Changes in East Asian Regional Economic Structure during the Dynamic Process of Economic Integration

- from the point of view of New Geographical Economics

Masato Hisatake
Senior Fellow, RIETI

Geographical concentration of economic activity

- **North America**
- New York as the global center of finance and services
- Silicon Valley as the global center of Information Technology (IT) industry
- Part of East Coast and part of the West Coast, among others

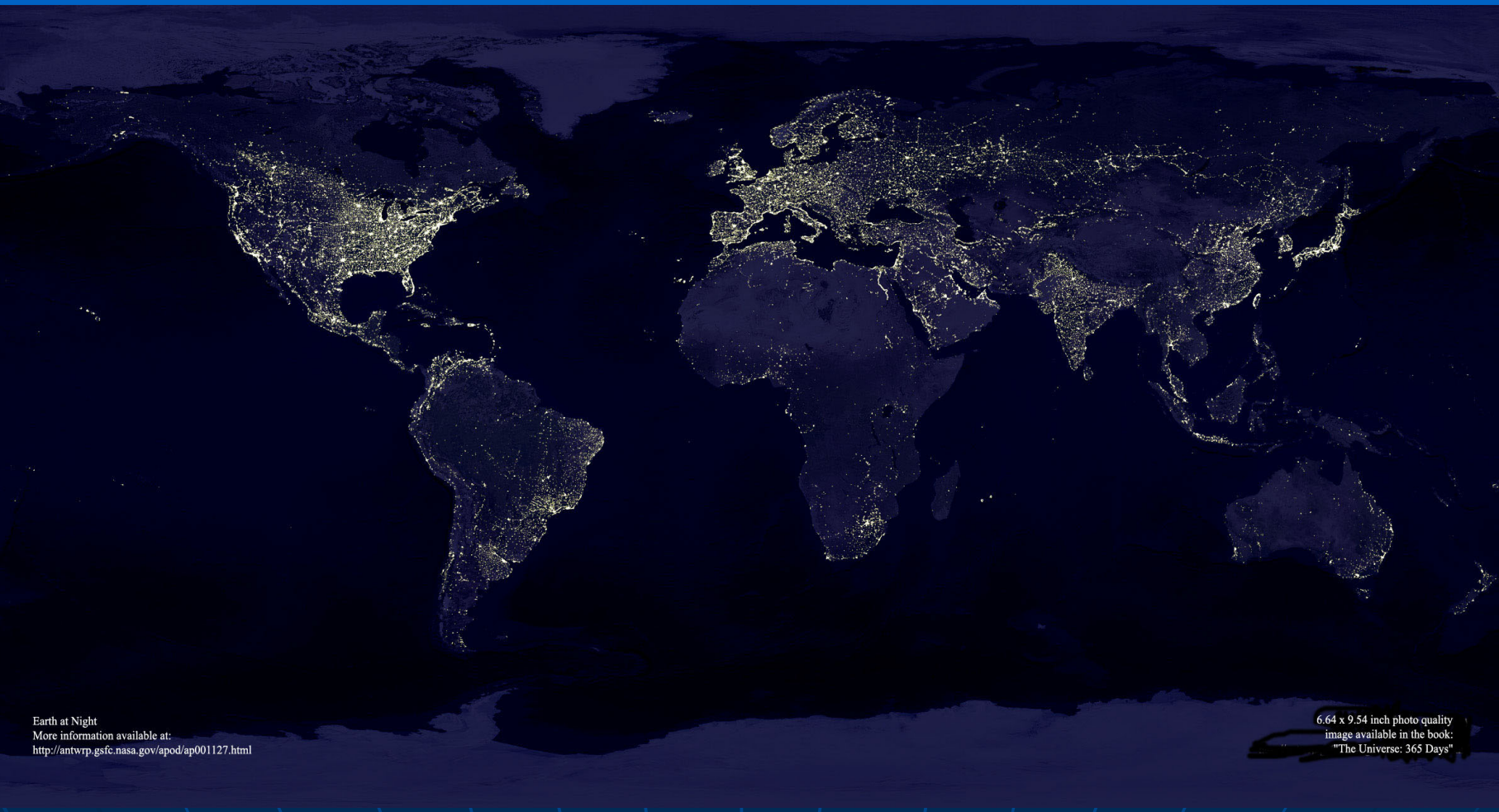
- **the integrated Europe**, a region called **"banana"**
- western Germany, the Benelux, north-eastern France and South-eastern part of the United Kingdom 7% of EU's surface area, but 1/3 of the population, 1/2 of the GDP of EU

also in the fast-developing East Asian region

Table 1-1 Degree of economic agglomeration in Japan and Japan-core vis-à-vis East Asia（2000）

	Share of Japan within East Asia (percent)	Share of Japan-core within Japan (percent)	Share of Japan-core within East Asia (percent)
Surface Area	3.5	5.2	0.18
Population	6.9 （7.9）	33 （33）	2 （2.5）
GDP	65 （72）	41 （40）	27 （29）
M-GDP	58 （68）	37 （44）	21 （29）
M-Employment	13 （32）	34 （31）	6 （10）

Satellite Photo



When economic integration is brought forward, what happens to economic activities from a geographical point of view?

- First, according to the theory of comparative advantage, countries specialize in industries where they have comparative advantage based on differences in technology and available factors of production.
- In this theory, labor mobility is not taken into consideration.

- Second, according to the new geographical economics, economic activities are expected to concentrate geographically as economic integration advances.
- At the background are such factors as economies of scale, transportation cost in the broader sense, and demand linkage.

Much evidence seems to show that industries are agglomerated more than the theory of comparative advantage would predict.

(continuing from the previous slide)

- The new geographical economics considers the dynamic process of the locational movement of firms and trade creation
- i.e. first the firms move from the center to the periphery (in most case, with fragmentation of corporate functions), and in this process trade is created.
- In contrast, according to the comparative advantage theory, the specialization of industry and trade based on comparative advantage exist as an equilibrium (without particular consideration for the process).

Many real-life phenomena cannot be explained without taking into consideration economies of scale.

1) horizontal division of labor in international economics including East Asia, and the development of intra-industry trade;
2) the rapidly growing multinational enterprises (MNEs) and intra-firm trade;
3) the formation of cities of a variety of size, from Shanghai and Tokyo on the one end, to unrecognized small cities on the other;
4) agglomeration of numerous small- and medium-sized enterprises in Silicon Valley, along the Tama River in Tokyo, and in Higashi-Osaka;
5) the formation of “castle towns” around large firms such as Toyota-city and Kitakyushu.

Contents of the paper

- § 2 Self-organization and changes in the regional economic system
- § 3 Changes in the regional economic system in Japan and the rest of East Asia
- § 4 Tendency of specialization in selected regions
- § 5 Conclusion and Implication for currency adjustment

The central notion of the "new geographical economics" is the notion of "economics of agglomeration"

- the interaction of
  economies of scale
  the cost of transport (in the broader sense)
- a lock-in effect around the location of the agglomeration
- the regional economic system, spacial structure with a strong inertia. However, in the long term, economic agglomerations continue to transform itself.
- path-dependent
- Generally speaking, a fractal structure, especially of the core-periphery-type

