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IJAPS, Vol. 5, No. 2 (July 2009)

THE FEASIBILITY OF EAST ASIAN MONETARY UNION AS AN OPTIMUM CURRENCY AREA

Chee-Heong Quah[*]
University of Malaya
e-mail: bruceleequah@yahoo.com

ABSTRACT

Monetary cooperation in East Asia has become increasingly important and practical, particularly in times of regional economic and financial crisis. Contrary to those papers of studies in the mainstream, this paper evaluates the feasibility of monetary union in East Asia by benchmarking its optimum currency area (OCA) criteria against selected dollarised countries and the European Economic and Monetary Union (EMU). Four criteria are proposed. The US dollar is designated as the anchor currency. To some extent, results do confirm the validity of the criteria and suggest a considerably strong case for monetary integration in parts of the region.

Keyword: East Asia, monetary integration, optimum currency area, OCA

INTRODUCTION

In a recent development, East Asian leaders have agreed to create an $80 billion fund to combat the global economic crisis (Esguerra 2008). The

[*] Chee-Heong QUAH is an academic fellow currently in the final stages of reading a PhD in International Business at Faculty of Business and Accountancy, University of Malaya. His research interests encompass international economics, Asian monetary integration, financial crisis, and optimum currency area. Quah receives guidance from Professors Patrick Crowley (Texas A & M University), Michael Artis (University of Manchester) Goh Kim Leng and Nazari Ismail (University of Malaya). His latest publications include (with Crowley, P. M. (2009, April). "A Single Currency for Asia? Evaluation and comparison using hierarchical and model-based cluster analysis", in *EUSA 11th Biennial International Conference*, edited by Frank Schimmelfennig (Marina Del Rey, California: European Union Studies Association, April 2009); (with Ismail M. N. (2008). "Could the Great Depression repeat itself in the 21st century?", *Malaysian Management Journal*, 12 (1&2) (2008); Quah, C. H. (2007, December). "Impossibility of another Great Depression in the 21st Century", in *The International Conference on Business, Environment, International Competitiveness and Sustainable Development of the Asia Pacific Economies*, edited by Sivalingam G. (Monash University, Malaysia).

initial agreement called for Korea, Japan, and China to provide 80 percent of the fund, or $64 billion, with ASEAN members providing the remaining $16 billion. This event clearly signifies a heightened awareness of the need for a region-wide monetary cooperative in East Asia.

Among scholars and policymakers, the idea of establishing an East Asian or Asian-Pacific currency area has attracted increasing attention (Swofford 2008; Kuroda 2004; Kwack 2004; Dutta 2000; Kwan 1998). The literature has generally favoured forming a currency area in East Asia on several grounds. The first is the continued progression towards openness and interdependence amongst the East Asian economies. The second is that these countries are vulnerable to economic disturbances from abroad, especially those caused by the high degree of mobility currently exhibited by international capital. Third, those disturbances appear to be symmetric among most of the East Asian countries. Lastly, the emergence of currency blocs elsewhere, in part intended to ward off speculative attacks, has reduced the options available for speculators to prey on.

Indeed, in May 2007, as an initial step of the Chiang Mai Initiative[1], the ASEAN+3 (ASEAN plus Japan, Korea, and China) countries agreed upon a network of bilateral swap agreements that would allow East Asian countries to borrow funds from one another. The creation of an Asian Currency Unit,[2] has also been put forward. Recently, the liberalisation of currency exchange, immigration, and trade between China and Taiwan (The China Post 2008) further supports the development of region-wide integration. As illustrated by Shirono (2008), certain regional currency arrangements in East Asia would stimulate regional trade and generate economically significant welfare gains. As a result, it is not unreasonable to envisage a form of monetary integration in East Asia in the 21st century.

Nonetheless, several observers have questioned the feasibility of an East Asian monetary union and the ability of member countries to adjust to external shocks in the absence of exchange rate flexibility as a policy instrument. The standard tool used in economic literature to evaluate the adequacy of a monetary integration is the OCA theory, first proposed by Mundell (1961) and McKinnon (1963), with subsequent refinements by Kenen (1969) and Krugman (1990). The OCA theory compares the benefits

[1] The Chiang Mai Initiative (CMI) is a collaboration among ASEAN+3 countries which strives for formation of Bilateral Swap Arrangements (BSAs) among them. It is intended to mitigate short-term liquidity difficulties and to coordinate the work of international financial organizations like IMF and World Bank.

[2] The ACU as it is proposed is a currency basket and not a real currency, that is, a weighted index of East Asian currencies that will function as a benchmark for regional currency movements.

and costs of countries participating in a currency area. Benefits include lower transaction costs, price stabilisation, improved efficiency of resource allocation, and increased access to product, factor, and financial markets. The main cost, however, is the countries' loss of sovereignty in maintaining national monetary and exchange rate policies. Many have argued that both costs and benefits depend on the nature of exogenous shocks affecting potential member countries and the speed with which they adjust to them. The costs tend to be lower (higher) if shocks are symmetric (asymmetric) and market mechanisms are quick (slow) to restore equilibrium after the shock.

Much of the literature hinges on the aforementioned issue. For instance, Chow and Kim (2003) have investigated the symmetry of shocks, finding that East Asian countries are structurally different from each other and thus are likely to be subjected to asymmetric shocks. Huang and Guo (2006), based on their analysis of structural shocks, suggest that there are subgroups among the East Asian countries, of which one is more synchronised and may be the first to form a currency union. Based on other versions of shock extracting techniques, Eichengreen and Bayoumi (1999), Bayoumi and Mauro (2001) and Kawai and Motonishi (2005) were able to conclude that East Asia is nearly as good a candidate as the European Union for an internationally harmonised monetary policy.

While shock symmetry is important, other criteria come into play as well. As a result, this paper attempts to differentiate itself from shock symmetry-related methods, including those related to correlations of macroeconomic variables. In this spirit, this paper intends to assess the feasibility of the East Asian countries' instituting a regional monetary union based on criterion variables that are rarely considered in the East Asian OCA literature. The variables for different economic periods and their cross-period changes are computed for each country.[3] With these variables, the characteristics of the East Asian countries are benchmarked against the dollarised and the EMU countries to evaluate the feasibility of monetary union.

