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From Euro to Asian Dollar : An Application of Generalized Purchasing Power Parity

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TEL: 886-2-2621-5656 ext.2090.   E-Mail: niehcc@mail.tku.edu.tw

Johansen (1988, 1990, & 1994)

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eleven euro countries implies the more suitable circumstance for the creditability and the effectiveness of the euro than the Asian currency unit (ACU). Moreover, from the Granger causality test, euro countries are found more equal weighted in their leading positions than those countries in the Asian. This paper concludes that European countries' setting is more suitable for constituting the domain of the OCA and thus the set up of the euro is appropriate. On the other hand, policy makers in each of the Asian countries need more exertions in fulfilling the regional economic and monetary integration in order for the ACU to be properly constituted.

Key Words: Euro, Asian currency unit, G-PPP,
optimum currency area, regional
integration

I. Introduction

Started from January 1, 1999, eleven European countries have been experiencing the monetary integration as euro emerged to the international financial market.[1] [2] The

Abstract

This paper empirically assesses the suitability of the Asian economies for a regional monetary integration, by comparing two regional multi-nation settings - Europe and Asia, on the basis of forming an optimum currency area (OCA). By adopting the theory of G-PPP and applying five Johansen (1988, 1990, and 1994) VAR models, this paper argues that both regions well constitute the domain of the OCAs. However, the higher degree of the linkage within the

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[1] Those eleven euro countries are Germany, France, Netherlands, Luxembourg, Italy, Spain, Portugal, Austria, Finland, Ireland, and Belgium
[2] The thought of the regional economic and monetary integration was first introduced in 1948 as the Marshall plan for the European countries' economic system.

Pan-European monetary integration has brought several advantages to the European economic and finance system. The boundless monetary coordination not only helps advance the political goals by giving European Union a strong position in international affairs, but reduces the transaction cost of each inter-country payment and makes the market activity and the price system more limpid. The long-run coordination of the merges and acquisitions and the strategy alliances for the multi-national entrepreneurs is also accelerated. On the other hand, after experiencing the serious damage by the Asian financial crisis, Asian countries have mostly found it important and necessary to establish an Asian currency unit (ACU) to shelter from the exposure risk and to promote the Asian economic integration.

The thought of the Asian economic integration can be found in "Chinese economic area" (CEA), which based only on the region of the Chinese society. For example, Cui (1998) found that most of the multinational corporations (MNCs) had practically viewed Hong-Kong, Taiwan, and China as a CEA for past two decades. However, scholars from few southeastern Asian countries suggest to discard the shortsighted thought of CEA and take the Pan-Asian monetary union (AMU) as a proxy. They argue that the Asian countries' economic systems should all integrate together to defend the American and European monetary invasion. Empirically, Ling (2001) suggests that there exists scope among selected groups of East Asian economies for potential monetary integration. Since the currency plays a key role in the economic integration, the ACU is viewed as the soul to integrate the Asian countries' monetary system. However, there are some difficulties in establishing the ACU. Mimicking the exchange rate mechanic (ERM) in European monetary union (EMU), a well-organized ERM in AMU should be set up.

The sense of the regional integration should not be dressed on the issue of the PPP since PPP is merely concern the relative price level of two countries and their bilateral exchange rate. When more than two countries are considered, PPP is inadequate in interpreting the relationship among all the bilateral rates and multi-countries' relative price levels. The elaborate work by Enders and Hurn (1994) on the issue of Generalized-PPP (G-PPP) is indeed a framework to examine the feature of the regional integration. Followed Enders and Hurn (1994), the G-PPP is further adopted by Sarno (1997) and Nieh (1998) for examining the regional monetary integration.

The spirit behind the G-PPP is the so-called "Optimal currency area" (OCA), which was first introduced in the earlier paper by Mundell (1961) and was further expounded by McKinnon (1963). OCA asserts that real shocks of all countries within the currency area share common trends and thus Mundell (1961) argued that OCA should based on the "region", not the "nation." Recent researches about OCA can be found in Builter (2000), Swofford (2000), and Kehoe (2001), etc.

For the credibility and the effectiveness of the ACU, we should investigate the co-integrated degree among those selected Asian countries. The purpose of this paper is to adopt the theory of the G-PPP to investigate the integration of the Asian monetary market. Using five Johansen (1988, 1990, and 1994) Gaussian VAR models to investigate two regions – European and Asian countries' settings, we examine the credibility and the effectiveness of the ACU by comparing the outcome of the euro in the international market. Granger causality test is further employed in this paper to investigate the short-run dynamic impacts among all countries considered for each of the European and Asian regions.

This paper is organized as following way. Section II discusses the theory of OCA and the model of G-PPP. Data sets are described in section III. Section IV introduces the methodologies and presents the empirical findings. Section V concludes the paper and gives some suggestions for further study.

II. Theoretical models

A high degree of economic integration between a country and a fixed exchange rate can be explained by the elaborate work by Enders and Hurn (1994) who developed a framework of generalized-purchasing power parity (G-PPP) to link the multinational monetary system based on the "region." The G-PPP adopts the spirit of the graceful theory of OCAs, which are groups of regions with economies closely linked by trade in goods and services and by factor mobility.

