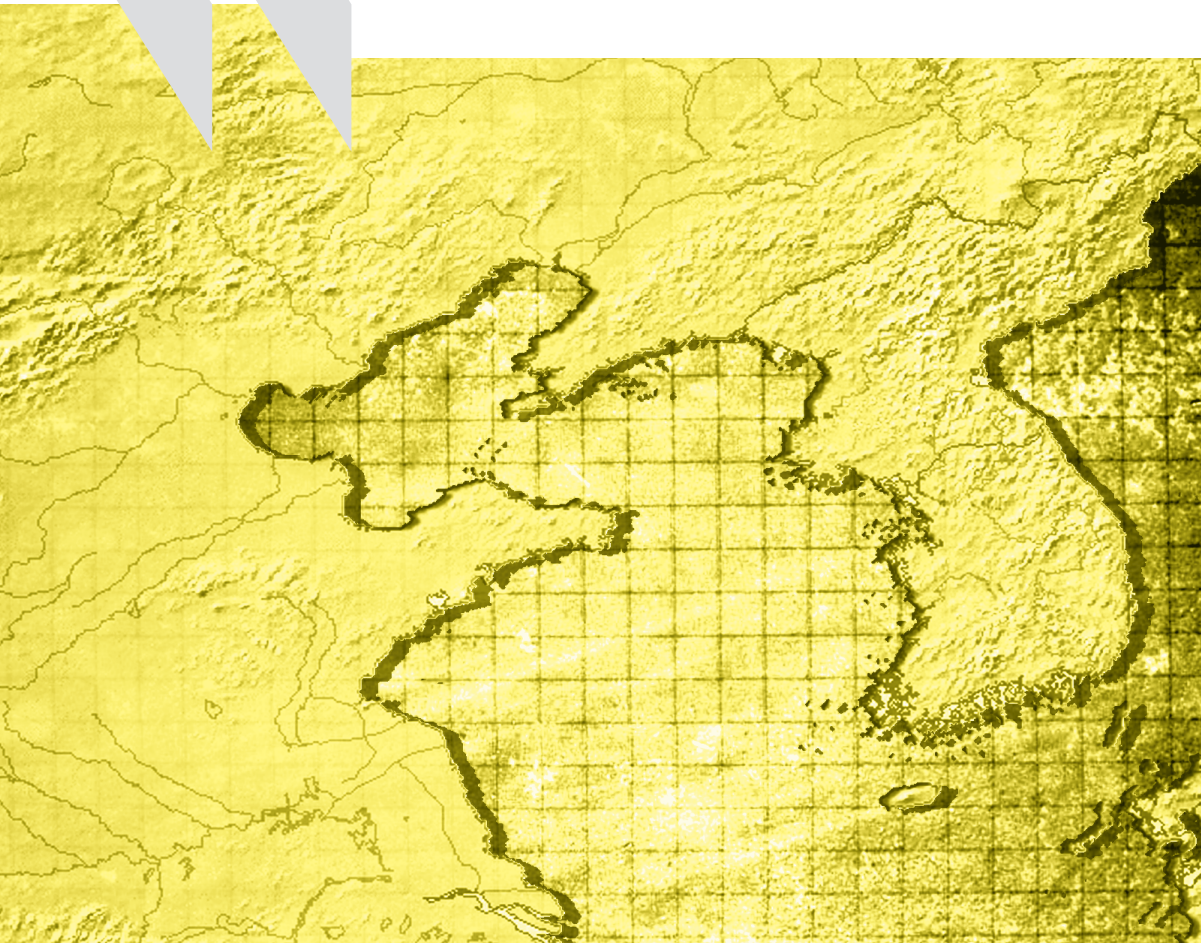
OECD Territorial Reviews

Trans-border Urban Co-operation in the Pan Yellow Sea Region



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OECD Territorial Reviews: Trans-border Urban Co-operation in the Pan Yellow Sea Region

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Foreword

At the beginning of this new millennium, regional economies are confronting momentous changes. The globalisation of trade and economic activity is increasingly testing their ability to adapt and maintain their competitive edge. There is a tendency for income and performance gaps to widen between and within regions, and the cost of maintaining social cohesion is increasing. On the other hand rapid technological change and greater use of knowledge are offering new opportunities for local and regional development but demand further investment from enterprises, reorganisation of labour and production, more advanced skills and environmental improvements.

Amid this change and turbulence, regions continue to follow very different paths. Some regions are doing well and are driving growth. Others are less successful at capturing trade and additional economic activities. Many territories with poor links to the sources of growth and prosperity, are finding it difficult to keep up with the general trend.

At the same time central governments are no longer the sole provider of territorial policy. The vertical distribution of power between the different tiers of government needs to be reassessed as well as the decentralisation of resources and competences in order to better respond to the different opportunities and demands of the different regions and improve policy efficiency. In that context public authorities need to weigh up current challenges, evaluate the strategies pursued in recent years and define new options.

Responding to a need to study and spread innovative territorial development strategies and governance in a more systematic way, in 1999 the OECD created the Territorial Development Policy Committee (TDPC) and its Working Party on Urban Areas (WPUA) as a unique forum for international exchange and debate. The TDPC has developed a number of activities, among which are a series of specific case studies on metropolitan areas across national borders on the following themes: multi-level governance, sustainable development at local levels and regional networks for competitiveness. These studies, following a standard methodology and a common conceptual framework, allow countries to share their experiences and disseminate information on good practices, and are intended to produce a synthesis that will formulate and diffuse policy recommendations.

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The OECD Territorial Review of Trans-Border Urban Co-operation in the Pan Yellow Sea Region is part of a series of OECD Territorial Reviews,

directed by Mario Pezzini, Deputy Director of the Directorate of Public Governance and Territorial Development. This Review was co-ordinated and drafted by Hyuck-Jin Kwon and Kazuko Ishigaki, under the supervision of Hiroshi Kobayashi, Head of OECD's Regional Policies for Sustainable Development Division. Valuable comments were provided by Karen Maguire and Soo-Jin Kim. Sophia Katsira prepared the Review for publication. Statistical data were produced by Brunella Boselli and Daniel Sanchez-Serra.

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Acronyms and abbreviations

BUG	Busan-Ulsan-Gyungnam area in Korea
CCP	Cities for Climate Protection
CLAIR	Council of Local Authorities for International Relations
CNDP	Comprehensive National Development Plan (Korea)
CO_2	Carbon dioxide
DSS	Dust and Sandstorms
EANET	East Asian Network on Acid Rain
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GRDP	Gross Regional Domestic Product
HIIT	Horizontal Intra-Industry Trade
ICLEI	International Council for Local Environmental Initiatives
ICSEAD	International Centre for the Study of East Asian Development
ICT	Information and Computer Technology
IIT	Intra-Industry Trade
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
JNTO	Japan National Tourism Organisation
KEI	Kyushu Economy International

KITA	Kitakyushu International Technology Cooperation Association
KOICA	Korean International Cooperation Agency
LCC	Low-Cost Carriers
LCL	Less than Container Load
MLTM	Ministry of Land, Transport and Maritime Affairs (Korea)
MNEs	Multi-National Enterprises
NAFTA	North American Free Trade Agreement
NDRC	National Development and Reform Commission (China)
NEAC	Northeast Asian Conference on Environment Cooperation
NEAR	Association of Northeast Asia Regional Governments
NEASPEC	North East Asia Sub-regional Programme for Environment Cooperation
NIE	Newly-Industrialising Economies
NOWPAP	North West Pacific Action Plan
NSP	National Spatial Plan
ODA	Official Development Assistance
OEAED	Organization for East Asian Economic Development
OWT	One-Way Trade
PCLCC	Promotion Council for Low Carbon Cities
PYSR	Pan Yellow Sea Region
R&D	Research and Development
RCA	Revealed Comparative Advantage
SEZ	Special Economic Zone
SITC	Standard International Trade Classification
SMEs	Small and Medium-sized Enterprises
SO_2	Sulphur dioxide
SSE	Shanghai Super Express
TEMM	Tripartite Environment Ministers Meeting
TEU	Twenty-foot Equivalent Unit
TPO	Tourism Promotion Organisation

UCLG	Urban Cities and Local Governments
UNEP	United Nations Environment Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention for Climate Change
VAL	Value Added Logistics
VIIT	Vertical Intra-Industry Trade
WTO	World Tourist Organization
YSRETC	Yellow Sea Rim Economic and Technology Conference

Assessment and recommendations

Rapid economic integration in the PYSR is driven by market forces …

The Pan Yellow Sea Region (PYSR) covers the coasts of northern China (Bohai Rim), south-western Japan (the Kyushu area) and western and southern Korea. It had a population of 256 million people in 2006. It is one of the fastest growing economic zones in East Asia with a regional GDP of USD 1.5 trillion in 2006. Rapid economic integration began in the early 1990s when the Chinese economy opened its markets to the world. Since then, the PYSR has made significant progress in economic exchange across its borders. This achievement has principally been driven by the private sector, which has taken advantage of the variations in factor prices within the region. In particular, Japan and Korea's multi-national enterprises (MNEs) have played a key role in turning the region into an integrated economic zone. China has an abundant labour force, vast natural resources and huge markets, while Japan and Korea have ample capital and advanced technologies. This process has been further driven by the industrial restructuring of Japan and Korea. Japanese firms relocated production sites overseas following sharp rises in the yen, land prices and unit labour costs. A similar approach was taken by Korean companies. At the same time, the Chinese government has provided a wide array of incentives to promote investment by foreign companies, such as creating special development zones in coastal areas, providing infrastructure and tax incentives. Matching interests among business sectors in the three countries has resulted in rapid economic integration in the region.

… and the PYSR continues to pursue economic integration

In the last 10 years, the PYSR has undergone another dynamic change. China is pursuing the value-adding market, and is exporting more middle-tech and high-tech products to Japan and Korea. Intra-industry trade is expanding as part of a trans-border supply chain. The export structure of the three countries is converging, contributing to a structural change in the regional relationship. At the same time, the market in the Chinese coastal

cities has expanded dramatically, and Japanese and Korean manufacturers are trying to tap the huge potential this offers. This has accelerated investment by Japan and Korea, and their MNEs are seeking more market opportunities in China.

… which generates fierce competition among the three countries.

This dramatic change has introduced economic competition into the PYSR. Japan and Korea have faced intensified export competition from China in their global markets since the early 2000s. In the 1990s China had already overtaken Japan and Korea in the production of labour-intensive items such as clothing and textiles. These two countries are now facing Chinese competition with their advantage in the high and medium-tech sectors, such as information and computer technology (ICT) and machinery. The relationship between Japan and Korea is changing too. In some industrial sectors, such as shipbuilding, automobiles and ICT, the technology level of Korean manufactures has almost reached parity with their Japanese counterparts. Korean industries drastically improved their technological levels when they were restructured during the economic crisis of the late 1990s. They are now competing fiercely with Japanese counterparts at the global level, including in the Chinese market.

Efficient logistics and transportation are supporting robust growth in the PYSR …

Robust economic growth in the PYSR is supported by an efficient logistics and transportation infrastructure, which is facilitating the flow of people and goods across borders and supporting the formation of a trans-border value chain. As the region is divided by the Yellow Sea, efficient sea and air connections are especially important to ensure the smooth movement of both people and goods. Air passenger traffic is rapidly increasing in the PYSR, with Incheon International Airport functioning as the region's hub airport. Maritime passenger volume between Busan and Fukuoka has quadrupled in the past decade thanks to rapid jet-foil services. Most coastal cities in the region are equipped with modern container facilities and connected by frequent international freight networks. The region's seaport network system is centred on Busan in Korea. In 2007, Busan handled 13.3 million TEU (twenty-foot equivalent unit) of containers, 5.6 million of which were transhipped, making Busan the PYSR's hub port.

… but further efforts are required.

As China is expanding its economic activities and becoming the PYSR's growth engine, Busan's key role is under challenge from Chinese ports, especially Shanghai, Qingdao, Dalian and Tianjin. These ports have rapidly expanded their facilities, and their cargo handling volume is reaching or overtaking Busan's. The increase in direct freight shipments between Chinese ports and North America and Europe has the potential to change the overall structure of the PYSR port set up. Several policy initiatives are required to further integrate the PYSR's transportation network:

- Expand the one-day business zone. The efficient use of existing airport and port facilities could create an effective business environment for the PYSR. Promoting an open-sky policy and integrated traffic strategy between gateway cities and the hinterland will also help boost the region's attractiveness.
- Develop the region's ports into a multi-hub structure. Differentiation strategies would help each port to adjust to this structural change. In particular, value adding logistics (VAL) could be a key strategy for increasing ports' comparative advantage, allowing them to shift from simply transmitting goods to providing logistical services such as de-bundling, processing and customs clearance.
- Achieve a good balance between volumes of exports and imports. In terms of container volume, China exports more to Korea and Japan than it imports from them. To redress this imbalance, ports in Korea and Japan must expand their catchment area and new tradable goods must be found, such as recycling goods, if half-empty containers are to be filled. The effective use of smaller container ships might also help.
- Diversify the transport mode and network to provide more choice for businesses. For instance, train-ferries with smaller containers can ensure frequency, speed and flexibility, making them suitable for meeting the diverse needs of MNEs. Standardisation and harmonisation of each mode are essential for smooth transportation and processing. Intense and frequent dialogue among policy makers will also bring a coherent strategy to the region, and ensure complementarities and synergies across cities.

The PYSR needs to strengthen human and cultural networking …

Sustainable trans-border linkages do not only require hard infrastructure. "Soft infrastructure", such as human resources, culture, and academic linkages, is also important. Coastal cities in the PYSR have a long tradition

of cultural exchange across borders, and cities are actively using this asset to pursue urban development projects and cultural events. Young people are increasingly learning the languages of neighbouring countries. Academic institutions are also deepening their collaboration across borders, such as the trans-border university consortium between Busan and Fukuoka cities. However, human and academic networking in the PYSR could be developed further. Our recommendations for strengthening socio-cultural networking include:

- Overcome language barriers. Smooth communication is the prerequisite for trans-border co-operation.
- Improve the living and visiting environment for foreigners.
- Promote tourism within the region. Fewer Chinese tourists visit the Japanese and Korean PYSR than those from Japan and Korea who visit the Chinese PYSR. Joint campaigns between Japanese and Korean cities, such as single brand tours and cruises, can be effective.
- Advance the multilateral academic network. As economic integration is intensified, the PYSR will face various issues which require a region-wide response. A multilateral academic arrangement could facilitate the flow of ideas and human networking for identifying solutions. Networking among local think tanks in the PYSR could also help with this process.

… and strengthen environmental collaboration…

The environment is another important sector around which trans-border collaboration could be strengthened in the region. Major cities in the PYSR have similar urban environmental challenges, such as traffic congestion and air pollution, water resource scarcity, surface water quality and solid waste treatment. While cities in the PYSR are at different development stages and have different environmental priorities, they can still share their experiences. Japanese and Korean cities in the PYSR have already undergone rapid industrialisation and have had time to tackle pollution and establish energy efficient industries. They are now actively engaged in sharing their green technologies with neighbouring cities. For example, Kitakyushu City in Japan is helping Qingdao and Tianjin in China to establish recycling industries. These sorts of bilateral efforts should be integrated into a multilateral framework for the PYSR.

… especially to tackle climate change.

Climate change mitigation and adaptation are urgent priorities for the PYSR, whose CO_2 emissions from the region's rapid economic growth are becoming a global concern. As urban agglomerations in the PYSR are concentrated on the coast, they will also be vulnerable to sea level rise and extreme climates. There are few trans-border city networks in the PYSR which specifically address climate change at the regional level. However, because climate change is becoming a major concern for the citizens of the PYSR, many of them are starting to engage in trans-border collaboration. If Japan and Korea can effectively transfer their energy-efficient technologies to China, China could make a quantum leap in tackling climate change. This would benefit not only the PYSR, but the whole global community. In the EU, for example, a regionally-targeted city network is actively promoting climate change action programmes. A similar platform could be established in the PYSR, in which central governments should initially take the lead. To kick-start the process, central governments should exchange views on establishing a regional network for climate change issues. They could also revitalise existing multilateral city networks, such as the Organization for East Asian Economic Development (OEAED).

Trans-border governance in the PYSR is still in the early stages.

Trans-border governance in the PYSR is not well developed and lags behind the more intense economic linkages. Recently, local governments have been seeking to build a trans-border governance framework in this region, and have had some concrete achievements. The OEAED, for example, was established in 2004 and involves the PYSR's ten major coastal cities. It holds an annual mayors' summit, and also involves working groups to discuss manufacturing, logistics, tourism and environment issues. However, these networks have yet to unite the fragmented visions of participating cities, and so far have failed to establish a coherent development strategy for the region as a whole. Trans-border city linkages in the PYSR, such as sister city programmes, are in the early stages of community building. The lack of a coherent strategy sometimes leads to rivalry rather than alliances, resulting in duplicated public investment and harmful competition among cities. Inter-city networks rely on voluntary agreements and no legally binding overarching framework exists in the PYSR.

Cities should move forward towards better trans-border governance.

Several agendas are necessary for better trans-border governance in the PYSR:

Develop a common vision

Cities in the PYSR should develop a common strategic vision. Each city has its own local economic development strategy, but it is decided in isolation from other cities' strategies. Even the concept of the Pan Yellow Sea Region itself does not seem to be shared unanimously across borders. A key issue here is how each city recognises the importance of vision sharing, and strives to establish a common development strategy as a whole region. The region's city network is fundamentally based on a give-and-take relationship, and each member will only participate as long as it perceives some benefits. Hence, deep discussion is required to identify concrete advantages accruing from the network.

Seek economic complementarities

Each city should seek its own unique niche within the region, thereby enhancing overall competitiveness. PYSR cities' public policies are sometimes dominated by competition rather than collaboration. The concern is that this might undermine the further development of the PYSR network. Frequent dialogue would eliminate excess competition among cities, and help them to achieve complementarities.

Recognise socio-economic diversity within the PYSR

Cities in the PYSR should recognise both differences and similarities inherent in the region. Although the area has a long history of human and cultural exchange, there is great socio-cultural diversity. Failing to recognise this often brings misunderstanding and friction. Another difference is the degree of interest; all the players in the PYSR see the benefits of co-operation, but their degrees of interest are different. Integration within the PYSR has been mainly driven by the business sector, while local governments have not incorporated this aspect fully into their development strategies. Identifying each city's position within the PYSR will be essential for reaching a coherent strategy.

Use a joint project as a starting point for better governance

Working together on a joint project would be a good starting point for building a common vision and seeking complementarities. Practical projects such as the operation of maritime information system and the region-wide tourism website could be catalysts for creating mutual benefits. The

participation of the business sector will be essential. If city networks can develop private-public dialogue around specific issues such as an efficient regulatory framework, then private sectors will recognise the value of such networks. Bilateral collaboration between key coastal cities could also play a leading role. Recent dialogue between Busan and Fukuoka has delivered a set of practical joint projects. These include tourism promotion, academic exchange among universities, and a joint council for economic co-operation which includes the private sector.

Increase compatibility in legal framework and enhance institutionalisation

Cities in the PYSR should harmonise their legal and institutional systems. There are many discrepancies among the three countries, and this could hamper the growth of mutual trust. Community building would be easier if this harmonisation could occur.

Strengthen financial resources

A lack of sufficient funding could damage the sustainability of trans-border collaboration among cities. Cities should increase their financial resources and seek more active participation from stakeholders in building a trans-border community.

Central governments should promote collaboration among local players.

Finally, central governments should promote the importance of the PYSR as a unique unit which can bring regional competitiveness and economic growth. Recently, the Japanese and Korean governments released new national spatial plans which highlighted trans-border regional collaboration. In these plans, central governments have committed to ensure more efficient networking and the seamless flow of goods and people. They should help cities to identify a coherent and holistic competitiveness strategy for the region.

Central governments can also play an important role as mediators. Local governments can often find themselves competing, rather than co-operating, with each other. Through the process of developing a regional spatial plan, central governments can help local governments to avoid this trap and instead enhance complementarities. This mediator function will become increasingly important given the rapid decentralisation occurring in Japan and Korea. Central governments should ease bottlenecks by aligning standards and harmonising regulations to help local businesses and people.There are several frameworks in which central governments could promote strategic dialogue among themselves and with cities in the PYSR:

- Establish trilateral dialogue on urban issues, such as a trans-border regional development strategy. There are existing bilateral dialogue mechanisms among the three countries on urban issues which could be enlarged to become trilateral.
- Increase the use of the OECD as a platform. The OECD has several multilateral policy dialogue platforms involving both member and non-member countries. These will enable a wider exchange of views with other member countries.
- Participate actively in local level dialogue channels. For example, the central governments of the PYSR could learn from the Union of the Baltic Cities (UBC) in the Baltic Sea Region, which consists of over 100 coastal cities and works through intense collaboration with national and EU governments.

Chapter 1

Trends in trans-border co-operation in the Pan Yellow Sea Region

Unlike other locally-driven sub-national economic blocs in East Asia – such as the Southern China Growth Triangle (SCGT)[1] and SIJORI[2] – the Pan Yellow Sea Region (PYSR), spanning the coastal areas of the Yellow Sea in Northeast Asia, has a relatively short history. Its spontaneous process of economic integration only began in the early 1990s, when the Chinese economy opened up and began functioning as the world's factory. In this short period, however, the PYSR has made significant progress in pursuing trans-border economic exchange. Intra-regional trade amongst the three PYSR countries (hereafter, China, Japan and Korea) has exploded, almost doubling from 12.7% of total trade volume of all three countries in 1990, to 23.9% in 2005. In terms of intra-regional investment, as of 2006, Korea and Japan were the world's largest and second largest providers of foreign direct investment (FDI) to China respectively[3], excluding Hong Kong. In addition, these three countries have jointly forged an extensive and dense production network to become a leading global manufacturing base. In 2007, the three countries' global share in the output of their key industries of shipbuilding, electronics and automobiles was 85.2%, 41.6% and 33.6% respectively (see Section 2.1 for more).

