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The Long Term Fate of Korea and Other "Small" Economies in East Asia: Economic Development, Integration Issues, and Political Power

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Abstract

In this paper it is argued that Korea and other countries in East Asia like Korea have a particular fate quite predictable in the long run in terms of economic growth and political dependency unless economic integration takes place in a particular direction. Thus the presence of the potentially giant China makes things "difficult" for "Korean" countries (e.g Thailand, Malaysia, Vietnam, and even Japan). This fate is not coloured with optimism unless some measures are taken that ensure a particular way of integration in East Asia. It is not unique that a giant economy is the centre of economic activities for the wider region. Unlike the European Union which does not contain any giant member in its process of integration, the USA could be the closest good example of how neighbouring countries have evolved next to this giant. In East Asia the situation is not similar to that of the USA at the moment, but in this paper there is a set of propositions and arguments that predict the fate of "Korean" economies next to a potentially giant China. Several methods will be used to demonstrate the validity of these propositions (mathematical model, cluster and scale analyses, and so on). Various strategies will be examined in the context of the propositions. It will be demonstrated that the short term and long term strategies that countries such as Korea and Thailand in isolation might have to follow are not necessarily consistent unless an overall strategy of regional integration takes place.

**Key words**: long term integration; fusion; exports; policies

Introduction

The East Asia region is becoming the hot spot of the world economic development. The rates of growth are consistently very high, higher than any other region in the globe. The huge population and workforce that this area has is a powerful weapon for economic expansion. This region also includes some of the oldest and most dynamic societies. One of them is also one of the largest countries and economies and is probably becoming the next superpower on this planet. China is indeed the new superstar on the economic arena and soon on the political arena. But we can start asking questions as to the destiny of this region, the Central Country (China), and the smaller nations in the area, such as Korea and Thailand. To uncover this destiny let us briefly examine some of the recent trends in some key indicators.

First the ratios of each country's or region's GDP to world GDP over time are shown in Figures 1 and 2. It is quite apparent that the USA's and West Europe's ration remains constant, Japan's ratio declines and China's rises, whereas ASEAN's[1] and Korea's rise as well but not as much as that of China.
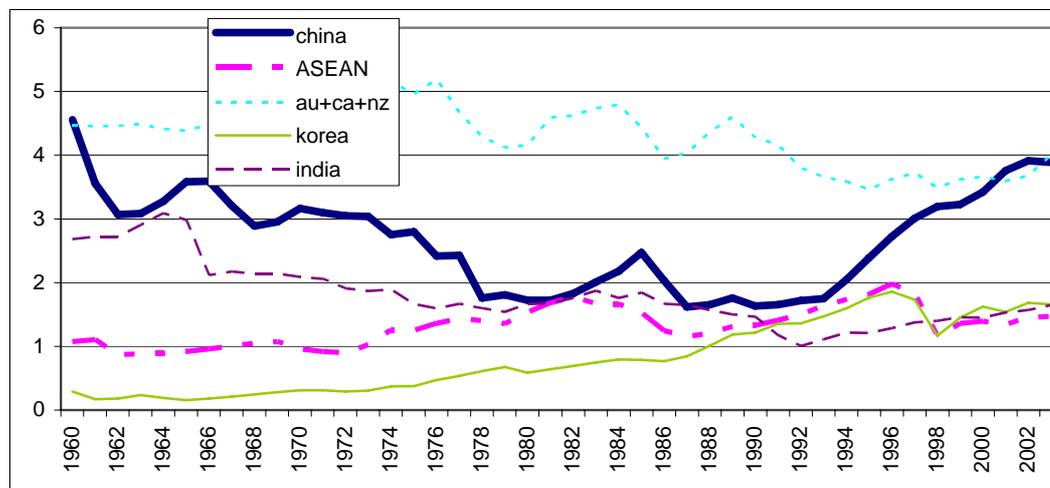
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[1] Malaysia, Thailand, Philippines, and Indonesia.