The remainder of the paper is structured as follows. Section 2 presents the relevant variables in the scope of OCA theory. Section 3 describes the methodology adopted in this paper. Section 4 discusses the

[3] The East Asian countries/territories included are Brunei, Cambodia, China, Hong Kong, India, Indonesia, Japan, Korea, Laos, Macau, Malaysia, Myanmar, the Philippines, Singapore, Taiwan, Thailand, and Vietnam. Though India is not located in East Asia, it is included here to reflect its rising dominance in Asia and the world. Abbreviations for the country/territory names are listed in Appendix.

results. Section 5 concludes and provides the relevant implications of the findings.

OPTIMUM CURRENCY AREA VARIABLES

We explore the feasibility of monetary union in East Asia by examining whether the OCA characteristics of candidate countries are desirable enough to support a fixed exchange rate system. The choice of variables is based on their pertinence to East Asia. For the variables that are dependent on a reference country, the United States is nominated *a priori* as the reference country for several reasons.

The US is chosen as the reference country, as soft pegs against the dollar are still strong and prevalent in East Asia despite the Asian financial crisis (McKinnon 2005).[4] As asserted by McKinnon and Schnabl (2004), the dollar is widely used as the invoice currency for most East Asian trade, even though Japanese trade in the region is as prevalent as American trade. Furthermore, Mundell (2003) has explicitly called for the fixation of the yen-dollar rate as a step to achieve region-wide monetary stability in the Asia-Pacific region.[5] If the yen-dollar rate is to be fixed, then setting the dollar as the reference currency for the region is completely rational. The following sections will argue why inflation convergence, export diversification, labour market flexibility and external indebtedness are critical factors that create efficiency and harmony in macroeconomic management.[6]

[4] Dollar pegs are entirely rational from the perspective of Asian countries; both facilitate hedging against exchange risks and help anchor domestic price levels. Though the East Asian countries have turned from being net debtors to net creditors against the US after the crisis, they still opt to maintain the soft pegs, as any devaluation of the dollar will reduce the value of their dollar-denominated assets. Furthermore, the dollar is also the 'safe-haven' currency, into which nationals in emerging markets fly in the face of a domestic financial crisis.

[5] For this reason, Japan is included among the East Asian economies even though its developed status could feasibly support an independent exchange rate. It is widely agreed that the sharp yen-dollar rate fluctuations have caused havoc in the Asian crisis. Hence, the option of a currency basket peg is ruled out in this paper. It is proposed that the region strict peg its exchange rates against the dollar.

[6] See Appendix for data definition of the variables.

Inflation Convergence

Inflation convergence has been repeatedly stressed by Robert Mundell as the most important convergence criterion (Mundell 2000). He asserts that if inflation rates are more or less similar, there should be no reason why exchange rate fixation would be difficult. As pointed out by Nyugen (2007), when inflation rates are steady over time, the terms of trade will be fairly stable, downplaying the need for a separate exchange rate. Also, since similar inflation rates result from similarities in monetary and fiscal stance as well as in economic structures, the cost of joining a currency area is presumably low when inflation rates are similar across countries.

In empirical studies, in addition to principally real variables suggested by traditional OCA literature, Artis and Zhang (2001), Boreiko (2003), and Nguyen (2007) have implemented a measure of inflation convergence. In practice, convergence of inflation rates, both actual and political, is of course the central theme of the Maastricht Treaty and a prerequisite for accession into the EMU (Artis & Zhang 2001). In this paper, this criterion is measured by absolute inflation differential, $|x_i - x_{US}|$, where x_i and x_{US} are the rates of inflation in country x^i and the US, respectively. Absolute value is used, since the magnitude is of concern here.[7] Differentials Differentials are averaged over time; the lower the differential is, the higher the inflation convergence.

Export Diversification

Kenen (1969) contends that when a diversified economy's export sectors are subject to shocks, the law of large numbers will come into play, and total production will not suffer much if the shocks are independent and the economy produces a sufficiently large variety of different goods. Thus, it is relatively more viable to fix the currency value of a diversified economy than that of a specialised economy. This criterion has been included as an OCA criterion in, for instance, Bénassy-Quéré and Coupet (2005) and Nyugen (2007). In this paper, as in Nyugen (2007), the degree of export diversification is measured by the inverse of the period average of the annual Herfindahl indices, a popular indicator of the degree of specialisation. The Herfindahl index is computed as $H = \sum_{i=1}^{n} s_i^{\,2}$, where s_i represents the share of the export of product i and n is the number of

[7] In Artis and Zhang (2001), absolute value is not used. In a correspondence with Artis in 2008, however, he indicated that absolute value may be a better option to avoid the problem of the cancellation of values of opposite sign.

products exported. Since export data of individual 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. Given that there are 10 categories, the diversification indices would range from 1, in countries where exports are least diversified, to 10, where exports are most diversified.

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: Nyugen (2007)

Labour Market Flexibility

Ingram (1962) and Kenen (1969) suggest that domestic labour market flexibility is equally important to Mundell's (1961) transnational labour mobility as an OCA criterion to maintain level of employment in the face of economic shocks. Thus, for any economy, the higher the flexibility of its labour market is, the greater its ability to recover from any unemployment shocks, and, thus, the higher its feasibility to enter a monetary union. A measure of labour market flexibility that has been used (Artis & Zhang 2001) 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, a variable derived from the indexes by the Doing Business Project[8] (Table 2) initiated by the World Bank, is used to measure labour market flexibility. The original indexes take values between 0 and 100, with higher values indicating more rigidity.[9] To get the index for flexibility, the

[8] Doing Business Project is a project to rank the easiness of doing business across countries in the world. The data source is provided in Appendix.

[9] The methodology used to construct these indexes can be found in Botero et al. (2003).

indexes are averaged and then deducted from 100. Thus, the higher the flexibility index is, the more flexible is the labour market.

Table 2
Indexes indicating labour 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 labour 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 and Schleifer (2003)

External Indebtedness

Bénassy-Quéré and Coupet (2005), and Tsangarides and Qureshi (2008) have used the liability to service external debt as an OCA criterion for African countries. According to them, the higher the external debt service is, the lower the incentive to devalue (i.e., to increase competitiveness) because the debt service is denominated in hard currencies, for instance, the dollar. The concept of external indebtedness can also be applied to East Asia.[10]

Some evidence is found to substantiate this argument. Rogoff (2005) discovers that many developing countries in Asia still have high levels of debt dollarisation and indexation. When external indebtedness is high, it becomes important for developing countries to fix exchange rates so that debt denominated in hard currencies would not be subject to excessive foreign exchange risk. Therefore, in order to avoid international debt crisis, accession into a monetary bloc could be an option. In the same way, McKinnon and Schnabl (2004) posit that countries with higher external debt stocks are expected to be more willing to form a monetary union with a hard peg on a foreign device. Due to data availability, a popular measure of country indebtedness, that is, the ratio of total external debt to total exports of goods and services, is used to measure external indebtedness in this paper.[11]

[10] As noted by Reinhart, Rogoff, and Savastano (2003), among the reasons for dependence on external debt are liberalisations undertaken by emerging markets since the late 1980s. These liberalisations have led to decline in tax revenues, particularly trade taxes, but increased expenditures due to the lifting of interest rate ceilings.