Along with this economic integration, a wide array of inter-city fora has been set up to increase regional integration, especially among the PYSR's major port cities, which are key transportation nodes and production bases, both locally and globally. Against this setting, we firstly delineate the boundary of the PYSR from both the geographical and historical viewpoints (Section 1.1). We then review the chief social and economic indicators of the individual sub-regions (Section 1.2), before outlining the region's ten key port cities, which are the main focus of this review (Section 1.3). Lastly, we present a conceptual framework of trans-border co-operation (Section 1.4).

1.1 Introduction

1.1.1 The PYSR's geographical boundary

Broadly, the PYSR includes the coasts of northern China (known as the Bohai Rim), south-western Japan (known as Kyushu) and western and southern Korea. All of these areas have direct or indirect connections to the Yellow Sea. However, the PYSR's geographical boundary is defined in different ways. Some describe the region as including the Shanghai area of China,[4] while others suggest it contains the entire Korean peninsula (Kim W-B, 2000)[5]. In this study, however, we assume a narrower boundary which excludes both the Shanghai area and Korea's east coast. As China's foremost production bases, Shanghai and nearby Jiangsu Province have obviously established strong economic ties with the Japanese and Korean parts of the PYSR. However, Shanghai's influence is a more national phenomenon, rather than being locally confined. We have also ruled out the east coast of Korea because it has shown relatively weaker economic integration with China's Bohai Rim or Japan's Kyushu region, and has instead been pursuing economic links with far-east Russia for energy and tourism.

Figure 1.1 shows the geographical coverage of the PYSR in this paper. China's Bohai Rim, one of China's three core economic regions – along with the Pearl River Delta region (PRD)[6] and the Yangtze River Delta region (YRD)[7] – includes three provinces (Shandong, Hebei and Liaoning) and one provincial level city (Tianjin).[8] Although its economic development still lags behind the YRD and PRD, the Bohai Rim is now rapidly catching up as the Chinese government has been shifting its development axis to the northern coastal regions (Kim J-K, 2007). Kyushu, located in the south-west corner of Japan, consists of seven prefectures: Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki and Kagoshima. Of these, Fukuoka Prefecture is by far the largest one both in terms of population and economy size. Kyushu has traditionally established strong economic ties with China and Korea based on its geographical and cultural proximity. Since the 1990s, this area has been receiving growing attention from Japan's both public and private sectors as Japan's economic relationships with China have explosively intensified. Lastly, Korea's portion of the PYSR consists of two axes: the west and south coast regions. Korea's south coast region covers one province (Gyeong-nam Province) and two provincial cities (Busan and Ulsan). Since the 1960s its development has hinged on Korea's unique regional development focus on the "Seoul-Busan development corridor" which connects the capital city of Seoul with Busan, the anchor city in the south coast region. On the other hand, the development of the west coast region, which consists of four provinces (are Gyeonggi, Chung-nam, Jeon-buk and Jeon-nam) and one provincial city (Incheon), only began in the 1990s when the Korean government sought to

promote economic exchange with China, as well as to reduce the region's disadvantage compared with the Seoul-Busan corridor (see Section 2.1). Although both regions have deep connections to China, as Korea's largest trading partner, the west coast provinces put relatively more emphasis on China, while the south coast leaned more towards Japan.

Within this boundary of the PYSR, we have mostly narrowed our analytical focus to the city level, as we primarily examine the inter-city linkages surrounding the Yellow Sea. For this we have chosen ten key port cities in the PYSR which are indicated in Figure 1.1. These ten cities have already established a solid multi-lateral network as exclusive members of the Organization for East Asia Economic Development (OEAED; see Chapter 3).[9] Four of the cities are in China (Tianjin, Dalian, Qingdao and Yantai), three in Japan (Fukuoka, Kitakyushu and Shimonoseki) and three in Korea (Busan, Incheon and Ulsan). These ten cities have the following distinctive features making them suitable for our analysis:

- They are separated from one another by multiple international sea boundaries.
- They are all closely networked via various forms of inter-city linkages.
- They are all second tier cities: none has the largest population or is the economic or political capitals of their respective countries.
- They all have well-established regional industrial centres.
- They all have a large-scale seaport which is recognized as a transportation hub nationally as well as internationally.

According to our definition, the PYSR had a population of 256 million in 2006, accounting for 17.2% of the total population of the three countries. The region's aggregated GDP was USD 1.5 trillion in 2006, or 19.4% of the total GDP of all three countries. In 2006, the PYSR's trade volume was 16.9% (USD 609 billion) of the three countries' total trade volume. Overall, the PYSR accounts for about one-fifth of the three countries' major economic performance (Table 1.1). However, there is great divergence in the regional GDP (GRDP) of each province in the PYSR, reflecting the different economic development stages of the three countries. In 2006, China's Bohai Rim area produced 39.8% (USD 590 billion) of the total GDP for the entire PYSR, with 84% (214 million) of the PYSR's population. In the same year, Japan's Kyushu area only accounted for 5.3% (13.5 million) of the PYSR's total population, but generated 25.3% (USD 375 billion) of its combined GRDP. The Korean part of the PYSR produced more than one-third (33.9%) of the PYSR's GDP and had 10.7% (27 million) of its total population. In fact, the average GRDP per capita of Kyushu in 2006 was almost nine times that of Chinese PYSR.

Figure 1.1. **Geographical scope of the PYSR**

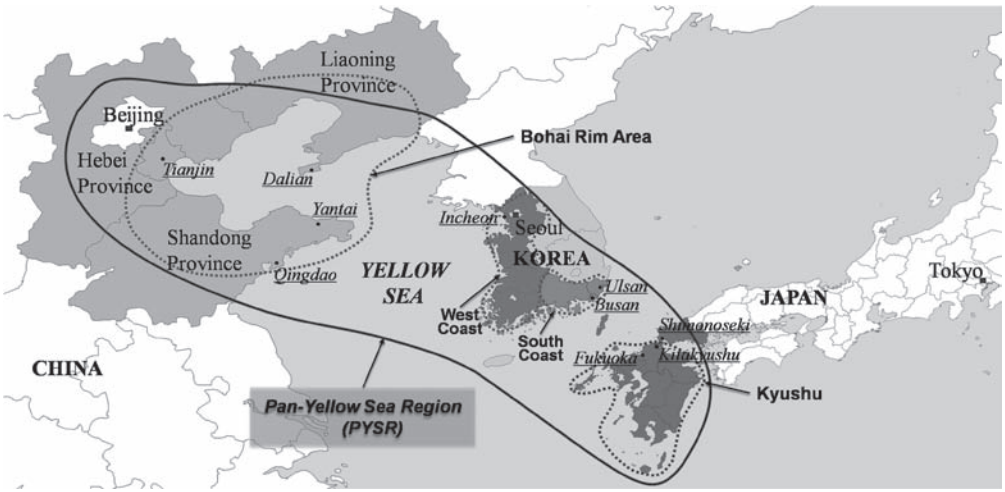


Figure 1.1. **Geographical scope of the PYSR** *(continued)*

KR01-CAPITAL REGION	**KR04-JEOLLA REGION**	**JPI-KYUSHU**
KR011-Seoul	KR041-Gwangju	JP40-Fukuoka
KR012-Incheon	KR042-Jeollabuk-do	JP41-Saga
KR013-Gyeonggi-do	KR043-Jeollanam-do	JP42-Nagasaki
KR02-GYEONGNAM REGION	**KR05-CHUNGCHEONG REGION**	JP43-Kumamoto
KR021-Busan	KR051-Daejeon	JP44-Oita
KR022-Ulsan	KR052-Chungcheongbuk-do	JP45-Miyazaki
KR023-Gyeongsangnam-do	KR053-Chungcheongnam-do	JP46-Kagoshima
KR03-GYEONGBUK REGION	**KR06-GANGWON REGION**	
KR031-Daegu	KR061-Gangwon-do	**JPG-CHUGOKU**
KR032-Gyeongsangbuk-do		JP35-Yamaguchi

Note: Cities underlined and in italics are ten key port cities of the PYSR, which are the principal analytical target of this paper.

Source: OECD Territorial Database.

Although this gap has started to close recently,[10] it is still considerable. Reflecting these country level differences, the ten key port cities in the PYSR which are the main target areas of this paper also show strong variances in major economic indicators (Table 1.1): the average GRDP per capita in 2006 of the four Chinese cities was USD 5 422; USD 23 899 for the three Korean cities; and USD 30 681 for the three Japanese cities. The population of all four Chinese cities is above 5 million in 2006, while the three Korean cities and three Japanese cities respectively had less than 2.5 million and 1 million people on average in the same year.

1.1.2 The formation of the PYSR

The PYSR dates back to ancient times. Throughout its long history, the PYSR has been an important location for the exchange of commodities, technology and people among the three countries. According to Kim W-B (2000), the heyday of coastal trading was the period between the seventh and tenth centuries when the countries were under the rule of Tang in China (618-907), Yamato-Nara-Heian in Japan (646-856) and Shilla in Korea (669-935 AD). Hamashita *et al.* (2003) also finds that the maritime trading system during this period had catalysed the regions and cities along the Yellow Sea to become densely networked. The focal points of this coastal trading were the

Table 1.1. **Key statistics for local economies in the PYSR, 2006**

	Country/region	Size (km^2)	Population (1 000 persons) 2006	GRDP [a] (billion USD)	GRDP per capita (USD) 2006	Trade (billion USD)
		9 596 960	1.3 billion [c]	2.6 trillion [c]	2 018	1.7 trillion [c]
China	Tianjin	11 760	9 489	54.4	5 138	67.4
	Shandong	153 000	93 090	274.0	2 954	110.7
	Qingdao	10 654	7 494	45.1	5 503	39.1
	Yantai	13 746	6 500	30.1	4 622	15.0
	Hebei	190 000	68 980	145.7	2 119	23.5
	Liaoning	145 700	42 710	116.1	2 735	52.4
	Dalian	12 574	5 721	38.7	6 424	48.8
	Subtotal	500 460	214 269	590	Avg. 3 236	254
	(share of the PYSR)	(84.5%)	(84.0%)	(39.8%)	(11.5% of Kyushu avg.)	(43.9%)
		99 678	48 000	911	18 788	634
Korea	Busan	764	3 615	51.8	14 340	8.0
	Incheon	994	2 630	43.7	16 674	15.9
	Ulsan	1 057	1 103	44.3	40 684	54.9
	Gyeonggi	10 131	10 910	187.4	17 179	63.2
	Chung-nam	8 600	1 970	54.6	27 732	38.9
	Jeon-buk	8 055	1 870	28.3	15 135	5.4
	Jeon-nam	12 095	1 940	44.6	22 988	19.0
	Gyeong-nam	10 522	3 170	61.5	19 406	31.3
	Subtotal	52 218	27 208	516	Avg. 21 767	237
	(share of the PYSR)	(8.8%)	(10.7%)	(34.9%)	(77.2% of Kyushu avg.)	(40.9%)
		377 944	127 000	4.3 trillion [c]	33 100	1.1 trillion [c]
Japan	Fukuoka	4 845	5 060	152	30 000	47.6
	Fukuoka city	341	1 414	57.1	40 725	N/A
	Kitakyushu city	488	991	29.7	29 894	N/A
	Kumamoto	7 077	1 830	45.0	26 218	0.8
	Nagasaki	4 104	1 450	36.6	25 210	4.2
	Oita	5 099	1 200	38.2	31 848	19.0
	Miyazaki	6 346	1 140	32.3	28 403	0.7
	Saga	2 440	860	17.5	20 336	1.0
	Kagoshima	9 044	1 740	46.9	26 975	14.2
	Yamaguchi	6 114	1 470	47.3	32 184	31.0
	Shimonoseki [b]	716	289	6.2	21 425	N/A
	Subtotal	39 671	13 569	375	Avg. 28 190	88
	(share of the PYSR)	(6.7%)	(5.3%)	(25.3%)	(100.0%)	(15.1%)
Total of PYSR		592 349	255 046	1.5 trillion [c]	Avg. 17 731	609
Share of three countries		(5.8%)	(17.2%)	(19.4%)	(98% of three states avg.)	(16.9%)

Notes: (1) [a] GRDP was normalised with the exchange rate for 2006 (USD 1 = CNY 7.97, USD 1 = JPY 119.00, USD 1 = KRW 929.6), [b] Shimonoseki is under the jurisdiction of Yamaguchi Prefecture of Chugoku region, not Kyushu but is included in this table as this city is a member of the OEAED. [c] Units are different when they have this note. (2) The highlighted 10 cities are exclusive members of OEAED and the main target areas of this paper. (3) Subtotal of China excluded cities of Qingdao, Yantai and Dalian as their figures are already reflected in their province. Japan's Fukuoka City and Kitakyushu City are also excluded for the same reason.

Sources: National Bureau of Statistics of China (2007), Japan Statistics Bureau (2007), Korea National Statistical Office (2007), and Kim W-B *et al.* (2008).

Liaoning and Shandong Provinces of China, and the west and south coastal regions of Korea and Kyushu in Japan. These mostly correspond to the PYSR boundary in this paper. Because of this active regional integration via the sea, the area has been even called as the "Mediterranean Sea of the East" (Box 1.1). However, from the 15th century when each state[11] became more stable and centralised in its administration, the Northeast Asian countries lost their impetus for trans-border networking, although some scholars assert that trans-border co-operation did continue even after the 15th century.[12]

Box 1.1. **The Mediterranean Sea of the East**

Many researchers, including Lombard and Aubin (1988) and Gipouloux (1996), have dubbed the Pan Yellow Sea Region the Mediterranean Sea of East Asia, inspired by the very active commercial exchanges between port cities in the region. According to Ogawa (2006), Mediterranean Sea and PYSR have following common features; location (north altitude of 30-45), area size (Mediterranean 2.5 million km^2, PYSR 2.2 million km^2) and shape (most sides are surrounded by land). From the viewpoint of Continental Asia, coastal areas of China and other East Asia had played a peripheral role. However, from the Maritime Asia perspective, port cities in East Asia had spearheaded the economic growth and exchanges. The recent economic rise of key port cities in the PYSR also re-emphasizes this maritime Asia perspective, prompting a spatial restructuring in the region. In fact, Chinese port cities spanning from South China Sea to Yellow Sea have served as driving forces to open China's market and bring economic success of China. The Japanese scholar Hamashita (1990) asserts that the historical sea zones of East Asia will be the ideal site for unlimited growth once they become well-connected. Some experts even see the geographical coverage of the PYSR to extend to Vladivostok of Russia and Bali of Indonesia.

Source: Kim W-B *et al.* (2008)

In the modern age, regional integration in the PYSR has been principally driven by market forces. In particular, multi-national enterprises (MNEs)[13] have played a key role in crafting an economically integrated region. They invest across borders, construct closely-knitted manufacturing networks, and sharply accelerate trade flow in the region, in order to make the most of economic complementarities of three countries in the PYSR. China's Bohai Rim area has abundant labour, vast natural resources and huge markets, whilst the Japanese and Korean side of the PYSR have ample capital and a range of advanced technologies with different degrees. This structure has been further exploited by the industrial restructuring processes of Japanese and Korean firms. Since the 1980s, Japanese firms have relocated domestic production sites overseas following sharp rises in land costs, wages and currency

(Japanese Yen) of Japan. This relocation process has been replicated by Korean companies since the early 1990s. At the same time, in its search for technologies and capital to transform its economy, the Chinese government provided a wide array of incentives to encourage Japanese and Korean firms to move into China, such as free industrial sites and long-term tax incentives. These two different dimensions have coincided to stimulate rapid economic integration within the PYSR.

Another important driver of regional integration in the PYSR has been the wave of decentralisation since the 1990s. The tide of devolution to local governments from the state has unleashed economic forces at the local level. Local authorities in respective countries are developing transport infrastructure, supporting local enterprises, seeking overseas business opportunities and competing with each other fiercely to bring more financial resources into their own region. They are also pioneering the formation of local-based networks across borders to facilitate the exchange of people and goods. Along with these movements, especially ten key port cities in the PYSR have been more actively pursuing trans-border collaboration. Serving as gateways to the hinterlands of each country, they have established extensive bi- and multilateral networks among themselves.

Geographical proximity has also deepened regional ties in the PYSR. Most cities in the region are closely located to each other. For instance, Busan is only 200km from Fukuoka City, while Fukuoka City and Japan's capital city of Tokyo are about 1 000km apart, or five times further. In addition, most cities in the PYSR are well connected across borders via sea and air. The rapid development of the sea transportation system in the PYSR is substantially lowering the cost of transporting goods by container ship compared to other parts of the world. According to the OECD (2008a), the cost to send a container from global to China, Japan and Korea in 2006 were only 1.2%, 0.8% and 0.5% of total import value respectively, whereas those to the US and Australia were 4.8% and 6.4% repectively.

1.2 Key social and economic indicators

1.2.1 Demography

The patterns of population development vary throughout the PYSR (Table 1.2). Between 1995 and 2000, the population growth in the Chinese Bohai Rim (0.5%) was far lower than the national average of 4.6%. However, the population of the Chinese Bohai Rim area increased remarkably (by 7%) between 2000 and 2006; a much higher growth rate than the national average of 3.7%. In particular, Tianjin's population significantly exploded (by 17.9%) between 2000 and 2006, corresponding to an annual increase of 3%. On

the other hand, population growth in Japanese PYSR is mixed. Japan's total population has been decreasing after peaking in 2004; Japan's population growth rate decreased from 1.1% between 1995 and 2000 to 0.7% between 2000 and 2006. The Kyushu area reflects this national pattern, with negative population growth between 2000 and 2006. Fukuoka Prefecture is not an exception to this trend. However, the population of Fukuoka City, the capital of Fukuoka Prefecture, grew more than 10% between 1995 and 2006, with a remarkable annual rate of 1%. Population trend in the Korean PYSR is also

Table 1.2. **Population development of the PYSR, 1995-2006**

		1995	2000	2005	2006	Increases (1995-2000)	Increases (2000-2006)
CHINA		1 211 210	1 267 430	1 307 560	1 314 480	4.6%	3.7%
Bohai Rim		200 541	201 460	213 090	215 530	0.5%	7.0%
Tianjin		9 280	9 120	10 430	10 750	-1.7%	17.9%
Hebei		63 877	64 370	68 510	68 980	0.8%	7.2%
Shandong		86 714	87 050	91 940	93 090	0.4%	6.9%
	Qingdao city	*6 750*	*7 067*	*7 409*	*7 494*	*4.7%*	*6.0%*
	Yantai city	*6 384*	*6 458*	*6 477*	*6 500*	*1.2%*	*0.7%*
Liaoning		40 670	40 920	42 210	42 710	0.6%	4.4%
	Dalian city	*5 315*	*5 515*	*5 653*	*5 721*	*3.7%*	*3.7%*
JAPAN		125 570	126 926	127 768	127 770	1.1%	0.7%
Kyushu area		13 424	13 446	13 353	13316	0.2%	-1.0%
Fukuoka pref.		4 933	5 016	5 050	5 054	1.7%	0.8%
	Fukuoka city	*1 239*	*1 292*	*1 340*	*1 370*	*4.3%*	*6.0%*
	Kitakyushu city	*1 020*	*1 011*	*994*	*991*	*-0.9%*	*-2.0%*
	Shimonoseki [a]	*311*	*301*	*291*	*289*	*-3.2%*	*-4.0%*
KOREA		45 982	47 977	49 268	49 625	4.3%	3.4%
West coast	Incheon	2 362	2 562	2 632	2 664	8.5%	4.0%
	Gyeonggi	9 645	9 280	10 853	11 107	-3.8%	19.7%
	Chung-nam	1 855	1 930	1 983	2 001	4.0%	3.7%
	Jeon-buk	2 010	2 007	1 896	1 882	-0.1%	-6.2%
	Jeon-nam	2 187	2 135	1 977	1 955	-2.4%	-8.4%
South coast	Busan	3 893	3 812	3 658	3 635	-2.1%	-4.6%
	Ulsan	966	1 044	1 096	1 103	8.1%	5.7%
	Gyeong-nam	3 959	3 109	3 188	3 209	-21.5%	3.2%

Notes: (1) [a] Shimonoseki City is in Yamaguchi Prefecture in the Chugoku area of Japan. (2) Cities in italics are NOT provincial level cities but members of the OEAED.

Sources: National Bureau of Statistics of China (2007), Japan Statistics Bureau (2007), and Korea National Statistical Office (2007).

mixed. Korea's national population is still growing. Between 2000 and 2006 the growth rate was 4.3%. While some provinces (or provincial cities) in the PYSR reflect this national trend well, some of them have had negative growth since the 2000s. For instance, Busan recorded a growth rate of -4.6% between 2000 and 2006, but the growth rate of Gyeonggi Province was 19.7% for the same period.

In terms of age structure of population, most provinces in the PYSR reflect national trends (Table 1.3). Japan already entered an ageing society, with the share of the population over 65 years in 2005 (20.1%) far outstripping the world's average of 10% in 1999 (UN-DESA, 2001). Likewise, in 2005 the shares of the ageing population in the Kyushu and Fukuoka

Table 1.3. **Age structures in the PYSR in recent years** [a]

	% of population under 15 years	% of population over 65 years
CHINA	**17.9%**	**9.4%**
Tianjin	11.3%	10.9%
Shandong	15.4%	9.7%
Hebei	16.8%	8.9%
Liaoning	12.7%	10.6%
JAPAN	**13.7%**	**20.1%**
Kyushu area	14.3%	23.1%
Fukuoka pref.	13.9%	19.8%
KOREA	**17.2%**	**10.2%**
Incheon	17.7%	8.0%
Gyeonggi	19.2%	8.1%
Chung-nam	17.2%	14.5%
Jeon-buk	17.2%	14.7%
Jeon-nam	16.4%	17.6%
Busan	14.5%	10.2%
Ulsan	19.1%	6.3%
Gyeong-nam	17.9%	11.4%

Note: [a] China 2007 data, Japan 2005 data, Korea 2007 data.