Figure 1   Ratios of a given country's GDP to total world GDP
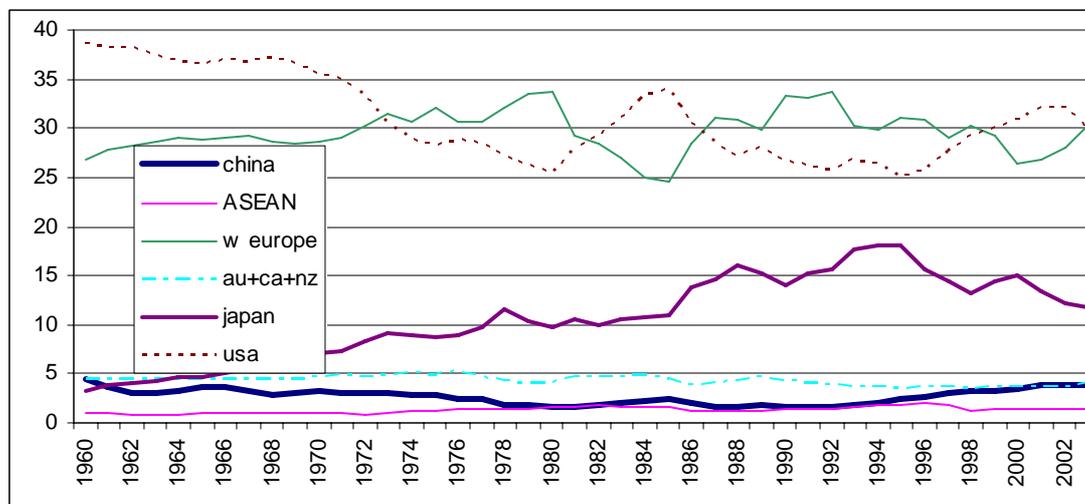
Notes: ASEAN consists of Malaysia, Thailand, Indonesia, and Philippines; "au+ca+nz" stands for Australia plus Canada, plus New Zealand.

Figure 2   Ratios of a given country's GDP to total world GDP

Second, the ratio of a country's exports to total world exports for some selected countries is shown in Figure 3. Korea's, ASEAN's, and especially China's such ratio has been increasing, whereas Japan's has been declining; the USA's ratio only recently started declining[2].

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[2] West Europe's ratio (not shown in this Figure) has been constant at about 40%.

