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行政院國家科學委員會專題研究計畫成果報告

東亞區域經濟整合的研究

Regional Integration in East Asia
計畫編號：**NSC 94－2415－H－032－003**
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一、中文摘要

　　本文爲了評估東亞區域經濟整合，利用貿易指標來分析東亞各國的貿易集中度及使用地理資訊系統技術來決定東亞貿易集團是否已經形成；然後應用引力模型去認定東亞各國雙邊貿易流量的關鍵因素。實證分析涵蓋 1990-2002 其間的資料。實証結果顯示東亞已經逐漸演變成一個貿易集團。預期未來在東亞的經濟發展的過程中，中國大陸將扮演引導的角色，而隨著時間的經過，東亞將形成世界三大貿易集團之一，支配全球經濟。

Abstract

The aim of this study is to evaluate regional economic integration in East Asia, using trade indicators to analyze the degree of trade concentration among the nations of East Asia, and employing geographic information systems (GIS) techniques to determine whether a trading block is taking shape in East Asia. Finally, the gravity model is used to identify the key factors that influence bilateral trade flows among the East Asian nations. The results of empirical analysis covering the period 1990 – 2002 show that East Asia has already evolved into a trading block. It is anticipated that, in the future, China will play a key role in directing the course of economic development in East Asia, and that, over time, East Asia will come to constitute one of three large trading blocks that dominate the global economy.

二、緣由與目的

Most of the literature in this area focuses on the distribution of global trading blocks, while the bulk of the work that has been done on individual trading blocks has targeted the Americas or Europe; so far, comprehensive empirical research on regional trade integration within East Asia has been very limited. What research has been done in this area has generally involved using the gravity model to

explore trade effects within the region. The utilization of this type of analytical framework cannot shed much light on whether regional concentration is taking place; the intention of the present study is to fill this gap in the literature. This study attempts a comprehensive appraisal of regional economic integration in East Asia, using trade indicators to explore the changes in the patterns of trade between East Asian nations in recent years, and employing GIS methods to gauge whether East Asia is evolving into a trading bloc (within the core-periphery framework). Finally, the gravity model is employed to explore the key factors affecting the flow of bilateral trade within the East Asia region.

三、結果與討論

1. Trade Concentration Within the East Asia Region

This study uses the trade indicators first proposed in Anderson and Norheim (1993) – intensity of trade and propensity to trade – to undertake empirical analysis of trade concentration. The following definitions were adopted:

Intensity of Trade, I_{ij}

$$I_{ij} = x_{ij} / m_j$$

where x_{ij} = the share of country i's exports going to region j

m_j = the share of world imports held by region j

Propensity to Trade, P_{ij}

$$P_{ij} = t_i * I_{ij}$$

where t_i = the ratio of i's total exports to i's GDP

I_{ij} = intensity of trade

First of all, in order to examine whether there is a tendency towards regional concentration in the trading activity of the individual East Asian nations, we look at intensity of trade and propensity to trade for nine groups: the 10 East Asian nations as a whole; 5 key East Asian nations (China, Japan, Hong Kong, South Korea and Taiwan); China, Hong Kong and Taiwan; the ASEAN member nations; ASEAN plus China; ASEAN plus Japan; ASEAN plus South Korea; ASEAN plus Taiwan; and ASEAN + 3. Doubts have often been raised about the practical usefulness of AFTA; examination of the intensity of trade

and propensity to trade indicators can help to clarify this issue too. The data sources used included Taiwan's Bureau of Foreign Trade and Directorate General of Accounting, Budget and Statistics, and the International Monetary Fund's International Financial Statistics (IFS) and Direction of Trade (DOT) databases.

The analysis presented above supports the view that East Asia is developing into a single regional trading bloc, with China and Japan at its center.

2. The Formation of an East Asian Trading Bloc

Besides employing trade indicators to analyze the pattern of regional trade, Geographic Information Systems (GIS) can be used to examine the level of trade concentration within the East Asia region.

The G_i^* statistic is computed as below:

$$G_i^*(d) = \frac{\sum_j W_{ij}(d)x_j}{\sum_j x_j}; i = j$$

$W_{ij}(d) =$ the binary contiguity matrix for spatial unit i and spatial unit j. If spatial unit i is within distance d of spatial unit j, this value is 1, otherwise it is 0.

$x_j =$ the observed value within spatial unit j.

GIS analysis reveals how an East Asian trading bloc is gradually taking shape; it is anticipated that, over time, this bloc will solidify. By the same token, a similar research method is used to identify where the core area of trading activity is located within the East Asia region, it can be seen that this core area lies in Northeast Asia, embracing China and Japan. To summarize, the trading activity of the East Asian nations will come to be centered around the enormous Chinese market, while the intensity of trade within the region increases steadily, causing the nascent trading bloc to solidify.

3. Analysis of Bilateral Trade Flows Between East Asian Nations

The gravity model can be described as follows:

$$\ln TR_{ij} = a + b_0 \ln GDP_i + b_1 \ln GDP_j + b_2 \ln POP_i + b_3 \ln$$
$$+ b_4 \ln DIST_{ij} + b_5 \ln AVE\_D_i + b_6 ASEAN + \varepsilon_{ij}$$

TR_{ij} = country i's exports to country j (in US$ millions)

GDP_i = country i's GDP (in US$ millions)

GDP_j = country j's GDP (in US$ millions)

POP_i = country i's population

POP_j = country j's population

$DIST_{ij}$ = distance between country i and country j (unit: 111.12 km)

AVE_D_i = average distance between country i and it's export markets in other countries

ASEAN = dummy variable (1 if j is a member of ASEAN, otherwise 0)

ε_{ij} = error term

For the most part, the coefficients obtained conform to the theoretical expectations and show statistical significance.

(1) With regard to income elasticity of mutual trade, the values obtained were positive for both the importer nation and the exporter nation, with little difference in the degree of elasticity. The values for population elasticity were negative for both the importer nation and the exporter nation. In the case of the exporter nation, the larger the domestic market, the greater the extent to which products circulate within that domestic market, and the lower the level of exports. For the importer nation, although our research did not show any sign of a trend towards positive population elasticity, it was clear that importer nation population elasticity had been gradually falling over the period 1992 – 2002; we believe that extending the period under study beyond 2002 would have shown a positive correlation. In this respect, the results obtained are not consistent with our original expectations that there would be positive population elasticity for the importer nation. It appears that, although under normal circumstances a large population implies a large market and would display a positive correlation with the volume of trade, if the population is excessively high, then the correlation can become a negative one due to a high dependency ratio. Given the high levels of population density in East Asia (by global standards), this result is relatively easy to explain.

(2) Distance elasticity was found to be negative, indicating that higher transportation cost can indeed lead to a reduction in exports; this result was thus

in conformity with our expectations.

(3) With respect to the regional variable (where regression analysis was performed at five-year intervals), the value obtained with this dummy variable fell from 0.2779 in 1992 to 0.1307 in 1997, to 0.0009 in 2002; what had at first been a significant correlation ceased to be significant over.

四、計劃成果自評

Our study not only contributes to the literature, but also provides some policy implications for decision-makers. We wish to publish our work in international journal.

五、參考文獻

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