PROLOGUE

Introduction

Economic Integration occurs when two or more countries join together to form a larger economic space. The member countries enter into the integration arrangements with expectation of economic gain, although they may pursue political and other interests as well. Currently, the topic of "Regionalism" has been widely discussed and is of the utmost importance in this age of globalization. The increasing interdependency, economic wise, among the regions means that the regional economic structure is getting stronger. Intra-regional trade and investment now play a crucial role, by helping to locate production according to comparative advantages and protecting against outside competitors. Today, in the age of Globalization, there is a severe competition in the world market. Each country is trying to be more competitive and have more bargaining power. So, countries, which have close-geographical area and somehow similarity in production function, form their own economic integration with the purpose of creating bargaining power and stronger economic region. The European Union, by far the most successful economic integration effort, is at the moment, moving towards the final stage of the process of Complete Economic integration. With the introduction of the Euro currency on 1st January 1999, with an aim to completely replace the individual currencies with the single Euro currency in the year 2002, their progress towards complete Economic Integration seems to get stronger and stronger. Meanwhile, other continents have also formed their own integration such as North American Free Trade Arrangement (NAFTA), Asia Pacific Economic Cooperation Forum (APEC), and Association of South East Asian Nations (ASEAN). Their forms of integration are in different stage, which can be distinguished into four basic types of formal regional economic arrangement: Free Trade Area, Custom Union, Common Market, and Economic Union.[1]

1. Free Trade Area (FTA) is established when a group of countries abolishes restrictions on mutual trade buy each member country retains its own tariff and quota system on trade with non-member countries.

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[1] Appleyard R. Dennis, Field J. Alfred, JR. , "International Economics Trade Theory and Policy", Third Edition 1998, The McGraw Hill Companies, Inc. p.353-355

2. Custom Union (CU) is created when a group of countries removes all restrictions on mutual trade and also set up a common system of tariffs and quotas with respect to non-member countries.
3. Common Market (CM) is created when a group of countries removes all restriction on the movement of productive factors -- Labor, Capital, and Enterprise.
4. Economic Union (EU) is the most comprehensive form of economic integration, which can be called "Single Market". It includes all features of a common market but also implies the unification of economic institution and the coordination of economic policy throughout all member countries. When an economic union adopts a common currency, it has become a monetary union. The European Union is the best example here of this stage.

The benefits of the economic integration can be observed from the success of the European Union. There are plenty of opportunities for specialization and trade among member countries. The economic integration will stimulate greater investment in the member countries form both internal and foreign sources by reducing risk and uncertainty because of the larger and stronger economy. Currency stability will take place and make foreign investors have more confident with the regional economic stability. The positive impact to the integration can be seen through the higher members' living standards, a powerful force for the multilateral liberalization, which can lift the members' economic growth and strengthen economic structure. That will raise both import and export values by strengthening the export-power and weakening the anti-trade force of the import competitors.

Asian countries also, realize the benefits of the formation of Economic Integration. They began setting up their own economic integration, and had good potential to do so. Before 1997 (Asian Crisis), the Asian economy seems to be doing so well and having the possibility to strengthen their own economic power through the formation of Asian economic integration. But with the collapse of economic and financial structure that occurred in mid 1997, the formation of their own economic integration was immediately suspended. Each country reduces their trade and investment interdependency with others and tends to be more self-concerned to protect his or her own country from the crisis. Intra-regional trade became less and less in both value and quantity in Asian due to the occurrence of Asia crisis. At present, many people talk about "crisis". But what is its meaning, and what are its effects? In economic terms, "crisis" literally translated as "Time of great difficulty or danger"[2] The cruel effects of a crisis on an economy have been well documented throughout the history of mankind. The greatest example, no doubt, is the Great Depression of the 1930s, which started in America but spread through and effected literally the whole world. At the depth of the Great Depression, the national income of the United States plummeted from $88 billion to 40 billion, with the output of the American factories declining by 50 percent, which at its worst were operating at 12 percent of its capacity. The average weekly wage went from $25.03 to $16.73 and at the peak of the depression, unemployment was recorded at 12.8 million workers out of work[3]. The economic crises in Mexico and the current one in Asia, although not as drastic as that of the 1930s, are two of the most recent situations.