Figure 3   Ratios of a country's exports to total world exports
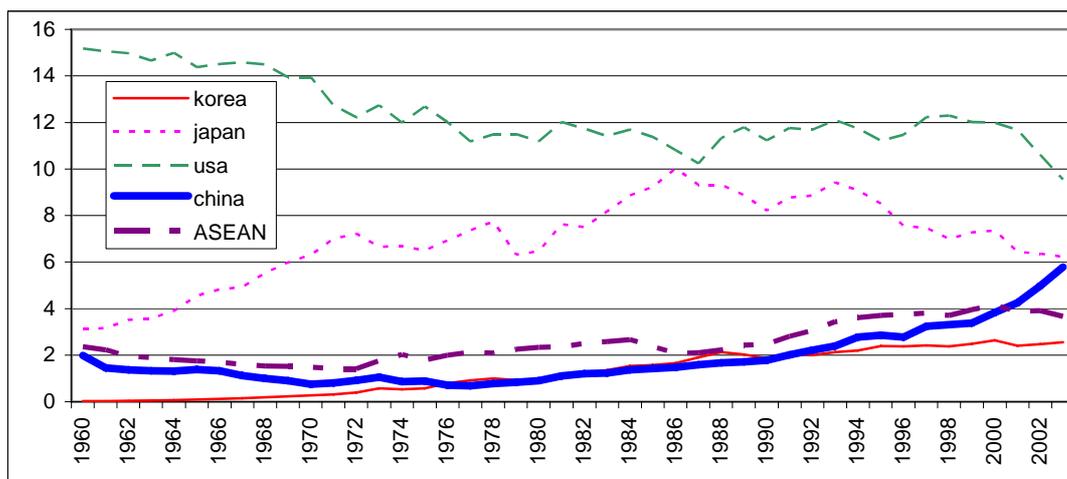
Figure 4   Ratios of Korean exports to some selected countries
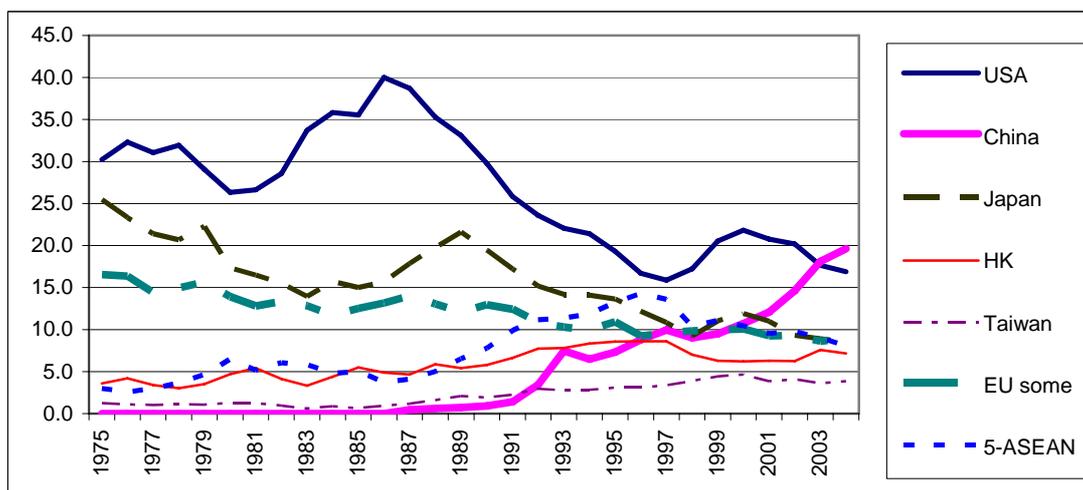
In Figure 4, the ratios of Korean exports to China and some other countries are shown. It is obvious that the ratio of exports to China over total exports has been growing very fast, whereas the ratio of exports to the USA and Japan has been declining. If we also add Hong Kong and Taiwan Chinese provinces then Korea is very fast depending on its exports to overall China for its economic prosperity.

Given the above brief account of trends in the East Asia region, some questions arise of paramount importance. Where will the Chinese expansion and growth stop? Will other nations, such as Korea see their economies fused with China eventually? Will

East Asia be integrated in the long run? Will this integration include some nations on the other side of the Pacific Ocean? In the present paper some preliminary answers to these questions will be provided as a hypothesis, called the fusion hypothesis of integration.

In the next section a mathematical model will examine some long term dynamic issues regarding the above questions. In section 3, some other methods will attempt to further confirm the fusion hypothesis. In section 4, a discussion will follow and some conclusions will be drawn.

Long term equilibrium: dynamic considerations

Let us determine the long term behaviour of a country like Korea in terms of its exports to China and to another country in the cluster. This can be achieved by considering a homogeneous[3] system of two differential equations:

$$\dot{x} = \alpha_{11}x + \alpha_{12}y$$

$$\dot{y} = \alpha_{21}x + \alpha_{22}y \tag{1}$$

In system (1) we can predict the sign of the coefficients α_{ij} almost with certainty. Thus, the rate of growth of Korean exports to China $\dot{x}$ depends positively on the level of these exports, hence the coefficient α_{11} has a positive sign; and it depends negatively on the level of Korean exports to another country[4] in the region, hence the coefficient α_{12} has a negative sign. This is already observed in the Korean exports[5] to China and to the other countries in the region. Regression analysis for the existing

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[3] The discussion for a non-homogeneous system is the same as for a homogeneous system (see also below), since a linear transformation of the existing variables into new ones will yield the same results (the analysis here is based on Sydsaeter *et al*, 2005).

[4] Or all other countries in the region.