As Sarno (1997) and Nieh (1998), this paper uses US dollar as the base currency to examine the G-PPP.[3]

The G-PPP for an m-country setting in an n-country economy:

$$E_{b1t}P_{1t}/P_{bt} = (E_{b2t}P_{2t}/P_{bt})^{\beta b2} (E_{b3t}P_{3t}/P_{bt})^{\beta b3} \ldots (E_{bmt}P_{mt}/P_{bt})^{\beta bm} \nu_t \qquad (1)$$

The condition that all β_{bi}'s are equal to zero is indeed a special case merging to a well-known theory of PPP relationship.

The logarithm form of equation (1) describes that within the domain of the currency area, there exists a long run equilibrium relationship between their m bilateral real rates.

$$r_{b1t} = \beta_{b2}r_{b2t} + \beta_{b3}r_{b3t} + \ldots + \beta_{bm}r_{bmt} + \varepsilon_t \qquad (2)$$

The traditional goods-market-clearing condition:

$$y_{0t} = \sum_{i=0}^{m} \eta_{0i}y_{it} + \sum_{i=1}^{m} y_{0i}r_{0it} - w_0 i_t \qquad (3)$$

If the real income levels among countries share common trends, the stationary property of at least one linear combination of the various bilateral real exchange rates will exist:

$$R_t = A Y_t \qquad (4)$$

the vector of real income levels can be jointly determined by the m+1 nonstationary variables, which are represented as m+1 stochastic trends:

$$Y_t = \Pi \Psi_t \qquad (5)$$

where $\Pi = \begin{bmatrix} f_{0,0} & \cdots & f_{0,m} \\ \cdots & \cdots & \cdots \\ f_{m,0} & \cdots & f_{m,m} \end{bmatrix}$ is a (m+1 *

m+1) matrix, and $\Psi_t = (\psi_{0t}, \psi_{1t}, \ldots, \psi_{mt})'$ is a (m+1 * 1) vector of the nonstationary

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[3] Japanese yen is used to be the base currency for

3

stochastic trends. Combining equations (4) and (5), the behavior of the real exchange rates vector R_t can be represented by:

$$R_t = A\Pi\Psi_t \qquad (6)$$

Even though all the P_{it}'s are nonstationary, the behavior of the real income series depends crucially on the rank of the matrix Π.

V. Conclusion

The international financial market has been reshuffled since the euro commences in January 1, 1999. The European monetary integration has brought several advantages to the European economic and finance system. On the other hand, after experiencing the serious damages through the Asian financial crisis, most Asian countries found it important and necessary to constitute an Asian currency unit (ACU) to shelter from the exposure risk and to promote the Asian economic integration.

This paper empirically assesses the suitability of the Asian economies for a regional monetary integration, by comparing two regional multi-nation settings - Europe and Asia, on the basis of forming an Optimum Currency Area. For the credibility and the effectiveness of the ACU, we first investigate the co-integrated degree among countries considered by adopting the theory of G-PPP and applying five Johansen (1988, 1990, and 1994) Gaussian VAR models to test and compare these two regions. Nonetheless, Granger causality test is further employed to investigate the short-run dynamic impacts. The results show that the

examining the G-PPP in Enders and Hurn (1994)

long-run equilibrium relationships among the bilateral rates hold for both regions of Europe and Asia (both cointegrated in the first Johansen's model, which presents no linear trend and quadratic trend). According to the theory of G-PPP, we argue that both regions well constitute the domain of the OCAs. However, the finding of six cointegrating vectors in the European multi-rates setting overcomes that of two cointegration ranks in the Asian setting. The higher degree of the linkage within the euro countries implies the more suitable circumstance for the creditability and the effectiveness of the euro, whereas for constituting the ACU, policy makers in each of the Asian countries need more exertions in fulfilling the regional economic and monetary integration.

The results from the GC test show that no significant finding exists in the multi-rates setting for the European countries (based on the 5% significant level). The absence of the causal relation for each pair of the bilateral rates among European countries describes that, in the short run, people can not predict the trend of any other rate by observing information of certain rate. However, the mixed findings emerge from Asian countries that different causal relations exist in different pairs of Asian countries' rates. For instance, the less developed countries as Thailand and China, with the cheaper labor and more investment opportunities, are more attractive to foreign direct investors to set up manufactures and export their product to these countries' trade partners. The bilateral rates of these developing countries thus show more significant leading position than the

4

rates of those relatively higher developed countries in the Asian region. Comparing the two regions, we see that European countries are more equal weighted in their leading positions than those countries in the Asian.

To conclude this paper, we argue that euro countries' economic and monetary systems are more robust in connecting to each other since they share more common trends in the presence of higher degree of linkage. The euro countries also show equal weight in their leading positions. Comparing the two regions of European and Asia, we conclude that European countries' setting is more suitable for constituting the domain of the OCA and thus the set up of the euro is appropriate. Whereas, the Asian economic and monetary integration need more exertions by each country's policy makers in order for the ACU to be properly constituted.

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