The crisis in Asia on the surface can be traced back to July 2nd 1997, when the Thai government decided to float the Thai Baht after unsuccessfully trying to defend it against speculative attacks from foreign speculators. This seems to be the catalyst for the Asian economic crisis that followed. However, a closer examination of the problem reveals that the crisis was not brought about only by the floatation of the Thai Baht alone, but moreover the forced appreciation of the Japanese Yen by the Americans in 1985. With the Yen appreciation, producing and manufacturing goods in Japan no longer offer high profit, so to maximize their profit, Japanese manufacturers had to relocate their production plants in other part of Asia, where labor was still relatively cheap. This phenomenon caused the Asian economy to open up to Japanese investment, resulting in the untimely and unprepared liberalization of most Asian economies during the late 1980s, which also contribute to the problem, and help brought about the Asian crisis. With the greater international capital mobility in recent times, it has made misalignment with a fixed exchange rate system, which is converted into a crisis by speculative capital flows and speculative attacks.[4] Saying that, institutional and structural weakness of most of the Asian economies, as well as non-transparent corporate governance or mismanagement and misguided government policies and market failures are the other main

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[2] Oxford Advanced Learner's Dictionary, Oxford University Press, p. 282.

[3] Klingaman, William K., "The Year of The Great Crash 1929". 1989, Harper & Row, 337-351.

[4] Ross H. McLeod and Ross Garnaut, "East Asia in Crisis: From being a miracle to needing one?" 1998, p 13.

factors that helped make the crisis inevitable[5]. There are other problems, which are caused by the "moral hazard", due to implicit government guarantees for weakly regulated financial intermediaries. The concept of moral hazard related to the market distortions, which is invoked to explain the Asian crisis. The other issues which should be discussed are that the East Asian crisis have not only involved excessive investments, but also unwise investments, the huge real currency depreciation are likely to cause "large decline in output, and other kind of market failures, e.g. herd behavior[6]. The further evidence could be found on "herd investor behavior" underlying the "contagion" or "domino effect", which describe the rapid spread of financial instability through East Asia, resulting from the fund managers or foreign investors fast loosing their confident and go with the herd by withdrawing their investments. And the hedge fund operations have tended to affect these phenomena, with disastrous consequences for the region. Most of the governments of the region are still coming to grip and are trying to find ways to solve the crisis even at this moment.

So what could be the way out? Government might implement either Fiscal or Monetary Policy to stimulate the economy. Monetary policies must be firm enough to resist excessive currency depreciation. Fiscal policies could be implemented by reducing countries' reliance on external saving and financial sector weaknesses required particularly urgent attention probably by taking into account of re-capitalized and re-structured banking system. The crisis prevention policies should be well-setup and implemented appropriately. When looking at the causes of the crisis, as mentioned earlier the most obvious indicator is that it is caused by institutional and structural weakness and nontransparent or misguided government policies. So the rules and institution which can function more effectively should be set up. The appropriate or transparent policy regulations and supervision of information should be employed at the first instance. Another way out is the role of the International Monetary Fund and the World Bank. The resources from the IMF may be adequate to provide sufficient liquidity to address current/future crisis of Asia. The World Bank, on the other side, plays a major role in structural reforms in the financial sector. There might be more ways to handle the crisis, but the concept of "Economic Integration" could well be one outstanding possibility to manage and handle the crisis.

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[5] Ha-Joon Chang, Gabriel Palma, and D. Hugh Whittaker, "The Asian Crisis: Introduction". Cambridge Journal of Economics 1998, volume 22, p. 649-652.

[6] Jomo K. S., "Tigers in Trouble. Financial Governance. Liberalization and Crises in East Asia". Hong Kong University Press 1998 p. 4-8

The East Asian crisis shows that there are serious systemic problems in the global monetary and financial arrangements. Economic and Monetary integration is under consideration in this place. The East Asian financial crisis has increased awareness for the need of global governance of finance and economic integration so as to prevent the recurrence of similar crises. Asian Economic Integration is worth considering for Asia in order to prevent against future crises.