Sources: National Bureau of Statistics of China (2008), Japan Statistics Bureau (2008), and Korea National Statistical Office (2008).

Prefecture showed respectively 23.1% and 19.8%. In Korea, population ageing is not an imminent social concern as the proportion of the population over 65 years is still relatively low (10.2% in 2008). The share of the elderly population in most provinces in the Korean PYSR remains about 10%, even though there are some variations. According to the OECD (2008b), however, by the middle of this century Korea will be one of the oldest countries, with more than one-third of its population over 65 years due to low fertility rates and increasing life expectancy. China has similar age structures to Korea, gradually moving into an ageing society. These patterns are also reflected at the sub-national level. The population share of elderly people in China in 2007 was close to the global average (9.4%). The population of people of non-working age (*i.e.* over 65 years) in four Chinese provinces in the PYSR in 2007 also converged with the national average.

1.2.2 Labour market

Labour markets in the PYSR have enjoyed a comparably favourable position. Unemployment rates in Japan, Korea and China were 4.1%, 3.5% and 4.1% respectively in 2006 (Table 1.4) – all considerably lower than the OECD average of 6.1% for the same year.[14] The unemployment rate at the sub-national level in the PYSR exhibited better performances than the national level. For instance, all provinces in Chinese PYSR, except Liaoning, have had continuously lower unemployment rates than the national average since the 2000s, reflecting the expansion of the economy and consequent strong job creation in the region. In the Korean PYSR, employment growth in Busan is outstanding. Between 2000 and 2006, Busan's unemployment rate fell sharply, from 7.1% to 4.2%, although it was still higher than the national average (3.5% in 2006).Japan's Fukuoka Prefecture has also experienced remarkable job creation. After peaking at 7% in 2002, its unemployment rate has continuously fallen, reaching 5.6% in 2006.

Three PYSR countries have a substantially lower share of foreign-born residents than the OECD average, revealing their relatively closed labour markets. In 2006, the percentage of residents with foreign citizenship in China, Japan and Korea was 0.1%, 1.4% and 1.6% respectively. This contrasts with the proportion of foreign-born population in the OECD countries – 9.7% in 2006[15] (OECD, 2008c). Most cities in the PYSR follow a national path. In 2005, foreign-born residents made up 0.4%, 0.3% and 1.4% of the population of Tianjin (China), Fukuoka (Japan) and Busan (Korea), respectively.[16]

Table 1.4. **Unemployment rates in the PYSR, 2000-2006**

% of total unemployment rate

		2000	2001	2002	2003	2004	2005	2006
CHINA		**3.1**	**3.6**	**4.0**	**4.3**	**4.2**	**4.2**	**4.1**
	Tianjin	3.2	3.6	3.9	3.8	3.8	3.7	3.6
	Hebei	2.8	3.2	3.6	3.9	4.0	3.9	3.8
	Shandong	3.2	3.2	3.6	3.6	3.4	3.3	3.3
	Liaoning	3.7	3.2	6.5	6.5	6.5	5.6	5.1
JAPAN		**4.7**	**5.0**	**5.4**	**5.3**	**4.7**	**4.4**	**4.1**
	Kyushu	5.4	5.6	6.1	5.9	5.5	5.3	5.0
	Fukuoka pref.	6.2	6.5	7.0	6.8	6.3	5.9	5.6
KOREA		**4.4**	**4.0**	**3.3**	**3.6**	**3.7**	**3.7**	**3.5**
West coast	Incheon	5.4	4.7	4.0	4.4	4.5	4.6	4.4
	Gyeonggi	3.9	3.6	2.8	3.4	3.7	3.9	3.6
	Chung-nam	2.8	2.9	2.7	2.9	2.3	2.6	2.4
	Jeon-buk	3.1	3.1	2.5	2.7	2.7	2.5	2.5
	Jeon-nam	3.3	3.1	2.3	2.3	2.5	2.3	1.7
South coast	Busan	7.1	5.7	3.9	4.1	4.4	4.3	4.2
	Ulsan	4.2	3.4	2.5	3.2	3.6	3.5	2.9
	Gyeong-nam	3.5	3.3	2.5	2.5	2.4	2.7	2.3

Sources: National Bureau of Statistics of China (2007), Japan Statistics Bureau (2007), and Korea National Statistical Office (2007).

1.2.3 Regional income trends

The **Chinese Bohai Rim area** has achieved significant economic growth since the 1990s (Table 1.5). Its GRDP per capita increased more than 10 times between 1990 and 2006, growing at an annual average rate of 38.4% between 1990 and 2000 and 20.4% between 2000 and 2006. Of the four provinces of the Bohai Rim, Shandong Province made the most remarkable progress, featuring an average growth rate of 42.7% between 1990 and 2000 and 24.4% between 2000 and 2006. This performance is more notable when considering that Shanghai, China's largest city in terms of population, recorded a 48.5% annual growth rate between 1990 and 2000 but an 11% growth rate between 2000 and 2006. In 2006, the Bohai Rim contributed 17.4% of the national GDP, while representing 15.5% of the national population.

Table 1.5. **Annual GRDP per capita of Chinese coastal provinces in the PYSR, 1990-2006**

1 USD, current prices

	1990	1995	2000	2006	Total increase (1990-2006)	Annual growth rate (1990-2000)	Annual growth rate (2000-2006)	Share of national GDP (2006)
Liaoning	385	983	1 604	3 115	8.0 times	31.7%	15.7%	3.4%
Hebei	209	635	1 095	2 413	11.5 times	42.4%	20.1%	4.4%
Tianjin	517	1 469	2 562	5 852	11.3 times	39.6%	21.4%	1.6%
Shandong	259	828	1 365	3 364	12.9 times	42.7%	24.4%	8.0%
Average for Bohai	342	918	1 656	3 686	10.7 times	38.4%	20.4%	17.4%
CHINA	235	721	1 123	2 298	9.7 times	37.8%	17.4%	100.0%
Shanghai	844	2 706	4 935	8 187	9.7 times	48.5%	11.0%	4.5%

Note: 1 USD = 7 CNY as of June 2008.

Source: National Bureau of Statistics of China, 2007.

Kyushu, in the Japanese part of the PYSR, is often called "one-tenth of Japan" because its size, population and economy are all about 10% of the nation (Table 1.6). Thus, Kyushu contributed 8.6% of national GDP in 2005, and this has remained largely stable for the past decade.[17] Kyushu also accounted for 11.2% of Japan's territory and 10.4% of Japan's total population in 2005. Kyushu's economic growth has been closely linked with national-level development. For instance, Kyushu's GDP grew by 9.2% between 1996 and 2005, with an annual growth rate of 0.9% between 1996 and 2000 and 1.3% between 2000 and 2005. The same statistics for Japan as a whole were 10.1%, 0.7% and 1.4% respectively. Of Kyushu's seven prefectures, Fukuoka has contributed the lion's share of Kyushu's economy, producing 40% of Kyushu's GRDP in 2005, or 3.5% of national GDP. Another remarkable case is the economic growth of Fukuoka City, a capital city of Fukuoka Prefecture. As one of Japan's 17 "designated" cities,[18] with a high degree of autonomy from the prefectural government, Fukuoka City grew at an annual rate of 1.8% between 2000 and 2005, outstripping even Tokyo (1.6%) during the same period.

In the **Korean PYSR** there is great variation among the eight provinces in terms of GRDP per capita. Ulsan City (at USD 40 684) had almost double the national GDP per capita in 2006 (USD 21 767), whereas most of the remaining provinces were lower than the national average (Table 1.1). Since the early 2000s, however, west coast region as the new growth axis of Korea has been performing well. This region had an annual growth rate of 7.6% between 2000

Table 1.6. **GRDP of the Kyushu area, Japan, 1996-2005**

1 billion JPY, real value, based on 2000 prices

	1996	2000	2005	Total increase (1996-2005)	Annual growth rate (1996-2000)	Annual growth rate (2000-2005)	Share of national GDP (2005)
Fukuoka pref.	17544	17919	19161	9.2%	0.5%	1.4%	3.5%
Fukuoka city	6657	6925	7547	13.4%	1.0%	1.8%	1.4%
Kitakyushu city	3796	3664	3709	-2.3%	-0.9%	0.2%	0.7%
Kyushu-wide	43390	44927	47848	10.3%	0.9%	1.3%	8.6%
JAPAN	504094	519075	555087	10.1%	0.7%	1.4%	100.0%
Tokyo	82630	90116	97346	17.8%	2.3%	1.6%	17.5%

Source: Japan Cabinet Office, 2006.

and 2006, while the national average was 5.5%. In particular, the economic performances of Gyeonggi and Chung-nam were outstanding (Table 1.7), growing at an annual average of 9.1% and 9.4% over the same period respectively, which was close to double the national growth rate. In 2006, the total GRDP of the five provinces of the west coast region was 40.2% of national GDP, to which Gyeonggi alone contributed 22.5%. On the other hand, the economic growth of the south coast region has remained stable for a long time. The national GDP share of the south coast's three provinces has consistently remained around one-fifth since the 1980s. Between 2000 and 2006, their annual GRDP growth rate was actually below the national average (5.5%). Of another interest is the weak growth of Busan, Korea's second-largest city. Busan's annual growth between 2000 and 2006 was only 3.9%, the second lowest rate of the eight provinces in Korean PYSR, after Jeon-nam.

1.2.4 Industrial structures

Reflecting the different stages of economic development, the PYSR's industrial structures are also diverse (Table 1.8). For the four Chinese PYSR provinces, the average share in regional GDP (or GRDP) of secondary industry was more than 50% in 2006, regardless of their GRDP size. Primary industry in the Bohai Rim also contributed a considerable share of GRDP, while the share of tertiary industry has been stagnant up to recently. For Japanese Kyushu, however, tertiary industry has dominated, contributing 78.6% of GRDP in 2006. This share is higher than the national average (69.4%). Kyushu also exhibited a higher share of primary industry (2.5%) in GRDP than the national average (1.5%) in 2006, reflecting its relative concentration on agriculture. The Korean PYSR is halfway between Japanese

Table 1.7. **GRDP of the Korean PYSR, 1990-2006**
Billion KRW, real value, based on 2000 prices

	1990	1995	2000	2006	Total increase (1990-2006)	Annual growth rate (1990-2000)	Annual growth rate (2000-2006)	Share of national GDP (2006)
Incheon	16366	25247	26230	34971	2.1 times	6.0%	5.6%	4.6%
Gyeonggi	53665	85755	111793	172648	3.2	10.8%	9.1%	22.5%
Chung-nam	14900	20941	28962	45314	3.0	9.4%	9.4%	5.9%
Jeon-buk	11763	16819	18977	23912	2.0	6.1%	4.3%	3.1%
Jeon-nam	16329	23929	26907	32496	2.0	6.5%	3.5%	4.2%
West coast total	113025	172693	212872	309343	2.7	8.8%	7.6%	40.3%
Busan	23235	32500	33839	41839	1.8	4.6%	3.9%	5.4%
Ulsan	NA	N.A	28355	38341	N.A	N.A	5.9%	5.0%
Gyeong-nam	30770	45360	37728	50693	1.6	2.3%	5.7%	6.6%
South coast total	54006	77681	99923	130875	2.4	8.5%	5.2%	17.0%
KOREA	332274	485493	577970	767887	2.3	7.4%	5.5%	1000%
Seoul	88925	127110	138492	162474	1.8	5.6%	2.9%	21.2%

Source: OECD calculations based on Korea Statistical Information Service (KOSIS, available at *www.kosis.kr*)

and Chinese PYSR in terms of industrial structure. The share of secondary industry of the Korean PYSR is higher than Kyushu but lower than the Bohai Rim. Ulsan is one exception to this general trend. Due to its concentration on heavy industries, Ulsan's secondary industry contribution to GRDP was 74.8% in 2006, which is almost double the national average and even exceeding that of the Bohai Rim.

1.2.5 Economic exchanges: trade and FDI

China's Bohai Rim

In terms of total trade volume, all four provinces in the Chinese Bohai Rim have ranked amongst the 10 largest provinces of China's 31 provincial municipalities. In particular, Shandong Province was sixth largest in 2008, while the three provinces in the Yangtze River Delta (YRD) ranked from second to fifth[19] (Table 1.9). As China's emerging economic engine, the Bohai Rim trades actively with Japan and Korea, which are amongst its top three trading countries. In 2008, Korea and Japan were its biggest and third

largest trading partners respectively.[20] Korea was Shandong's biggest trading partner in 2008, accounting for 14.1% of trading volume. Japan ranked third, with a share of 9.9%. Both Hebei and Tianjin also showed a same pattern. Of notable is that there is a strong regional divergence in terms of trading countries among the Chinese coastal provinces. While the north coast provinces (*i.e.* the Bohai Rim) rely more on Korea for trade, the south coast provinces (*i.e.* YRD) trade more with Japan. In fact, since the 1990s Japan has continuously claimed to be the second largest trading partner with the three YRD provinces after the US. However, apart from Zhejiang Province, Korea is not amongst the YRD provinces' top three trading partners (Kim K-S *et al.,* 2008).

Table 1.8. **Industry contribution to national and regional GDP in the PYSR, 1995-2006**

% of GDP (for country) and GRDP (for region)

		1995			2006		
		Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
CHINA		20.5	45.6	33.9	17.3	47.9	34.7
Bohai Rim	Tianjin	6.5	55.6	37.8	2.7	57.1	40.2
	Hebei	22.2	46.4	31.4	13.8	52.4	33.8
	Shandong	35.7	8.3	56.0	9.7	57.8	32.6
	Liaoning	14.0	49.8	36.2	10.6	51.1	38.3
JAPAN		1.6	31.8	70.8	1.5	29.0	69.4
	Kyushu	3.5	26.5	73.5	2.5	22.1	78.6
	Fukuoka pref.	1.1	24.8	77.7	0.8	20.3	78.9
	Fukuoka city	0.2	11.1	93.6	0.1	11.6	88.3
	Kitakyushu city	0.2	35.0	71.0	0.1	24.2	75.7
KOREA		6.4	40.2	53.3	3.3	39.9	56.6
West coast	Incheon	1.6	56.8	41.5	0.7	43.0	56.1
	Gyeonggi	3.9	55.5	40.4	2.0	49.7	48.2
	Chung-nam	17.4	45.0	37.5	7.6	60.4	31.9
	Jeon-buk	17.1	35.6	47.1	10.9	37.9	51.1
	Jeon-nam	21.9	39.8	38.2	11.0	49.0	39.9
South coast	Busan	2.3	34.0	63.6	1.0	30.1	68.8
	Ulsan	N/A	N/A	N/A	0.7	74.8	24.4
	Gyeong-nam	7.8	59.3	32.8	6.0	53.0	40.9

Sources: National Bureau of Statistics of China (2007), Japan Statistics Bureau (2007), and Korea National Statistical Office (2007).

Table 1.9. **Trade volume of the Chinese Bohai Rim with Japan and Korea**
billion USD

		1998			2003			2008		
		Total	Japan %	Korea %	Total	Japan %	Korea %	Total	Japan %	Korea %
Bohai Rim	Liaoning	13.7	31.7%	10.7%	26.5	33.4%	13.2%	82.3 (8)	17.4%	10.5%
	Hebei	4.2	16.5%	9.7%	8.9	12.2%	9.2%	50.6 (9)	5.2%	9.6%
	Tianjin	11.0	21.5%	12.8%	29.3	19.4%	18.3%	86.6 (7)	12.3%	16.2%
	Shandong	19.1	22.6%	18.8%	49.4	17.9%	19.5%	187.3 (6)	9.9%	14.1%
YRD	Jiangsu	28.1	22.3%	5.8%	113.6	20.0%	8.3%	430.4 (2)	11.5%	10.2%
	Shanghai	31.1	25.3%	4.4%	112.3	18.5%	6.2%	313.9 (3)	14.6%	5.6%
	Zhejiang	16.6	17.6%	5.2%	61.4	15.4%	6.3%	242.2 (5)	7.9%	4.6%

Note: Numbers in ( ) are the ranking of each province in terms of national share of trading volume.

Source: OECD calculations based on statistical yearbooks of each province.

The Bohai Rim receives a significant national proportion of inbound foreign direct investment (FDI); receiving more than 30%[21] of China's total inbound FDI in 2006 (USD 67.4 billion). In a single year (2006), Shandong Province alone attracted USD 9 billion in FDI, equivalent to 70% of Korea's national cumulative outbound investment between 1986 and 2004. The annual growth rate of inward FDI into the Bohai Rim is also remarkable. For Liaoning and Hebei Provinces, it rose at an annual rate of 25% and 20% between 2002 and 2006 respectively, which is close to the annual rate of Zhejiang Province at YRD (30%), one of the most rapidly developing provinces in China. Although Japan and Korea are also major providers of FDI in the Bohai Rim, their FDI significance is weaker than their trade with the Bohai Rim. In terms of cumulative inward FDI between 1986 and 2006, Korea was the largest investing country in Shandong and the second largest in Liaoning. Japan ranked third in both Tianjin and Liaoning. However, in the remaining Bohai Rim provinces, Hong Kong and the US contributed the most to inward FDI.

Japan's Kyushu

Kyushu's share of its total export volume with China and Korea in 2007 reached almost 34.4%, remarkably higher than national share (22.9%) in the same year (Kyushu Economic Research Center, 2008), reflecting its traditionally strong economic ties with these two countries. China significantly contributed to this steep rise, outstripping Korea in 2005 to become the

largest trading country with Kyushu. Among Kyushu's seven prefectures, Fukuoka Prefecture has taken unrivalled position in terms of trade volume. In 2006, the prefecture contributed 62% of Kyushu's total global export value;[22] Fukuoka City accounted for more than half of this. Kyushu's major export items to China and Korea are machinery (*e.g.* electrical machinery, transport machines and general machinery), representing 50% and 58% of total value of Kyushu's export to these countries in 2006, respectively. Interestingly, these machinery items are also major import items into Kyushu from China and Korea. For instance, in 2006, the top three items imported into Kyushu from Korea, in terms of import value, were precision machines (24.4%), electrical machinery (22.9%) and general machinery (11.4%). This trade structure implies that Kyushu is actively engaging in parts trade for machinery with Korea and China using the PYSR's factor price differences and triangular trade structures (see more in Chapter 2.1).

Asia in general has become more popular for investment by Kyushu companies since the 1990s. Asia's share in Kyushu's total overseas investment significantly increased, from 65% between 1986 and 1990 to 81% between 2001 and 2005 (Table 1.10). In particular, China has attracted a remarkable proportion of Kyushu's companies. Between 2001 and 2005, half of Kyushu's companies operating overseas were in China. It is also noteworthy that the ratio of Kyushu companies opting for China as their business base has far outstripped that of overall Japanese companies choosing China. In 2006, the share of Kyushu's overseas companies who based themselves in China reached 40%, compared to 23% for Japanese overseas companies as a whole

Table 1.10. **Kyushu companies developing businesses overseas, 1986-2006**

Numbers of companies and % of companies investing overseas

Company location	Kyushu						National data
	1986-1990	1991-1995	1996-2000	2001-2005	2006	'86-'06	(2006)
World total	90 (100%)	196 (100%)	167 (100%)	184 (100%)	31 (100%)	708 (100%)	25 135 (100%)
Asia	59 (65%)	147 (75%)	125 (75%)	149 (81%)	29 (94%)	545 (77%)	15 034 (60%)
China	15 (16%)	88 (45%)	56 (34%)	91 (50%)	13 (42%)	284 (40%)	5 763 (23%)
Korea	6 (7%)	9 (5%)	3 (2%)	7 (4%)	3 (10%)	30 (4%)	829 (3%)
US	19 (21%)	29 (15%)	22 (13%)	15 (8%)	-	86 (12%)	4 427 (17%)
EU	6 (7%)	15 (8%)	12 (7%)	8 (4%)	2 (6%)	44 (6%)	4 006 (16%)

Note: China includes Hong Kong.

Source: OECD calculation based on Japan Bank for International Cooperation (2008) and METI Kyushu (2007).

(Table 1.10). Korea, on the other hand, has not been favoured by Kyushu's companies as a business destination. Over the last two decades (1986-2006), only 30 companies (4%) out of the 708 Kyushu-based companies investing overseas located in Korea. This is slightly higher than the national preference (3% in 2006) for developing businesses in Korea.

Korean PYSR

The trade volume of Korea's five west coast provinces grew significantly between 2000 and 2007, at an annual rate of 18.1%. This represented 43.2% of national trade volume in 2007. While China is the largest trading country for all of these five provinces (both exports and imports), Gyeonggi Province in particular has shown the most active economic exchange with China, which accounted for 40.4% of Gyeonggi's trading volume in 2007. Although Gyeonggi Province still has the largest share of trade volume, its national share fell from 22.1% to 18.2% between 2000 and 2007. Contrastingly, Chung-nam has recently made remarkable headway owing to its massive investments in transportation infrastructure, as well as its favourable location for trading with China. Its share in national trade volume increased from 8.1% to 10.2% between 2000 and 2007. In the meanwhile, the trade volume of Korea's three south coast provinces has also shown outstanding growth – 26.9% per annum between 2000 and 2007. Their national share increased substantially, from 20.8% to 27.3%, over the same period. Among these three provinces, Ulsan, with its strong manufacturing bases for automobiles and shipbuilding, has shown exceptional growth in trade volume. Thanks to a global boom in these two industries, Ulsan expanded its national share in trade volume from 10.3% in 2000 to 16.4% in 2007.