[11] As widely accepted in the literature (see, e.g., Calvo and Reinhart 2002), developed countries are generally not subjected to currency risks associated with external indebtedness. Thus,

METHODOLOGY

The OCA variables are computed for 17 East Asian (EA)[12], four four dollarised (DL), and three developed Pacific (DP) countries for different economic periods: the growth period (1981–1996), the crisis period (1997–2000), the post-crisis period (2001–2007), and the long-run period (1981–2007). For identification, these periods are referred to as EA periods when EA countries are concerned and as DL periods when DL countries are concerned. These periods clearly reflect the general economic conditions in EA countries and characterise the economic circumstances in the DL countries. This is so because the 1997 Asian crisis had not only impacted the EA region but also spilled over to Brazil and the whole Latin American continent (inclusive of the DL countries) in 1998–1999 (Beckerman and Solimano 2002).

The growth period, 1981–1996, is part of the period prior to the Asian financial crisis, when the region experienced high economic growth. This period was called the "East Asian Miracle" by the World Bank (Calomiris & Beim, 2000).[13] This period also takes into account the structural change after the petroleum crises in 1979. The crisis period, 1997–2000, is intended to assess if results are significantly different in times of distress. The period thereafter, 2001–2007, is analysed separately, since many believe that the regional crisis has driven the EA region toward greater regional integration and bilateral cooperation (Plummer, 2007).

Other than the variable values corresponding to the respective periods, cross-period percent changes are also reported to capture their trends. Percent change is used so that magnitudes of change between countries can easily be compared. Percent changes are calculated for growth-to-crisis-period (G-C), crisis-to-post-crisis-period (C-P), and growth-to-post-crisis-period (G-P). While the G-C and C-P changes are meant to describe the trend from one economic period to another, the G-P change is, to an extent, intended to look at the trend minus the Asian crisis effect.

The DL countries included are Ecuador, which dollarised in 2000, El Salvador and Guatemala, which both dollarised in 2001, and Panama, which

external indebtedness as an OCA criterion is not applied to developed countries (Japan, Canada, Australia, New Zealand, and EMU countries) in this paper.

[12] Also stands for East Asia.

[13] Real GDP of eight EA countries in 1965–1993 grew at an average annual rate of nearly nine percent, more than twice as fast as their Latin American counterparts.

dollarised in 1904 (Castillo 2006).[14] The DP countries are Canada, Australia, and New Zealand. As with the EA countries, the reference country designated for the DL and DP countries is the US. The purpose of including the DP countries is to introduce a control on the power of the methods adopted. Given our a priori economic knowledge, these countries should possess some characteristics that can help us to verify the validity of the measurements used.

In addition, the variables are also computed for the EMU countries for the pre-Maastricht period (1988–1993), the post-Maastricht period (1994–1998), and the post-euro period (1999–2007). These periods shall be called the EMU periods. The periods are structured according to several milestones: July 1, 1987, the effective date of the Single European Act; November 1, 1993, the effective date of the Maastricht Treaty; and January 1, 1999, the day the euro was launched. As with other countries, cross-period percent changes are also computed for the EMU countries.

The EMU countries included are those that adopted the euro in the initial stage: Austria, Belgium, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain. Germany is not included, since it is considered the de facto anchor country—the reference for the EMU countries when it comes to the variables that require a reference. Thus, 10 EMU countries are included.

To assess the feasibility of the EA countries, benchmarking against the DL and EMU countries is carried out. First, by benchmarking against the DL countries, the feasibility of hard dollar pegs among EA countries can be partially evaluated. Besides the DL countries, comparison to Hong Kong, which has adopted a formal currency board system (which fixes the HK dollar to the US dollar) since 1983, is also made whenever necessary. Second, by benchmarking against the EMU countries, the feasibility that a regional monetary union in the EA region will be as good a candidate as the EMU can be assessed.

The benchmarking is done in a simple manner.[15] Every variable value of each EA country for each EA period is compared to the second least-favourable value (the benchmark) of the DL countries for each DL period and of the EMU countries for each EMU period. Favourability is defined according to the OCA theory. For every EA-DL and EA-EMU 'paired comparison', if the majority of the EA values are as favourable as or more

[14] In September 2000, Ecuador replaced its Sucre with the dollar. On January 1, 2001, El Salvador followed suit, and on May 1, Guatemala elevated the dollar to equal status with its quetzal.

[15] The next section provides an illustration of the procedure employed.

favourable than the benchmark, then the pair (paired comparison) is considered 'desirable'. Of all the EA-DL pairs, if most of them are desirable, then the case for fixed dollar pegs for EA countries is supported. Meanwhile, of all the EA-EMU pairs, a desirable majority would support the case for a region-wide monetary union. The two outcomes are independent and are not mutually exclusive.

A similar exercise is carried out for the cross-period percent change. An EA trend in accordance with the development of DL and EMU countries would bolster the case for a hard dollar peg and monetary union, respectively.

RESULTS

The analysis for the four OCA variables: (i) inflation convergence; (ii) export diversification; (iii) labour market flexibility; and (iv) external indebtedness, are presented in this section.

Inflation Convergence

Table 3 reports the inflation differential (INF) and its cross-period percent change. The lower the EA INF is, the higher the inflation convergence with the US, and thus, the stronger the argument for exchange rate fixation with the dollar. In the EA region, the lowest EA INF is demonstrated by Malaysia (growth and long-run periods), Singapore (crisis period), and Thailand (post-crisis period). While Laos, Myanmar, Vietnam, and Indonesia have shown high INFs, Myanmar is the only EA country that consistently exhibits very high INF throughout all periods. Thus, Myanmar is the least feasible country in EA for exchange rate fixation.

Even before benchmarking is done, several interesting findings can already be observed in Table 3. First, the universal trend toward inflation convergence with the US[16] seems to bolster Mundell's (2005) proposal for a world currency, a system of many currencies tied by a fixed exchange rate arrangement. Second, the large reduction in DL INFs throughout the periods does fit the dollarisation policies undertaken by the DL countries. Third, the results do conform to our a priori economic knowledge. Canada, which is closely linked to the US, persistently demonstrates low INFs across all periods.