From the above discussion of the problems of a crisis, it is necessary to study the possibility of the formation of East Asian economic integration. In addition, examining if the crisis slow down the integration process or not, will be valuable. If an Asian Economic Integration already exist, the member countries' economy would naturally, be quite strong and stable. This would mean a more efficient economic and financial structure, which in turn would lead to more intra-regional trade. When the economic and financial structure is strong, it should be enough to defend against any crisis, be it internal or external. So the study of a central institution or mechanism and possible in the form of an Asian Central Bank by using the European Central Bank as the model, will provide precious information for the member countries, and any other regional grouping, that are interested in the study of Economic Integration as a solution and possible prevention of a crisis.

Objectives of the study

1. To study the possibility of the formation of an East Asian Economic and Monetary Integration by employing the Theory of Optimum-Currency-Area for the monetary side, and supported by the study of Interdependency for the economic side.

2. To consider whether the crises causes difficulty in the possible formation of East Asian economic integration.

Scope of the study

- For the purpose of this study, 9 Asian countries will be selected for their varied characteristics. The 9 countries are China, Indonesia, Japan, Malaysia, The Philippines, Singapore, South Korea, Taiwan, and Thailand.

- For the observation of the Interdependency and the pattern or the correlation of economic activities will be studies through the Trade Matrix and the comparison among countries' growth rate. The statistical and qualitative data will cover 1985 to 1998.

- For the selected Asian countries Optimum-Currency-Area index, the statistical and qualitative data will be collected annually from 1989-1998 (10 years). The variables to be studies are nominal exchange rate, real output, shares of agricultural, industrial and service sectors in relative to domestic GDP, bilateral export to domestic GDP, GDP, and CPI inflation.

Literature Review

The study of "Economic Integration" has been widely discussed since the increase in regional grouping such as The European Union, Latin America Free Trade Area (LAFTA), and ASEAN grouping. The most successful region in Economic Integration as everybody know is the European Union, which so far has reached the stage of Economic and Monetary Union (EMU). Other regional grouping see this opportunity to form their own Economic Integration due to the benefits over the cost of forming Economic Integration by using the European Union's experience as their example. With the changing of the European Union, the concept of "Economic Integration" urges economists to discussion the theory of Economic Integration and other theories based on Economic Integration in more depth than ever. There are several studies on the Theory of "Economic Integration", which are based on different methodologies. But most economists share the same perspective on the result of their studies that based upon the evidence available, the possibility of the formation of Asian economic integration is relatively low and it would take time to achieve the formation of Monetary Union or Single Currency. In the study of Monetary Integration Or Monetary Union, in other words, Common (Single) Currency, there are several ways to be implemented or discussed. Here, I am going to mention the study of Interdependence of selected countries and the Theory of Optimum-Currency-Area in detail. Hence, this Literature Review will be divided into 3 topics, which are the possibility of Asian integration, the Study of Interdependence of Asian countries, and the Optimum-Currency-Area Theory for a clearer understanding.

Asian Integration

From the sources that had been read in researching this topic, all the authors conclude that the possibility of forming the Asian Economic Integration is relatively low as mentioned above. Georgios Karras (1997) applied several convergence tests, such as the Neoclassical Growth Model, the Production technology, the dispersion of real GDP per capita across countries, and some other sets of equation, in the study of convergence in income. His paper addresses the issue by examining the post-war convergence experience of three regional economic areas: the Association of Southeast Asian Nations (ASEAN), the European Union (EU), and the Latin America Free Trade Area (LAFTA). The study examined whether the economic integration facilitates convergence in per capita income within the three groups of region or not. His conventional test for convergence examine the cross-sectional relationship between the average real growth rate and beginning period GDP per capita within ASEAN, EU, and LAFTA, respectively. A number of different empirical tests provided evidence that convergence in income per capita has been the strongest and most rapid in European Union, milder but probably present in Latin America Free Trade Area (LAFTA), and nonexistent in ASEAN. The findings, in fact, are not inconsistent with divergence within ASEAN. The immediate conclusion to be drawn from the results is that the formation or expansion of economic blocs, far from assuring homogenization among the country-members, does not even guarantee a gradual convergence in their standard of living. He examined that among these three blocs, all these factors have been the strongest in the EU and the weakest in ASEAN, so they are at least circumstantially consistent with the EU-LAFTA-ASEAN pattern.[7]