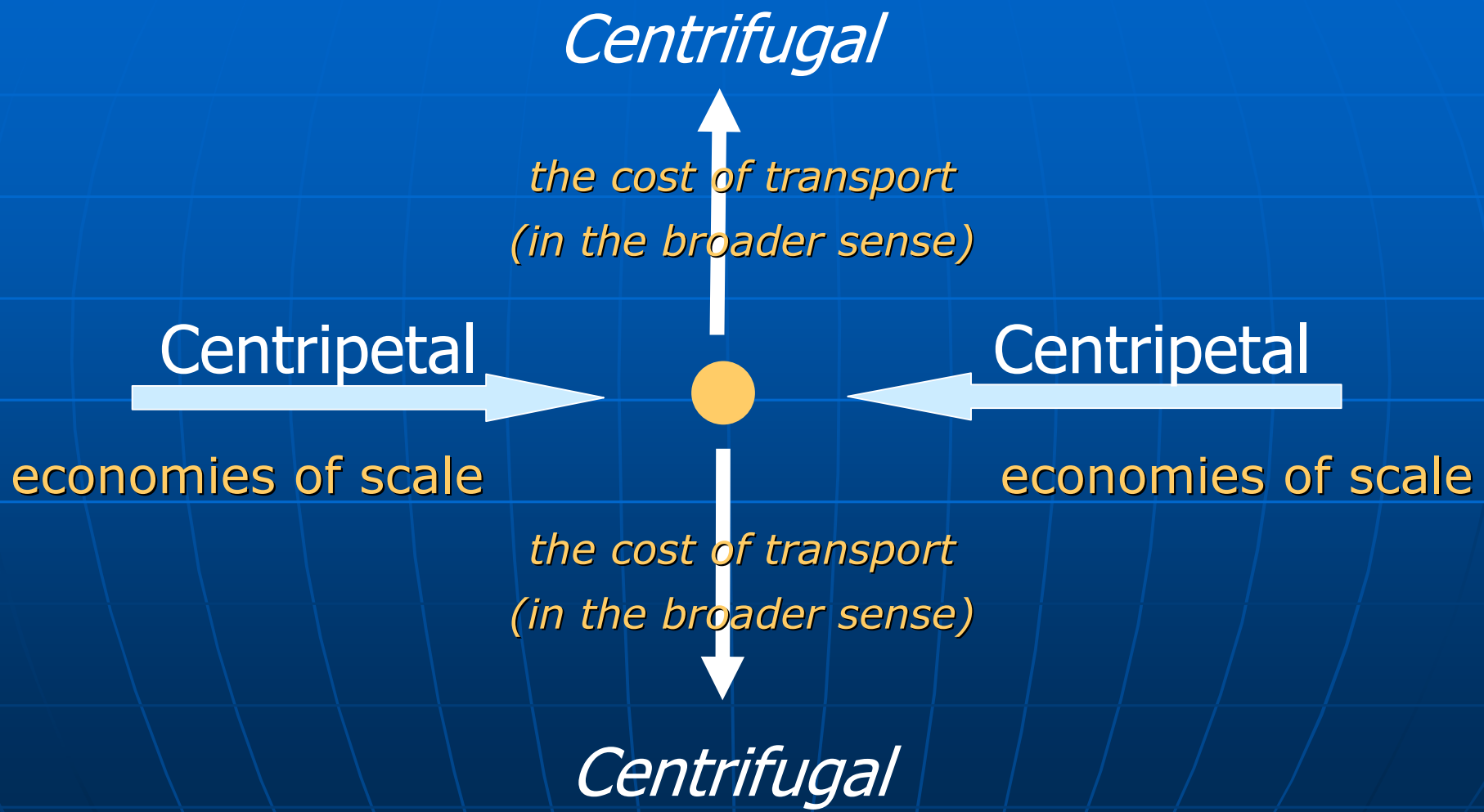
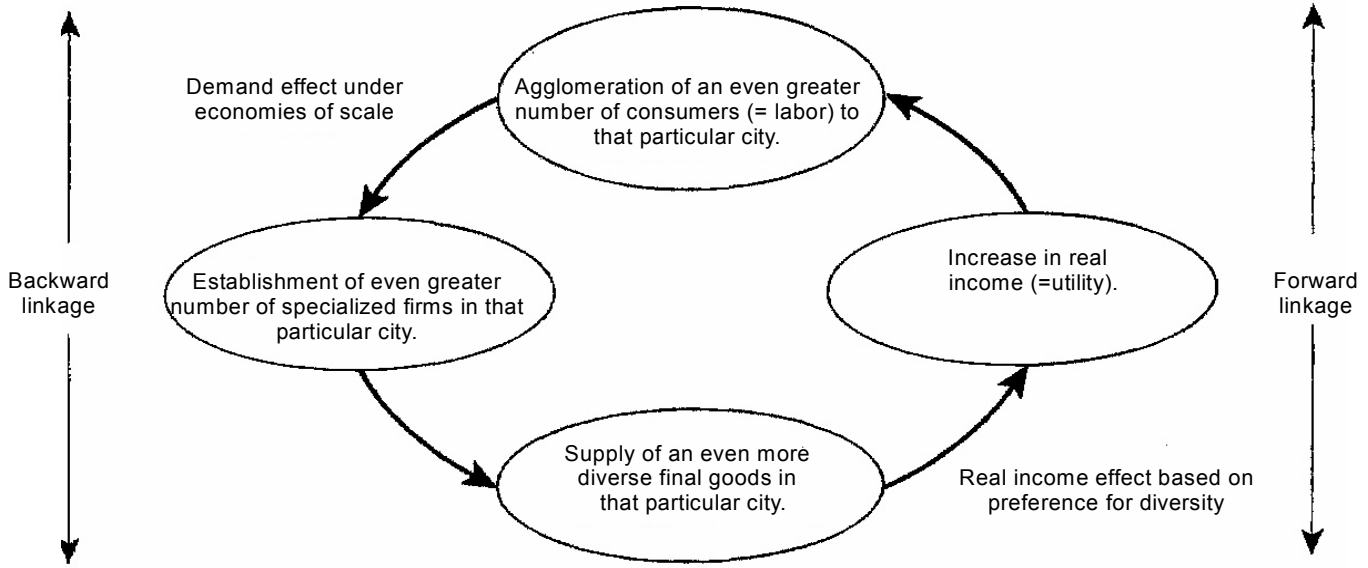
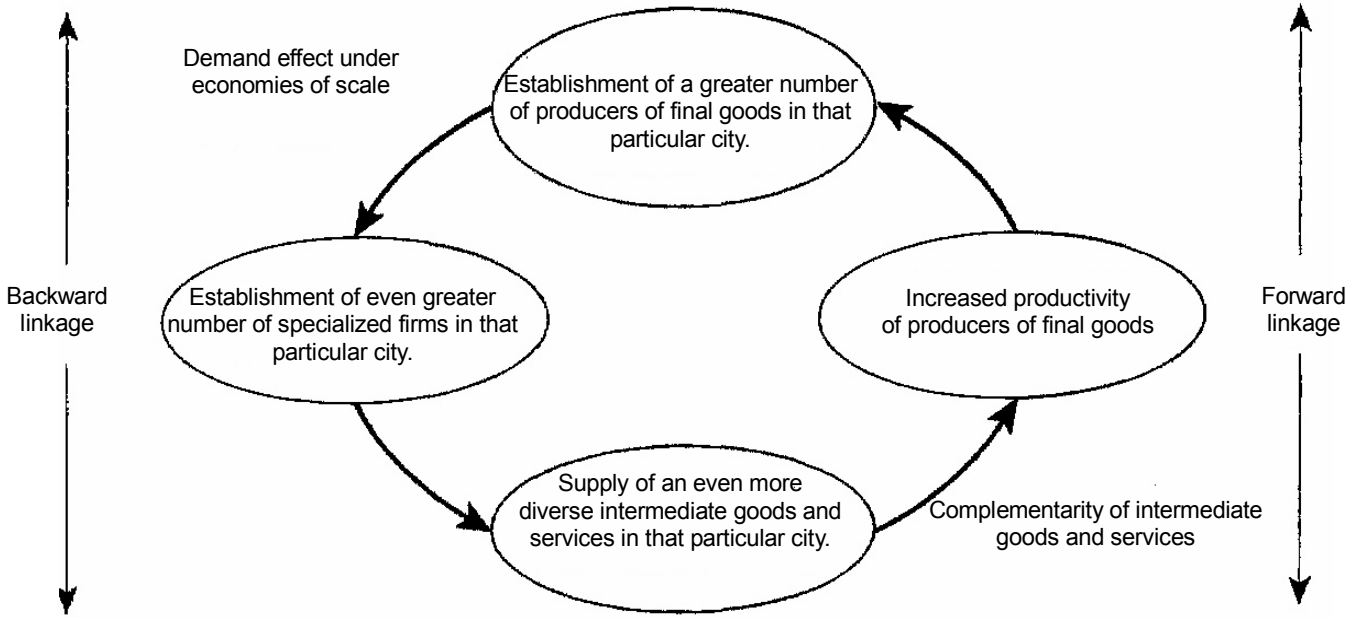

Centrifugal
the cost of transport
(in the broader sense)
Centripetal
economies of scale
Centripetal
economies of scale
the cost of transport
(in the broader sense)
Centrifugal

Figure 2-1 Agglomeration of producers of consumer goods, and consumers (=labor) based on circular causality