[16] Since the anchor for the EMU countries is Germany, this interpretation does not apply to the EMU countries.

Table 3
Inflation differential (INF)

			Value (%)			% Change		
		Growth (G) 1981–1996	Crisis (C) 1997–2000	Post-crisis (P) 2001–2007	Long-run 1981–2007	G-C	C-P	G-P
	East Asia (EA)							
1	CHN	9.268	2.532	1.986	5.502	–72.68	–21.56	–78.57
2	HKG	4.920	4.790	3.005	4.387	–2.64	–37.27	–38.92
3	KOR	2.697	2.663	0.975	2.230	–1.26	–63.39	–63.85
4	TWN	1.991	1.676	1.869	1.909	–15.82	11.52	–6.13
5	KHM	2.928	6.694	2.149	3.667	128.62	–67.90	–26.61
6	IDN	4.611	21.576[1]	6.663	7.644	367.921	–69.12	44.50
7	LAO	16.120[1]	67.298[1]	6.162	22.596[1]	317.481	–90.84	–61.77
8	MYS	1.443	1.709	0.987	1.360	18.43	–42.25	–31.60
9	MMR	14.438[1]	24.586[1]	23.681[1]	18.338[1]	70.29	–3.68	64.02
10	PHL	8.930	4.943	2.512	6.625	–44.65	–49.18	–71.87
11	SGP	1.941	1.652	1.881	1.883	–14.89	13.86	–3.09
12	THA	1.593	3.493	0.955	1.700	119.27	–72.66	–40.05
13	VNM	24.109[1]	3.890	4.166	11.006[1]	–83.86	7.10	–82.72
14	IND	5.315	5.310	2.046	4.437	–0.09	–61.47	–61.51
15	MAC	3.951	3.308	2.994	3.455	–16.27	–9.49	–24.22
16	BRN	5.303	1.771	2.511	3.886	–66.60	41.78	–52.65
17	JPN	2.404	2.143	2.968	2.517	–10.86	38.50	23.46
	Dollarised (DL)							
1	ECU	33.452	51.111[1]	7.982	29.2031	52.79	–84.38	–76.14
2	ELS	12.575	1.682	1.139	7.913	–86.62	–32.28	–90.94
3	GTM	12.002	4.415	4.454	8.866	–63.21	0.88	–62.89
4	PAN	2.552[1]	1.205	1.632	2.108	–52.78	35.44	–36.05
	Developed Pacific (DP)							
1	AUS	2.818	1.227	0.822	2.054	–56.46	–33.01	–70.83
2	NZL	4.400	1.222	0.492	2.894	–72.23	–59.74	–88.82
3	CAN	1.445	0.596	0.882	1.170	–58.75	47.99	–38.96
	Mean							
East Asia		4.894	3.327	2.739	3.657	0.47	–57.82	–39.71
Dollarised		19.343	2.434	3.802	6.296	–3.58	–73.96	–74.90
Developed Pacific		2.888	1.015	0.732	2.039	–64.85	–27.88	–74.65

(continued on next page)

Table 3 *(continued)*

		Pre-Maastricht (R) 1988–1993	Post-Maastricht (M) 1994–1998	Post-euro (E) 1999–2007	Long-run 1981–2007	R-M	M-E	R-E
	EMU							
1	AUT	0.789	0.435	0.482	0.738	–44.82	10.85	–38.84
2	BEL	1.138	0.387	0.676	1.226	–66.04	74.85	–40.62
3	FIN	2.844	0.911	0.778	2.107	–67.96	–14.59	–72.63
4	FRA	1.475	0.594	0.434	1.833	–59.70	–26.97	–70.57
5	IRL	1.482	0.704	2.208	3.017	–52.49	213.54	48.97
6	ITA	2.353	1.768	0.829	3.300	–24.86	–53.10	–64.75
7	LUX	0.901	0.347	0.860	1.220	–61.54	148.16	–4.56
8	NDL	1.191	0.458	1.018	0.850	–61.51	122.18	–14.47
9	PRT	7.000	1.862	1.389	6.618	–73.40	–25.42	–80.16
10	ESP	2.456	1.667	1.627	3.422	–32.15	–2.36	–33.75
Mean		2.163	0.913	1.030	2.433	–54.45	44.71	–37.14

Source: See Appendix for data definitions and sources.
Note: [1] Excluded from mean calculation.

Table 4
EA-DL and EA-EMU paired comparisons for INF

EA	DL				EMU			
	Growth (G)	Crisis (C)	Post-crisis (P)	Long-run (LR)	Pre-Maastricht (R)	Post-Maastricht (M)	Post-euro (E)	Long-run (LR)
Growth (G)	14	8	8	12	6	2	2	7
Crisis (C)	14	10	10	14	7	2	0	7
Post-crisis (P)	16	14	14	16	10	3	3	13
Long-run (LR)	15	10	11	14	6	2	1	6

Source: Author's calculation

As explained in the methodology section, benchmarking is done to assess the potentialities of the EA countries. The cells in Table 4 display the number of favourable EA INFs for each EA-DL and EA-EMU paired comparison. For example, the upper-left-most cell shows that 14 of the 17 EA INFs of the EA growth period are less than the DL benchmark of the DL growth period. We can also find that almost all the EA-DL pairs, especially those concerning the EA post-crisis period, are highly desirable (more than half of the 17 EA INFs are more favourable than the benchmark). On the other hand, almost all the EA-EMU pairs are not desirable. Only the EA-P/EMU-R pair is slightly desirable. All these findings may lend some support for fixed dollar pegs for most EA countries, but they may suggest that only about half of the EA countries (in the post-crisis period) have reached the stage of EMU (in the pre-Maastricht period).

Table 5 exhibits the paired comparison results for INF change. Amongst the EA-DL pairs, only those related to the DL C-P change are desirable. This may imply a general EA INF trend, which is in accordance with the DL INF movement from the crisis to the post-crisis period. Since three of the four DL countries only began to dollarise towards the end of the crisis period and in the beginning of the post-crisis period, this finding may indicate a fixed-dollar-peg prospect as good as or better than the DL benchmark for the EA countries. A comparable result can also be found for the EA-EMU pairs. All of the pairs pertaining to EMU M-E change are highly desirable. The cross-period shifts in EA seem to be in line with the integration process that took place in EMU from the post-Maastricht to the post-euro period.