Meanwhile, Richard E. Balwin (1997) studied the causes and the progress of regionalism considering the 3 main regional groupings of EU, NAFTA, and ASEAN. Baldwin shares Karras's view that the regional grouping can be developed in the region of European and North America but it is still far fetch for Asian regionalism. Baldwin quotes DeRosa (1995) that "the ASEAN failed in the attempt at regional integration due to heavy reliance on administrative protection, and opposition by industrial and agricultural vested interest".[8] As for the reason why Asian can not become a regionalism soon would be that they seem to think that they do not need a regional grouping for their economic growth. With the strengthening of other regional groupings, this is the reason why Asia is fast loosing its trading partners without realizing. In his study, he also introduced the Domino Theory of Regionalism. *"That is, resurgent regionalism was caused by idiosyncratic events that were multiplied many times over by a domino effect. The domino theory cannot explain all incidents of regionalism, since some agreements have little to do with economics. For instance, the theory never tells us why the triggering incidents of regionalism occurred."*[9] In my point of view, the regionalism can be explained by the theory of domino effect. Since there

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[7] Georgios Karras, "Economic Integration and Convergence: Lessons from Asia, Europe, and Latin America". Journal of Economic Integration, Volume 12 Number 4, December 1997, p. 419-432.

[8] DeRosa (1995) in "The causes of Regionalism" by Richard E. Balwin. The world economy Volume 20 Number 7, November 1997 p.873.

[9] Richard E. Balwin, "The causes of Regionalism". The world economy Volume 20 Number 7, November 1997 p.865-888.

is an increasing in regionalism, the shocks from domino effect could be vanished away from the member of regional grouping due to their higher economic force. With the explanation of the domino, the regionalism may be a powerful force for multilateral liberalization.

Miss Pimporn Chungsawanant wrote another paper on the subject of ASEAN Monetary Integration. Her main objective of study is the possible formation of an ASEAN Monetary System using the European Monetary System (EMS) as a guideline. She used the theory of Optimum-Currency-Area by considering 4 economic convergence criteria, which are the degree of Capital Mobility, the degree of Openness, the degree of Product Diversification, and the degree of Inflation Rate. These 4 economic convergence criteria were then employed to study the possibility of ASEAN Monetary System (AMS). The result shows that there is the possibility of convergence only in the Fiscal sector but not yet in the Monetary sector due the fact that each ASEAN countries have different current account deficit and the diversification of growth among countries. Moreover, there is still an anti-trade on goods and services in the region, which is the most important obstacle in the formation of ASEAN Monetary Integration.

All three authors, although different in their approaches to the issue of integration and employ different methodology, came to the same conclusion that Asia is not yet capable of forming the Economic and Monetary Integration. But in my point of view, I will further study the issue by using 2 different techniques, which are the Theory of Optimum-Currency-Area and the study of Interdependency of selected Asian countries.