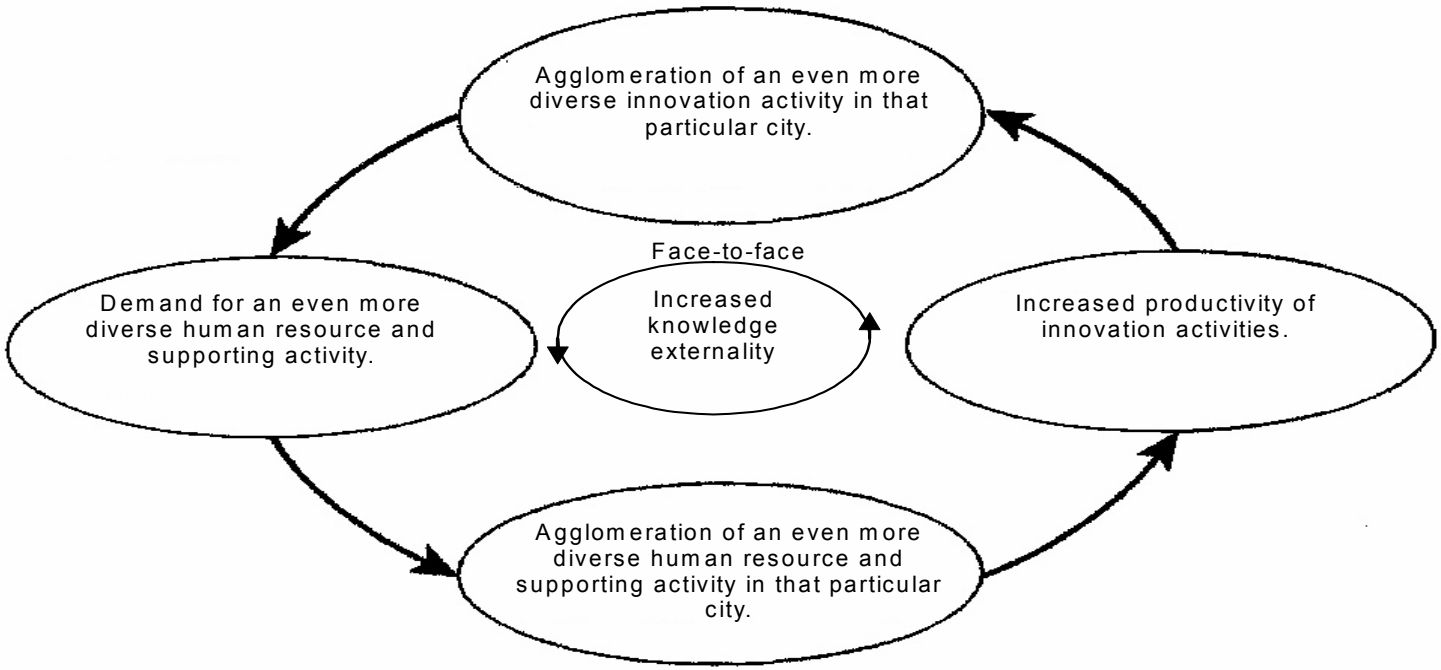
Source: Fujita (2003), figure 6-2 a

Figure 2-2 Agglomeration of producers of final goods and intermediate goods and services based on circular causality