Table 5
EA-DL and EA-EMU paired comparisons for INF change[17]

EA change	DL change			EMU change		
	G-C	C-P	G-P	R-M	M-E	R-E
G-C	3	11	3	4	15	8
C-P	6	12	5	9	17	11
G-P	6	14	4	9	17	13

Source: Author's calculation

In short, the EA inflation convergence levels and their shifts are consistent with the argument for a hard dollar peg. While their inflation convergence levels have up to now not seemed to buttress the case for monetary union, their trends, however, conform to those moving toward a union.

Export Diversification

Table 6 shows the export diversification index (EXP) and its cross-period percent change. To recap, the EXP extends from 1, in countries where exports are least diversified, to 10, where exports are most diversified. The higher the EXP, the stronger is the case for a fixed exchange rate. The highest EA EXP is shown by the Philippines (growth period), Indonesia (crisis and post-crisis periods), and India (long-run period). The lowest EA EXP is exhibited by Brunei (growth, crisis, and long-run periods), and Cambodia (post-crisis period).

[17] Abbreviations are explained here: G-C for growth-to-crisis-period change, C-P for crisis-to-post-crisis-period change, G-P for growth-to-post-crisis-period change, R-M for pre-Maastricht-to-post-Maastricht-period change, M-E for post-Maastricht-to-post-euro-period change, and R-E for pre-Maastricht-to-post-euro-period change.

Table 6
Export diversification index (EXP)

		Value (index)				% Change		
		Growth (G) 1981–1996	**Crisis (C) 1997–2000**	**Post-crisis (P) 2001–2005**	**Long-run 1981–2005**	**G-C**	**C-P**	**G-P**
	East Asia (EA)							
1	CHN	4.356	3.252	3.201	3.867	–25.34	–1.57	–26.52
2	HKG	2.895	2.953	3.211	2.963	2.00	8.74	10.92
3	KOR	3.539	2.833	2.508	3.154	–19.95	–11.47	–29.13
4	TWN	3.501	2.630	3.087	3.242	–24.88	17.38	–11.83
5	KHM	1.782	1.546	1.141	1.592	–13.24	–26.20	–35.97
6	IDN	2.904	6.390	6.159	3.599	120.04[1]	–3.62	112.091
7	LAO	1.927	2.674	2.442	2.041	38.76	–8.68	26.73
8	MYS	4.358	2.475	3.073	3.616	–43.21	24.16	–29.49
9	MMR	2.529	3.412	4.119	2.834	34.91	20.72	62.87
10	PHL	4.854	1.928	2.382	3.347	–60.28	23.55	–50.93
11	SGP	3.148	2.187	2.615	2.833	–30.53	19.57	–16.93
12	THA	3.829	3.922	4.270	3.925	2.43	8.87	11.52
13	VNM	3.346	3.859	5.105	3.591	15.33	32.29	52.57
14	IND	4.542	4.294	4.910	4.568	–5.46	14.35	8.10
15	MAC	1.678	1.381	1.171	1.515	–17.70	–15.21	–30.21
16	BRN	1.099	1.229	1.197	1.164	11.83	–2.60	8.92
17	JPN	2.001	1.964	2.149	2.023	–1.85	9.42	7.40
	Dollarised (DL)							
1	ECU	2.158	2.406	2.659	2.281	11.49	10.52	23.22
2	ELS	2.028	1.898	4.830	2.217	–6.41	154.481	138.17[1]
3	GTM	2.113	2.655	3.972	2.418	25.65	49.60	87.98
4	PAN	3.606	3.975	1.609	2.924	10.23	–59.52	–55.38
	Developed Pacific (DP)							
1	AUS	5.136	6.173	6.612	5.532	20.19	7.11	28.74
2	NZL	3.327	3.717	3.834	3.478	11.72	3.15	15.24
3	CAN	5.038	4.456	5.025	4.932	–11.55	12.77	–0.26
	Mean							
East Asia		3.076	2.878	3.102	2.934	–8.57	6.45	–2.62
Dollarised		2.476	2.734	3.268	2.460	10.24	0.20	18.61
Developed Pacific		4.500	4.782	5.157	4.647	6.79	7.68	14.57

		Pre-Maastricht (R) 1988–1993	**Post-Maastricht (M) 1994–1998**	**Post-euro (E) 1999–2005**	**Long-run 1981–2005**	**R-M**	**M-E**	**R-E**
	EMU							
1	AUT	3.956	3.293	3.927	3.859	–16.76	19.26	–0.73
2	FIN	3.591	3.603	3.353	3.646	0.34	–6.94	–6.62
3	FRA	4.547	4.164	3.928	4.366	–8.44	–5.65	–13.62
4	IRL	5.319	3.563	3.262	4.193	–33.01	–8.45	–38.67
5	ITA	4.146	4.096	4.244	4.265	–1.21	3.59	2.34
6	NLD	6.946	6.381	5.522	6.249	–8.12	–13.47	–20.50
7	PRT	4.563	4.515	4.453	4.742	–1.06	–1.38	–2.42
8	ESP	4.557	4.180	4.276	4.569	–8.28	2.30	–6.18
9	BEL-LUX[2]	4.681	5.021	4.968	4.909	7.25	–1.06	6.11
Mean		4.701	4.313	4.215	4.533	–7.70	–1.31	–8.92

Source: See Appendix for data definitions and sources.
Notes: [1] Excluded from mean calculation.
[2] Data for Belgium and Luxembourg are lumped together by the source.

A few important observations are worth mentioning. First, the EXP values seem to be valid in measuring the level of diversification; the EXP values are in agreement with the common knowledge that larger or more industrialised economies (in this case, Canada, Australia, and New Zealand) would have more resources and thus more diversified exports. Second, the high DL EXP increases from the growth to the post-crisis period appear to be consistent with the fixed exchange rate policies undertaken by the DL countries. Third, the pattern of the EA EXPs appears to suggest that the Asian turmoil has a negative relationship with the region's diversification levels.