The study of Interdependency

Regarding the Economic Integration, there might be a number of different factors that can cause the Integration to succeed rather than fail. In my opinion, the study of Interdependency among the potential member countries is a good indicator to measure whether the integration is feasible or achievable. Yoichi Nakamura and Izumi Matsuzaki studied on the topic of “Economic Interdependence: Japan, Asia, and the world”. The authors concluded that with the Yen appreciation, it caused the Japanese to loss their competitiveness in the world market together with their high labor cost bringing up their production cost. So, that is the reason why Japan has to shift their capital and production to invest more in Asia where there is relatively low labor cost and can lower their cost of production. This situation has strengthened the interdependence between Japan and Asia in both trade and economy space and vice versa. In recent years, as the Japanese Yen has become cheaper; some Japanese companies are bringing their production investment back home, that make the level of interdependency lower. However, there still remains a big gap in labor cost and the cost of production between Japan and Asia. Moreover, Asian countries are major players in the global economy. That is the reason why Japan and Asia still maintain the level of interdependency between them. Interdependency, be it economic interdependency, political interdependency or social interdependency, no matter what form it takes, already implicate a form of integration no matter how big or small it may be. David D., Selover and David K., Round also studied about interdependency in the topic of "Business Cycle Transmission and Interdependence Between Japan and Australia". This paper examines Japanese-Australian economic interdependence over the last 34 years (1961.1-1994.4) and attempts to evaluate the extent to which Japanese business cycles are transmitted to Australia by using Co-integration error correction model in examining that relationship. They mention that economic interdependence and business cycle transmission are two distinct characteristics of international economic relations.

The strengthening of economic interdependency can explain the possibility of Economic Integration among the selected Asian countries. With the higher level of interdependency between countries, it can imply that the higher level of interdependency, the higher possibility to form the integration or regional grouping. In another word, the interdependency leads the possibility of the integration. Hence, I will employ Economic Interdependency of the selected Asian countries as the first screening in the study of possible Economic Integration.

The Theory of Optimum-Currency-Area

The formation of single currency is more suitable for some areas of the world than for others. At present, the European Union has reached the stage of Economic and Monetary Union (EMU) using the same currency – the EURO. It could be said that the European Union is the most successful region in the Economic and Monetary Integration. There are always economic benefits from forming a single currency, which are saving on the transaction costs of currency exchanges, the stability of currency exchange, the stability of the economy, hedging, and so on. But the essential problem still remains and has been to find a rationale for the existence of separate currencies. The problems can be explained on the fact that neighboring countries may have vary different economic characteristics, so that shocks affect them differently. If wages and prices are not fully flexible and resources not fully mobile, that might require separate currencies. So, it is very important in studying the theory of

Optimal Currency Area (OCA) whether the region is suitable in forming a single currency or not.

The analysis of a single currency system is based on the studies of the Optimal Currency Area (OCA) theory.[10] The Optimal Currency Area refers to the area that is optimal to permanently fixed national currencies among member countries and maintains a flexible exchange rate regime with the rest of the world. The study of Optimal Currency Area (OCA) can be characterized into 2 approaches: First; Cost and Benefit approach to a nation participating in a currency area, and Second; the Pre-Conditional characteristics of a national economy that desires to participate in a currency union. Here, in this Literature Review, I will divide the study of Optimal Currency Area into 2 subsections.

First, **the Cost and Benefit Approach**: Let's *first* consider the benefits of a common currency. There are several benefits in forming the common currency but the most outstanding benefit is the desirability of exchange rate certainty, which finally bring to the economic stability. The adoption of a single currency eliminates exchange-rate risk. De Grauwe (1997) explained in detail that common currency would create both direct gain and indirect gain from the elimination of transaction cost, which is one of the benefits to forming common currency. This benefit will stimulate economic integration. Moreover, by reducing price uncertainty, a common currency will improve the allocative efficiency of the price mechanism. This will certainly improve welfare of the union. George S. Tavlas also shares the same view as De Grauwe that exchange rate risk affects trade in both directions that will tend to reduce a country's exports and imports. So, if there is the formation of a common currency, the country's benefit will be seen through the higher growth of trade and country's economy. De Grauwe also quotes Gruvel (1981 page 505) that the adoption of a single currency would eliminate the need of firms to maintain staff to look after currency exchanges within the area. George S. Tavlas (1993) also agree with this benefit to common currency additional with other benefits, which are economizing on exchange reserves through the pooling of reserves, elimination of speculative capital flows within the area, and enlargement of the foreign exchange market vis-à-vis other countries, decreasing both the volatility of prices and the ability of speculator to influence prices and, thus, to disrupt the conduct of monetary policy.[11] Yoshihide Ishiyama also agrees that the speculative