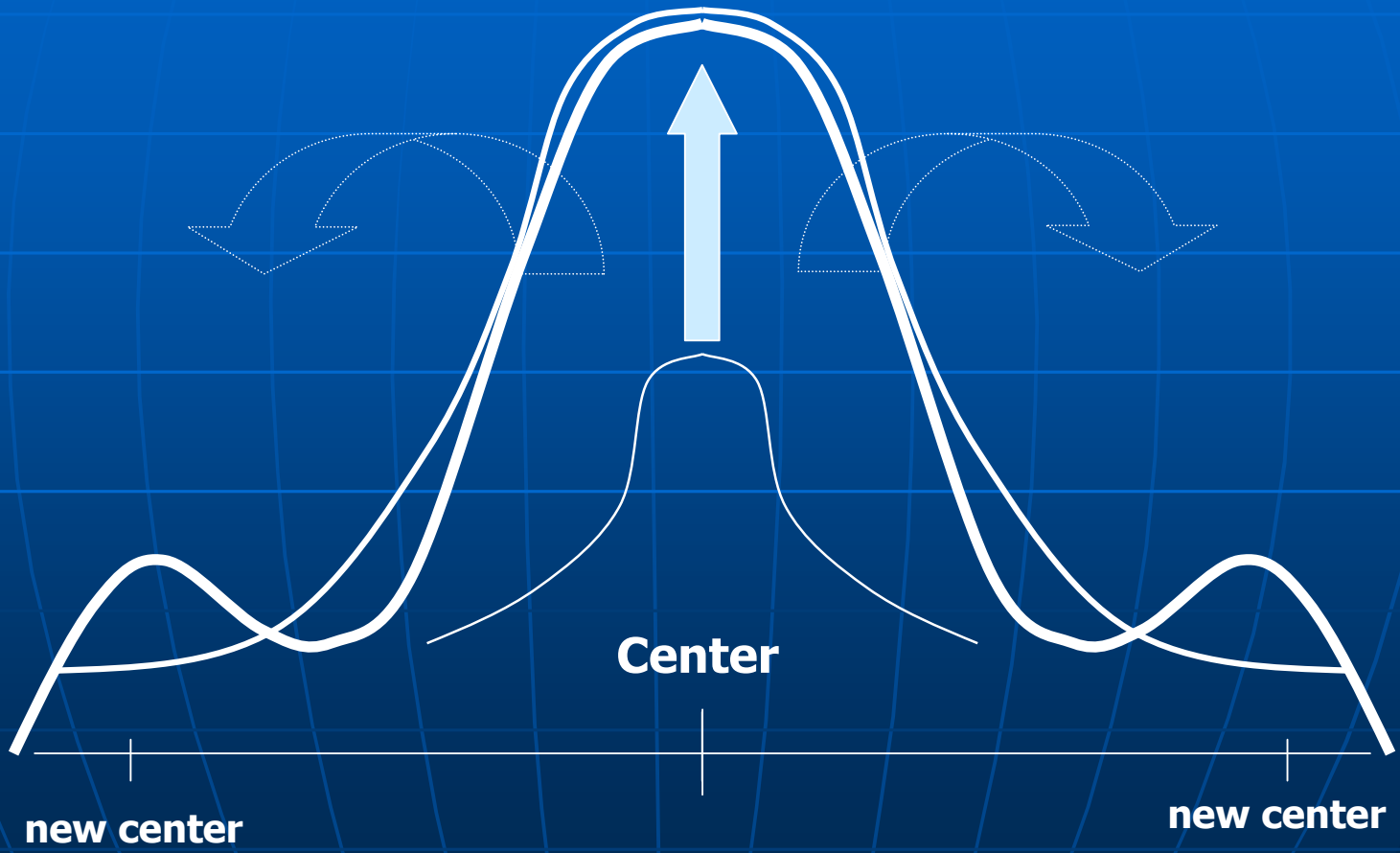


Source: Fujita (2003), figure 6-2 b

Figure 2-3 Formation of an innovation space centered on diversity of people



Source: Fujita (2003), figure 6-3


Center
new center
new center

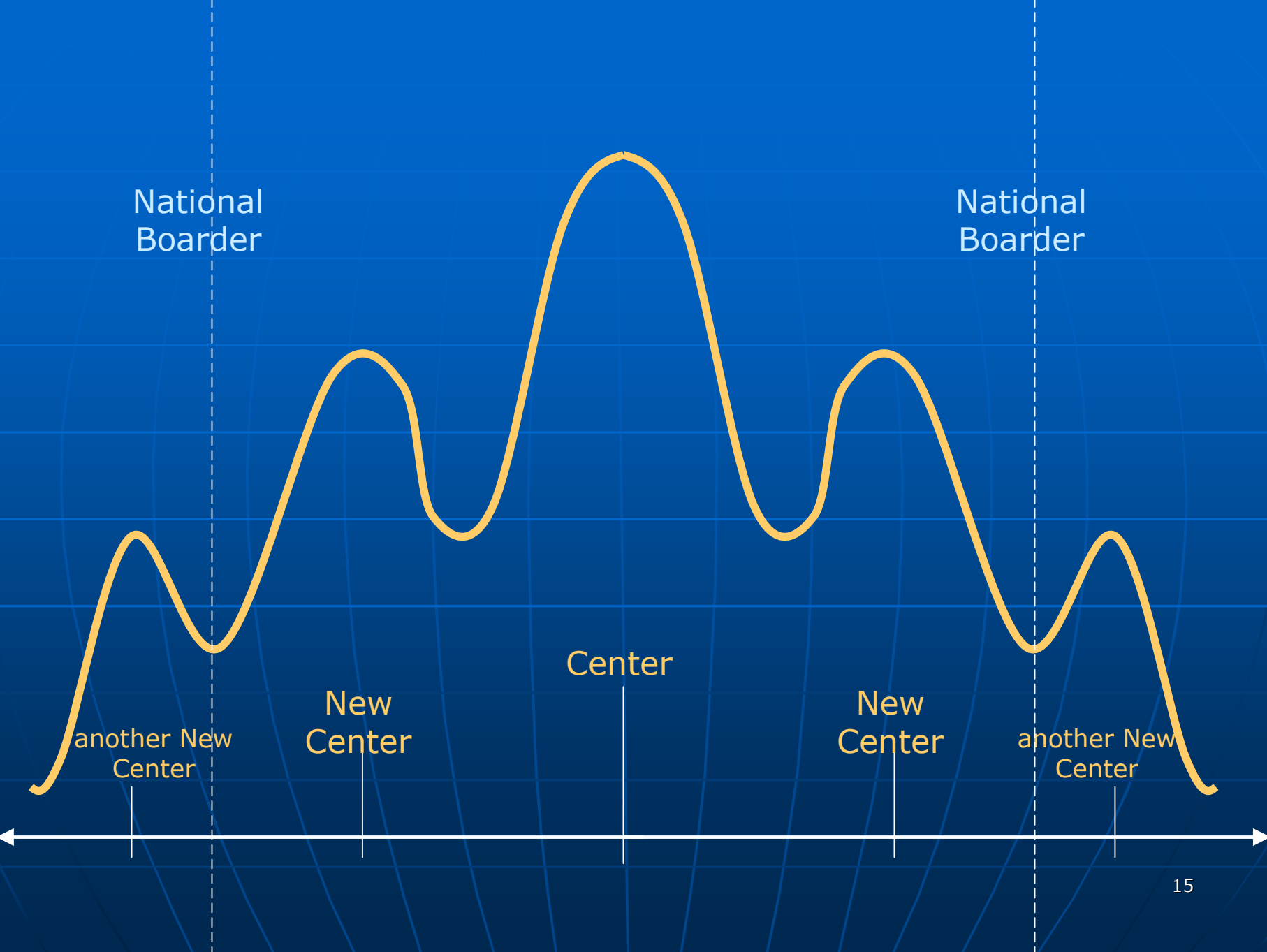
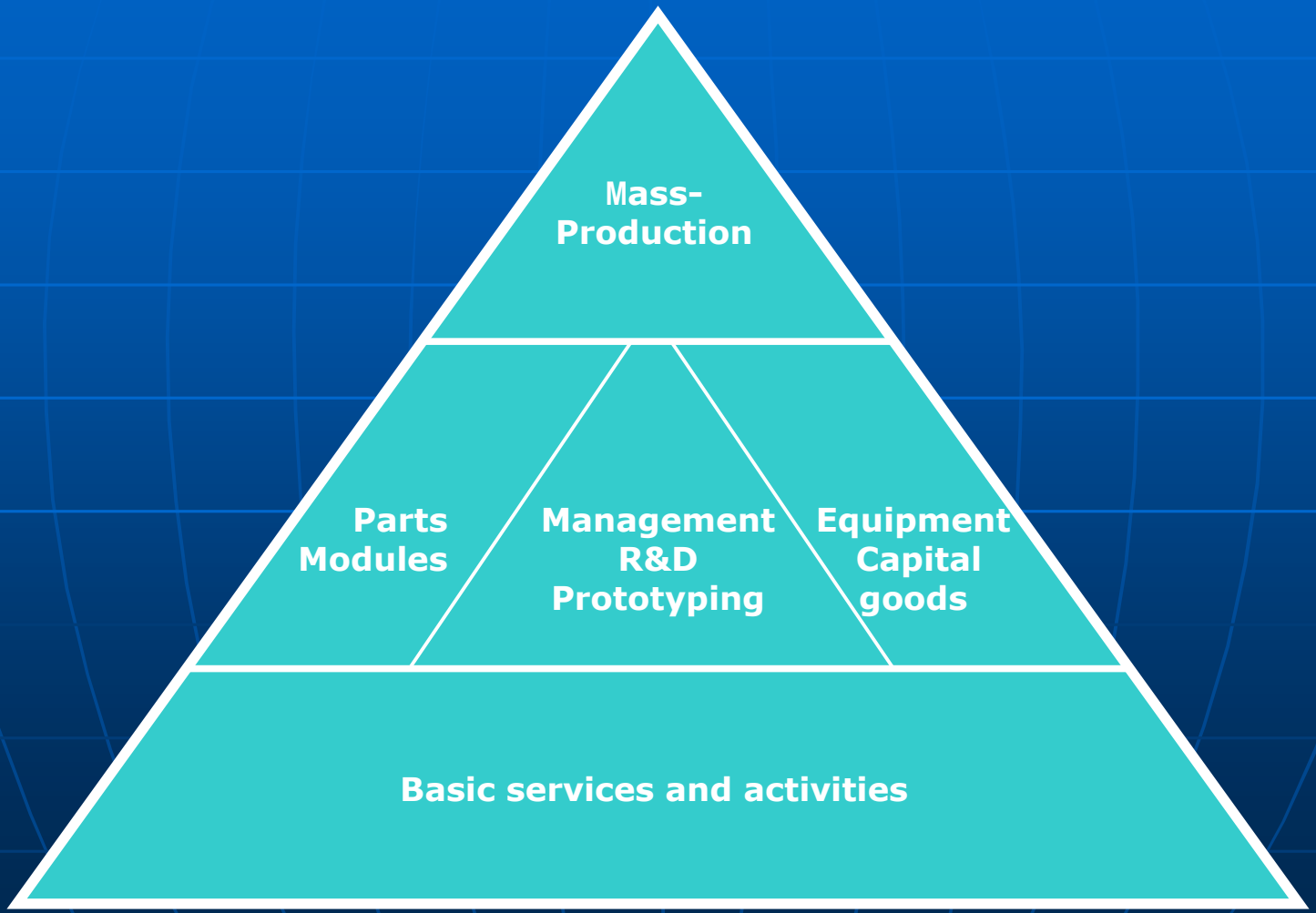

National Boarder
National Boarder
another New Center
New Center
Center
New Center
another New Center

Figure 2-4 Production activity in the manufacturing industry



- these diversified intermediate goods, and workforce,
  → a driving force of agglomeration
- Examples from machinery industries agglomerated alongside Tokyo's Tama River Higashi-Osaka, agglomeration of auto and auto-parts industries in Kanagawa and Aichi prefectures, to the agglomeration of semiconductor and IT industries in Silicon Valley.

- However, every production activity shown in figure 2-4 need not be agglomerated at a single location/region. The growth of agglomeration increases wages and land prices. Thus, if for example the transportation cost (in a larger sense of the meaning) of intermediate goods is low, it is possible for the mass-production site to be located away from the site of agglomeration of other activities, to locations with cheaper labor and land prices, or locations near large markets.

- In reality, a flexible production network is being formed in East Asia as a whole, and fragmentation of corporate activities is observed, resulting from the firms' international expansion.

Industrial Structure

Regional Economic Structure

Japan

- — 3 cycles in this half the century
  - 1st 1950 — mid 70's
  - 2nd mid 70's – mid 90's
  - 3rd mid 90's — present
- Tokyo, ended up with even more agglomerative power, and led to the present monopolar regional structure centered on Tokyo.