To evaluate the prospect of a fixed dollar peg and monetary integration, as before, comparison to DL and EMU benchmarks is done. The results in Table 7 indicate that all of the EA-DL paired comparisons are desirable. In each pair, at least half of the 17 EA EXPs are more favourable than the DL benchmark. Nevertheless, the pairs concerning the DL post-crisis period show smaller majorities, which means that fewer EA EXPs have reached the post-crisis period DL benchmark level. On the other hand, all of the EA-EMU pairs are not desirable. This may indicate that the case for hard dollar pegs in EA is somewhat supported but that the case for monetary union is not.[18]

Table 7
EA-DL and EA-EMU paired comparisons for EXP

EA	DL				EMU			
	Growth (G)	**Crisis (C)**	**Post-crisis (P)**	**Long-run (LR)**	**Pre-Maastricht (R)**	**Post-Maastricht (M)**	**Post-euro (E)**	**Long-run (LR)**
Growth (G)	12	12	11	12	4	5	7	4
Crisis (C)	12	11	9	11	2	4	5	4
Post-crisis (P)	14	12	9	13	5	5	5	5
Long-run (LR)	12	12	12	12	1	6	6	3

Source: Author's calculation

Table 8 displays the results of paired comparisons for EXP change. The results show that all of the EA-DL pairs are not desirable whereas all of the EA-EMU ones are desirable. Particularly, the EA-EMU pairs related to the EA C-P change are highly desirable. This may imply that the nature of the EA EXP shift, especially from the crisis to the post-crisis period, is particularly parallel to the developments in EMU. The patterns found here

[18] Nonetheless, as mentioned in the previous paragraph, the stage of economic development does play a role in EXP. Industrialised countries should have higher EXPs regardless of whether they are part of a monetary union. But then again, one cannot refute that industrialised countries may be more ready to form a monetary union than would be industrialising countries.

may strengthen the prospect for monetary integration but not for hard dollar pegs.

Table 8
EA-DL and EA-EMU paired comparisons for EXP change

EA change	DL change			EMU change		
	G-C	C-P	G-P	R-M	M-E	R-E
G-C	5	5	3	10	9	12
C-P	7	7	3	16	13	16
G-P	6	6	4	10	9	11

Source: Author's calculation

In conclusion, when the level of export diversification is contemplated, the EA countries are more ready to fix exchange rates to the dollar individually than they are to collectively establish a regional monetary union. Nonetheless, the pattern of the diversification level shifts seems to demonstrate some evidence of the EA's being on the road to implementing monetary union but not fixed dollar pegs.

Labour Market Flexibility

Table 9 exhibits the labour market flexibility index (LAB) for post-crisis period (2004–2008).[19] The index extends from 0 in countries where labour markets are the least flexible to 100 where labour markets are the most flexible. The higher the LAB is, the more flexible the labour market, and thus, the stronger the case for fixed exchange rate.

The means show that the general EA labour market is more flexible than the DL and EMU ones but is less flexible than the DP one. Among the EA countries, Singapore, Brunei, Hong Kong, and Japan have the highest LABs, whilst Taiwan has the lowest LAB. Amongst the EA countries, all of the EA LABs are higher than the DL benchmark, and only the Taiwanese LAB is lower than the EMU benchmark.[20]

In another respect, the relatively high LAB enjoyed by Hong Kong seems to be consistent with the currency board policy employed by the state. The high LABs displayed by Brunei and Singapore are also consistent with the monetary union between the two countries since 1967.

[19] Labour market flexibility data are available only from 2004 to 2008.

[20] Since LAB data are not available for the period before 2004, unlike those of the other variables, the data range here for the EMU is thus similar to the EA one.

Table 9
Labour market flexibility index (LAB)

East Asia (EA)		Index	Dollarised (DL)		Index	EMU		Index
1	CHN	62.12	1	ECU	37.07	1	AUT	71.10
2	HKG	88.34	2	ELS	65.56	2	BEL	73.98
3	KOR	55.61	3	GTM	60.36	3	FIN	59.43
4	TWN	44.97	4	PAN	40.32	4	FRA	49.40
5	KHM	58.41		Mean	50.83	5	IRL	82.78
6	IDN	48.38				6	ITA	68.76
7	LAO	69.44				7	LUX	49.83
8	MYS	77.77		**Developed**		8	NDL	64.72
9	MMR	n.a.[1]		**Pacific (DP)**	**Index**	9	PRT	45.24
10	PHL	57.54	1	AUS	88.75	10	ESP	46.30
11	SGP	97.98	2	NZL	94.86		Mean	61.15
12	THA	76.90	3	CAN	90.89			
13	VNM	58.39		Mean	91.50			
14	IND	64.86						
15	MAC	n.a.						
16	BRN	94.00						
17	JPN	85.45						
	Mean	69.35						

Source: See Appendix for data definitions and sources
Note: [1] Not available.

In brief, it can be deduced that the levels of labour market flexibility in EA are as high as or even higher than the levels feasible for the hard dollar peg and monetary union.

External Indebtedness

Table 10 reports the external indebtedness ratio (DEB) for each economic period and its cross-period percent change. The higher the DEBs are, the higher the currency risks, and the higher the incentives to fix exchange rates. The table reveals that the most indebted EA country is Laos for all periods, whilst the least indebted country is Singapore (growth period), and Taiwan (crisis, post-crisis, and long-run periods). Understandably, the least developed countries in the EA region (Laos, Cambodia, and Myanmar) are highly indebted for some of the periods.

Table 10
External indebtedness ratio (DEB)

			Value (ratio)			% Change		
		Growth (G) 1981-1996	**Crisis (C) 1997-2000**	**Post-crisis (P) 2001-2006**	**Long-run 1981-2006**	**G-C**	**C-P**	**G-P**
	East Asian (EA)							
1	CHN	0.771	0.653	0.429	0.670	–15.30	–34.30	–44.36
2	HKG	0.169	0.996	0.387	0.353	489.35	–61.14	128.99
3	KOR	0.854	0.780	0.660	0.818	–8.67	–15.38	–22.72
4	TWN	0.249	0.235	0.337	0.269	–5.62	43.40	35.34
5	KHM	6.749	2.014	1.055	4.220	–70.16	–47.62	–84.37
6	IDN	2.220	2.416	1.722	2.087	8.83	–28.73	–22.43
7	LAO	10.621	5.252	4.457	8.613	–50.55	–15.14	–58.04
8	MYS	0.758	0.456	0.377	0.621	–39.84	–17.32	–50.26
9	MMR	9.475	3.261	2.009	6.539	–65.58	–38.39	–78.80
10	PHL	2.804	1.421	1.471	2.282	–49.32	3.52	–47.54
11	SGP	0.088	1.161	1.188	0.506	1219.32	2.33	1250.00
12	THA	1.335	1.359	0.563	1.158	1.80	–58.57	–57.83
13	VNM	4.925	1.516	0.600	3.215	–69.22	–60.42	–87.82
14	IND	3.156	1.951	1.170	2.469	–38.18	–40.03	–62.93
15	MAC	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]
16	BRN	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]
17	JPN	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]	n.a.[1]
	Dollarised (DL)							
1	ECU	3.287	2.760	2.019	2.913	–16.03	–26.85	–38.58
2	ELS	1.853	1.134	1.741	1.716	–38.80	53.53	–6.04
3	GTM	1.666	1.075	1.082	1.440	–35.47	0.65	–35.05
4	PAN	1.235	0.838	1.006	1.121	–32.15	20.05	–18.54
Mean	East Asia	3.155	1.677	1.173	2.416	–46.85	–30.05	–62.82
	Dollarised	2.010	1.452	1.462	1.798	–27.76	0.69	–27.26

Source: See Appendix for data definitions and sources
Note: 1 Not available. For Japan, not applicable.

