in respect of symmetry in the Maastricht dimensions, Macau might have diverged from Hong Kong and converged instead with Singapore and Brunei in the post-crisis period. Remember that Singapore and Brunei are also associated with fixed exchange rates; hence, this observation may not be unreasonable.

Preparedness Assessment

Recall that euroized cases are inserted into cluster analysis to infer the degree of preparedness for monetary union amongst the East Asian economies. Cases which share the same groupings in the Asian-only and the Asian-plus-EMU-benchmark solutions should be somewhat symmetrical in both the OCA dimensions and the level of

preparedness for EMU-like monetary union. In the findings, no cross-method linkages are also robust over the periods. Nonetheless, the following cross-anchor linkages may be notable. For reference, revisit Section 7.5.2.

HongKong-Macau

For pre-crisis period, Hong Kong and Macau are shown to robustly share those features over methods across dollar, basket, and euro anchors whilst for crisis period across dollar and yuan anchors. Therefore, in relation to US, Hong Kong and Macau could have shared common Maastricht dimensions and degree of readiness for monetary union, in line with their prevailing hard dollar pegs, but only for the pre-crisis and crisis periods.

Malaysia-Canada

For pre-crisis period, Malaysia and Canada are indicated to robustly share those features by US, G3, Japan, or Germany/EMU. In light of this, in the pre-crisis period Malaysia and Canada could have shared common Maastricht dimensions and degree of readiness for monetary union as far as Maastricht conditions and the respective reference countries are concerned.

8.2.3 OCA and Maastricht Criteria Classifications

This part comments the common findings over methods and criteria involving the East Asian cases only, as discussed earlier in Section 7.6.1. Once again, no common linkages are also robust across periods. The following findings may be noteworthy.

HongKong-Macau

Hong Kong and Macau are stably linked regardless of method and criteria in the pre-crisis and crisis period solutions when US is the reference.

This finding endogenously supports the actual effective dollar standards in Hong Kong and Macau since the 1980s. Hong Kong and Macau could have been maintaining closely parallel OCA and Maastricht features against the US in each of those periods. Nevertheless, similar observation is not present for the post-crisis period.

Thus, in the more recent post-crisis period, these two Chinese territories might not have been as symmetrical as before. This may not pose a problem for Hong Kong which unilaterally fixes its currency to the dollar but it may be a concern to Macau which maintains a currency board on the HK dollar.

At the same time, Hong Kong and Macau are also linked by the OCA and Maastricht measures by the Japan reference for pre-crisis period and by the China reference for crisis period.

Along these lines, Hong Kong and Macau could have commonly shared OCA and Maastricht features against US and against Japan in the pre-crisis period and against US and against China in the crisis period.

Based on this evidence, it might be possible for two Asian economies with similar exchange rate policies (in this case Hong Kong and Macau with effective dollar pegs) to jointly share real and nominal macroeconomic relationships (OCA and Maastricht features) against the same reference country over two consecutive periods (the US reference over pre-crisis and crisis periods).[60] The Asian economies could also commonly maintain those parallel features in relation to not only one economy (the US) but to another economy as well (Japan for the pre-crisis period and China for the crisis period).

[60] Of course not all the OCA or Maastricht variables defined in this research are measures against a reference country but most of them are.

Korea-Taiwan, Korea-Malaysia

In the results, for pre-crisis period Korea is grouped with Taiwan irrespective of method and criteria by the G3, the Germany/EMU, and the China reference but for crisis period, Korea is grouped with Malaysia by the US, the G3, and the Japan reference.

This observation suggests that it could be possible for an Asian economy to closely share OCA and Maastricht features with a different Asian economy against each of a different set of reference economies in a different period.

China-HongKong

Meantime, it may also be of interest to find China and Hong Kong being placed together robustly in the post-crisis 7V findings by the G3, the Japan, and the Germany/EMU reference. Hence, in the post-crisis period China and Hong Kong could have been closely symmetrical in the OCA and the Maastricht dimensions against each of these reference countries but only when the labor criterion is not involved.