Industrial Structure ⟺ Regional Economic Structure

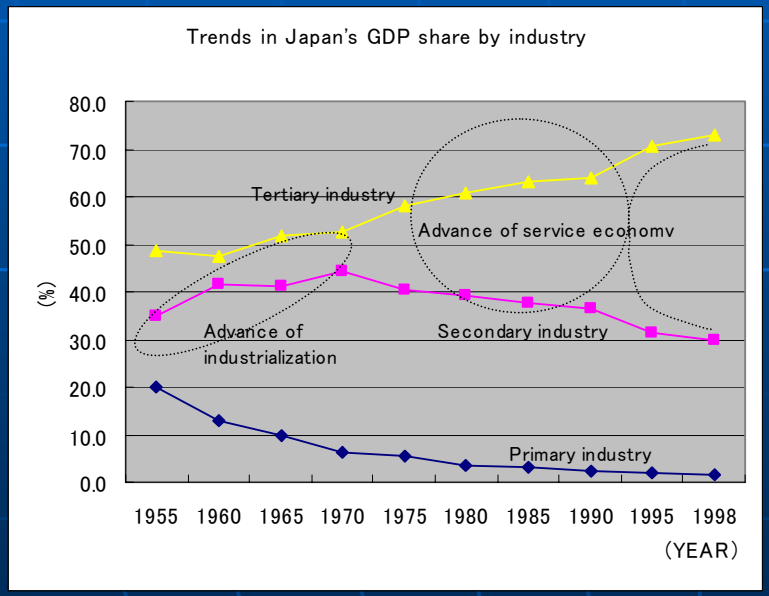
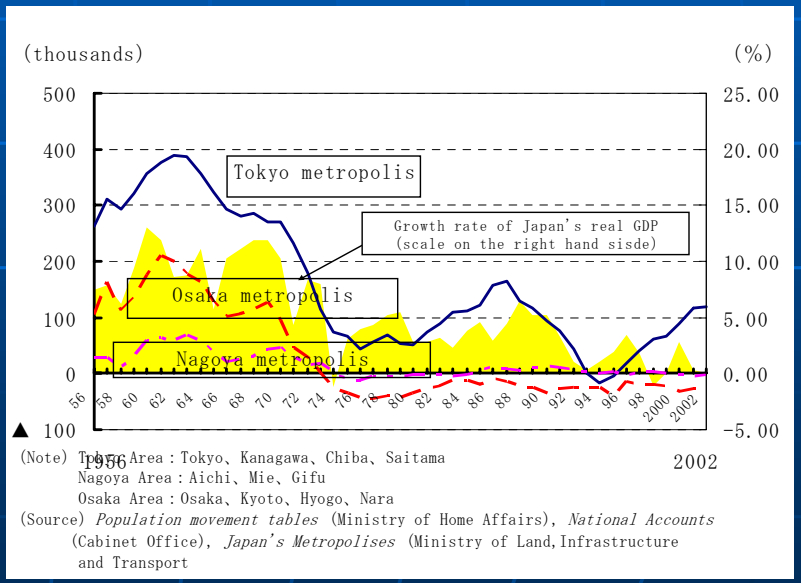


Figure 3-1 Net population inflow into Japan's three largest metropolitan areas



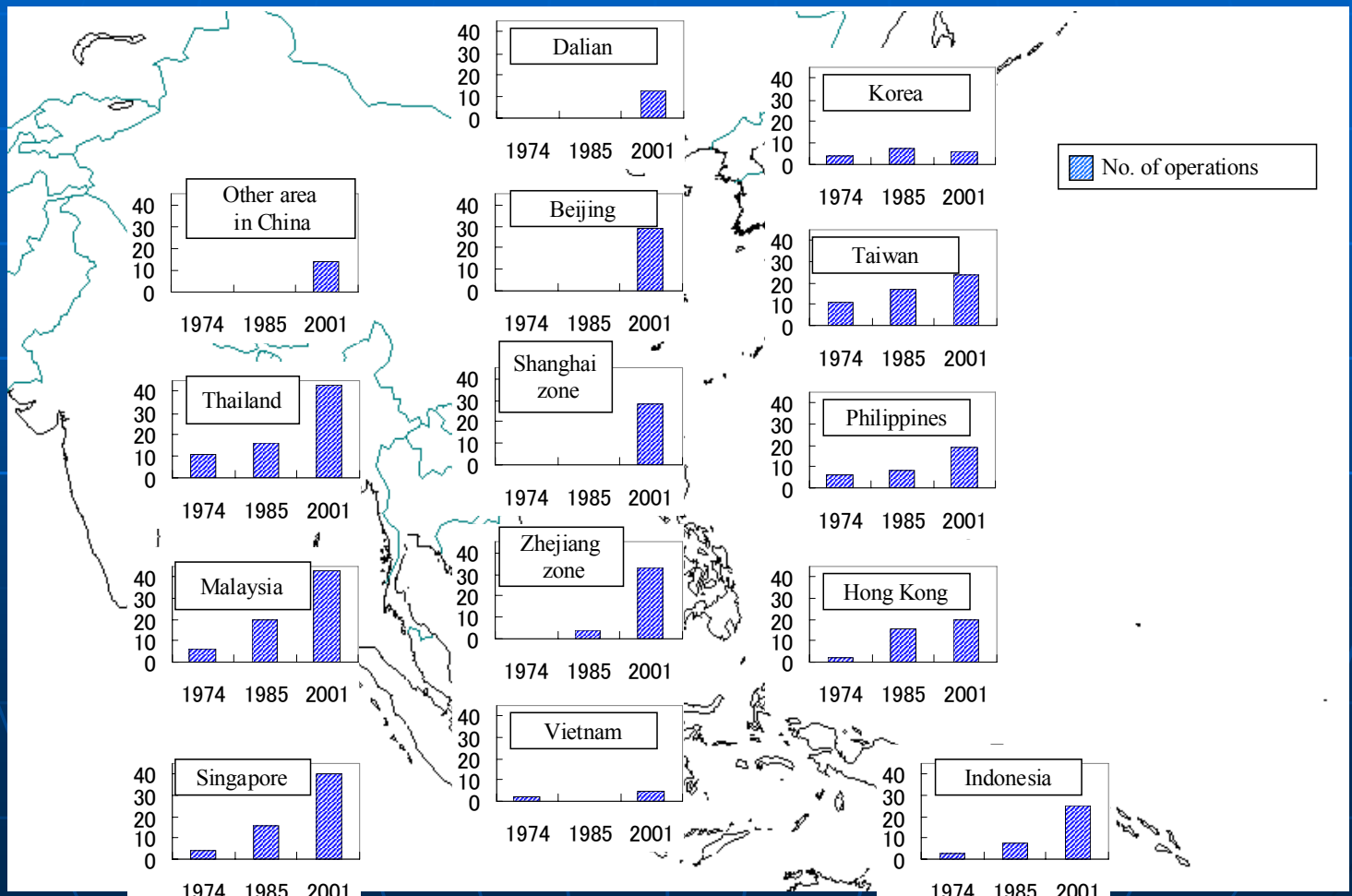
(Note) Tokyo Area : Tokyo、Kanagawa、Chiba、Saitama
Nagoya Area : Aichi、Mie、Gifu
Osaka Area : Osaka、Kyoto、Hyogo、Nara
(Source) *Population movement tables* (Ministry of Home Affairs), *National Accounts* (Cabinet Office), *Japan's Metropolises* (Ministry of Land, Infrastructure and Transport

Table 3-1: Characteristics of the three cycles in the transformation of Japan's regional economic structure

	Status of population inflow into the three metropolis	Shift in industrial structure	Change in productivity	Growth of the manufacturing sector and structural change
First period	Tokyo ++ Osaka + Nagoya +	Primary -- Secondary ++ Tertiary +	**Converging** Tokyo - Osaka -	**Growth period** manufacturing (except textile)
Second period	Tokyo + Osaka - Nagoya 0	Primary - Secondary - Tertiary ++	**Diverging** Tokyo ++ Osaka -	**Growth period** centered on electric machinery
Third period	Tokyo + Osaka - Nagoya 0	Primary - Secondary - Tertiary ++	**Low** Tokyo --	**Low growth** Centered on electric machinery

It is important to point out that these changes taking place in Japan, as the only advanced economy is the East Asian region then, has influenced the East Asian region as a whole, through for example, the overseas expansion of Japanese firms.

Figure 3-2 Status of offshore operations of five electrical and electronic machinery manufacturers and three automobile manufacturers



East Asia's inter regional (agglomeration) linkages are also deepening.