Table 11 displays the favourable EA DEBs and DEB changes for each EA–DL paired comparison. Moving from the EA growth to the EA post–crisis period (from the top to the bottom row), we can see that the numbers through the columns decline gradually (at most increase by one in the crisis period), until each number is less than half of 14, the total number of EA DEBs. For the DEB change, those pairs related to the DL C–P change are especially undesirable, meaning that almost all of the EA DEBs have not increased more than the DL benchmark has when the DL C–P change is concerned.

Table 11
EA–DL paired comparisons for DEB and DEB change

EA	DL				EA change	DL change		
	Growth (G)	Crisis (C)	Post-crisis (P)	Long-run (LR)		G-C	C-P	G-P
Growth (G)	8	8	8	7				
Crisis (C)	5	9	9	6	G-C	7	4	7
Post-crisis (P)	3	6	6	4	C-P	8	3	8
Long-run (LR)	7	8	8	7	G-P	5	3	5

Source: Author's calculation.

It is apparent that the EA DEBs, on the whole, have been falling to levels lower than the DL benchmark level. It may be concluded that the EA countries do not display debt–induced exchange–rate–fixing incentives as high as those displayed by the DL countries.

CONCLUSION

Upon examining the four OCA variables, some conclusions are worth highlighting. The results of INF, EXP, and LAB appear to support the OCA theory; the actual arrangements do conform to those proposed by the theory. The EA region, when benchmarked against the DL countries, exhibits inflation rates and export diversification levels that fulfil the "requirement" for exchange rate fixation. Also, these variables are found to be moving on the path toward monetary union when compared against the EMU countries. In addition, the region's labour markets have reached a flexibility level that can most probably support a region–wide monetary integration. Nevertheless, the EA countries may not be hastened to move into a dollar bloc, since their external debt levels have fallen tremendously vis–à–vis their DL counterparts. Out of the four criteria, three of them seem to provide some evidence for an EA dollar bloc. Specifically, if Mundell's argument is right, the low INFs of EA countries during the post–crisis era should be the best foundation for exchange rate fixation.

How do these conclusions compare with those made by others using different methods (and criteria)? Bayoumi and Eichengreen (1994) show that EA countries have adjusted more rapidly to demand and supply shocks than have the EMU countries. Accordingly, they conclude that the EA region came as close as the EMU to being an OCA. In a later update with a comparable method by Kawai and Motonishi (2005), similar conclusions have been reached. They even demonstrate that real activity variables, such as growth rates of real GDP, real personal consumption, and real fixed

investment, were highly correlated among major EA economies. In a more recent study, Sato and Zhang (2006) find that some clusters in the EA region share both long–run and short–run synchronous movements of real outputs, which are favourable insofar as OCA is concerned. In particular, short–run common business cycles are found in parts of ASEAN. These studies confirm to an extent the evidence for an EA dollar bloc found in this paper.

Hitherto, interpretations are made for the whole region. Nonetheless, it may be valuable to look at the results at the individual country level. Since the post-crisis period is the most current period, the results for this period are detailed. Table 12 summarises the results for the EA countries by the four OCA variables. The results are for the comparison of the post-crisis period EA value with the DL and EMU values for their corresponding periods. For each country, if a variable value is more favourable than the corresponding benchmark, a score of 1 is assigned; otherwise, a score of 0 is given. The higher the total score is, the higher the feasibility of establishing a dollar currency area. The ratios of each country's total obtained score to its total obtainable score are also provided.

In Table 12, the total scores show that some countries are more suitable than others for forming a dollar area. Among them, India, Thailand, and Malaysia can be said to be 'highly eligible' (% score≥70); China, Korea, Indonesia, the Philippines, Singapore, and Vietnam may be 'moderately eligible' (50≤% score<70); Hong Kong, Taiwan, Cambodia, Laos, Myanmar, Brunei, and Japan can be considered 'slightly eligible' (30≤% score<50); and Macau is 'the least eligible' (% score<30).

These groupings do not seem to be similar to those found in existing studies. Bayoumi and Eichengreen (1994) discover a northern bloc comprising Japan, Korea, and Taiwan and a south-eastern bloc comprising Hong Kong, Indonesia, Malaysia, Singapore, and Thailand. Meanwhile, Kawai and Motonishi (2005) found highly correlated economies among Japan, Korea, Taiwan, Singapore, Malaysia, and Thailand. The groups found here also do not show any resemblance to a group suggested by Huang and Guo (2006). Nevertheless, the groupings discovered here are somewhat in accordance with those found by Sato and Zhang (2006). They find groupings of Singapore-Thailand-Indonesia, Hong Kong-Korea-China, and Japan-Taiwan.

Table 12

Paired comparison results for post-crisis period EA

	INF						EXP						LAB		DEB			Total	% score
	DL			EMU			DL			EMU			DL	EMU	DL				
	G	C	P	R	M	E	G	C	P	R	M	E			G	C	P		
CHN	1	1	1	1	0	0	1	1	1	1	0	0	1	1	0	0	0	10	58
HKG	1	1	1	0	0	0	1	1	1	0	0	0	1	1	0	0	0	8	47
KOR	1	1	1	1	1	1	1	1	0	0	0	0	1	1	0	0	0	10	58
TWN	1	1	1	1	0	0	1	1	1	0	0	0	1	0	0	0	0	8	47
KHM	1	1	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	6	35
IDN	1	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	1	11	65
LAO	1	0	0	0	0	0	1	1	0	0	0	0	1	1	1	1	1	8	47
MYS	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	0	0	12	71
MMR	0	0	0	0	0	0	1	1	1	0	0	1	n.a.[1]	n.a.	1	1	1	7	47
PHL	1	1	1	1	0	0	1	0	0	1	0	0	1	1	0	1	1	10	58
SGP	1	1	1	1	0	0	1	1	0	0	0	0	1	1	0	1	1	10	58
THA	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	13	76
VNM	1	1	1	0	0	0	1	1	1	0	1	1	1	1	0	0	0	10	58
IND	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	1	1	14	82
MAC	1	1	1	0	0	0	0	0	0	0	0	0	n.a.	n.a.	n.a.	n.a.	n.a.	3	25
BRN	1	1	1	1	0	0	0	0	0	0	0	0	1	1	n.a.	n.a.	n.a.	6	43
JPN	1	1	1	0	0	0	1	0	0	0	0	0	1	1	n.a.	n.a.	n.a.	6	43

Source: Author's calculation.
Note: [1] Not available. For Japan, not applicable.