Not surprisingly, all provinces in the Korean PYSR have looked strongly to China as an investment destination (Table 1.11). In 2006, all provinces except Jeon-buk directed more than 50% of their investments (in terms of cases) towards China. Incheon invested the greatest proportion in China, at 64.4% of its investment cases. This geographical concentration of Korean PYSR's outbound FDI has been continued throughout the 2000s. The aggregate share of outbound FDI to China of all eight Korean PYSR provinces slightly decreased, from 57.9% to 54.1%, between 1995 and 2006 in terms of cases of reported investment. However, investment amount substantially increased, from 23.5% to 30.9%, for the same period. This could indicate that Korean companies' investment in China is gradually advancing into more capital-intensive manufacturing sectors (see Section 2.1). On the other hand, Japan has not been favoured as an investment destination by Korean PYSR. The aggregate share of outbound FDI to Japan from the eight provinces in Korea in 2006 was only 2.6% and 1.2%, in terms of investment cases and amount respectively. This figure has not improved since 1996 (1.2% and 1.9%).

Table 1.11. **Outbound FDI from Korean coastal provinces in the PYSR, 1995-2006**

			1995			2000			2006		
			Total	China	Japan	Total	China	Japan	Total	China	Japan
West coast	Incheon	Cases[1]	157	55.4%[3]	0.6%	189	63.0%	4.2%	533	64.4%	1.9%
		Amount[2]	217	28.6%[4]	0.1%	105	44.8%	0.6%	333	68.8%	0.3%
	Gyeonggi	Cases	459	52.7%	2.0%	832	41.1%	4.0%	2872	51.3%	2.9%
		Amount	1523	16.2%	2.6%	2221	9.0%	1.4%	5385	25.4%	1.9%
	Chung-nam	Cases	45	57.8%	0.0%	58	60.3%	0.0%	215	58.1%	1.4%
		Amount	32	34.4%	0.0%	26	53.8%	0.0%	232	41.8%	1.3%
	Jeon-buk	Cases	37	62.2%	0.0%	29	58.6%	6.9%	104	46.2%	1.0%
		Amount	19	36.8%	0.0%	42	83.3%	0.2%	159	22.0%	0.1%
	Jeon-nam	Cases	22	68.2%	0.0%	13	30.8%	0.0%	71	63.4%	1.4%
		Amount	15	73.3%	0.0%	3	20.0%	0.0%	108	26.9%	0.0%
South Coast	Busan	Cases	165	64.8%	1.2%	182	68.1%	4.9%	481	50.1%	3.7%
		Amount	101	59.4%	0.2%	75	69.3%	1.3%	658	35.6%	0.6%
	Ulsan	Cases	25	84.0%	0.0%	25	48.0%	4.0%	92	55.4%	2.2%
		Amount	31	93.5%	0.0%	12	16.7%	0.3%	48	27.1%	2.1%
	Gyeong-nam	Cases	83	65.1%	0.0%	118	73.7%	0.8%	394	63.7%	1.3%
		Amount	130	44.6%	0.0%	63	39.7%	0.0%	831	47.2%	0.1%
PYSR total		Cases	993	57.9%	1.2%	1446	51.2%	3.7%	4762	54.1%	2.6%
		Amount	2068	23.5%	1.9%	2547	14.7%	1.2%	7754	30.9%	1.2%
KOREA total		Cases	2577	49.3%	1.8%	4007	34.8%	5.9%	10492	44.6%	3.7%
		Amount	5408	23.3%	1.9%	6242	16.1%	2.3%	19616	23.1%	1.5%

Notes: [1] number of cases of reported investments; [2] USD 1 million; [3] % of total investment cases, [4] % of total investment amounts

Source: OECD calculations using data from Korea Export-Import Bank database (*www.koreaexim.go.kr*).

1.3 Fact files for the PSYR's ten key port cities[23]

1.3.1 Port cities in the Chinese Bohai Rim

Tianjin has a population of about 10 million and is located near China's political capital of Beijing. It has served as an important industrial base in North China, along with Dalian. In terms of economic development, Tianjin still lags behind other big leading cities in China. Tianjin's GDP per capita was USD 5 138 in 2006, whereas that of Shanghai at YRD was USD 8 187

and that of Guangzhou at PRD was USD 11 696. Recently, however, Tianjin has been rapidly catching up with those cities, driven by strong support from the central government and its geographical closeness to Beijing and the neighbouring countries of Korea and Japan. In particular, the Binhai New Area Project, ratified by the State Council in 2006 after a decade of construction, gives Tianjin great impetus for upgrading its economic structure and amplifying its growth potential. As one of China's prominent Special Economic Zones (SEZs), the Binhai New Area is comparable to Shanghai's Pudong Area and is rapidly emerging as a new growth engine in the Beijing-Tianjin-Hebei area (known as Jingjinji). Tianjin is also distinguished by its modernised international port, the largest in the Bohai Rim by capacity and the second largest for container volume. In 2007 it handled 7 million TEU,[24] which was an almost 10-fold increase over 1995 (702 TEU).

Dalian (population of 5.7 million) is major industrial city in northern China. As the second largest city in Liaoning Province, Dalian is serving as an important industrial centre for petroleum refining, general machinery, electronics and textiles. Dalian showed more than 10% annual GRDP growth rate since the 1980s and the biggest GRDP per capita (at USD 6 424 in 2006) of the Bohai Rim's four port cities. Of recent, Dalian is gradually transforming into a service-oriented economy. In 1978, its tertiary industry composition ratio was only 18%, but this rapidly increased to 45.2% in 2006, while the contribution of secondary industries to GDP substantially decreased, from 65.8% to 46.3%. Within the Dalian's service sector, tourism is one of the most rapidly growing industries and has been strongly supported by Dalian's local authority. Of notable is that the composition of Japanese and Korean firms in Dalian economy is overwhelming. As of 2008, the total amount of Japanese (USD 8.6 billion) and Korean (USD 2.5 billion) investment in Dalian jointly constituted 78.6% of the city's inbound FDI. Like other port cities in the Bohai Rim, Dalian has well-developed port infrastructure. The port's cargo handling volume has been expanded 12 times between 1995 and 2007. It mainly serves the three northeast provinces of China (Liaoning, Jilin and Heilongjiang), but also connects to Inner Mongolia, where 120 million people live. Dalian is also the origin of the Dalian-Harbin railway and Dalian-Shenyang highway, which constitute the backbone of the transport system in Northern China.

Qingdao (population 7.5 million) is a key port in Shandong Province and occupies a crucial position in the economic development of the Bohai Rim area. With its excellent connections to China's trunk rail line, its geographical proximity to Korea and Japan, and abundant cheap labour force and natural resources, Qingdao has been favoured by many Korean and Japanese firms for relocating their manufacturing bases since the 1980s. In fact, foreign direct investment from Korea and Japan has been a driving force of Qingdao's open economy. By the end of 2003, cumulative Korean investment

accounted for 45% of the total FDI in Qingdao, reaching USD 1.8 billion. Japan was the third largest foreign investor that same year. With its strong industrial base in textiles and other light industries, Qingdao has enjoyed a double-digit economic growth rate for the past two decades. Its GDP per capita in 2006 was USD 5 503. Thanks to recent massive investment in its port facilities, Qingdao is well positioned to act as a hub port for the Bohai Rim. Its container handling volume expanded more than 15 times in the last decade (from 0.6 million TEU in 1995 to 9.5 million TEU in 2007), making it one of the top ten ports worldwide in 2007 in terms of container handling volume. Of all the ports in China, Qingdao is the nearest to South Korea. The distance between Qingdao and Incheon is less than 200km, which is almost one-third of the flying distance (552 km) between Qingdao and Beijing.

Yantai (population of 6.5 million) is the second largest industrial city in Shandong Province after Qingdao (adjacent to Yantai). With the establishment of two sub-national level SEZs, Yantai is emerging as key manufacturing base in the Bohai Rim, in particular for its pillar industries including automobiles, shipbuilding and food processing. Yantai has also shown a strong presence in China's tourism industry, based on many favourable factors such as its fair weather and natural sightseeing attractions. However, Yantai's primary industry still constitutes a substantially bigger share of its GDP. In 2006, its share was almost 10%, the largest percentage of the Bohai Rim's four port cities. In addition, there is a clear disparity in terms of economic development between Yantai and the other key cities in the Bohai Rim which belong to Jingjinji line (or Beijing-Tianjin-Hebei). In 2006, Yantai had the lowest level of trade volume (USD 15 billion) and GDP per capita (USD 4 622) amongst four port cities in the Bohai Rim.

1.3.2 Port cities in Japanese Kyushu

Fukuoka City is Japan's gateway to East Asia. It has long been Kyushu's regional headquarters, both politically and economically. This city has the biggest population (1.3 million in 2007) and GDP per capita (USD 40 684 in 2006) in Kyushu and, combined with the neighbouring city of Kitakyushu, forms the fourth largest metropolitan city in Japan after Tokyo, Osaka and Nagoya. Traditionally, Fukuoka City has had extensive trans-border networks with China, Korea and other East Asian countries. Indeed, the expansion of economic exchange with Asian countries, in particular with China, has helped Fukuoka to maintain steady growth, even during the Japanese economy recession of the 1990s. As well as its favourable geographical location for trans-border trade, the city of Fukuoka has two other distinct advantages: its successful transition to a soft economy and the provision of superior infrastructure (Kim W-B, 2000). Fukuoka City has re-aligned its economic basis toward high-tech assembly and processing industries. The growth of

ICT has been remarkable in Fukuoka City since the 1990s. The city also has well established hard infrastructure. It hosts Japan's largest passenger port – Hakata. It also operates 22 direct international flight routes to East Asia. Among these routes, seven flights head directly to cities in the PYSR: Beijing, Dalian, Qingdao and Shenyang in China and Seoul, Busan and Jeju in Korea.

Kitakyushu City, another gateway between west Japan and East Asia, has historically played an important role in the modernisation of the Japanese economy, serving as a production base for key Japanese heavy industries such as steel and chemicals. The mainstay of Kitakyushu City remains heavy industries, although high-end industries such as semiconductors have been slowly growing thanks to recent industrial restructuring efforts. In 2006, secondary industry's contribution to Kitakyushu's GRDP was 24.2%, more than double that of Fukuoka City (11.6%). The growth of the environmental industry in Kitakyushu City is quite notable. Taking advantage of knowledge gained while struggling with serious pollution problems caused by dense manufacturing activities in the 1970s, the city is making remarkable progress in developing a recycling industry. The logistics industry is another backbone of Kitakyushu's economy. Kitakyushu Port is a key trading port between Japan and other Asian countries. In order to retain this position, Kitakyushu City has recently conducted large-scale infrastructure investments, including opening Kitakyushu Airport in 2006 and Hibiki container terminal in 2005.[25] Owing to this investment, the port's cargo volume increased significantly from 93 million tonnes in 2005 to 114 million tonnes in 2007 – an annual growth rate of 7.3%. Kitakyushu City had a population of 1 million and a GRDP per capita of USD 29 894 in 2006.

Shimonoseki City, at the south-western tip of Yamaguchi Prefecture in Chugoku region, is well-known as a fishing port in Japan. Shimonoseki City was merged with four neighbouring towns in 2005 to form the new city of Shimonoseki and was subsequently designated as a core city.[26] This merger has helped Shimonoseki to become a leading city for agricultural and fishing industries in the prefecture. Shimonoseki Port is a key port for freight distribution in western Japan, principally linking to northeast countries by virtue of its geographical proximity. In 2006, 75.7% of the containers departing from Shimonoseki Port went to Korea, and 44.5% of containers arriving at the port also came from Korea. China received 8.6% of the port's export cargo volume and contributed 29.9% of its import cargo the same year. In 2006, Shimonoseki had the smallest population (289 000 in 2006) and the lowest GDP per capita (USD 21 425 in 2006) of Kyushu's three port cities.

1.3.3 Port cities in the Korean PYSR

Busan is Korea's largest trading port and second largest metropolitan city after Seoul. It had a population of 3.6 million and a GDP per capita of USD 14 340 in 2006. It drove the export-oriented Korean economy in the 1970s and 1980s. However, Busan's contribution to the national economy has been shrinking since the 1990s. Its share of national GDP was 7.2% in 1985, but this dropped to 6.7% in 1995 and 5.4% in 2005. In the face of this weakening economic growth and rising pressure from domestic and overseas, Busan is currently restructuring its economy from labour-intensive manufacturing to knowledge-intensive services. Busan has made significant achievements in developing its logistics industry, taking advantage of its strategic location to efficiently connect nearby cities in Japan and China. Busan Port was ranked fifth largest globally in terms of container handling volume for six consecutive years from 2003 to 2008, increasing its cargo handling volume three times from 4 million to 13 million TEU between 1995 and 2008. Busan Airport also handles 18 direct international flights, of which three destinations are in the PYSR: Beijing and Qingdao of China and Fukuoka of Japan. Busan has also hosted several international events, such as the Asian Games in 2002 and the APEC summit in 2005, to improve its status as a convention city.

Incheon, the second largest trading port in Korea after Busan, was open to Western countries in 1882, and has since become a key port city in Korea. Incheon has favourable location to be a logistic hub. It borders Seoul, the capital of Korea, and Gyeonggi Province, Korea's largest manufacturing base. It is also within only 40 minutes distance by plane of Yantai in China's Shandong Province.[27] Incheon has invested massively in transportation infrastructure, including opening Incheon international airport in 2001. This airport was ranked fourth and eleventh globally in cargo and passenger volume in 2008 and 2007 respectively and has won the World's Best Airport award for four consecutive years (2006-2009). Owing principally to the rapid growth of its logistics industry, Incheon's GDP increased at an annual rate of 5.6% between 2000 and 2006. Its population also expanded from 1 million in 1979 to 2.6 million in 2006. In terms of GRDP composition by industries, Incheon has experienced a structural change. The share of secondary industry substantially decreased from 56.8% to 43% between 1995 and 2006, while that of tertiary industry increased from 41.5% to 56.1% over the same period.

Ulsan, home to Korea's heavy industries, has been contributing significantly to the country's economic success since the 1970s. Ulsan produced 1.6 million automobiles in 2007, or 40% of all automobile production in Korea. For a single city, it has the largest automobiles production outputs in the world. Ulsan is also well known for its shipbuilding industry. The total volume of shipbuilding orders in Ulsan in 2007 was 411 compensated gross

tonnes (CGT), which is 34% of all domestic ship-building volume and 12% of global volume. Attributed to the strong presence of these industries, Ulsan has a remarkably high GRDP per capita (USD 40 684 in 2006), the highest of the country's 13 provincial governments. However, the over-concentration of heavy industry has caused several problems for Ulsan, including environmental concerns and a monolithic regional economy structure. In 2006, secondary industry contributed almost 75% of Ulsan's GDP, while tertiary industry contributed 19.5%. Against this backdrop, in early 2008, Ulsan City government presented *The Basic Plan for the City's Global Development* in order to set various strategies for becoming an "advanced industry promotion city".

1.4 Trans-border co-operation: a conceptual framework

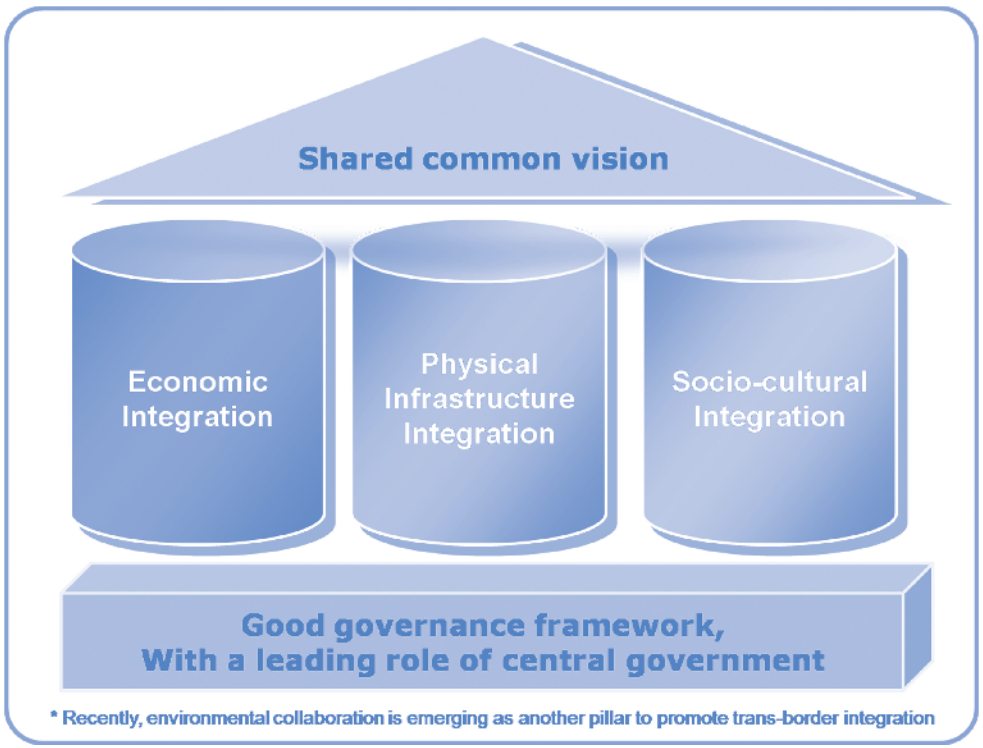
Previous OECD territorial reviews of trans-border cases (OECD, 2003a; OECD, 2003b) and the experiences of European and North American trans-border co-operation have revealed certain common preconditions for building integrated regions across borders. The PYSR can draw lessons from these (see Annex A for more):

- A shared common vision is a principal precondition for any trans-border co-operation. Unless all stakeholders share a common sense of destiny, their collaboration tends to lose direction and can be highly fragile. In both Europe and North America, most cases of successful trans-border co-operation started with a shared common identity.
- Economic exchange, integrated physical infrastructure and a socio-cultural network are the three principal pillars of a well-integrated trans-border region. Economic exchange is often driven by private interest taking advantage of the complementarities of each different economy and is frequently the catalyst for forging trans-border communities. Physical infrastructure can intensify co-operation: transportation and telecommunication enable the efficient flow of goods, people and ideas. Social and cultural networking is also crucial for developing co-operative relationships. The exchange of human capital helps to build mutual trust and link research institutions to generate a new knowledge pool. Other than those three pillars, recently environmental collaboration is emerging as another important pillar to promote integrated trans-border region.
- Trans-border co-operation needs to be established on good governance system. Institutionalising vertical and horizontal governance structures ensures stable and effective co-operation. In particular, while co-operation is being built, the active engagement of supra-national organisation and/or national government is indispensable.

In Europe, financial support from the EU has been pivotal for facilitating trans-border co-operation. In North America, strong backing from the state government was also a key for the emergence of a trans-border region.

In sum, appropriate development of trans-border co-operation needs to be founded on good governance led strongly by central government and to be underpinned by the three pillars of co-operation (*i.e.* economy, infrastructure and socio-culture), all under the "roof" of a shared common vision (Figure 1.2). In Chapter 2 we analyse the principal pillars which fortify trans-border co-operation in the PYSR. Finally, in Chapter 3 we review a governance structure in the PYSR as a common platform for aligning these co-operation sectors harmoniously.

Figure 1.2. **A conceptual framework of a fully integrated trans-border region**



Source: OECD

Notes

1. The Southern China Growth Triangle (SCGT) is composed of Hong Kong, Guangdong and Fujian of China and Chinese Taipei.
2. The SIJORI is composed of Singapore, Johor in Malaysia and Riau in Indonesia.
3. The national share of inbound FDI of China from Korea and Japan was 7.3% and 6.1% in 2006, respectively (National Bureau of Statistics of China, 2008).
4. For example, Kyushu Economy International (KEI), see *www.kyushu-kei.org/kankokai/about.html*.
5. According to this definition, Korea's east coast area is also included in the PYSR.
6. The PRD consists of Guangdong Province, Shenzhen City and Hong Kong.
7. The YRD consists of Shanghai City, Jiangsu Province and Zhejiang provinces.
8. The Bohai Rim normally includes Beijing City but we excludes it because, unlike other target cities of this paper, Beijing is a capital city (rather than a second-tier city) and has not its own port.
9. The OEAED changed its name in 2004 from the East Asian City Conference, which was founded in 1991 with six member port cities (Dalian, Qingdao, Kitakyushu, Shimonoseki, Incheon and Busan).
10. For instance, according to Kim W-B (2000), in 1998, Chinese PYSR accounted for 78% (84% in 2006) of the PYSR's total population, but produced only 22% (39.8% in 2006) of its GDP. However, please note that the geographical definitions in his research differ slightly from this paper.
11. The Ming and Qing Dynasty in China, Tokugawa Bakufu in Japan and Chosun Dynasty in Korea.
12. Chen (2005) asserts that, even after the 1400s, the trans-border sub-region had been active through the China-centric tributary system and the geographic structure of maritime Asia.
13. MNE is generally defined as a corporation that manages production or delivers services in more than one country. It is also called as Multi-National Corporation

(MNC). According to UNCTAD (2006), there were 77 000 MNEs and 770 000 subsidiary companies as of 2005.

14. In the same year, the EU 15 countries had an average unemployment rate of 7.8%.

15. The share of foreign residents in Spain, Germany and UK represented 10.3%, 8.2% and 5.8% respectively in 2006 (OECD, 2008c).

16. The figures for the other OEAED cities are: Dalian 0.3%, Qingdao 1.3%, Yantai 0.2%, Kitakyushu 1.1%, Shimonoseki 1.3%, Incheon 0.5% and Ulsan 0.4%. All data are from OECD computation based on official websites of National Bureau of Statistics of China (www.stats.gov.cn/enGliSH), Japan Statistics Bureau (*www.stat.go.jp/english/*) and Korea National Statistical Office (*www.stat.go.jp/english/*).