[5] The date for exports and GDP are extracted form the World Bank (2005) data basis.

data and simulation with extended data with the same pattern into the next 15-25 years shows that the signs of these coefficients are correctly predicted. The rate of growth of Korean exports to another country (or group of countries) $\dot{y}$ depends positively on the level of these exports, hence the coefficient α_{22} has a positive sign; and it depends negatively on the level of Korean exports to China, hence the coefficient α_{21} has a negative sign.

The solution to this system is:

$$x = Ae^{\lambda_1 t}v_1 + Be^{\lambda_2 t}u_1 \quad \text{and} \quad y = Ae^{\lambda_1 t}v_2 + Be^{\lambda_2 t}u_2 \tag{2}$$

where λ_1, λ_2 are the two real eigenvalues determined by the following equation:

$$\lambda^2 - (\alpha_{11} + \alpha_{22})\lambda + (\alpha_{11}\alpha_{22} - \alpha_{12}\alpha_{21}) = 0 \tag{3}$$

We are interested in proving that at least one eigenvalue is real negative so that we have either a sink solution to (1) and hence globally asymptotically stable (in this case both eigenvalues must be real negative) or a saddle solution to (1) and hence a local or global unique equilibrium. *A priori* we would opt for the plausibility of a saddle solution since there are so many factors that can influence the very long term equilibrium that at any moment a saddle stable point can easily become unstable (as the image of a saddle would suggest).

To determine the signs of the two eigenvalues derived from (3) we must now show the expected sign of the quantity under the square root of the two solutions of (3) denoted as D:

$$D = (\alpha_{11} + \alpha_{22})^2 - 4(\alpha_{11}\alpha_{22} - \alpha_{12}\alpha_{21}) \tag{4}$$

This quantity is equal to: $D = (\alpha_{11} - \alpha_{22})^2 + 4(\alpha_{12}\alpha_{21})$

which is always >o, if α_{12}, α_{21} are either both positive or both negative. We already know that these coefficients are both negative, hence D>0.

Hence the signs of λ_1, λ_2 depend on the quantities of: $\alpha_{11} + \alpha_{22} + \sqrt{D}$, and $\alpha_{11} + \alpha_{22} - \sqrt{D}$ respectively. The former quantity is always >o since $\alpha_{11} + \alpha_{22}$ >0. As we can easily show the quantity $\alpha_{11} + \alpha_{22} - \sqrt{D}$ <0. Consequently we have two real eigenvalues (providing that α_{12} and α_{21} are not equal), one positive and one negative and hence we have a saddle point.

Another way to approach this problem is to say that for a non-homogeneous system:

$$\dot{x} = \alpha_{11}x + \alpha_{12}y + \beta_1$$

$$\dot{y} = \alpha_{21}x + \alpha_{22}y + \beta_2 \qquad (5)$$

the saddle point is a unique global equilibrium if $\alpha_{11}\alpha_{22} - \alpha_{12}\alpha_{21}$ <0 (Sydsaeter *et al*, 2005). In this case both eigenvalues λ_1, λ_2 are real and of opposite sign each. For this to happen, we must have $\alpha_{12}\alpha_{21} > \alpha_{11}\alpha_{22}$. As both α_{12} and α_{21} are negative whereas the other two coefficients are positive, then the latter inequality takes place only if the cross (or indirect) impact of Korean exports as indicated by α_{12} and α_{21} is larger than the direct impact of α_{11} and α_{22}. These cross impacts are probably the main reason as to why we might have the strong tendency for a continuous increase of Korean exports to China to the detriment of all other Korean exports (diversion effect).

We have thus proved that Korean exports to China will keep increasing to the detriment of Korean exports to all other countries, since no other country is in the

same position as China is, unless a different policy of integration is followed (see below). To further show this outcome, consider a more complicated case of Korean exports to China and Korean exports to other countries as shown by the following non-linear system of differential equations:

$$\dot{x} = ax - bx^2 - y$$
$$\dot{y} = w(a - 2bx)y$$
(6)

Providing the right initial values of x and y exist, the saddle solution to this system is point $S = (a/2b, a^2/4b)$ (7)

The parameters a and b can be such that the solution S is for example, 85% Korean exports to China and 11% Korean exports to a group of other countries in the region in the very long run.