Since Hong Kong is robustly classified with China in the post-crisis finding, it might have been highly symmetrical with China in the post-crisis period. Recall that the post-crisis period defined here covers 2001–2007 which includes part of the period after the 1997 Hong Kong's reunification with China. To an extent, the finding here is consistent with the actual relationships between the two Chinese economies.

Preparedness Assessment

For countries which jointly share convergence features and level of preparedness across OCA and Maastricht criteria, revisit Section 7.6.2. While some of the linkages are robust across sets of criteria, none of them are also robust across clustering methods.

8.3 Contributions and Implications

This section discusses the key contributions of this study to the body of knowledge, implications for policy and practice, and implications for scholarship.

8.3.1 Contributions to Knowledge

First of all, the present study has laid out an example by which the usefulness of cluster analysis methods can be judged. This can be important because when compared to that in other disciplines, cluster analysis is rarely applied to economic analysis. In this respect, cluster analysis can be regarded as another alternative approach to applied OCA research.

Along this line, the study has demonstrated the application of model-based cluster analysis, a comparatively recent approach in the school of pattern recognition, in addition to the more conventional hierarchical clustering and fuzzy clustering approaches. The study has also showed that albeit some similarities, results by different clustering methods can be rather different. Differences in the ways the objects are partitioned can be easily recognized when the cluster analysis solutions are compared to the spatial plots from principal component analysis. In view of the differences, the study has attempted to assess the cluster analysis solutions in terms of how appropriate the classifications are.

Another noteworthy contribution is the consideration of not one or two, but five alternative possible monetary anchors, US dollar, basket of G3 currencies, Japanese yen, euro, and Chinese yuan for the economies under review. This can be useful because the choice of monetary anchor for East Asia is still widely open and hence the findings from the alternatives should shed some light on the relative feasibility of each of the anchor options. Pertaining to the countries investigated, the study has not only included most of the economies located geographically in the East Asia region but also major economies in the Asia Pacific rim.

Besides the above, the study has also exhibited configurations based on a fairly comprehensive set of criteria pertaining to the OCA theory. In this regard, it contributes by incorporating the scarcely examined dimension of international capital flows through a variable measuring external indebtedness, one measure of dependence on foreign capital. The study has also investigated dimensions which are relatively rarely inspected in applied literature—the export diversification dimension which has been put forward since the early classics and the interest rate movement synchronicity dimension which has been used quite extensively in the European context. In addition, solutions have been evaluated when the benefit and cost aspects of the OCA facets are given equal importance. Facets which are relatively dominant and those which produce better partitioning have also been determined.

On top of that, OCA and Maastricht criteria findings are compared and assessed. Interesting observations have been identified of which in some of the findings certain countries are suggested to be symmetrical in both sets of criteria whilst others are symmetrical in one of the criteria sets.

In light of the endogeneity view of convergence criteria, the study has used countries which have actually dollarized and those which have euroized as benchmarks. Even if convergence dimensions are indeed endogenous, groupings with these benchmarks should indicate relatively higher levels of preparedness for integration amongst the Asian economies.

In another aspect, since the findings are compared and contrasted over pre-crisis, crisis, and post-crisis periods, possible impact from the Asian financial crisis on the associations between the Asian economies in relation to the reference countries, the dominant world economies today, can be inferred.

Last but not least, the study has also provided some insights on Asian economies associated with rigidly fixed exchange rates in practice. In some of the findings, the

fixed exchange regimes of those economies are endogenously supported.

8.3.2 Implications for Policy and Practice

Besides the academia, the findings of the present study are also particularly important to national policymakers and international managers associated with the Asia Pacific region.

To national policymakers in particular the monetary authorities, the results can serve as another piece of essential reference when dealing with issues on regional cooperation. For instance, based on the cross-method findings by the real convergence criteria of OCA, the currency basket option has appeared to be relatively feasible as a monetary anchor option. This may be helpful in light of the recent proposal at the 2009 Southeast Asian Summit by the Japanese Prime Minister Yukio Hatoyama for a common currency in East Asia and that by the Australian Prime Minister Kevin Rudd for a pan-Pacific economic community with US. It may also shed some light on the Asian Monetary Unit (AMU) proposed by Japan.