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[10] Sabhasri Chayodom, "Therov of Optimal Currencv Area and the Euro". Chulalongkorn Review, Volume 11 Number 41, October-December 1998

[11] George S. Tavlas, "The Theorv of Optimum Currencv Areas Revisited". Finance & Development, June 1993, Volume 30 Number 2

capital flows will be completely eliminated and there is the benefit of saving on exchange reserves. Yoshihide Ishiyama quotes Mundell (1973a) that there are 6 benefits of a common currency—reserve saving, a reduction in the cost of financial management, risk pooling, intermediation, information saving, and innovation. All authors share the same perspective on the benefits of a common currency. *Second*, let's consider the Cost of a Common Currency. George S. Tavlas, De Grauwe, and Yoshihide Ishiyama have the same view that the main cost of joining a monetary union is the loss of Monetary autonomy and Fiscal Autonomy. Another costs to country's joining a currency area was the loss of the use of the exchange rate tool, which could be especially severe in the event of differentiated term-of-trade shocks among the members of a currency area.[12] There is also a long-run trade-off between unemployment and inflation; a nation pays a high price in joining a currency union in that it cannot use monetary policy as a means of achieving its desired mix between inflation and unemployment. This is another cost of joining a common currency, which is introduced by George S. Tavlas (1993).

Second, **the Pre-Conditional characteristics:** there are several criteria for an Optimum Currency Area, which are the degree of factor mobility, similarity of inflation rates, the openness and size of the economy, the degree of commodity diversification, price and wage flexibility, the degree of goods market integration, fiscal integration, the need for real exchange rate variability, political factors, and so on. The first, suggested by Robert Mundell, showed that unless labor and capital can move freely between regions, a shock, which shifts global demand from the products of one region to those of another will create unemployment in the former if wages and prices are rigidity and its exchange rate are fixed.[13] So, the labor should be highly mobile within the area. As a result, the international *factor mobility* is a necessary condition for an Optimum Currency Area. Second, Ronald I. McKinnon introduced the openness and size of the economy criteria. He argued that the effectiveness of exchange rates might decline with the degree of openness. This means that the smaller the size and the more openness of the economy, the more the country tends to be a good candidate to participate in a common currency. Third, the degree of commodity diversification: Peter Kenen (1969) suggested that highly diversified economies are viewed as better candidates for currency area than less-

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[12] Ibid., p.669

[13] Robert A. Mundell, "A Theory of Optimum Currency Areas". American Economic Review (1961)

diversified economies since the diversification provides some insulation against a variety of shocks. Fourth, Friedman (1953) discussed the degree of goods market integration. He suggested that countries with similar production structures be deemed to be better candidates for currency areas than are countries whose production structures are markedly different. Kenen (1969) also discussed about the *Fiscal Integration*. He mentioned that the higher the level of fiscal integration between two areas, the greater their ability to smooth out diverse shocks through fiscal transfers from a low unemployment region to a high-unemployment region. In summary, the traditional approach suggested 4 criteria for judging whether regions should form a currency area: mobility of factors of production, flexibility of prices and wages, openness to trade and diversity of production. Regions that have relatively closed economies, narrow product ranges, strong price and wage rigidities, and low external mobility of labor and capital should not join monetary union, but should retain exchange rate flexibility instead. The recent work on the Theory of Optimum Currency Area has been modified through the study of time inconsistency and credibility problems, labor mobility under conditions of uncertainty, and exchange rate determination. George S. Tavlas(1993) is the one who raises an issue on the time consistency, which concerns the inflation expectations and credible commitment of monetary authorities as a key success of a currency area.[14] Many economists have analyzed the further study of the theory of Optimal Currency Area. Bayoumi and Eichengreen (1997) constructed the OCA index for European countries by using cross-country data to find the relationship between OCA characteristics of countries and observed the behavior of the exchange rates. They develop a procedure for applying the core implications of the theory of optimum currency area. The key to their approach to operationalizing the theory of optimum currency areas is to analyze the determinants of nominal exchange rate variability. They use their exchange rate equations to predict which countries will be best able to support stable exchange rates in the future - equivalently, which are likely to be best prepared to be among the founding members of Europe's monetary union. The results show European countries dividing into three groups: those exhibiting a high level of readiness, those with a tendency to converge, and those in which little or no convergence is evident. Moreover, they also identified the possible-founding members of the European OCA and pursue further finding is that to investigate the