17. Kyushu's GRDP in 2005 was JPY 4.7 trillion, exceeding the GDPs of both Belgium (USD 392 billion) and Switzerland (USD 374 billion) in 2006.

18. In order to be a "designated city", cities need to have more than 500 000 people. Once designated, many of the functions which were normally performed by the prefectural governments, such as public education, social welfare, sanitation, business licensing and urban planning, are delegated to the designated cities to administer themselves.

19. The largest province in terms of trade volume in China in 2006 was Guangdong Province (USD 500 billion) in the Pearl River Delta (PRD) area.

20. The second largest trading country of Shandong, Hebei and Tianjin in 2008 was US, representing 12.6%, 9.4% and 14.5% of total trading volume of respective provinces.

21. When the three YRD provinces are included, this share rises to more than 70%.

22. Even for import values in the same year, Fukuoka Prefecture was top (39%), followed by Kagoshima (29%) and Oita (21%) prefectures.

23. OECD collected most of the information in this section using official websites, statistical yearbooks, city pamphlets and other information notes of each city. Some data in this section is based on Kim W-B (2008).

24. The TEU (Twenty-foot Equivalent Unit) is a measurement unit corresponding to the volume of a 20-foot long intermodal container.

25. According to Kitakyushu City, both airport and seaport could operate 24 hours a day to provide a consistent and convenient logistics service to businesses.

26. A core city differs from a designated city in that not as many functions are delegated from the prefectural government. In order to become a core city, its population must exceed 300 000.

27. The flying distance between Incheon-Yantai is 450 km.

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City of Qingdao, *www.qingdao.gov.cn*

City of Dalian, *www.dl.gov.cn*

City of Yantai, *www.yantai.gov.cn*

Port of Kitakyushu, *www.kitaqport.or.jp*

Port of Shimonoseki, *www.shimonoseki-port.com*

Busan Port International Passenger Terminal, *www.busanferry.com*

Chapter 2

Towards deepening trans-border co-operation in the Pan Yellow Sea Region

As we described in the previous chapter, regional integration in the PYSR has been primarily driven by business sectors taking advantage of economic complementarities across borders, combined with the favourable waves of decentralisation and globalisation since the 1990s. Following this economic integration, many other sectors in the PYSR have also built extensive inter-regional networks. One notable case is the transportation network. Having benefited from their world-class port facilities, many cities in the PYSR have actively constructed dense port linkages to be the backbone of regional integration. Another example is the socio-cultural network, inspired by historic ties and intensified further by the increasing movement of people and goods across borders. Especially among the younger generation in the PYSR, cultural exchanges are sharply growing. The environmental co-operation network has also had substantial outcomes. Many dialogue channels are being created and several projects to address common environmental concerns in the PYSR have been launched. Against this background and a conceptual framework developed in Section 1.4, in this chapter we first analyse the PYSR's production network (Section 2.1), then move on to the transportation network (Section 2.2) and the socio-cultural network (Section 2.3). Finally in Section 2.4 we discuss environmental co-operation.

2.1 Evolving production networks in the PYSR

Since the 1990s, the PYSR has achieved outstanding economic growth, attributed principally to vigorous manufacturing activities in the region. Total manufacturing outputs for the three PYSR countries in 2007 were 29.1% of the global share, up from 19.8% in 1990. On top of this quantitative expansion, the manufacturing sector in the PYSR has also undergone an unprecedented qualitative change in its trans-border production network structure. Prior to the 1990s, trade in the PYSR was clearly dominated by a typical north-south trade

pattern (Ando, 2006), referred to as "inter-industry trade". Within the PYSR, China exported natural resources-based and labour-intensive final products, while Japan and Korea exported a wide range of capital-intensive final goods which varied in their technology level. This simple exchange of final products among different industries didn't necessarily require the establishment of a complicated trans-border production network in the PYSR. However, since the early 1990s, production processes in the region have been swiftly fragmenting. In order to minimise total production costs, vertically-integrated manufacturing nodes for commodities within the same industry are being divided into ever smaller processes and then relocated across borders, with each country in the PYSR specialising in a particular stage of the production sequence. This fragmentation has brought a drastic increase in the trade of parts, linking production back and forth across borders. Hence, *intra*-industry, rather than *inter*-industry, trade has become more important.

More recently, the PYSR's trans-border production network has advanced further. As the technology catch-up of China to Korea, as well as that of Korea to Japan, is rapidly progressing, the horizontal division of labour in the PYSR is growing fast, although the vertical production network is still widespread. The share of high-tech products in total intra-regional export has sharply increased since the start of the 2000s (Bang, 2008c). In addition, an increasing number of Japanese and Korean Multi-National Corporations (MNEs) investing in China are seeking upstream functions such as R&D. This differs from the previous concentration on downstream functions in China such as simple assembly. According to Greenaway *et al*. (1995), this could imply that the PYSR production network is gradually shifting from vertical to horizontal one as goods within the same industry are increasingly differentiated by attributes rather than quality or technology.

This section begins with an overview of manufacturing outputs in the PYSR (Section 2.1.1). We then present the theoretical background of multi-national production networks (Section 2.1.2) and describe patterns of trans-border trade and investment in the PYSR (Section 2.1.3). This is followed by analysis of trade structures changes in the PYSR to see the development of more horizontal production network in this region (Section 2.1.4). We lastly review two case studies of the automobile industry to explore the dynamics of a real production network in the PYSR (Section 2.1.5). Our analysis in this sub-chapter tries to include sub-national statistics, but due to limited data availability, state-level data are mostly used.

2.1.1 Expansion of manufacturing outputs in the PYSR: an overview

Manufacturing in the PYSR has significantly expanded over the last two decades. The total global share in real GDP of all the industries of the three PYSR countries (*i.e.* China, Japan and Korea: hereafter define these three

countries constitute Northeast Asia) notably increased, from 13.9% to 17.8% between 1980 and 2005, while it stagnated in the North American Free Trade Agreement (NAFTA) and even declined in the EU over the same period (Table 2.1). This GDP growth in the PYSR countries is closely linked to the region's dramatic increase in manufacturing outputs. The aggregate global share of manufacturing outputs in the three PYSR countries rose from 19.8% to 29.1% between 1990 and 2007, far outstripping that of the US in 2007 (22.1%). In particular, China's achievement is remarkable. China's global share sharply increased from 2.8% to 13.9% over the same period to make it the world's second largest manufacturer after the US in 2007 (Table 2.2). Korea has also expanded its global manufacturing share considerably, growing 7.5% per annum from 2000 to 2007, to become the ninth largest global manufacturer in 2007. For Japan, although its manufacturing output growth rate has recently been modest (1.8% annually between 2000 and 2007), it still contributed 12.5% to the global share and was the world's third biggest manufacturer in 2007.

Table 2.1. **Percentage global share in real GDP, 1980-2005**

%, real dollar bases (1990 constant prices)

	NAFTA	EU	Northeast Asia	China	Japan	Korea
1980	33.4%	28.9	13.9	1.0	12.2	0.7
2005	34.6%	24.8	17.8	5.4	10.5	1.9

Source: World Bank (2009)

Table 2.2. **Global manufacturing output, 1990-2007**

Billion USD (1990 constant prices)

	1990		1995	2000	2005	2006	2007		Annual growth rate (2000-2007)
China	143	(2.8%)[1]	323	525	881	969	1084	(13.9%)	15.2%
Japan	804	(15.7%)	817	867	923	987	977	(12.5%)	1.8%
Korea	65	(1.3%)	95	140	193	210	214	(2.7%)	7.5%
Sub-total	1 012	(19.8%)	1 235	1 532	1 997	2 166	2 275	(29.1%)	6.9%
US	1 041	(20.3%)	1 212	1 516	1 651	1 663	1 724	(22.1%)	2.0%
Germany	438	(8.6%)	419	467	492	521	525	(6.7%)	1.8%

Note: [1]Percentages are for global share of manufacturing

Source: OECD calculations using data from UNSTATS (*http://unstats.un.org/unsd/snaama/dnllist.asp*)

The three PYSR countries have demonstrated a particularly strong presence in the following four manufacturing sectors: shipbuilding, automobiles, electronics and steel production. Most notably, these three countries jointly produced 85.2% of the world's ships in 2007, aggressively expanding the region's global share by nearly 13 percentage points within a decade (Table 2.3). In terms of a new order basis, Korea, China and Japan respectively produced 32.8, 31.3 and 10 million CGT[1] in 2007, accounting for 37.7%, 36% and 11.5% of global share. This ranked them as the first, second and third biggest shipbuilders worldwide correspondingly in 2007. For automobiles, the total global share of the three PYSR countries reached 33.6% in 2007. Japan became the world's largest auto manufacturer in 2006 by producing 11.4 million units, overtaking the US. For the same year, China and Korea produced respectively 8.8 and 4 million automobiles, making them respectively the third and fifth largest car manufacturers. In the case of electronics, the global share of the three PYSR countries also increased considerably, from 32.4% to 41.6%, between 1995 and 2007. In particular, China's global share in electronic products rose ten times over that period, and the country was producing more than one-fifth of the world's electronics in 2007. The global steel industry is also dominated by the three PYSR countries in terms of production volume. In 2005, almost one out of two steel products worldwide was manufactured by these three countries. China also cut a conspicuous figure in this industry, doubling its global share from 15% to 31% within only a half decade in the 2000s.

Table 2.3. **The PYSR's percentage global share of major manufacturing items, 1995-2007**

% share of global production

	Shipbuilding[1]			Automobiles[2]			Electronics[3]			Steel production[4]		
	1997	2000	2007	1995	2000	2007	1995	2000	2007	1995	2000	2005
China	4.0%	6.7	36.0	3.0	3.5	12.1	2.7	5.9	22.7	12.7	15.0	31.0
Japan	42.1%	25.7	11.5	20.7	17.4	15.9	25.5	19.3	11.8	13.5	12.6	9.8
Korea	37.6%	36.2	37.7	5.3	5.3	5.6	4.2	5.6	7.1	4.9	5.7	6.4
Sub-total	72.3%	68.6	85.2	28.9	26.3	33.6	32.4	30.8	41.6	34.6	36.2	49.4

Note: Order basis for shipbuilding figures.

Sources: OECD calculations using data from the following: (1) Shipbuilding; Lloyd's Register-Fairplay (2008), *World Shipbuilding Statistics*, December 2008; (2) Automobiles; International Organisation of Motor Vehicle manufacturers (OICA), Automobile production statistics, each year, *http://oica.net/category/production-statistics*; (3) Electronics; Reed Electronics Research (2008), *Consumer electronics in Asia-Pacific*; (4) Steel production; World Steel Association (WSA), *Steel statistics archive*, *www.worldsteel.org/?action=stats_search*.

Sub-national level

This national pattern of expanding manufacturing outputs in the PYSR is also well reflected at the sub-national level. Most provinces in the PYSR have seen remarkable growth in their manufacturing sectors since the 1990s, showing similar industrial specialisation at the state level.

The Chinese Bohai Rim is distinguished for electronics, steel and automobiles (Kim K-S *et al.*, 2008). Both Hebei and Liaoning provinces are the centres of China's steel production, accounting for 17.9% and 8.2% respectively of the country's total rolled steel production in 2006. Tianjin City has been developed as China's major manufacturing base for high-tech information and computer technology (ICT) products. In 2006, it produced more than 6 million mobile phones, accounting for 21% of all China's production. Meanwhile, Shandong Province is well known in China for producing white home electronic appliances. In 2006, it produced 30.4% of China's refrigerators and 12.6% of its televisions. Of interest is that these four provinces in the Chinese Bohai Rim have all served as key manufacturing centres for automobiles. Indeed, in 2006, four provinces in the Bohai Rim together produced 1.4 million cars, or nearly one-fifth of China's total car production (Table 2.4).

Table 2.4. **The Bohai Rim's national share in key manufacturing products, 2006**

Province	Production items (production volume, national share)
Liaoning	White iron (37 million tonnes, 9.2%), Rolled steel (38 million tonnes, 8.2%), Crude oil (13 million tonnes, 7.2%), Automobiles (280 000, 3.8%), Cement (32 million tonnes, 2.7%)
Hebei	Steel (90 million tonnes, 21.5%), Pig iron (82 million tonnes, 20.4%), Rolled steel (84 million tonnes, 17.9%), Cement (84 million tonnes, 6.9%), Cloth (28 billion metres, 5.1%), Automobiles (260 000, 3.6%)
Tianjin	Mobile phones (63 million, 21%), Computer monitors (6.9 million, 17%), Crude Oil (19 million tonnes, 10.6%), Automobiles (410 000, 5.6%), Rolled steel (21 million tonnes, 4.5%)
Shandong`	Refrigerators (10 million, 30.4%), Colour TVs (10 million, 12.6%), Crude oil (2,755, 15.3%), Air-conditioners (5.5 million, 8.1%), Cement (165 million tonnes, 13.4%), Automobiles (490 000, 6.7%)

Source: Kim K-S *et al.* (2008).

Japan's Kyushu region, which has a relatively large share of primary industry (2.5% of its GRDP) compared to the national average (1.2%), did not have a thriving manufacturing sector until recently, when Kyushu's national share in manufacturing has expanded substantially. In terms of export shipment value, it increased from 6% in 1985 to 6.9% in 2006 (Kyushu Economic Research Center, 2008). The food industry still takes the largest share in Kyushu (12.3% of shipment value in 2006), but has exhibited a negative annual growth rate since 2000 (Table 2.5). In the meantime, the electronics

and automobile industries, Kyushu's second and third largest industries respectively as of 2006, have shown dramatic growth. Between 1985 and 2006, the shipment value of electronics and transport machinery increased 196% and 116%, showing that these two industries have played a leading role in transforming the region into a high-end industrial centre. In particular, Kyushu's transport machinery has shown outstanding expansion since 2000, recording an 11.7% annual increase in shipment value.

Table 2.5. **Pattern of shipment value of fifth-largest industries of Kyushu, 1985-2006**

(Shipment value, billion JPY)

	1985	1995	2000	2006	National share (2006)	Increases (2006/1985)	Annual increase (2000-2006)
Food	3216	3941	3993	3953	12.3%	22.9%	-0.2%
Electronics	1727	3306	4044	3742	7.3%	116.7%	-1.2%
Transport machinery	1235	2042	2153	3660	6.1%	196.4%	11.7%
General machinery	1148	1474	1785	1696	5.1%	47.7%	-0.8%
Chemicals	1267	1275	1179	1463	5.6%	15.5%	4.0%

Source: OECD calculations using data from METI Kyushu Bureau (2007) and Kyushu Economic Research Center (2008).

The Korean PYSR has also seen significant progress in its manufacturing sector. Of the eight coastal provinces (including provincial cities), Gyeonggi Province has taken an unrivalled position in manufacturing. In 2006, it produced 24.7% of national manufacturing outputs in terms of shipment value and accounted for 28.2% of manufacturing employees in Korea. After Gyeonggi, Gyeong-nam Province and Ulsan City on the south coast have also contributed a large share of industrial outputs. They contributed 10.0% and 11.4% of national manufacturing production in 2006 respectively (Table 2.6). In the cases of individual industries, Gyeonggi Province produced 72.9% of Korea's computers (and computer-related) products in 2006. Ulsan manufactured 52.3% of the country's petroleum products, while Gyeong-nam produced 47.8% of transport equipment (except automobiles) in that same year. Gyeonggi and Ulsan jointly produced 2 million automobiles, representing 53.8% of national production in 2006. Notably, electronics (including computers) and transport equipment (including automobiles) were ranked as Korea's top two export commodity sectors in 2008, representing 23.3% and 11.5% of Korea's total export value in that year, respectively.[2]

Table 2.6. **Percentage share of Korea's coastal provinces in national manufacturing production, 2006**

	Manufacturing overall		
	Share of employee	Shipments value	Major industries (national share, in terms of shipments value)
Incheon	7.5%	5.6%	Machinery (12.0%), Metals (10.6%), Motors (4.7%), Electrics (6.6%), Petroleum products (5.6%)
Gyeonggi	28.2%	24.7%	Computers (72.9%), ICT (33.3%), Chemicals (18.9%), Metals (30.7%), Machinery (25.4%), Motors (26.9%)
Chung-nam	5.0%	7.9%	Petroleum (12.1%), Chemicals (11.4%), Non-metallic (8.7%), ICT (9.6%), Optical instruments (7.0%)
Jeon-buk	2.6%	2.6%	Motors (5.9%), Textiles (2.9%), Chemicals (4.6%), Non-metallic (5.8%), Metals (1.7%)
Jeon-nam	2.6%	6.0%	Petroleum (28.4%), Chemicals (21.6%), Non-metallic (7.6%), Metals (14.8%), Transport equip (5.9%)
Busan	6.6%	3.6%	Leather (19.9%), Apparel (6.9%), Metals (7.8%), Machinery (5.2%), Electrics (3.6%)
Ulsan	4.3%	11.4%	Petroleum products (52.3%), Transport equip (38.2%), Motors (28.8%), Chemical (20.9%), Metal (9.2%)
Gyeong-nam	10.3%	10.0%	Transport equip. (47.8%), Machinery (28.5%), Metals (16.3%), Electrics (10.1%), ICT (6.8%), Optical instruments (9.6%)

Source: OECD calculations using data from Kim K-S *et al.* (2008), Korea National Statistical Office (KNSO) (2008a) and KNSO (2008b).

2.1.2 Trans-border manufacturing networks: theoretical background

According to traditional trade theories, international trade is principally triggered by differences in factor endowment between countries, leading to different countries specialising in different industries. Thus, the international division of labour is engaged in the exchange of varieties of end-products subject to different industries (Sven and Kierzkowski, 2001). This pattern of trade is called inter-industry trade (or one-way trade). In reality, however, international trade frequently occurs between countries with similar factor endowments for different features of a given commodity within the same industry – known as intra-industry trade (IIT; Greenaway *et al.*, 1995). In fact, 57% of US trade in 1996 took place within the same industry and more than 60% of European trade in the same year was also intra-industry[3] (Ruffin, 1999). A notable feature of IIT is that, among total trade volume within the same industry, parts and components rather than final products have increasingly taken a large share, revealing a strong tendency for intra-industry manufacturing specialisation.

Intra-industry specialisation can take place where the various phases of a production process are physically amenable to fragmentation. This specialisation process can increase the gains from trade by better exploiting economies of scales as intra-industry trade leads countries to concentrate on a limited number of products within a given industry. In general, however, fragmentation process may undermine certain areas, such as communication and co-ordination among separated production bases in a given product process. Thus, in the past, spatial separation of manufacturing bases was not common and hence stayed within national boundaries. But thanks to rapid advances in transportation and telecommunication technologies, as well as the drastic removal of trade regulatory barriers, the geographical distance between production bases has been losing its significance.

Within these settings, MNEs have emerged as the main driving force in extending fragmentation processes across borders since the mid-1980s (Fukao *et al*., 2003). Taking advantage of favourable global trade environments, MNEs have cut their previously internalised activities into thin slices and are placing them wherever production costs are lowest, regardless of national boundaries. In this splitting of a product process, MNEs continue to engage in high-value manufacturing activities, whereas they are increasingly compelled to outsource a large portion of their simple manufacturing functions from independent manufacturers overseas (Yeung, 2006). This fragmented production process unsurprisingly leads to increasing trade in parts across borders. MNEs pull together parts and components from their globally scattered production bases to produce the final goods. They transact parts back and forth with their affiliates operating overseas. Attributed to this increasing intra-firm as well as arm's-length transaction, global parts trade has been on the sharp rise in recent decades (Ando and Fukunari, 2003). According to Bang (2008c), the volume of global parts trade increased at an average annual rate of 11.9% between 1992 and 2006.

While this evaluation of intra-industry trade has been a key development in international trade theory, recently a great deal of theoretical effort has been focused on another important area: distinguishing intra-industry trade by vertical and horizontal product differentiation. Horizontal intra-industry trade (HIIT) involves different varieties of similar quality but differentiated attributes, whereas vertical intra-industry trade (VIIT)[4] involves different varieties of different quality[5] (Greenaway *et al*., 1994). Vertical IIT occurs when two countries with different income distributions have different factor endowments in the homogeneous product or industry. Trade in the automobile industry between the Western European countries and the transition economies of the Eastern European countries, such as Czech and Slovak, is a good example of this vertical form of IIT.[6] Germany, a high-income country, exports high-quality products like engines, whereas Slovak, a low-income country, exports low-quality products like accessories. However, the

products from both countries belong to the same automobile industry. As such, differences in technology and income distribution are two key features of vertical IIT. On the other hand, in horizontal IIT products are differentiated because of certain attributes, while individuals of each trading country consume products which are fundamentally the same in terms of quality, cost and even technology employed in their production. For instance, Germany exports high-end cars to France but simultaneously imports same class cars from Italy. In this context, vertical IIT would be more pronounced between developing and developed economies, whereas horizontal IIT could more appropriately explain intra-industry trade among developed economies, such as the members of the EU (Fukao *et al*., 2003).

Flying geese model vs. leapfrogging model: theories for manufacturing networks in East Asia

Until the 1980s, East Asia's trade structure was clearly dominated by typical inter-industry trade (Ando, 2006). Different sets of countries in East Asia with different technology levels specialised in different products. Countries at the bottom of the "quality ladder" exported labour and resource-intensive products, while countries at the top of the ladder, like Japan, exported capital-intensive and technologically sophisticated products. Under this production scheme, countries in East Asia mostly traded final goods which were produced within each country. This pattern of production and trade in East Asia fits well to the conventional trade theory of comparative advantage, implying that factor endowment differences largely determine the production location, as well as the trade flow.