Figure 3-3 Expansion of flight routes
between major airports in Japan and East Asia

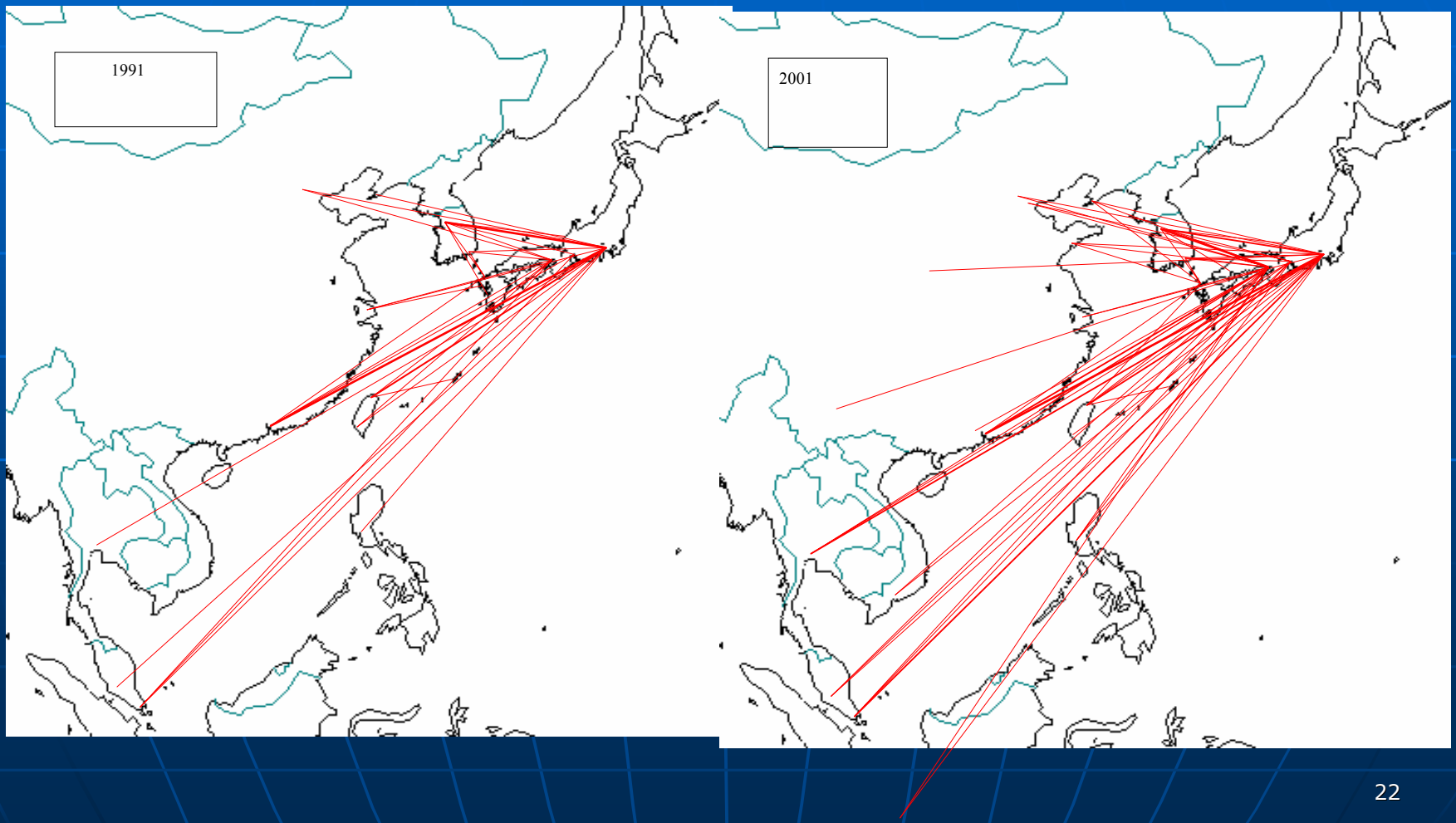
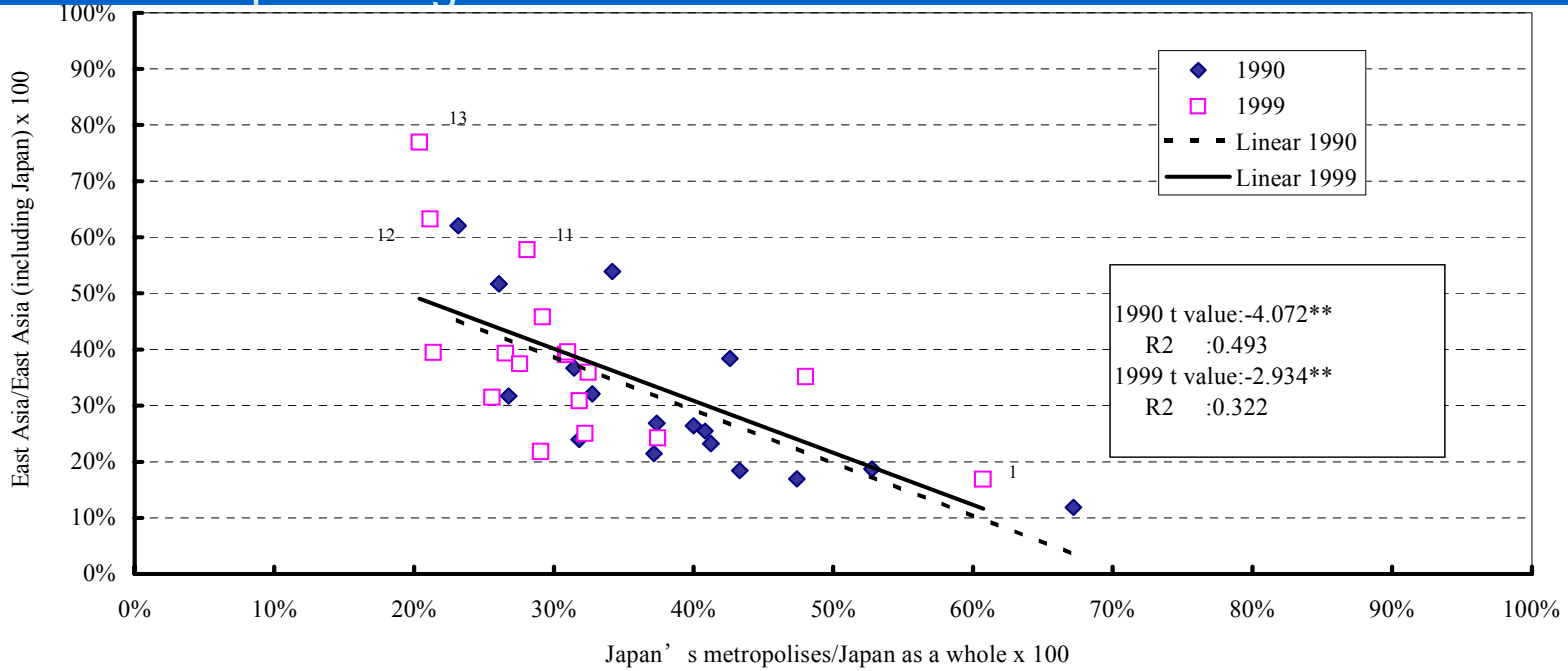


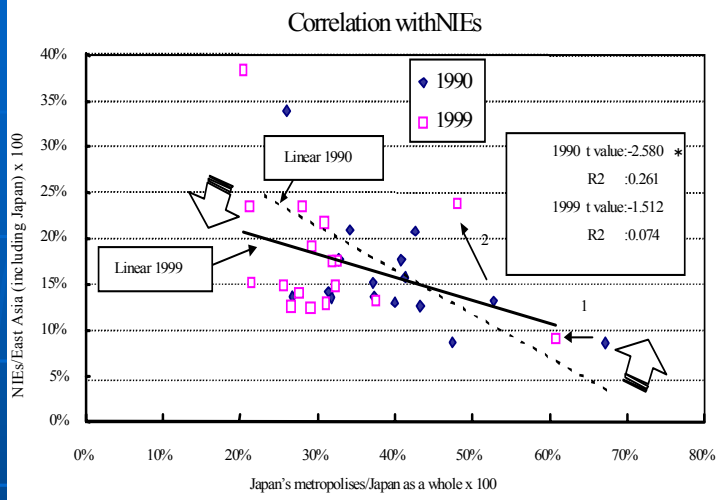
Figure 3-6 Changes in correlation between Japan's regional economic structure and East Asia