In short, the results suggest that when the rarely studied OCA variables are considered, different country groupings from those in the literature can be found. Therefore, consideration of a comprehensive set of variables from different facets of the OCA theory is crucial in identifying homogenous groups. Thus, the 'highly eligible' group identified here may take the lead in fostering integration. Obviously, active commitments to the Asian Currency Unit initiative by the Asian Development Bank would be a good start. Nonetheless, asymmetries in resource dependencies, growth experience, maturity of financial markets, and/or economic policies (Chow & Kim 2003) could be possible obstacles to integration.

Nevertheless, identifying groups of countries that have achieved a high degree of macroeconomic convergence is only the first step and may raise more questions than answers. The existence of differences or heterogeneities across countries does not necessarily imply that benefits cannot be achieved through monetary integration. This follows from the endogeneity argument of the OCA criteria—originally flagged by Frankel and Rose (1998)—which suggests that countries become similar when they share a common currency. Viewed in this light, the conclusions of this paper are a valuable contribution to the scholarly and policy debate over whether creation of a monetary union should precede or follow other forms of integration. The results could also be a valuable resource for the Asian

Development Bank for considering the technical issues (e.g., the choice of anchor currency) of an Asian currency.

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APPENDIX

Data Definitions and Sources

Table A
Data definitions and sources

Country	Code	CPI1	Export structure2	Employing workers index3	EDT, XGS4
Brunei	BRN	83:1–08:3	88–065	08	–
Cambodia	KHM	94:1–07:12	81–04	04–08	86:06
China	CHN	87:1–08:4	81–05	04–08	82:06
Hong Kong	HKG	81:1–08:3	81–05	04–08	82:07
India	IND	81:1–08:3	81–05	04–08	81:06
Indonesia	IDN	81:1–08:4	81–05	04–08	81:06
Japan	JPN	81:1–08:4	81–05	04–08	n.a.6
Korea	KOR	81:1–08:4	81–05	04–08	81:06
Laos	LAO	87:12–01:12, 03:5–08:3	81–05	04–08	81:06
Macau	MAC	88:1–08:3	81–04	–	–
Malaysia	MYS	81:1–08:3	81–05	04–08	81:06
Myanmar	MMR	81:1–07:12	81–04	–	81:06
Philippines	PHL	81:1–08:4	81–05	04–08	81:06
Singapore	SGP	81:1–08:3	81–05	04–08	81:06
Taiwan7	TWN	81:1–08:4	81–05	04–08	84:06
Thailand	THA	81:1–08:4	81–05	04–08	81:06
Vietnam	VNM	90:1–08:4	81–03	04–08	81:06
Ecuador	ECU	81:1–08:4	81–05	04–08	81:06
El Salvador	ELS	81:1–08:4	81–04	04–08	81:06
Guatemala	GTM	81:1–08:4	81–05	04–08	81:06
Panama	PAN	81:1–08:4	81–05	04–08	81:06
Australia	AUS	81Q1–08Q1	81–05	04–08	n.a.
New Zealand	NZL	81Q1–08Q1	81–05	04–08	n.a.
Canada	CAN	81:1–08:4	81–05	04–08	n.a.
United States	USA	81:1–08:4	81–05	n.a.	n.a.
Austria	AUT	81:1–08:9	81–05	04–08	n.a.
Belgium	BEL	81:1–08:9	81–05	04–08	n.a.
Finland	FIN	81:1–08:9	81–05	04–08	n.a.
France	FRA	81:1–08:9	81–05	04–08	n.a.
Ireland	IRL	81:1–08:9	81–05	04–08	n.a.
Italy	ITA	81:1–08:9	81–05	04–08	n.a.

(continued on next page)

Table A *(continued)*

Country	**Code**	**CPI1**	**Export structure2**	**Employing workers index3**	**EDT, XGS4**
Luxembourg	LUX	81:1–08:9	81–05	08	n.a.
Netherlands	NLD	81:1–08:9	81–05	04–08	n.a.
Portugal	PRT	81:1–08:9	81–05	04–08	n.a.
Spain	ESP	81:1–08:9	81–05	04–08	n.a.
Germany	DEU	81:1–08:9	n.a.	n.a.	n.a.

Notes:

1. Consumer price indexes are from the IMF IFS database. For China, Vietnam, and Brunei, CPIs are sourced from ILO LABORSTA database whenever not available from IMF IFS. Cross–validation shows that both sources provide identical data. For Brunei, CPI data after 2005 are sourced from Department of Economic Planning and Development (DEPD) website, retrieved July 17, 2008 from http://www.depd.gov.bn/archive.html. Data should be consistent, since data from IFS are also sourced from DEPD.
2. Export structure data for 1981–2000 are extracted from the NBER World Trade Flows database, whilst those for 2001–2005 are taken from International Trade Statistics at the International Trade Center UNCTAD/WTO website, retrieved April 08, 2008, from http://www.intracen.org/tradstat/sitc3–3d/indexre.htm
3. Data are sourced from the World Bank Group: Doing Business website. Retrieved July 08, 2008, from http://message.worldbank.org/external/external_error.htm
4. EDT represents total external debt, sourced from ADB website, retrieved April 08, 2008, from http://www.adb.org/Statistics/ki.asp; XGS for exports of goods and services. For Hong Kong, 1999–2007 data are external-debt-to-export ratios reported directly from EIU ViewsWire, various issues, downloaded from the Proquest database.
5. Brunei data from ADB.
6. Not applicable.
7. Taiwan data are sourced from the Bureau of Foreign Trade, Directorate-General of Budget, Accounting and Statistics (DGBAS) and central bank databases.