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[14] Sabhasri Chayodom, "Therov of Optimal Currencv Area and the Euro". Chulalongkorn Review, Volume 11 Number 41, October-December 1998

symbiotic relationship between economic integration and monetary integration.[15]

All the above studies can be used to apply to the selected Asian countries whether there is the possibility in the formation of Asian economic integration or not. In this thesis, the work done by Bayoumi and Eichengreen (1997) will be mainly followed by constructing an OCA index for selected Asian countries by using the same estimation and forecasting techniques as them.

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[15] Tamim Bayoumi, Barry Eichengreen, "Ever closer to heaven? An Optimum-Currency-Area index for European countries". European Economic Review, Volume 41 (1997) p. 761-770.

Research Methodology

The methods that will be employed in this study are both Descriptive method and Quantitative & Statistical Analysis.

The *"Descriptive method"* will focus on the Asian crisis and the consideration on the formation of an Asian economic integration against the crisis. The reasons why selected Asian countries have or do not have the tendency of currency convergence will be mentioned. The possibility of an Asian integration will be described by the statistical data in the forms of tables and charts.

In the *"Quantitative & Statistical Analysis"* section, the methodologies that will be employed are the study of Economic Interdependency among selected Asian countries, and the theory of Optimum-Currency-Area through the multiple regression.

The study on the Theory of Optimum-Currency-Area:

The Optimum-Currency-Area Index will be calculated to represent the measurement of convergence among selected Asian countries in the currency area. OCA index is used to predict which countries will be best able to support stable exchange rates in the future, and are likely to be best prepared to be among the founding member of the monetary union. In case, the OCA index is small, it implies that the convergence level is high. This means that there is the tendency for countries to form a single currency. The theory of Optimum-Currency-Area in this thesis will follow the works done by Bayoumi and Eichengreen (1997). They constructed the OCA index that showed the relationship between the Pre-Conditions of countries, which the OCA theory states. The purpose of this study is to observe the behavior of exchange rate by using a cross-country data over a period of time and to investigate the relationship between economic integration and the monetary integration. The Theory of Optimum-Currency-Area will show the result whether selected country could join the same currency area or not by running the multiple regression and applying the Ordinary Least Square (OLS) method to the OCA estimating equation by using the calculated index and some collected data. The Optimum-Currency-Area index of selected Asian countries will be constructed to observe the relationship of the countries by using the equation formulated by Tamim Bayoumi and Barry Eichengreen.

The estimating equation is

$$\mathbf{SD(e_{ij}) = \beta_0 + \beta_1\, SD(\Delta y_i\text{-}\Delta y_j) + \beta_2\, DISSIM_{ij} + \beta_3\, TRADE_{ij} + \beta_4\, SIZE_{ij} + \beta_5\, SD(\pi_i\text{-}\pi_j)_{ij} + \varepsilon_{ij}}$$

where

$SD(e_{ij})$: the standard deviation of the changes in the logarithm of the annual average bilateral nominal exchange rate between Country i and j This represents the OCA index,

$SD(\Delta y_i\text{-}\Delta y_j)$: the standard deviation of the differences in the logarithm of real output between countries i and j (difference between country i And country j real GDP growth rate),

$DISSIM_{ij}$: the sum of absolute differences in shares of agricultural, industrial and service sectors in relative to domestic GDP for countries i and j This variable is used to measure the structure of each sector,

$TRADE_{ij}$: the average ratio of bilateral exports to domestic GDP for the two countries i and j This variable is used to measure the degree of openness,

$SIZE_{ij}$: the average of logarithm of the two countries' GDP. This variable is used to measure the size of economies of countries,