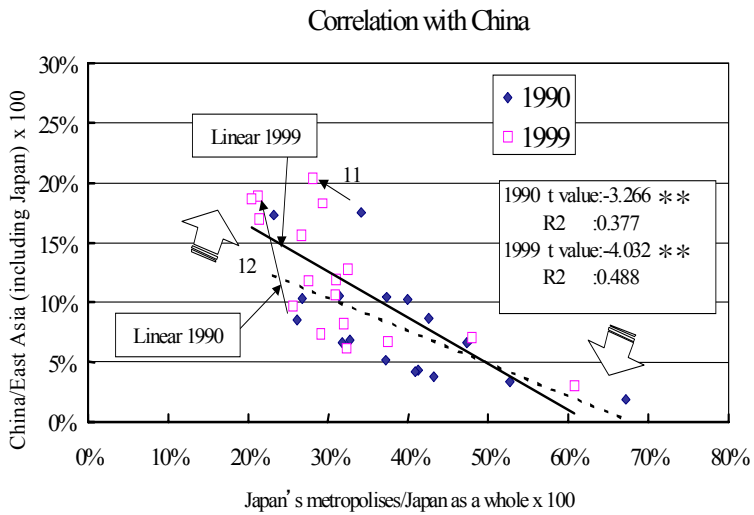


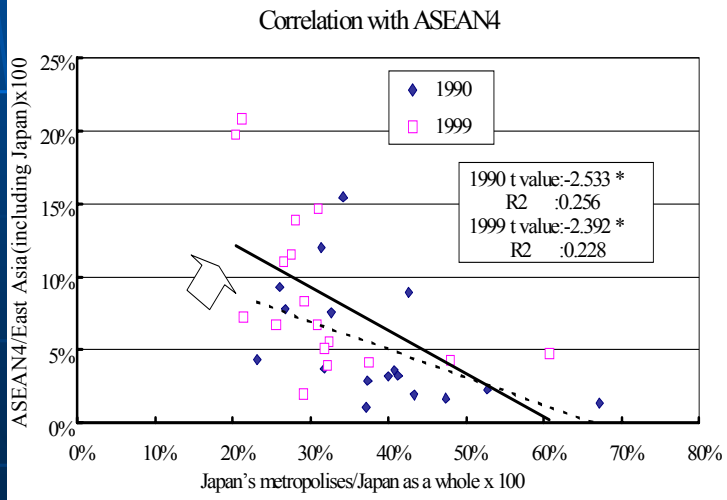
Note:
(1) Industries represented: 1. Publishing and printing; 2. Transport machinery; 3. General machinery; 4. Electrical machinery; 5. Precision machinery; 6. Metal products; 7. Metals; 8. Chemicals; 9. Plastics; 10. Rubber products; 11. Textiles; 12. Apparel; 13. Petroleum and petroleum products; 14. Paper and paper products; 15. Foods, beverages, cigarettes; 16. Ceramics and cement products; 17: Other.
(2)A single asterisk on the t-value indicates a 5% level of significance, a double asterisk a 1% level of significance.

•The negative correlation indicates that East Asia has limited competitiveness compared to Japan in those industries agglomerating in Japan's metropolitan areas; while conversely, East Asia's competitiveness is comparatively high in those industries not agglomerating in said major cities (that is, industries located in local Japanese cities).

Figure 3-7　Regional economic structure in Japan and changes in correlation with East Asian countries and regions







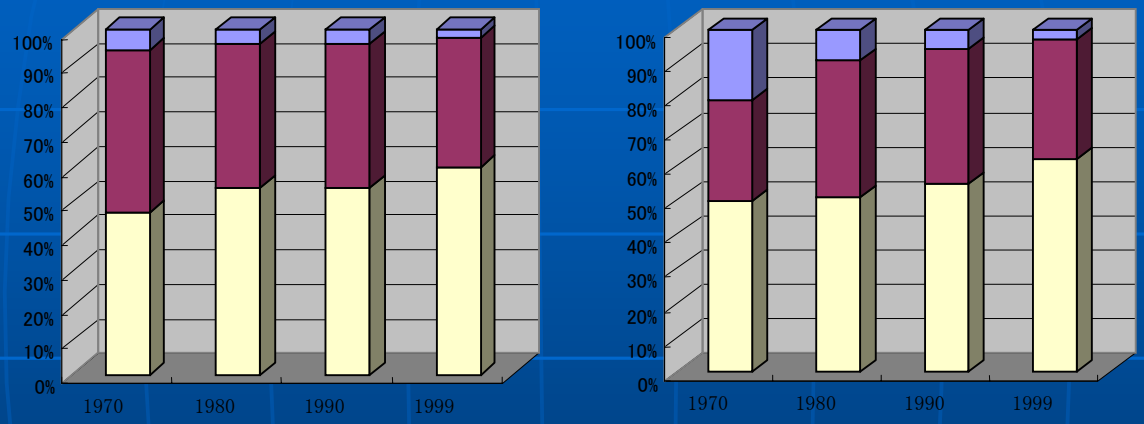
Note:Same as Fig.1.2.23
Source:Same as Fig.1.2.23

- The improved competitiveness of East Asia in those industries seems to have been marked in the NIEs. Particularly in 1999, the explanation toward a correlation had become extremely difficult.
- In other words, the strong competitiveness of Japan compared to the NIEs in those industries agglomerating in major Japanese cities is beginning to erode.

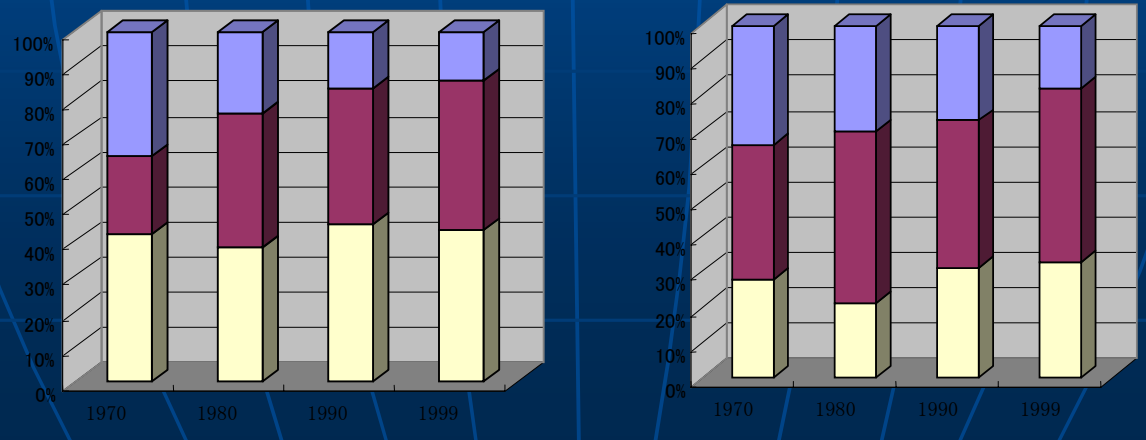
- In terms of the relation between ASEAN 4, China and Japan, the downward trend line of 1990 had become even steeper in 1999.
- This would suggest that the economic development of ASEAN 4 and China has been focused in the industries located in local Japanese cities rather than those agglomerating in metropolitan areas. In China, this correlation is considerably more marked in 1999 than in 1990.

Figure 3-8 Shift in industrial structure of Japan, NIES, ASEAN and China

Japan and NIES



ASEAN and China



Specialization and diversity

- In Japanese economic agglomerations, the larger is the city, the higher is the level of diversity, and this characteristic has an upward trend. In particular, the Tokyo-area has a high degree of diversity, while its level of specialization is lowest.

- For South Korea, one can observe that for Seoul, the capital, and the second largest and port city of Pusan, the level of specialization increased during the decade of the 1990's, while the level of diversification is decreasing.
- Malaysia is achieving economic growth through specialization in its industry.

- The overall trend in China is similar to those of South Korea and Malaysia (table 4-5). However when looking at the Shanghai economic zone, there isn't any dramatic change as the degree of specialization increased from 1.91 in 1993 to 2.09 in 1999, while the level of diversity decreased from 3.29 in 1993 to 3.10 in 1999. It can be thought that the Shanghai economic zone is maintaining economic growth while maintaining its degree of diversity to a certain extent.

3 scenarios as prototypes of the possible changes in East Asia's regional structure in a relatively long-term

- Scenario A:
  Maintenance of a monopolar structure centered on Japan

- Scenario B:
  An East Asian regional economy with multiple cores with Japan as one of the major core economies.

- Scenario C:
  Similar to Scenario B, but with Japan as a sub-core economy

- the industrial structures also show that Japan and the NIEs have entered the stage of service economy, whereas industrialization has not yet peaked out in ASEAN countries and China.
- in examining the relationship between the level of agglomeration of economic activities into large metropolises, and the pattern of international division of labor between Japan and the rest of East Asia, while the relationship between Japan and the NIEs is becoming less clear, ASEAN and China demonstrated a pattern of specialization with Japan as the core economy.
- after calculating the actual level of specialization, at the country-level, whereas the degree of specialization is decreasing in China, regions that are facing direct competition from Mainland China, i.e. Taiwan, Malaysia, Singapore and other ASEAN countries, the degree of specialization is increasing.
- at the city or regional levels, every major city and region other than Japan show a strong tendency toward specialization. This is likely to be because those regions are in the process of convergence as they catch up to developed economies, and as such, are taking advantage of the merits of agglomeration and specializing in fields where they are most competent. In the European Union, an increase in the level of specialization was observed at the regional level as the process of integration advanced, but this phenomenon in East Asia is probably of a different nature as the element of horizontal trade is small in East Asia.