In the 1970s, Japan had already relocated labour-intensive industries such as textiles to the lower-tier group of Korea and Chinese Taipei when it was advancing into higher technology sectors. Within a decade, countries in the second-tier group were moving into electronics and automobiles as Japan relocated production bases of these industries overseas. At this point they conceded the leadership in the textiles industry to newcomers in Southeast Asia. As such, in the 1980s, East Asia's production network had exhibited a substantial hierarchy of technology, with competitiveness in previously established export sectors shifting from higher tech countries to lower tech ones, whilst higher tech countries acquired competitiveness in new product lines (UNCTAD, 1993). This catching-up processes of industrialization in East Asia could be well explained by the "flying-geese model".[7] According to the model, industrial development in East Asia is transmitted from the front goose of Japan to the second-tier geese of the newly-industrialising economies (NIEs),[8] which in their turn lead the third-tier geese in East Asia, such as the ASEAN countries[9] and China. As the less industrialized countries import goods from the developed country, the diffusion of new technologies

begins and their industrial capacities are strengthened. Over time, the late-comer economies produce import-substitution products and start to export consumer goods, while the leading country manufactures more sophisticated capital goods (Kasahara, 2004)

Yet the validity of this flying-geese model has been substantially diminished since the 1990s. Although some scholars, including Kwan (2002),[10] argue that the industrial development of East Asia is still in line with the flying-geese model, a growing number of scholars support the significant disruption of the conventional flying-geese pattern. Japan has been losing its energy to lead the remaining geese, after experiencing a "lost decade" in the 1990s (Furuoka, 2005), while countries in the second-tier group have been increasingly competing among themselves, as well as with Japanese firms, investing explosively in China and other ASEAN countries thanks to their increased domestic capital accumulation (Yusuf, 2006). More importantly, as the front end of the flock of geese has become crowded together, the back of the flock has also become overcrowded mainly due to China's entry into the global market (Korkut, 2002). China's global share of exports has far outstripped four ASEAN countries since the 1990s even for the product groups that were the top 10 manufactured exports of those countries between 1988 and 1990 (World Bank, 1998).

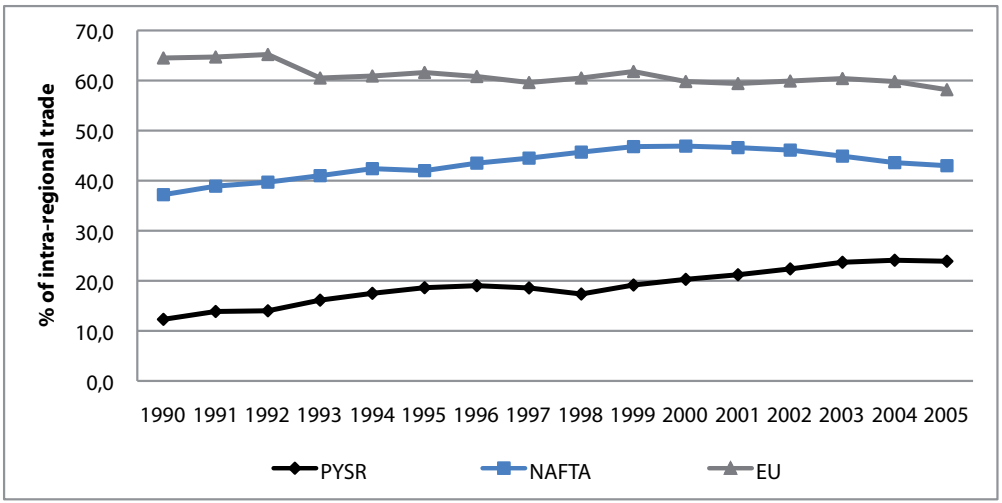
The conventional division of labour in East Asia implied by the flying-geese model has been further disrupted in the 2000s. The technology catch-up by the NIEs and China has rapidly progressed, not only in labour-intensive but also technology-intensive products. Horizontal intra-industry trade is remarkably increasing in East Asia, especially in Northeast Asia, although the majority of trade is still largely vertical IIT. Indeed, both China and Korea's export structures are becoming similar to Japan's, even for high-tech products (Kim and Lee, 2003; see also Figure 2.5). In this context, East Asia's production and trade pattern can no longer be fully explained by a simple flying-geese model. In fact, the Japanese Ministry of Economy, Trade and Industry recognises that the complementary division of labour in East Asia is giving way to a new pattern in which competition between countries is intensifying (METI, 2001). Further on this, Kim W-B *et al.* (2008) claims that Northeast Asia's uni-polar flying-geese development path could eventually evolve into a multi-polar growth pattern, although this is unlikely to happen in the very near future. In line with this growing number of assertions, as the APEC Economic Committee (2005) indicated, the applicability of the so-called "leapfrogging" hypothesis to the current development path in East Asia is notably increasing. According to this hypothesis (Krugman *et al*., 1993), owing to occasional major changes in technology, some developing countries could skip the learning stages involving inferior technology and enter the market for advanced technologies directly.

2.1.3 Trans-border trade and investment in the PYSR

Intra-regional trade

China's emergence in the 1990s has significantly intensified economic interdependency among the three countries of the PYSR. To make the most of complementary economy structures, hundreds of Japanese and Korean firms have established production networks in China, actively seeking fragmentation of their manufacturing processes. This increase of fragmentation has resulted in a sharp rise in intra-industry trade across borders in the PYSR over the last two decades. China-Korea trade volumes soared after diplomatic normalisation in 1992, while that of China and Japan also bounced back from 1991 onwards, ending the decline of the 1980s. With these two axes of trade, the share of intra-regional trade in the PYSR countries' total trade volume almost doubled from 12.7% to 23.9% between 1990 and 2005. Although this share is still smaller than in NAFTA (which was 43% in 2005) and the EU (58.2% in 2007), it is noteworthy that the PYSR's level was reached without any type of economic bloc; the EU and NAFTA achieved their level under the umbrella of formal economic blocs (Figure 2.1).

Figure 2.1. **Comparison of the percentage share of intra-regional trade in the PYSR, NAFTA and EU, 1990-2005***

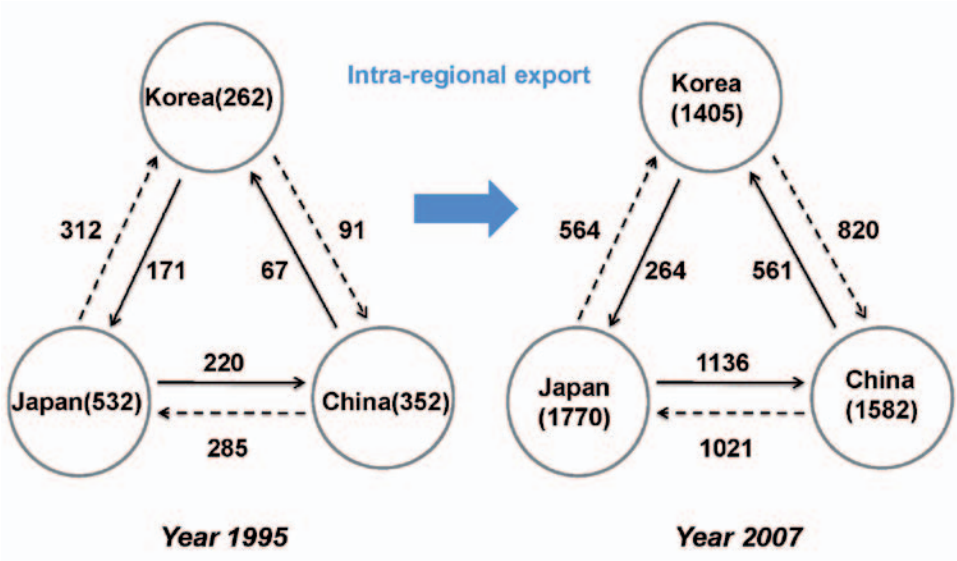


Note: % of intra-regional trade (sum of exports and imports) in total global trade (left scale).

Sources: Bang (2008a)

Figure 2.2. **Changes in trade structure of the three PYSR countries between 1995 and 2007**

Volume of intra-regional exports in 100 million USD, current price of each year



Note: Figures in parentheses mean total export volume of a certain country to its trading countries in the PYSR.

Source: OECD calculations based on data from the *Trade statistics database* of Korea International Trade Association (KITA), *http://stat.kita.net*.

Another interesting feature for intra-regional trade in the PYSR is that China's dependency on Japan and Korea has continuously decreased since the 1997 Asian crisis, while both Japan and Korea's export dependency on China has sharply increased (Bang, 2008b; see Figure 2.2). Trade share of China in Japan and Korea's total trade volume expanded from 7.4% to 17.7% and 6.2% to 19.9% respectively between 1992 and 2007, while China's intra-regional trade ratio fell from 26.5% to 18.2% during the same period (Table 2.7). This is mainly due to China's sharp decline in intra-regional exports, from 23.6% in 1995 to 13% in 2007. China's reduced intra-regional dependency reflects the country's unique role in the PYSR's economy; while still importing a larger share of capital and intermediary goods from Japan and Korea, China is exporting more final products offshore, such as to the US and EU (Box 2.1).

Box 2.1. **The PYSR countries' major trading partners, 1992-2007**

The growing, but asymmetric, trade dependency among the three PYSR countries is also well reflected in the changes of each country's trade partner rankings. For Japan, China was the second largest trading economy until 2006 but has become the most important one in 2007, overtaking the US, whereas Korea has remained in third place since the mid-1990s. For Korea, China has been its most important trading partner since 2006, while Japan was its third largest trading country. In the case of China, however, the US was still its biggest trading country in 2007, leaving Japan and Korea as the second and fourth largest trading partners, respectively.

	China			Japan			Korea		
Ranking	1992	1996	2007	1992	1996	2007	1992	1996	2007
1	HK	Japan	US	US	US	China	US	US	China
2	Japan	US	Japan	Germany	China	US	Japan	Japan	US
3	US	HK	HK	CT	Korea	Korea	HK	China	Japan
4	CT	Korea	Korea	Korea	CT	CT	Germany	HK	Saudi
5	Germany	CT	CT	China	Germany	Australia	China	Germany	Germany

Notes: in terms of total trade volume, CT: Chinese Taipei, HK: Hong Kong.

Source: OECD calculations using data from the *Trade statistics database* of KITA.

Table 2.7. **Trade interdependency of the three PYSR countries, 1992-2007**

% of total trade of each country with its trading partner

	1992	1995	2000	2005	2007
China ←→ Japan + Korea	18.2%	26.5%	24.8%	20.8%	18.2%
(only export basis)	(16.5%)	(23.6%)	(21.2%)	(15.6%)	(13.0%)
Japan ←→ China	5.1%	7.4%	10.0%	17.0%	17.7%
Korea ←→ China	4.0%	6.2%	9.4%	18.4%	19.9%

Notes: The share of trade is the average of export and import share.

Source: OECD calculations using data from the *Trade statistics database* of KITA.

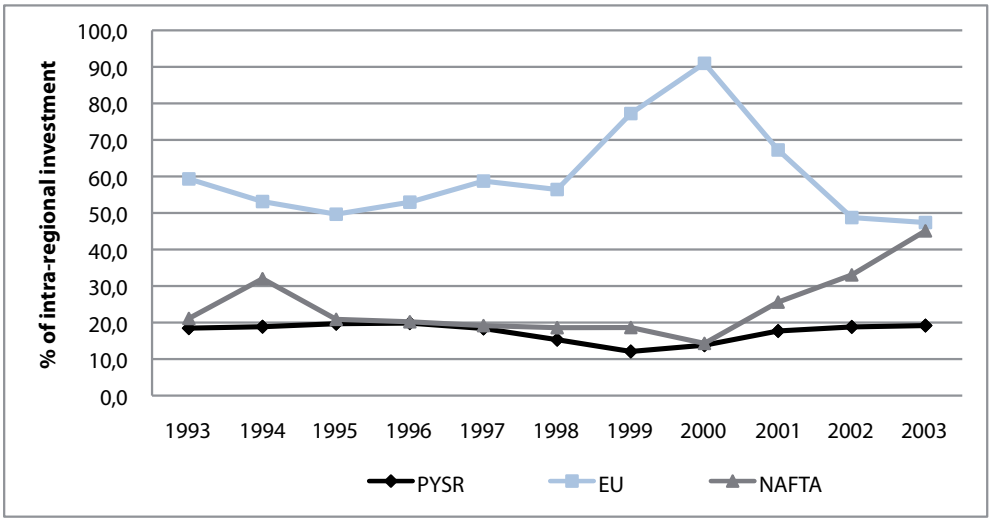
Intra-regional investment

In general, trade and investment can interact in a mutually reinforcing way. Investment can lead trade (*e.g.* investment results in new parts exports from the home country), or trade can contribute to investment (*e.g.* exports require new offices to be established overseas for import-related services). However, investment and trade can be also substitutes, as they are both ways of selling products to foreign customers (Petri, 1994). Thus, the relationship between trade and investment can vary across countries and is too complex to draw clear conclusions (Sakakibara and Yamakawa, 2003).

In the case of the three PYSR countries, the overall sign of intra-regional trade and intra-regional investment seems to be neutral. Unlike intra-regional trade, intra-regional investment in the PYSR has remained static. While intra-regional trade increased from 12.7% to 23.9% between 1990 and 2005, the share of intra-regional investment among total inbound and outbound investments of the three countries only slightly increased from 18.5% to 19.2% in the decade between 1993 and 2003 (Figure 2.3). The PYSR's share of intra-regional investment in 2003 (19.2%) was less than half of the share within the EU (47.4%) and NAFTA (45.1%) in the same year.

Figure 2.3. **Intra-regional investment ratios for the PYSR, NAFTA and the EU, 1993-2003**

% of intra-regional (in- and outbound) FDI to total (in- and outbound) FDI

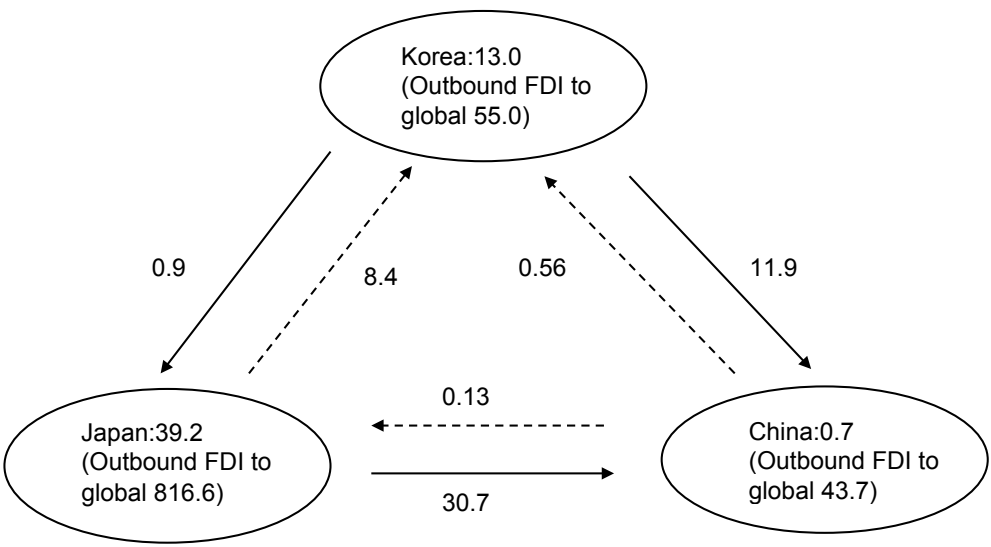


Source: Bang (2008a).

This relatively weak intra-regional FDI in the PYSR could be partially explained by the disproportionate FDI outflows among the three countries. While outbound FDI from Japan and Korea is increasingly concentrating in China, FDI outflows from China to Japan and Korea have remained stagnant (Figure 2.4). Between 1989 and 2004, China absorbed more than 80% of all intra-regional investment, while Korea attracted 17.1% of intra-regional FDI and Japan only received 2.1%. Another possible explanation for the lower intra-regional investment in the PYSR is the different economic development strategies of the three countries. Japan and Korea have used indigenous capital to pursue their development. Neither Japan nor Korea was eager to absorb either global or intra-regional foreign direct investment until the early 1990s (OECD, 2006b; OECD, 2007c). Contrastingly, China has depended heavily on foreign direct investment to accelerate its industrialisation process (Kim and Lee, 2003; see Box 2.2). In the meantime, despite the low intra-regional investment, the PYSR overall has enjoyed a sharp rise of FDI coming from beyond the region since the mid-1990s. While the global FDI stock grew 3.2 times from USD 1 950 to 8 245 billion between 1990 and 2003, the total inbound FDI of the three PYSR countries from out of the region rose 16.9 times from USD 35 to 638 billion (UNCTAD, 2004).

Figure 2.4. **Intra-regional outward FDI in the PYSR, 2004**

Outbound FDI in billion USD



Note: Japan and Korea's figures are cumulative amounts for 1989-2004; China's data is the cumulative amount up until 2004.

Source: OECD calculations using data from the *Trade statistics database* of KITA.

Box 2.2. **The GDP share of inward FDI in the PYSR countries, 1990-2005**

For China, the share of inward FDI was only 5.8% of its GDP in 1990, but this soared to 35.6% in 2003. In Korea, the share increased almost five times, from 2.1% in 1990 to 10.9% in 2005, while Japan's rose almost 10 times – from 0.3% in 1990 to 2.9% in 2005. Despite these increases, however, the share of inward FDI into Japan (2.9%) and Korea (10.9%) relative to GDP in 2005 is still lower than the OECD average (24.5% in 2005). In 2005, Japan and Korea were ranked the second lowest and the third lowest respectively of OECD countries in terms of the FDI performance, which compare actual FDI inflows to its economic size (OECD, 2007c).

	1990	1995	2000	2002	2003	2004	2005
OECD total	6.3%	8.9	15.9	19.2	22.6	25.0	24.5
China	5.8	19.3	32.2	35.4	35.6	-	-
Japan	0.3	1.1	1.6	2.4	2.7	2.9	2.9
Korea	2.1	1.8	7.3	7.3	7.5	9.5	10.9

Notes: unit is %, using constant PPP.

Sources: OECD database (*http://dotstat.oecd.org/wbos/index.aspx*); figures for China are from Chang *et al.* (2004).

2.1.4 Structural changes to trans-border production networks in the PYSR

According to Hurley (2003), between trading partners, the more similar the capital-labour intensity and technology level are, the more horizontal intra-industry trade will be. As noted in the previous sections, with the rapid economic development and technology catch-up of both China and Korea, the division of labour in Northeast Asia has become increasingly horizontal and accordingly the importance of horizontal intra-industry trade has been on the rise. In this section, we will explore key evidence for these structural changes to production networks and trade patterns in the PYSR.

Expanding parts trade

One of the important features of production fragmentation is an increase of trade in parts and components at a rate exceeding that of trade in final goods (Athukorala and Yamashita, 2006). As production processes for individual commodities are divided into ever smaller nodes, trade volume of intermediate inputs within the same industry rapidly increases across borders. Reflecting an active fragmentation process worldwide since the 1990s, global trade volume in parts and components more than doubled

Table 2.8. **Northeast Asia's share in global trade of parts and components, 1992-2003**

	Export			Import		
	1992	1996	2003	1992	1996	2003
Global trade volume in P&C (billion USD)	438	728	986	447	735	983
East Asia (%)	29.3	38.2	39.2	23.8	30.8	37.9
Northeast Asia (%)	18.5	21.0	22.4	9.3	11.2	19.0
China (%)	0.8	1.7	6.1	2.7	3.0	10.7
Japan (%)	15.2	15.5	11.9	3.5	4.8	4.7
Korea (%)	2.5	3.8	4.4	3.1	3.4	3.6

Note: % represents the composite share of exports and imports compared to global trade volume.
Source: Athukorala and Yamashita (2006).

from USD 885 to 1 969 billion between 1992 and 2003 (Table 2.8). Northeast Asia accounts for a substantial share of this expanding global parts trade, increasing its share from 18.5% to 22.4% of exports and from 9.3% to 19% of imports for the same period. Of the three countries in the PYSR, China is seeing a growing importance in parts and components trade. China's share in total global parts exports increased from 0.8% to 6.1% and in total global parts imports from 2.7% to 10.7% between 1992 and 2003.

Changes in the commodity structures of intra-regional trade in the PYSR also reflect increasing parts trade in Northeast Asia. The share of parts in the total intra-regional trade volume for the three PYSR countries has been on an upward trend, increasing from 19.4% to 30.8% of exports and from 19.9% to 27.3% of imports between 1995 and 2004. Yet the share of consumer goods has been falling continuously, from 20% to 14% of exports and from 21.3% to 14.4% of imports between 1995 and 2004 (Table 2.9).

Table 2.9. **Growing intra-regional parts trade volume in the PYSR, 1995-2004**
% of total intra-regional trade volume in the PYSR

	Exports			Imports		
	1995	2000	2004	1995	2000	2004
Primary goods	2.4	2.4	2.8	2.6	3.1	3.8
Intermediary goods	57.6	62.2	63.7	57.0	59.6	59.1
Partial goods	38.2	36.8	32.9	37.1	32.9	31.8
Parts	19.4	25.4	30.8	19.9	26.7	27.3
Final goods	39.9	35.5	33.4	40.4	37.4	37.1
Consumer goods	20.0	19.1	14.0	21.3	17.2	14.4
Capital goods	19.9	16.3	19.5	19.1	20.2	22.7

Source: Yang (2006).

Rapid technology catch-up

Since the early 2000s, the production network and corresponding trade structure of the three PYSR countries have been becoming more technologically advanced owing to the remarkable technology catch-up of China to Korea and of Korea to Japan. In fact, the share of intra-regional export of high-technology products in the PYSR to total export volumes drastically rose from 11.4% to 20.2% between 1995 and 2004, while the share of low-tech industry fell from 25.3% to 20.3% for the same period (Table 2.10).