$SD(\pi_i\text{-}\pi_j)_{ij}$: the standard deviation of the difference between country i and country j CPI inflation,

The variables using in this estimating equation can be written in mathematical terms:

$$SD(e_{ij}) = SD\,(\,\Delta \log e^{ij}{}_t \,|_{t=1989\text{-}1998})$$

$$SD(\Delta y_i\text{-}\Delta y_j) = SD\,\{(\Delta y_i\text{-}\Delta y_j)_t\,\}$$

$DISSIM_{ij}$ = | the mean of the share of agricultural sector in GDP of country i – the mean of the share of agricultural sector in GDP of country j | + | the mean of the share of manufacturing sector in GDP of country i – the mean of the share of manufacturing sector in GDP of country j | + | the mean of the share of service sector in GDP of country i – the mean of the share of service sector in GDP of country j |

$$TRADEij = \frac{\sum_{t=1989}^{1998}\left[\frac{GDPi}{GDPi+GDPj}\left(\frac{Xi\rightarrow j}{GDPi}\right)+\frac{GDPj}{GDPi+GDPj}\left(\frac{Xj\rightarrow i}{GDPj}\right)\right]}{N}$$

$$SIZEij = \frac{\left[\sum_{t=1989}^{1998}\left(\frac{\log \mathrm{GDP\ i} + \log \mathrm{GDPj}}{2}\right)_t\right]}{N}$$

$$SD(\pi_i-\pi_j)_{ij} = SD\ \{(\pi_i-\pi_j)_t\}$$

The expected result:

The parameters of $SD(\Delta y_i-\Delta y_j)$, $DISSIM_{ij}$, $SIZE_{ij}$, and $SD(\pi_i-\pi_j)_{ij}$ are expected to be positive in relation to the standard deviation of nominal exchange rates. This can be implied that if

- $SD(\Delta y_i-\Delta y_j)$ or different in output growth in two countries increases; bilateral exchange rate of them will be more volatile.
- $DISSIM_{ij}$, the more dissimilarity between countries; the more volatile of bilateral exchanges rate of them.
- $SIZE_{ij}$, the size of two countries increases; they are unlikely to gain from having fixed exchange rate together. Simply said, the greater size, the more volatile of bilateral exchange rate of them.
- $SD(\pi_i-\pi_j)_{ij}$, the higher the differences in inflation rate between two countries; the more volatile of bilateral exchange rate of them.

The parameter of $TRADE_{ij}$ is expected to be negative in relation to the standard deviation of nominal exchange rates. This can be implied that if

- $TRADE_{ij}$, there is the increasing in trade between two countries, it will strongly encourage exchange rate stability.

The study of Economic Interdependency:

The study of Economic Interdependence among selected Asian countries will be observed and analyzed through "Trade Matrix". The purpose of this study is to observe bilateral relationship among selected Asian countries, how much country rely on each others in trade space. Trade and Investment are important indicators of economic interdependence. Once, countries engage in close trading relationship, this could be implied that two economies are found to be somewhat interdependent to each other. Trade Matrix presents the import and export bilateral relationship between selected Asian countries.

From both studies above (The study of Economic Interdependency and The study on the Theory of Optimum-Currency-Area), the results will explain the possibility on the formation of Asian economic and monetary integration. This could answer the first objective of this thesis. We will then be able to see whether selected Asian countries are able to form an Economic Integration or not. If not, the reason why Asia cannot form an Economic Integration will be mentioned. If there is the possibility in the formation of Asian Economic Integration as the success of the European Union, that would bring the possibility to address and solve the problem of the member countries or even protect against the crisis in the region, will be discussed and concluded here.

The study of possible ways out of the crises:

The additional study will mention whether the crises cause difficulty in the possible formation of Asian economic and monetary integration. Because of the cons of the crisis, each country foresees the opportunity to form some *institutional arrangement* with the purpose of having stronger policies to handle with the crisis, and even more is to protect against the possible crisis in the future.

Sources of the Data

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