Specifically, policymakers would be able to make more informed judgments on the feasibility of embarking upon or to continue any economic collaboration with any other country considered here. For instance, Hong Kong and Macau are indicated to have robustly (i.e. over cluster analysis methods) shared common OCA and Maastricht features against US in the pre-crisis and crisis periods but not in the post-crisis period. In this regard, Macau may need to realign its policies with Hong Kong should the territory still wish to maintain its official currency board anchored on the HK dollar. The specific OCA and Maastricht areas that have diverged between them can be found in Chapter 6 for OCA and Chapter 7 for Maastricht.

In the meantime, Hong Kong and Macau are also shown to be consistently and closely symmetrical in the OCA dimensions against Japan over the periods. On this evidence, Hong Kong and Macau might have also been feasible to jointly adopt the

Japanese yen particularly for the post-crisis period when they are no longer indicated to share common OCA features against US.

Some of the findings may also be useful to the existing monetary union arrangement between Singapore and Brunei. In the cross-method OCA results, Singapore and Brunei do not share the same grouping over periods by any reference country. Thus, though they have unified their nominal exchange rates, their real (OCA) dimensions might not have been necessarily aligned and this may pose a problem to the sustainability of the monetary union if the misalignment continues. But then again, Singapore is found to share common Maastricht features with Brunei for the post-crisis period over methods and anchors. Hence, Singapore might have achieved Maastricht convergence with Brunei in that period.

Meantime, the cross-method OCA results also suggest that Singapore might have closely shared parallel OCA features with Hong Kong regardless of reference country in the post-crisis period. Hence, Hong Kong and Singapore might have been somewhat feasible to unify their exchange rates as far as symmetry in the OCA dimensions is concerned. Moreover, Hong Kong and Singapore are also signified to share common levels of preparedness by the US reference for the post-crisis period.

The governments of Australia and New Zealand may also benefit from the findings. As the group silhouettes and the cross-method cluster solutions signify, Australia and New Zealand could have been highly symmetrical in the OCA dimensions regardless of reference country in the post-crisis period.

In addition to the above, by looking at the characteristics describing the generated clusters, specific areas that needed to be aligned can be identified by national governments to achieve structural convergence with the rest of the countries. For instance, the monetary authorities of Indonesia, Laos, and Myanmar may consider curbing their inflation rates to be more parallel with the rest. Indeed, inflation

convergence has been repeatedly stressed by Robert Mundell (see e.g. Mundell, 2000; 2005) as the most important convergence dimension. The same may apply to HongKong-Macau and Singapore-Brunei, the pairs of economies with fixed nominal exchange rates.

In another respect, if the idea of an Asian monetary union is actually materialized, policymakers may wish to use the agglomeration process illustrated by the HCM dendrograms as an aid for sequencing accession among aspiring countries. In this regard, since the post-crisis period is the more recent period, the post-crisis findings might be more useful. Meantime, the degree of belongingness for each country provided by FCM could also be used as a guide when selecting prospective partners to integrate with.

To international corporate managers in financial markets and in other sectors of the economy, the results could assist in decisions pertaining to, for instance, international diversification, sourcing, production, operations, marketing, sales, and so forth. This is so because firms are exposed to external environments such as economic environment which are highly uncontrollable. The common economic relationships shared by certain Asian economies in relation to the reference countries (the major financial hubs and/or export destinations in the world today) identified in the analysis could serve as a reference to business managers.

For example, Singapore-based US corporations that intend to expand their operations in a market homogenous to Singapore may consider Hong Kong since some of the findings have hinted that Singapore and Hong Kong are highly parallel in relation to US in the real (OCA) dimensions in the post-crisis period. Nonetheless, if the objective is to diversify international risk, then the corporations may want to select other countries which are different from Singapore.

Lastly, the study has also found that certain OCA criteria can be more dominant than the others in demarcating the clusters. The importance of the criteria varies

depending on the period, the reference country, and the method. Hence, both national and private policymakers must be aware that consistently using the same set of macroeconomic indicators might not be always valid in characterizing a group of countries in the region, particularly in its relationships with any of the reference countries.