Table 2.10. **PYSR's intra-regional export distribution by technology level, 1995-2004**

% of intra-regional exports to overall exports

	1995	2000	2004
High tech	11.4%	14.3	20.2
Medium-high tech	15.3%	15.8	23.0
Medium-low tech	19.8%	20.7	22.8
Low tech	25.3%	24.5	20.3

Note: the four technology groups are comprised of following International Standard Industrial Classification (ISIC) sectors: 15-22, 36 and 37 for the low-tech; 23, 25-28 and 351 for the medium-low tech; 24, 29, 31, 34 and 35 for the medium-high tech; and 353, 2423, 30, 32 and 33 for the high tech. The difference between 100% and total share of the four technology groups in this table is corresponding to the share of non-manufacturing group.

Sources: Yang (2006).

While Japan has become a technologically-advanced economy with a stable export structure, Korea and China's comparative advantages have been advancing from labour-intensive low-technology to capital-intensive high-tech industries. Japan's technology level of its export products remained virtually unchanged between 1992 and 2007, with three technology groups (automobile MT 1, engineering MT 3 and electronics HT 1) comprising almost two-thirds of its exports (Table 2.11). On the other hand, in Korea, the share of HT 1 in total export products rapidly increased, from 20.9% in 1992 to 27.0% in 2001, while its aggregated share of LT 1 (textiles) and LT 2 (other low-tech goods) in global export volume dropped from 32.3% to 11.2% for the same period. More dramatic, however, is China's high-tech advancement. In 1992, nearly 70% of China's manufacturing global export was low-tech products (including primary and resource-based products); only 8.4% were in the high-tech group. Yet, by 2001, China had significantly increased its share of high-tech industries to 33.6%, while the share of low-tech industries fell to 41.3%. This drastic change took place in only a decade, raising the question of whether China will simply replicate the catch-up development paths of Japan and Korea as was anticipated in the "flying geese model" (Kim and Lee, 2003).

Table 2.11. **PYSR global export distribution by technology level, 1992-2007**

% share of global export value of the three PYSR countries by technology groups

	China			Japan			Korea		
	1992	2000	2007	1992	2000	2007	1992	2000	2007
Primary products	14.0%	6.3	3.2	1.2	1.4	2.2	3.1	2.4	2.9
RB 1 (Resource Based products)	4.8%	3.7	3.0	1.8	1.5	1.7	3.2	2.6	2.0
RB 2 (Other resource based)	4.8%	4.5	4.3	3.4	3.8	5.7	4.7	8.3	10.4
LT 1 (textile cluster)	29.7%	22.5	15.1	1.5	1.1	0.8	18.7	8.8	3.1
LT 2 (other low tech)	14.9%	16.0	15.7	8.4	6.8	8.3	13.6	8.1	8.1
MT 1 (automobile products)	0.9%	1.5	2.4	23.0	18.4	22.2	4.2	8.8	13.2
MT 2 (chemicals and metals)	4.1%	5.0	4.3	4.5	4.9	5.7	10.1	6.6	5.3
MT 3 (engineering products)	8.5%	10.6	13.0	22.5	22.0	21.8	15.6	14.0	17.5
HT 1 (electronics and electrical products)	6.3%	20.0	30.7	24.6	26.2	17.3	20.9	34.7	27.0
HT 2 (other high-tech)	2.1%	2.3	2.9	3.1	4.7	3.4	1.2	1.1	6.1
Unclassified	9.9%	7.6	5.4	6.0	9.2	10.9	4.7	4.6	4.4

Note: products at the 3-digit SITC level have been classified into 10 groups according to technology level following Lall (2000). The share of "Unclassified" is coming from the mismatch between SITC classifications and Lall (2000)'s grouping.

Source: OECD calculations using data from UN COMTRADE.

Increasing convergence of export structures

In general, as two different economies converge in terms of factor endowments and technology, their export structures also tend to converge. This similar export structure, in turn, expands the intra-industry trade between the two countries relative to inter-industry trade and further increases the horizontal nature of intra-industry trade. This pattern can also be observed in the PYSR. As China and Korea's comparative advantages in medium and high-tech products rapidly overtake Japan's, the export structures of the three PYSR countries continue to converge. Table 2.12 shows China's clear change in its revealed comparative advantage (RCA)[11] towards high-tech production, although it still holds an overwhelming advantage in the low-tech sectors. On the other hand, Korea is closely following Japan, in particular, in high-technology sectors, while the gap in the RCA index between Korea and China in mid- and high-tech industries has been narrowed rapidly. Japan has shown little change in comparative advantage in almost every sector, retaining a higher RCA index in its traditionally strong manufacturing industries.

Of special interest are the changes in the RCA index for the three PYSR countries of the electronics (HT 1) and other high-tech (HT 2) sectors. In HT 1 group, Korea's RCA index (1.98) already outstripped that of Japan (1.49) in 2000, and China's RCA index (2.24) subsequently surpassed that of Korea (1.97) in 2007. A similar overtaking process is taking place in HT 2 group. The RCA index of Korea sharply increased from 0.26 to 1.62 between 2000 and 2007 to exceed that of Japan (0.92 in 2007), while China is also rapidly expanding its RCA level (0.78 in 2007) to surpass Japan. These changes could imply that, even in high-tech industries, the technology levels of export products of the three PYSR countries are increasingly converging and hence more harsh competition among them is occurring. In fact, Korea and China have faced intensified export competition in many of their global markets since the early 2000s. China has taken a significant market share, in particular in Japan and the US, at the expense of Korea. Between 1992 and 2004, the import share of Chinese products in the Japan and US markets increased from 7% to 21% and 5% to 14% respectively, while Korea's share in those markets remained almost the same at 5% and 3% each (Kim J-K *et al*., 2006). This market erosion by China had previously been confined to labour-intensive products such as clothing; however, Korea has recently lost some of its market share to China in medium-high and even high-tech industries such as ICT.

Table 2.12. **Comparative revealed advantage index of the three PYSR countries by technology level, 1991-2007**

Revealed Comparative Advantage (RCA) index

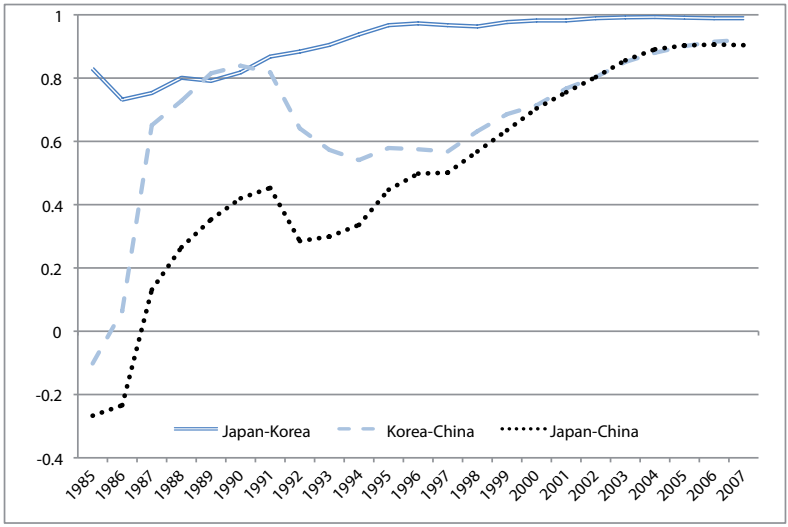
	China			Japan			Korea		
	1992	2000	2007	1992	2000	2007	1992	2000	2007
Primary products	1.20	0.53	0.25	0.16	0.12	0.17	0.28	0.38	0.23
RB 1 (Resource Based products)	0.64	0.61	0.55	0.23	0.26	0.31	0.44	0.45	0.37
RB 2 (Other resource based)	0.67	0.59	0.46	0.47	0.50	0.60	0.68	1.10	1.11
LT 1 (textile cluster)	4.21	3.82	3.16	0.21	0.19	0.18	2.64	1.49	0.64
LT 2 (other low tech)	1.55	1.88	1.68	0.87	0.80	0.88	1.41	0.95	0.87
MT 1 (automobile products)	0.09	0.17	0.28	2.33	2.10	2.62	0.43	1.00	1.55
MT 2 (chemicals and metals)	0.76	1.04	0.89	0.82	1.01	1.16	1.86	1.37	1.07
MT 3 (engineering products)	0.59	0.82	1.01	1.57	1.69	1.69	1.08	1.07	1.35
HT 1 (electronics and electrical products)	0.55	1.14	2.24	2.15	1.49	1.26	1.82	1.98	1.97
HT 2 (other high-tech)	0.47	0.59	0.78	0.68	1.17	0.92	0.26	0.26	1.62

Note: If the RCA index is over 1.0, the country is said to be specialised in that sector; an increasing index value indicates the country's growing comparative advantage in that product.

Source: OECD calculations using data from UN COMTRADE.

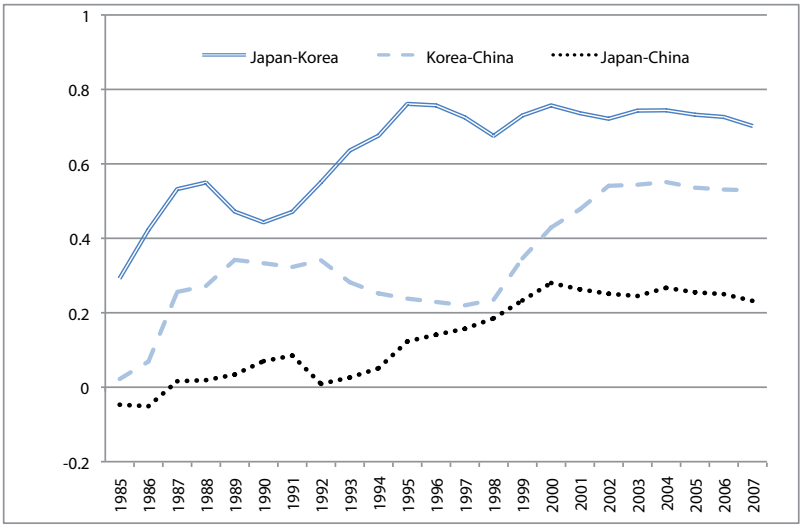
Figure 2.5. **Correlation coefficient of export structures between China-Japan, Japan-Korea and Korea-China**

Measured by 1-digit SITC level



Source: OECD calculations using data from UN COMTRADE.

Measured by 3-digit SITC level



Source: OECD calculations using data from UN COMTRADE.

In 2004, the import share of high-tech products from China (21%) in the US market far exceeded that of Korea (6%), while the shares of China and Korea in 1992 were 2.5% and 5% respectively (Kim J-K *et al*., 2006).

Figure 2.5 shows further evidence of this convergence of export-structures in the PYSR. Between 1985 and 2007, the correlation coefficient[12] for Japan-China, measured by 1-digit Standard International Trade Classification[13] (Figure 2.5; upper part), increased sharply from -0.26 to 0.90. In the case of Japan-Korea, there has been a more strong upward movement over the last two decades. The correlation index of export structures between Japan-Korea showed 0.82 in 1985 but reached almost 1.0 in 2007. For Korea-China there was an increase in correlation until 1990, a slight decrease until the mid-1990s and then an upward trend in correlation again. In 2007, the correlation index of Korea-China exhibited 0.92. A similar upward trend of correlation index for export structures in the PYSR was also found with an even narrower industry classification (Figure 2.5; lower part). Between 1985 and 2007, the correlation index of Japan-Korea and Korea-China, computed by 3-digit SITC, remarkably increased from 0.29 to 0.70 and 0.02 to 0.52 respectively, even though that of Japan-China remained relatively lower level (-0.04 to 0.23 for the same period). It is clear from these findings that both China and Korea are converging with Japan in terms of their export structure; Korea more closely than China but China more rapidly than Korea.

Pursuing upstream value chains

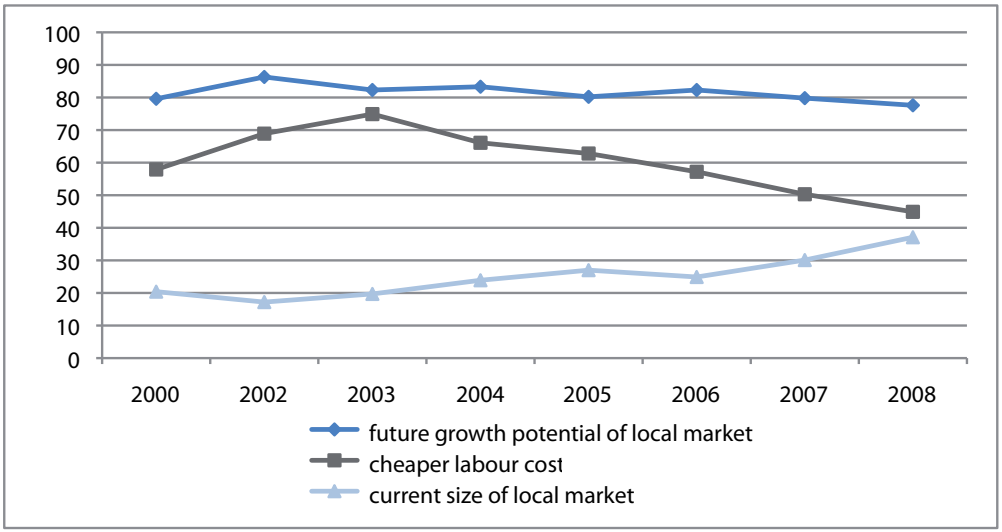
In the early stages of the PYSR's production network, most Japanese and Korean companies investing in China kept their core business functions, such as planning, design and R&D, at home. As the Chinese economy has rapidly grown, however, the importance of China as a market has sharply increased and accordingly more Japanese and Korean firms are trying to place their upstream functions close to manufacturing bases in China. They need to be able to respond accurately to local market demand[14] and address production site challenges swiftly in China, where product cycles are getting shorter (see Section 2.1.5 for more).

Many surveys confirm this trend. According to the JBIC survey,[15] the pursuit of cheaper labour costs fell as a motivating factor for Japanese firms to invest in China (from 57.9% to 44.9% between 2000 and 2008). At the same time, the attractiveness of current market size of China almost doubled as an investment motivation from 20.4% to 37.1% over the same period (Figure 2.6). A similar motivation shift was also found in Korean companies. Two surveys[16] conducted by the Korea Chamber of Commerce and Industry (1997, 2002) clearly show this change (Jee *et al.*, 2004). In the 1997 survey, of 182 sample firms, 52.6% gave market access and 56.6% cheap labour costs as their main motivations for moving into China. In the 2002 survey, however,

55.5% picked the former and 39.5% the latter. In fact, this phenomenon is not confined to Japanese and Korean firms but is common in most global companies. According to an UNCTAD survey (UNCTAD, 2005), 61.8% of responding firms saw China as an attractive place to locate R&D bases in the mid-term (2005-2009), making China the top global R&D destination,[17] followed by the US (41.2%) and India (29.4%).

Figure 2.6. **Motivating factors for Japanese firms to invest in China, 2000-2008**

% of responses of the JBIC survey



Source: JBIC annual reports for respective years.

Empirical test results on structural changes in the PYSR production network

All the evidence we have seen above suggests structural changes in the production and trade patterns in the PYSR. The PYSR's trade form has shifted from one-way trade (OWT) to more horizontal intra-industry trade (HIIT), even though vertical intra-industry trade (VIIT) still dominates in the region. In order to see this change more clearly, we have reviewed the results of some empirical tests on trade patterns in the PYSR (see Annex 2.A for details of the methodology of these tests).

Table 2.13 compares East Asia's intra-regional trade pattern with the EU's. The share of OWT in East Asia is much higher than in the EU, while the share of horizontal IIT in East Asia is far lower. In 2000, the share of

OWT of all industries in East Asia was 68.7% (double the EU) but the share of horizontal IIT remained 7.6% (about one-third of the EU). However, there has been a notable increase of vertical intra-industry trade in East Asia since the mid-1990s. It expanded from 16.6% to 23.7% between 1996 and 2000, while that of the EU only slightly increased. This suggests relatively big differences in income and factor prices among countries in East Asia compared to the EU enhance vertical IIT (Fukao *et al.*, 2003).

Table 2.13. **Trade patterns comparison between the EU and East Asia, 1996-2000**

% share of three different trade patterns

	Intra-EU		Intra-East Asia	
	1996	2000	1996	2000
Inter-industry trade (OWT)	34.0%	34.1%	78.7	68.7
Intra-industry trade	66.0%	65.9%	21.3	31.3
Horizontal (HIIT)	28.5%	25.8%	4.7	7.6
Vertical (VIIT)	37.5%	40.0%	16.6	23.7

Note: data for all industries, East Asia includes Japan, NIEs and 4 ASEAN countries. The sum of OWT, HIIT and VIIT is 100%.

Source: Fukao *et al.* (2003).

On the other hand, Table 2.14 shows different trade patterns among the three PYSR countries. Like in East Asia in general, the share of intra-industry trade has rapidly increased since the 1990s in the PYSR, while the relative importance of OWT has substantially weakened. The share of intra-industry trade between Japan and Korea increased remarkably – from 33.7% in 1996 to 51.4% in 2006 – while that of Korea-China and China-Japan also increased more than 10 percentage points for the same period. This increase principally reflects the expansion of back-and-forth transactions among the three countries in the vertically fragmented production processes (Ando, 2006). However, the horizontal form of intra-industry trade in the PYSR countries has also shown a gradual increase since the 2000s. In particular, the Japan-Korea trade shows meaningful development in this regard, with the share of horizontal IIT remarkably increasing from 4.4% to 14.4% between 1996 and 2006. In the meanwhile, the share of horizontal IIT between Korea and China also increased, nearly doubling from 3.7% to 6.5% for the same period, even though its absolute share is still insignificant. These features again confirm that the technology catch-up of Korea to Japan and China to Korea is extensively progressing throughout most industries at a relatively rapid pace (Kim and Lee, 2003).

Table 2.14. **The share of three trade patterns in the PYSR countries, 1996-2006**

% share of three different trade patterns

	Japan-Korea		Korea-China		China-Japan	
	1996	2006	1996	2006	1996	2006
Inter-industry trade (OWT)	66.3%	48.6%	64.0	52.5	67.0	57.1
Intra-industry trade	33.7%	51.4%	36.0	47.5	33.0	42.9
Horizontal (HIIT)	4.4%	14.4%	3.7	6.5	3.8	5.9
Vertical (VIIT)	29.3%	37.0%	32.3	41.0	29.2	37.0

Note: data for all industries except agricultural industry.

Source: Bang (2007).

2.1.5 Manufacturing fragmentation in the PYSR: case studies of the automobile industry

The PYSR has played a key role in the automobile industry, even from a global perspective. In 2006, the three countries in the PYSR jointly produced 30% (22.4 million units) of all the world's automobiles, with Japan, China and Korea each manufacturing 11.4, 7.1 and 3.9 million units respectively. Of this production volume, provinces in the PYSR contributed 27.7%, producing 6.2 million units.[18] This figure is higher than Germany's annual output (5.8 million) and was two times that of France (3.1 million) in the same year. While producing such a large volume, automobile companies in the PYSR have established extensive and close manufacturing networks across borders. Here, we examine two different dimensions of car production linkages in the PYSR to see how they are working and will evolve: *(i)* a production network in China established by Japanese and Korean carmakers, which reveals a vertically integrated division of labour (vertical IIT); and *(ii)* a production network between Kyushu of Japan and Busan-Ulsan-Gyeongnam of Korea, illustrating a more horizontal form of manufacturing collaboration (horizontal IIT).

Case 1: Japanese and Korean vertical production networks in China[19]

Since its accession to the WTO in 2001, China has seen drastic growth in its automobile industry (Table 2.15). Between 1998 and 2005, automobile production expanded almost four times, from 1.6 million to 5.7 million units. China was the third largest automobile manufacturing country in 2006, just after the US and Japan, and is expected to be the second largest manufacturer

after the US by 2012 (Jung and Lee, 2007). China has also emerged as a key automobile consumer market. The sales volume of passenger cars in China increased six times, from 530 000 to 3.2 million units between 1998 and 2005 (Kim W-B, 2008). China was the fourth largest car sales market in 2005 after the US, Japan and Germany, and is on course to becoming the world's largest car consumer market (MSNBC, Feb. 4, 2009).

Table 2.15. **Trends in automobile production in China, 1998-2005**

Thousand cars

	1998	1999	2000	2001	2002	2003	2004	2005
All cars	1 600	1 832	2 089	2 436	3 414	4 525	5 048	5 750
Passenger cars	504	570	613	781	1 268	2 154	2 491	3 132

Note: All cars include passenger cars, commercial vehicles and SUVs.

Source: Jung and Lee (2007).

To take advantage of this expanding market potential, many global car manufacturers, such as Volkswagen and General Motors, have moved into China since the mid-1980s. Yet Japanese and Korean carmakers have launched businesses in China belatedly. Honda paved the way for the entry of Japanese automobile businesses into China in 1999 by opening its first factory in Guangzhou in the Pearl River Delta region. Subsequently, Nissan and Toyota built their first factories in China's Hubei Province in 2001 and Tianjin in 2002, respectively. Korean carmakers followed a similar investment path. Hyundai opened a production base in Beijing in 2002 and Kia in Jiangsu Province a year later. Although carmakers from Japan and Korea have a shorter history than their European and North American counterparts,

Table 2.16. **Car sales volume of foreign companies in China**

Thousand cars	1998	2002	2005
VW (Germany)	301	508	490
Shanghai GM (US)	0	110	298
Hyundai (Korea)	0	1	233
Honda (Japan)	10	59	230
Nissan (Japan)	0	41	166
Toyota (Japan)	0	2	135
Kia (Korea)	0	20	110

Source: Kim W-B (2008).

they have significantly expanded their market share and production capacities in China since the early 2000s (Table 2.16). Japanese carmakers' market share in China for passenger cars significantly increased, from 7.2% to 28.6%, between 1998 and 2005. Korean carmakers also remarkably increased their market share, from 0% to 11.2% over the same period (Jung and Lee, 2007).