The foregoing dynamic analysis provides some extra evidence to the fusion hypothesis promoted in this paper. In the very long term, Korean exports can be fused or almost totally integrated with China's economy. This is already happening with Canada and Mexico in relation to the USA. Canada's exports to the USA were about 65% in the 1970s; they are now at about the 85% level. Mexico's economy is even more fused with that of the USA. Mexico's exports to this country were about 80% in 1990 and are now more than 90%. There are of course differences between the situation of Korea vis-à-vis China and the situation of Canada or Mexico vis-à-vis the USA. For example, Canada has had a parallel strong economic development with the USA in the last 200 years. Korea and China have only been accelerating their economic growth recently. However, one very important similarity exists between all these pairs of countries; thus, both Canada and Mexico are small economies in

relation to the USA and they are all neighbours. The same holds for Korea and China in a potential way, mainly due to their population size difference.

If what happened to Canada and Mexico vis-à-vis the USA can happen to Korea (or any other "Korean" economy such as potentially Vietnam, Thailand, or even Japan) we may ask the plausible question as to what the reasons are for this eventual fusion. An obvious first answer to this question is the huge market in China for any small economy to be attracted to and be an integral part of. Other reasons are: similar cultures, some common historical events; increasing globalization; regional integration policies; and so on. One extra reason is the importance of the central location of the Shanghai region as we will analyse below.

If we apply the same differential equations model to Korean GDP growth rate ($\dot{x}$), the latter depends on the Korean level of GDP x (with a positively signed coefficient) and on the level of Chinese level of GDP y (also with a positively signed coefficient) as per system (1). The coefficients of the Chinese GDP rate of growth differential equation are also positively signed. This has as a consequence a probable saddle equilibrium point in the long run with both GDPs reaching some high point in the distant future *ceteris paribus*. This can be more clearly seen with system (6), where the values of a and b can indicate that both GDPs of equilibrium S (see above) are such that the Korean GDP is no more than 5% of the sum of Chinese and Korean GDP (approximately the Korean population as a ratio to total Chinese and Korean population is about 4% now). In the very long run, economies will have the tendency to grow according to their population growth rates ceteris paribus (for example, if per capita income and technology are the same). This result together with our conclusion

regarding exports reconfirms our thesis about an inherent tendency for the fusion of Korean and Chinese economies (unless other events take place).
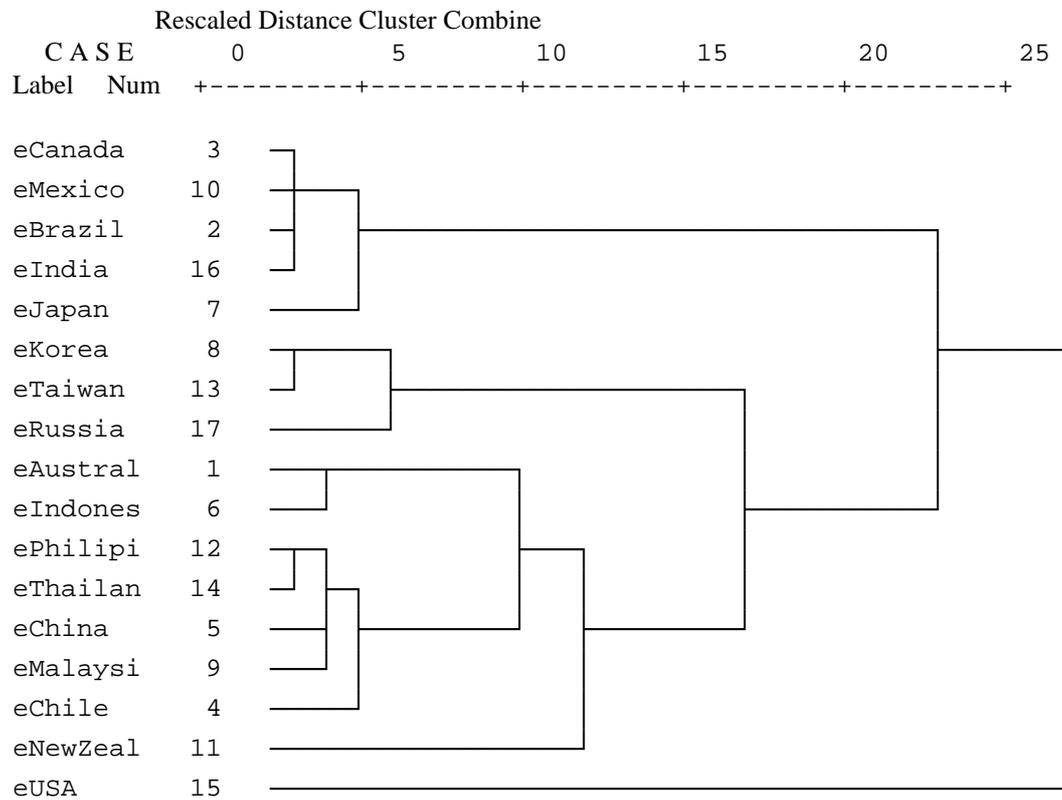
The economic hub of the Shanghai greater region