8.3.3 Implications for Scholarship

The present work will be compared to existing literature, either confirming or disconfirming the findings by other similar studies. The study will be particularly relevant to scholars who have interest in cluster analysis and/or economic convergence in the context of emerging economies. It can also be used as a teaching tool for international business and economics at undergraduate and postgraduate levels. Among others, the literature survey, dimensions, methodology, analysis, and results can be used for discussion in classes and students could use this thesis as a guideline for developing their own research papers.

8.4 Limitations of Study

Notwithstanding the popularity of the OCA framework, recently there has been growing criticism against the OCA literature (Boreiko, 2003). The OCA literature has allegedly failed to consider the dynamic and endogenous nature of the criteria because economists have often applied OCA criteria as if they were taking a snapshot of motionless object. However, these characteristics could react to the very policy decision to fix the exchange rate, to adopt another country's currency or to join a monetary union (Frankel & Rose, 1998). Hence, the endogeneity of convergence criteria poses some limitations to a static application of the theory.

Despite the above, for the purpose of this paper it has little relevance. The present

work is concerned about identification of homogeneous country groups and their readiness for integration, so the analysis would indicate if there is a group or groups of economies which are relatively symmetrical so that asymmetric shocks within the groups are less likely and so they might be more feasible for monetary union. Should the criteria are indeed endogenous, then these countries will have competitive advantage over the others and thus the likely structural changes will be less dramatic. Moreover, in the analysis dollarized and euroized cases are used as benchmarks; hence, even if the criteria are endogenous, associations with the benchmarks should provide substantially valid inferences on the degree of preparedness.

But then again, the use of the dollarized and euroized countries as benchmarks only makes sense if the criteria had been valid for the euroized and dollarized countries in the first place and only if the criteria would also be valid for the Asia Pacific economies reviewed.

In addition to the conceptual issues above, the accuracy of the results also depends on the validity and reliability of the data used even though due diligence has been performed to ensure only reliable sources and the most consistent data over time and over countries are used. In some cases, data splicing is carried out with the greatest degree of consistency in check.

The analysis is also limited in the sense that data for most of the variables and countries are only available since 1981, thus investigation cannot be made with the earlier time period. Besides that, the labor market flexibility data which approximate an important OCA criterion are only available for the post-crisis period, hence direct comparisons with previous periods cannot be made.

8.5 Suggestions for Future Research

Future scholars may work on the limitations posed above to improve the present effort.

In addition, readers and scholars must also be aware that there are several serious challenges faced by Asian countries which are not confronted by countries in EMU.[61]

Firstly, in Asia, ASEAN maintains a legal charter which is bound by a strict policy of non-interference that prevents any version of Europe's pooled sovereignty. It began as a cold-war security alliance without a common vision.

Secondly, political, cultural, and economic disparities in the Asian region also loom large. Even leaving aside the perennial distraction of Myanmar, a repressive military dictatorship that Western allies find hard to sit down with, mutual mistrust and outright hostility between certain countries also make a mockery of encomiums on unity. They bode poorly for the resolution of disputes in a possible economic union.

Studies have shown that East Asian countries should move by its natural way of integration, and politically and institutionally it is very difficult to achieve a monetary union in East Asia even in the not too near future.[62]

Indeed, linguistic and cultural barrier has always been cited as one serious hindrance to labor mobility in the eurozone which to some extent contributed to the recent Greek crisis and pressures on euro.

In light of the above, future scholars may wish to incorporate political and cultural dimensions into the cluster analysis approach demonstrated in this thesis. In addition to statistical analysis, scholars may also employ qualitative evaluations particularly to political and social matters to complement their findings.

Lastly, in terms of dataset, with the advantage of using the data after the recent global financial and economic crisis, scholars may adopt the present methodology to study the impacts of the global crisis on cluster configurations in the region.

[61] Comments excerpt from a blind reviewer for one of the present author's works related to this thesis.
[62] Comment given by internal thesis examiner.

8.6 Chapter Conclusion

This chapter is a conclusion to the thesis. The chapter has explained the ways by which the research questions and objectives were addressed. It has also commented on the key findings and provided relevant interpretations on them. Possible contributions and implications of the present work, the limitations of the research, and suggestions for future research have also been discussed.

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