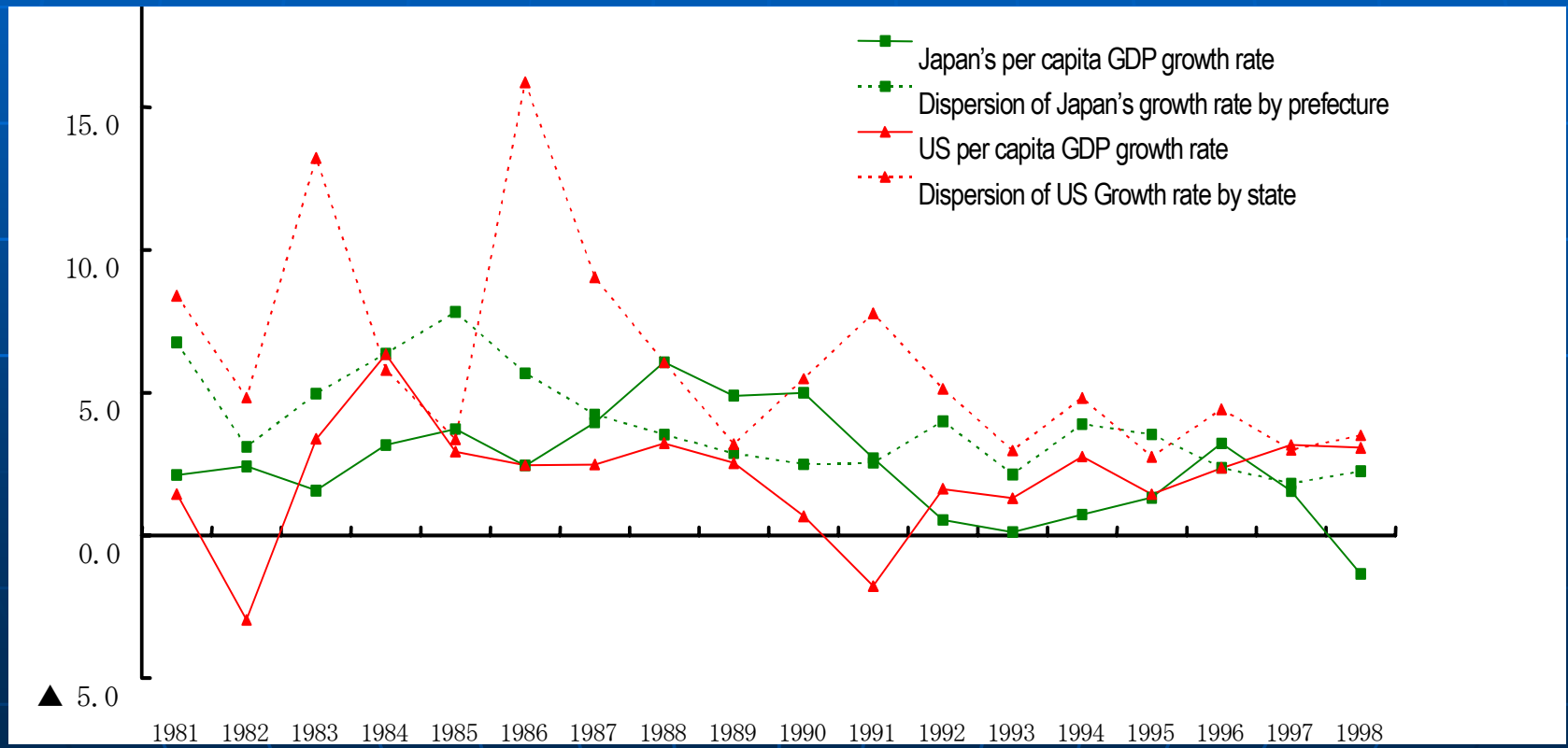
Observations emanating from the paper

- six criteria are raised for an optimal currency area

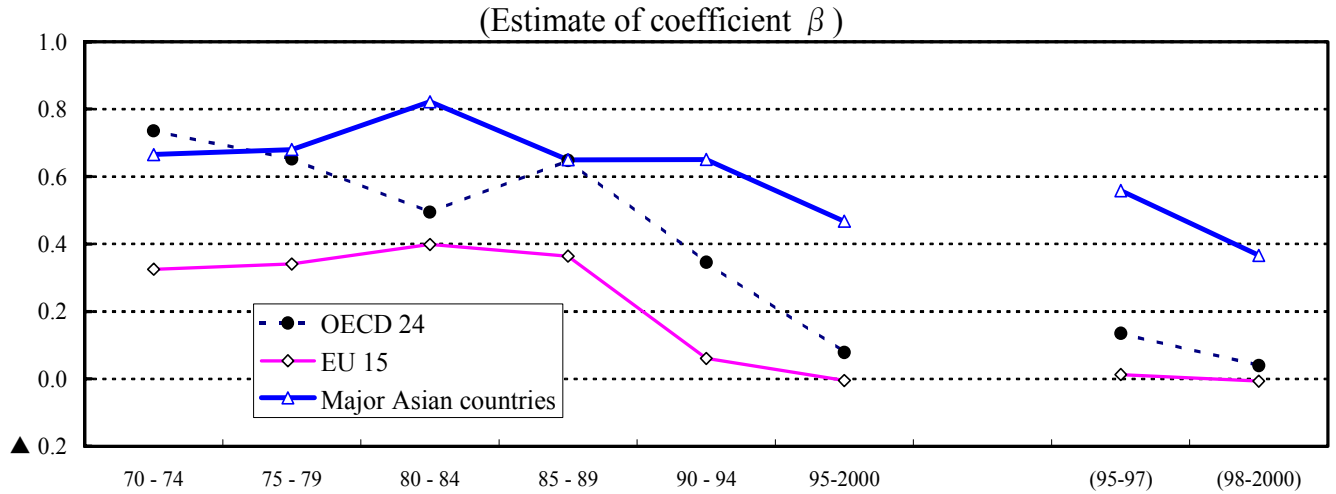
  a) integration of the goods market; b) integration of the market for factors of production; c) symmetry of economic structure and real economy shock; d) integration of the financial market; e) similarity in the selection in the trade-off between inflation and growth-rate; f) macroeconomic policy coordination.
- in either case, the comments are not based on concrete quantitative analysis to evaluate the prospect of an optimal currency area, and more of an impression.
- First, with respect to a) integration of goods market, the deepening of the division of labor seems to indicate that integration has progressed substantially.
- Second, with respect to c) symmetry of economic structure and real economic shock, it is possible to give an affirmative nod in consideration of the fact that the countries commonly show a tendency of specialization, when looking at particular cities and regions' tendency for specialization, the situation might be more complicated. For example, there are flexible collaborative relationships between regions that specialize in specific areas be they the automobile industry or the electronics industry. These regional economic activities will hold important positions within the respective countries, and at the same time, the final destination of the product is more than often the United States.

- The two countries naturally use a single currency within their own domestic market, it can be seen that even in the case of developed countries like the U.S. or Japan, the level of similarity to shock is quite different from one region to another.

Trend in Economic Growth Rate and its Dispersion in the US and Japan



Whether market (financial and product) integration processes will increase the necessity of foreign exchange stability within the East Asian region would depend heavily on the changes in the level of specialization and diversity of the regions, and whether the demand for the outputs be generated from within the region.



Notes: 1. A regression equation was estimated for the EU, OECD and major countries and regions of Asia to explain the proportion of investment to GDP (I/Y) by the proportion of savings (S/Y).

$(I/Y) = \alpha + \beta * (S/Y)$

2. Figures for the OECD focus on 24 countries that joined the OECD up till the 1970s, and members joining in the 1990s - Czech Republic, Hungary, Republic of Korea, Mexico, Romania, Poland and Slovakia - are excluded.
3. Major countries and regions of Asia are: Japan, Republic of Korea, Singapore, Hong Kong, Taiwan, Malaysia, Thailand, Indonesia, Philippines, China and India.
4. Data used was solely that from the CD-ROM of the WDI 2002 edition. However, for some countries and regions data is not available for some years and in such cases calculations were made on the basis of the data that was available.

Source: *World Development Indicators* (World Bank).