The East Asian region is much less homogeneous than the European region is, in terms of similarities in size, location and economic development of its constituent nations. China by its position and size seems to play a central role in this area (there is no "China" in Europe). In particular there is a sub-region in China, around Shanghai city that plays a very leading role. This region contains the following Chinese provinces (in whole or part): Shanghai, Jiangsu, Zhejiang, Anhui, Shandong (part). Together all these 4.25 provinces produce approximately 25% of the Chinese national income. A radius of about 2500 kms from Shanghai embraces most of China, Korea, Japan, and most of South East Asia; all this area is almost like Europe in terms of area but denser in population.

We will support our contention about the central role of the Shanghai greater region as central to the development of the whole East Asia region with some more arguments. First we will conduct a cluster statistical analysis by examining the export patterns of all the major countries of the East Asia and Pacific Ocean greater region (data are extracted from ITC internet site). The dendogram of cluster analysis (Hair *et al*, 2006) in Figure 5 shows that some spontaneous groups have been formed already. The first is made of Canada, Mexico, Brazil, and Japan (India as well) mainly because of their strong links with the USA (both Japan's and Brazil's exports to the USA constitute about 30% of their total exports). Korea, Taiwan, and Russia seem to group together thus giving some evidence that Korea does not seem to fit in the group with

Japan nor in the group with ASEAN. It is also important to note that Russia can eventually play a significant role in the East Asian region.

Figure 5   Cluster analysis

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                    Rescaled Distance Cluster Combine
      C A S E        0        5        10       15       20       25
      Label   Num    +--------+--------+--------+--------+--------+

      eCanada    3
      eMexico   10
      eBrazil    2
      eIndia    16
      eJapan     7
      eKorea     8
      eTaiwan   13
      eRussia   17
      eAustral   1
      eIndones   6
      ePhilipi  12
      eThailan  14
      eChina     5
      eMalaysi   9
      eChile     4
      eNewZeal  11
      eUSA      15
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Note: Dendrogram using the Ward Method and z-scores

Korea is very similar to Taiwan in terms of population, economic performance and so on, hence its tie with this country. If eventually Taiwan is absorbed by China, Korea will be left alone in the area. The ASEAN countries, plus Australia, plus China (Chile[6] as well) form another broad group (Indonesia seems to pair more with Australia). New Zealand (a very small country) and the USA seem to be rather independent from the other groups. This result is expected for the USA due to its particular characteristics (a leading world nation and rather independent economically).

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[6] Chile was included to test its relevance to its integration policies with Korea.

Second we will support our conclusions with a multidimensional scaling[7] statistical analysis (Hair *et al*, 2006) using the same export data; this is shown in Figure 6. The results of the cluster analysis are confirmed here. The USA and New Zealand are away from the other groups. The group of Mexico, Canada, Brazil, Japan, and India is apparent; Korea and Taiwan are together (Russia is not far away from them) and close to the ASEAN group (plus Chile), although Australia and Indonesia seem once more to pair together.

Figure 6   Scaling analysis: derived stimulus configuration
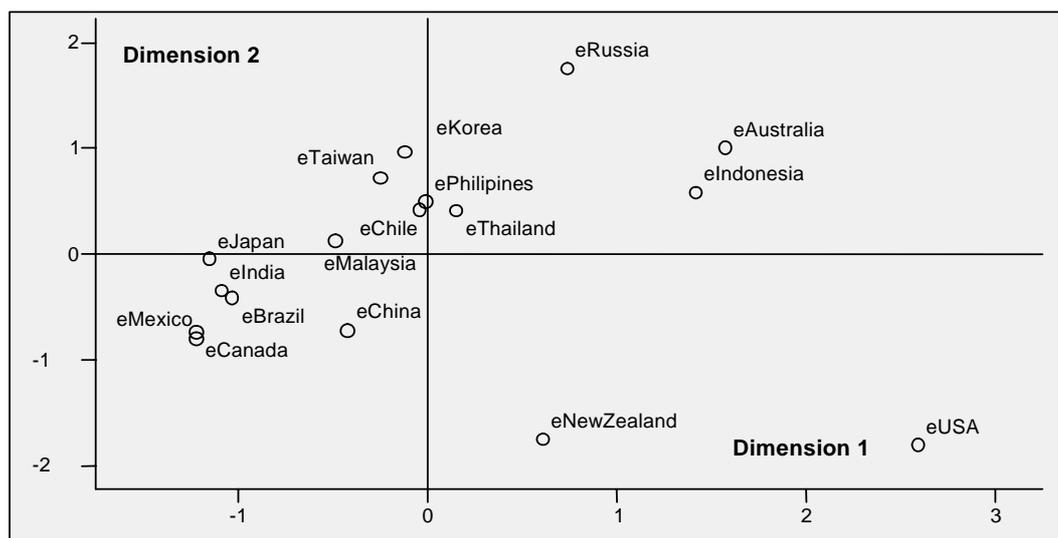
Third we will refer to the so called Chinese Diaspora across several countries in the South East Asia region. Cheung (2004) has called this Chinese ethnic group a "virtual nation" holding a collective capital of about US$600 billion in 1996 and constituting a borderless empire. Its impact on national economies is considerable and adds more potential power to the Chinese economy and politics. Also its impact on regional integration is very important since it makes connections and relations in this region

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[7] Euclidean distances and z-scores were used (ALSCAL algorithm as per SPSS program).

easier through the networking facilities of its members. Consequently if a formal integration takes place between China and ASEAN then this integration will be further facilitated because of the role of the Chinese diaspora just described.

Fourth, we should also ask the question whether or not China follows the East Asian development model, as initiated by other countries or regions such as Japan, Korea, Taiwan, and Thailand. Baek (2005) concluded that the Chinese way of development shares many characteristics with the East Asian development, such as state control over finance, import substitution industrialization in heavy industry, a high rate of domestic savings, and so on. We support this conclusion and add that we can predict that the whole East Asian region is quite homogeneous from this point of view, hence making a formal integration easier to implement at least in the near future.

The four points just briefly analysed all lead to the following overall conclusion: China and in particular the greater Shanghai region is becoming the moving force of economic development of East Asia. This is so, because China is already integrating with all other neighbours (this is confirmed by the cluster and scale statistical analysis); it has a penetrating human, financial, and social capital as represented by the Chinese diaspora; and it has similar development characteristics to those of many other East Asian countries.

In view of all these points we can now answer a question that is more relevant to Korea, or any other "Korean" economy. Can this country become an economic hub in its region? Lee and Hobday (2003) identified a hub as being a central place for foreign direct investment, regional headquarters, financial institutions, commercial,

trading transhipment and logistics operations, high technology manufacturing, and technical support/R&D for foreign MNCs. These authors concluded that such a hub would be difficult to establish in Korea, as several interviews with senior executives indicated. As we have seen competition from the greater Shanghai region would make things much more difficult for Korea to play the same role as this Chinese area can play in the very long term (see Sanidas 2006 forthcoming).

Policies of integration and long term future

The foregoing analysis would suggest that each country, individually taken, will be fused with the potential huge market of China unless some other events occur. This fusion would be even more unavoidable if a formal integration arises. In this respect we can discern two contradictory forces. First all countries in the region would like to and as a matter of urgency must trade with China as much as possible. This situation can be compared with the prisoner's dilemma situation. Each country individually taken will be better off by trading and integrating with China now given the potential market of the latter country although each one of them knows that in the very long term it will become a satellite of China both economically and politically. This situation is similar to the long term tendency for increasing environmental pollution although under a mutual enforced cooperation the best solution would be to reduce such pollution.

Second all countries in the East Asia region would like to integrate amongst them selves in order to take advantage of the benefits of regional integration (such as increased trade flows, higher economic growth, and so on). But should this integration include China, or not? The group ASEAN was initially formed to enhance the South

East Asian countries development and cover itself from the increasing power of China in the region (both politically and economically). ASEAN has achieved a high integration and has increased its intra-regional trade significantly (see in this respect Jayanthakumaran and Sanidas, 2006). Korea has sought to integrate with South American countries such as Chile. Japan has been traditionally trading intensively with the USA. The dilemma remains: should these countries formally integrate with China as a group? However, on an individual basis this dilemma ceases to exist as each one of them would like to enhance bilateral integration. Hence, as Park (1996, p. 368) predicted, "East Asia will become increasingly dependent on China as its economic might grows…The countries on China's periphery could very easily come to be known as the economic area of 'greater China'…"

Given the potential situation of eventual fusion of each individual small economy with China, a formal overall integration (which would include China) is not recommended at present. Instead the reinforcement of subgroups of regional integration is the best option in the medium term. Thus ASEAN[8] should accelerate its integration and include Korea. On the other hand Korea, Japan, and Mongolia in the North should speed up their integration with more American countries such as Canada, Mexico, Brazil, and so on. Other options would be available under a more careful examination of the situation but this is outside the scope of this paper. For example Russia could potentially play a significant role in Asia (as well in Europe).

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[8] ASEAN seems to be the key to East Asian integration. All other countries in the greater region actively seek to form close ties with ASEAN, for example China, Japan, and India (see for instance He, 2004, p. 106). The free trade area between ASEAN and China is the first one to emerge with certainty (Cai, 2003).

Furthermore, we should also mention the role of informal types of integration. We already mentioned the Chinese diaspora as one such type, but this also reinforces the Chinese potential for fusion with other countries. However there is also the so-called 'regional production network' which is driven by Japanese foreign direct investment, mainly in the ASEAN group of nations (Peng, 2000). This network enhances the influence of Japan in the region but eventually it cannot be as strong as the potential size of the Chinese economy. Subregional economic zones are also another type of informal integration (Peng, 2002/2003). Although all these zones are important in East Asia, the Shanghai one will have the greatest impact on the region on account of what we proposed so far.

At this point we must add a few thoughts on the relationship between economic and political integration. True economic integration cannot take place in the long run unless political integration follows as it is happening in Europe. However, "East Asian countries support regionalism for national interests and state power. Asian nationalism never significantly challenges a nation-state system" (He, 2004, p. 120). One of the aims of the present paper was to show that this nation-state system is very asymmetric in East Asia. The Central Country (China) is much larger than any other one in the area and this asymmetry can lead to many problems. One of them is the fusion of smaller economies with China as was extensively analysed above.

This asymmetry can be further observed with the following behaviour as He (2004, p. 116) argues: "Unlike the middle powers of Malaysia or Korea, China's status as a big country and big power in Asia reduces its incentive to establish regionalism for its survival and influence". Consequently, unless politically all East Asian countries feel

the need to become one nation under the Chinese umbrella, an economic fusion in the long run between China and each one of its "neighbours" will be a *de facto* political fusion as well. We can imagine that at least Japan and Indonesia would strongly resist such a fusion; and perhaps a united Korea would as well. The 21st century will tell us to which extent this fusion will take place.

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