Unlike Western carmakers operating in China, Japanese carmakers have transplanted into China their own traditional self-contained and vertically-integrated production system. Most Japanese complete carmakers moved into China with their first and even second-tier parts suppliers which have already built long-term and exclusive production relationships in Japan. In fact, the Toyota manufacturing system in Tianjin and Guangzhou in China almost replicated the one in Aichi Prefecture in Japan. In order to manage this unique production network, Japanese automobile firms in China have shown a strong geographical concentration. Most of their production bases are clustered in three regions: Yangtze River Delta around Shanghai City, Pearl River Delta around Guangzhou City and the Bohai Rim around Tianjin City (Figure 2.7). Of the 865 companies operating in China between 1984 and 2005, more than 70% were located in these regions.[20] The production clusters of Japanese carmakers in China have the following features:

- While having no active relationship with suppliers outside their clusters, most Japanese firms in China receive parts from a limited number of Japanese *Keiretsu*[21] suppliers which are physically located in the same cluster and have moved together into China. Only a small proportion of parts is procured from non-Japanese and local-based suppliers. In 2004, for instance, Honda motors in Guangzhou procured only 20% of its parts from non-Japanese suppliers in China and overseas, while purchasing 60% of its parts from Japanese suppliers in China and directly importing the remaining 20% from Japan.
- Japanese Production clusters in China have limited power to make their own managerial decisions. The establishment of a new factory, production of a new model and selection of new suppliers are determined by headquarters in Japan. Even quantity and specifications of parts to be used in China are controlled via consultation with headquarters in Japan.
- Accordingly, Japanese clusters in China tend to simply conduct manufacturing orders from headquarters in Japan, leaving most upstream functions, such as R&D and design, to Japan.

Korean carmakers in China have similar features to their Japanese counterparts. Korean R&D activity in China is weak. They have established clusters in Beijing, Shandong and Jiangsu Province[22] (Figure 2.7). Of 126 Korean parts suppliers who had moved there by 2006, more than 70% (90 firms) were

located in these three regions. They also transplanted their own hierarchical production system into China, accompanied by their exclusive parts providers in Korea. Exchange with parts suppliers outside of their clusters is also rare. Of the 126 parts suppliers, about 90% (111) do business with no more than two companies in China; 67% of them engage in transactions only with Korean carmakers in China.

Thus, both Japanese and Korean carmakers have built vertically integrated production systems in China, facilitating parts exchanges between their homeland and China in the form of vertical intra-industry trade. Recently, however, this structure has gradually shifted as the market situation in China has rapidly changed. Both Japanese and Korean carmakers are facing more competitive pressure to reduce costs and to adapt to local requirements in China. To respond to these challenges, they are trying to convert their closed, hierarchical production systems to flatter and more

Figure 2.7. **Production bases of Japanese and Korean complete carmakers in China**

Source: Kim W-B (2008).

open ones. They have substantially increased their local procurement share and even expanded their supply chain to include non-*Keiretsu* firms. They have also given increasing autonomy to local cluster managers in China. Local production bases are also engaging more in upstream activities. For instance, Honda announced a plan in 2007 to establish an R&D institution in Guangzhou worth USD 4 billion. This shift in production patterns by the Japanese and Korean carmakers in China is expected to intensify further as sales and production volume in China continue to expand.

Case 2: Horizontal production network between Kyushu (Japan) and Busan-Ulsan-Gyeongnam (Korea)[23]

Together, Kyushu and the Busan-Ulsan-Gyeongnam (BUG) area across the Korea-Japan Strait form one of the largest automobile production bases in the world (Figure 2.7). As the third largest car-producing area in Japan after the Tokai (centering on Aichi Prefecture) and Kanto (centering on Tokyo Metropolitan area) regions, Kyushu manufactured one million units (9.1% of national production) in 2006. The BUG region is the single largest automobile industry base in Korea, producing about 1.8 million units in 2006; almost half the national production. The combined annual output of this entire zone reached over three million units in 2006, rivalling only the Great Lakes region in the US and northern Italy among global automobile production bases. Unlike the production networks established in China, however, the manufacturing linkages across the Korea-Japan Strait have developed a more horizontal division of labour, as the technology of Korean firms rapidly catches up with the Japanese and the difference between factor prices across the strait substantially reduces.

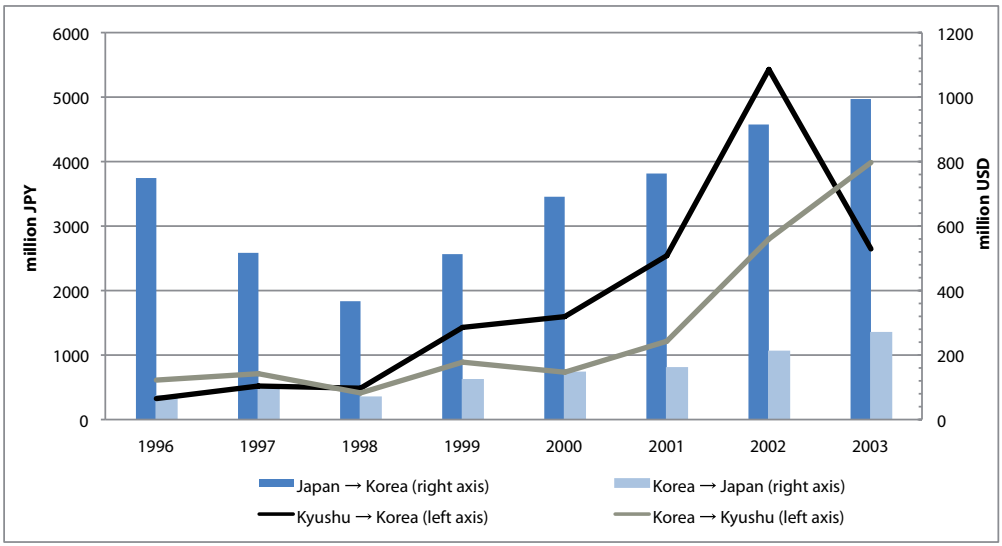
Initially, there was little trans-border co-operation between Kyushu and the BUG's automobile industries. Until the 1980s, Korean carmakers focused on technology transfer from Japanese carmakers. In addition, many carmakers in Kyushu maintained branch functions, with limited competence to make their own decisions. As a result, trade in automotive parts across the strait was negligible. However, the situation has changed remarkably since the 1990s, when major carmakers in Japan began to move a larger share of production facilities to Kyushu from their headquarters. The aim was to reduce production costs as well as to take advantage of Kyushu's geographical proximity to China and Korea, positioning Kyushu as one of the core car manufacturing bases in Japan. At the beginning of the 1990s, Nissan made a large-scale plant investment in Kyushu. Toyota even opened an engine plant in Kyushu in 2006 – the first to be established outside its headquarters in Aichi Prefecture. In the meantime, Korean carmakers drastically improved their technology levels following a harsh restructuring process during the 1997 economic crisis. As a consequence, Japanese automakers in Kyushu have now begun importing

parts from Korea on their own initiative, in a departure from their traditionally concentrated procurement system. For instance, Toyota Kyushu itself, rather than Toyota headquarters in Aichi, decided to procure dyes and moulds from Korean parts companies in 2001 which helped reduce costs by 20% compared to procurement from suppliers in Japan.

Between 1998 and 2003, the value of parts exports from Korea to Kyushu rose almost ten times, from JPY 0.41 billion to JPY 3.9 billion (Figure 2.8). The 2003 figure accounted for roughly 15% of the total value of parts exported from Korea to Japan. At the same time, the value of parts exports from Kyushu to Korea increased about six times, from JPY 0.48 billion to 2.6 JPY billion JPY. This latter figure represented 3% of total parts export value from Japan to Korea. Thus Kyushu's trade imbalance in automotive parts with Korea is much smaller than between the whole of Japan and Korea.[24] The major exports from Kyushu to the BUG are key automotive parts such as engine parts and gear boxes. Those from the BUG to Kyushu remained at standard automotive parts, such as lights and wheel parts; however, recently trade has been shifting towards more technologically sophisticated products.

On the other hand, there has been little trade in complete cars between the two regions. The major export destinations for complete cars produced in Kyushu are the EU and North America, representing 57% of total exports

Figure 2.8. **Trade in automobile parts between Japan (Kyushu) and Korea, 1996-2003**



Source: OECD adaptations based on Kim W-B *et al.* (2005).

from Kyushu.[25] The number of complete cars exported from Kyushu to Korea is insignificant. Even on a nationwide base, only 3 581 passenger cars were exported from Japan to Korea in 2003. The situation is similar in Korea, whose major export destinations for automobiles are also the EU and North America, accounting for 30% and 28.5% respectively of total exports in 2008 (KAMA, 2009). The export of complete cars from Korea to Japan in 2008 was only 414 units, an almost negligible share of Korea's car exports.

As such, economic co-operation between Kyushu and the BUG in the automobile industry concentrates on parts trade. Procurement of parts in the region is based on the competition principle. As many Japanese carmakers have opened new plants in the Kyushu area to reduce manufacturing cost, they are increasingly seeking new competitive parts suppliers across the strait, as an alternative to their conventional suppliers in Kanto and Toukai, which are 700 km away.[26] Kyushu's assembly plants could pay cheaper transportation costs when they bring parts from the BUG which is within 200km. Thus, parts production in the BUG has emerged as an attractive sub-contract option for Kyushu's carmakers, taking advantage of cheaper logistics costs as well as factor prices, so far as the quality of automotive parts can be appropriately controlled. In fact, for the French carmaker Renault, borders do not matter for procuring parts as its two strategically-aligned companies of Nissan-Renault in Kyushu and Renault-Samsung in Busan share similar production lines (Box 2.3). As a result, the horizontal international division of labour in automobile production between Kyushu and the BUG and, accordingly, horizontal intra-industry trade has rapidly expanded since the late 1990s.

Box 2.3. Co-operation between Nissan-Renault in Kyushu and Renault-Samsung in Busan

Renault in France formed a strategic coalition with Nissan motors in Japan and Samsung motors in Korea in 1999 and 2000, respectively. Since then, Nissan-Renault's Kyushu factory and Renault-Samsung's Busan factory have established very similar design and production lines. In fact, Samsung-Renault Busan's model plant is Nissan's Kyushu plant and the "SM3", a small car made by Samsung Renault, is based on Nissan Kyushu's model of the "Bluebird". Nissan's Kyushu plant received many Korean trainees from Busan factory following a technical agreement between the two factories. In this regard, apart from the BUG region's cheaper factor prices and transportation costs, there are more positive benefits for Nissan-Renault in Kyushu to co-operate with parts suppliers for Samsung-Renault in Korea's Busan than with its conventional automotive parts suppliers in Japan's Kanto and Tokai regions.

Source: Kim W-B *et al.* (2005).

2.1.6 Concluding remarks

Our analysis regarding manufacturing networks in the PYSR has identified some meaningful achievements of collaborative economic development in the region. A trans-border production system has advanced significantly. The division of labour has been becoming more horizontal as the technology catch-up of both China and Korea to Japan rapidly progresses. The export structures of the three PYSR countries are converging and competing with one another, and the upstream value chain is more marked. Intra-regional trade, especially parts and component trade within the same industry, has doubled between 1990 and 2005. Economic integration in the PYSR is heading in a promising direction, bringing reciprocal benefits to each participant in this economic network. Indeed, the PYSR has great potential to form an integrated economic zone based on its strong manufacturing capacity.

However, several factors are still hindering further economic integration in the PYSR, requiring appropriate address from governments in the PYSR:

- Uneven interests for regional economic development. Although each state, as well as municipal governments, in the PYSR collaborates closely to enhance economic performance, the intensity and objectives of co-operation vary substantially among participants. While Korea has the strongest interest in forming an economic zone in the PYSR, China is less interested in economic integration, instead focusing on policies to encourage competition among domestic provinces to bring in more financial resources from Japan and Korea. Japan's interest in the PYSR is limited to the Kyushu area, which comprises only one-tenth of national economy. Reflecting these diverging concerns, the negotiation for a trilateral China-Japan-Korea free trade agreement has made little progress since its initiation in 2003.
- Excessive competition. The intensified economic links in the PYSR have created over-competition among participants. All parts of the PYSR are striving to move up the value ladder to become industry leaders, and are expanding their industrial build-up and infrastructure capacity in competitive ways. For instance, both Tianjin City of China and Gyeonggi Province of Korea intend to build a key R&D hub for the electronics industry in the Yellow Sea area. Fukuoka City of Japan and Ulsan City of Korea are also competing to be a core production base for high-end automotive parts. If all the regions follow the same growth path, however, sustainable development in the PYSR will not be feasible. Without considering complementary comparative advantage among stakeholders, an effective division of labour or successful integration across the Yellow Sea are unlikely to be achieved.

- Weak intra-regional investment. While intra-regional trade has reached remarkable levels, the quality and direction of intra-regional investment are not fully-fledged yet. Small-scale and labour-intensive manufacturing sectors still make up a substantial portion of intra-regional investment in the region. For instance, Korean manufacturers clustered in China's Shandong Province recorded an average amount of USD 1 million per investment case between 1991 and 2006, seeking cheap production costs.[27] The direction of intra-regional investment flow is also unbalanced. The bulk of surplus capital from Japan and Korea has flowed into the Bohai Rim area of China, but there is no sufficient counter-flow occurring yet. The preponderance of China as an investment destination is at the expense of conventionally close economic connections between Korea and Kyushu; both of them are currently struggling to develop more intimate economic ties with China.
- Inadequate foundation to build common knowledge assets. In order to enhance trans-border economic exchange among production bases, the standardisation of technology and services is a pre-requisite. However, regional endeavours in this regard are still lagging behind. There has been no meaningful movement to launch joint research for developing general purpose parts for the booming industries in the PYSR (*e.g.* automobiles and ICT). Several institutional barriers are also inhibiting the exchange of skilled labour and researchers among production clusters in the PYSR. As such, well-aligned platform for sharing knowledge and technology in the PYSR is lacking.

2.2 Hard infrastructure: an integrated transportation network

Recent spatial economics, economic geography and international trade analysis reveal the influence of such factors as transportation costs, natural conditions and factor endowments on international trade and regional development (Fujita, 2007a). Transportation costs are one of the most influential factors; for example, port cities, which enjoy cheaper transportation costs, have historically created metropolitan areas all over the world.[28] The accumulation of population and economic activities in one place facilitates economies of scale and further lowers transportation costs, thus promoting further accumulation of activities in the area.[29] This virtuous cycle between the development of transportation functions and economic growth of the catchment area has contributed to the uniqueness of each port city. Conforming to the theory of spatial economics, East Asia's economic development has been supported by an improved transportation infrastructure, which facilitates the flow of people and goods beyond borders and has thus allowed a global value chain to form. The smooth movement of people and goods is a precondition

for any kind of trans-border linkage and co-operation. The uniqueness of the PYSR is its dependence on air and sea transportation because of the existence of the Yellow Sea and North Korea's diplomatic isolation. For these reasons, flying is the most popular form of trans-border passenger transport within the region. In contrast, the business sector transports substantial amounts of goods by sea because it is cheaper, especially over long distances and for large volumes.[30]

In this section we explore the increased mobility of people, especially through air transport. We also explore the trends in goods transportation, mainly marine traffic. Finally we briefly summarise some challenges facing the transportation network. Though we acknowledge the importance of IT infrastructure in the formation of the East Asian value chain system (Box 2.4), in this section, we focus on transportation infrastructure.

Box 2.4. **Strengthened IT infrastructure between Kyushu and Busan**

The PYSR's links to a global value chain do not only depend on transportation infrastructure, but also on the development of IT infrastructure. The best example in the PYSR is the Japan Korea cable network, which has connected the Japanese cities of Fukuoka and Kitakyushu with Busan City since 2002. The Japan Korea Optic Corridor project, which laid the cable, was privately financed.[31] The project was supported by the Business Association of Kyushu and Yamaguchi in Japan and the Federation of Korean Industries (FKI). Because Fukuoka-Busan is the shortest distance between Korea and Japan, the cable provides for the direct transmission of information, thus lowering the service price.

In 2006, one of China's two largest internet carriers, China Netcom, and the 100% subsidiary Asia Netcom, expanded the East Asia Crossing Optic Cable Network into Qingdao. Qingdao is midway between Shanghai and Beijing, and close to Japan and Korea. The development of the Qingdao connection point will improve connection speeds and make the crowded southern routes near Chinese Taipei redundant. This will contribute to the development of the PYSR as a region.

In 2008, the major internet companies in Japan, Korea, China, Chinese-Taipei and the US agreed to construct a new Trans-Pacific Express Cable Network to deal with the drastic increase of international traffic. The total length of the network will be around 18 000 km. The first phase will construct a southern route connecting the US, China, Korea and Chinese-Taipei. The second phase will construct a northern route to link in Japan. The project is planned to be completed by early 2010. Even though the network will improve connections in the pan-Pacific area in general, and more specifically the PYSR (by connecting Quingtao and Korea), it does not include the Kyushu Region.

Sources: City of Fukuoka (*www.city.fukuoka.lg.jp/itplan/html/c_5/c_5_2_1_3/index.html*), China Netcom (*http://news.searchina.ne.jp/disp.cgi?y=2006&d=0809&f=it_0809_001.shtml*), NTT news release (*www.ntt.co.jp/news/news97/970331a.html*), accessed 23 September, 2009.

2.2.1 Increased mobility of people

The movement of people within China, Japan and Korea is significant (Table 2.17). There are many more visitors to China from Japan and Korea than there are Chinese visiting Japan and Korea. The relationship between Japan and Korea is strong both in terms of numbers and share of total visitors. Popular tourism activities explain the Japan-Korea flow. Though city level statistics are not well-developed in the PYSR, Kyushu statistics show that Chinese and Korean visitors constituted 76.3% of all visitors to Kyushu in 2007 (69.1% from Korea and 7.2% from China; METI Kyushu Bureau, 2008). Chinese and Korean visitors to Kyushu more than doubled between 1996 and 2007. Korean visitors especially increased more than the national average over the same period. In 2007, the share of Korean visitors to total visitors in Kyushu was 69.1%, much higher than the national average of 31.1%. This resulted from transportation development between Korea-Kyushu and enhanced economic activities in both regions. Chinese visitors to Kyushu also increased supposedly because of Japan's deregulated visa policy and the increased value of Chinese currency (METI Kyushu Bureau, 2007).

Table 2.17. **Regional travel in 2008 (2006 for China)**

Destination (A)	Origin	Visitors(B)	Tourist share (tourist/B)	Share (B/total Visitors to A)
China	Japan	3 745 881	48.9%	16.9%
	Korea	3 923 986	52.7%	17.7%
	Sub-total	7 669 867	34.4%	34.5%
Japan	China	1 000 416	45.6%	12.0%
	Korea	2 382 397	79.4%	28.5%
	Sub-total	3 382 813	38.8%	40.5%
Korea	China	1 167 881	35.8%	16.9%
	Japan	2 378 092	96.8%	34.5%
	Sub-total	3 545 973	58.6%	51.5%

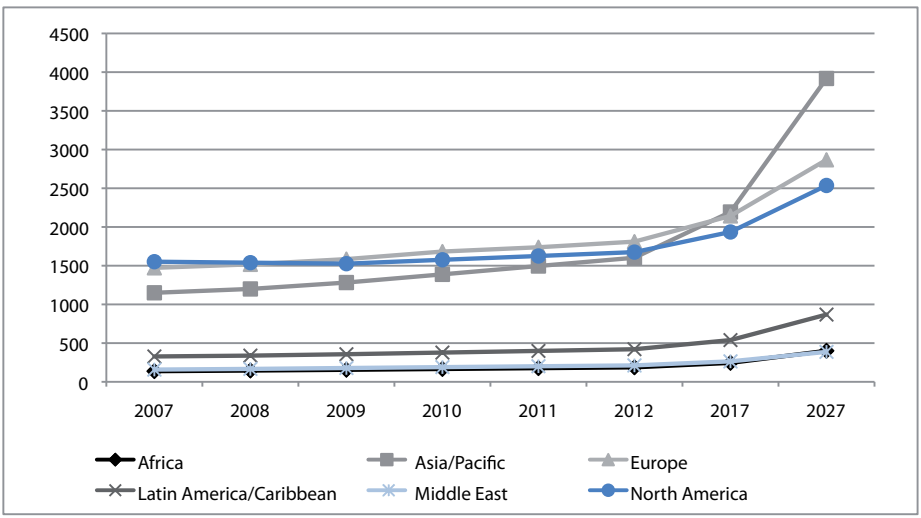
Note: China data are for 2006. Between countries there are some inconsistencies of numbers depending on the definition. City-level statistics are not available.

Source: calculated by the OECD based on the following statistics: Destination China, Ministry of Public Security, cited in China National Tourist Office (*www.cnto.org/chinastats.asp*); Destination Japan, JNTO (*www.jnto.go.jp/jpn/tourism_data/visitor_data.html*); Destination Korea, Korea Tourism Organization (*http://kto.visitkorea.or.kr/inout.kto?func_name=search*).

Air passenger traffic

Air passenger traffic is steadily increasing and further increases are expected in the Asia/Pacific region (Figure 2.9). The Asia/Pacific region's world share was 24% in 2007, but by 2017 this is expected to increase to 35.7%, which is higher than the estimated shares of Europe (26.1%) and North America (23.1%) in 2017. The Asia/Pacific region is the world's fastest growing region, thanks to the rapid economic development of China and India. As a result, the region will soon be the largest region in terms of passenger volume. This demand increase will require emerging countries to quickly build their capacity (Airports Council International, 2008).

Figure 2.9. **Total passenger volume by region (million passengers), 2007-2017**



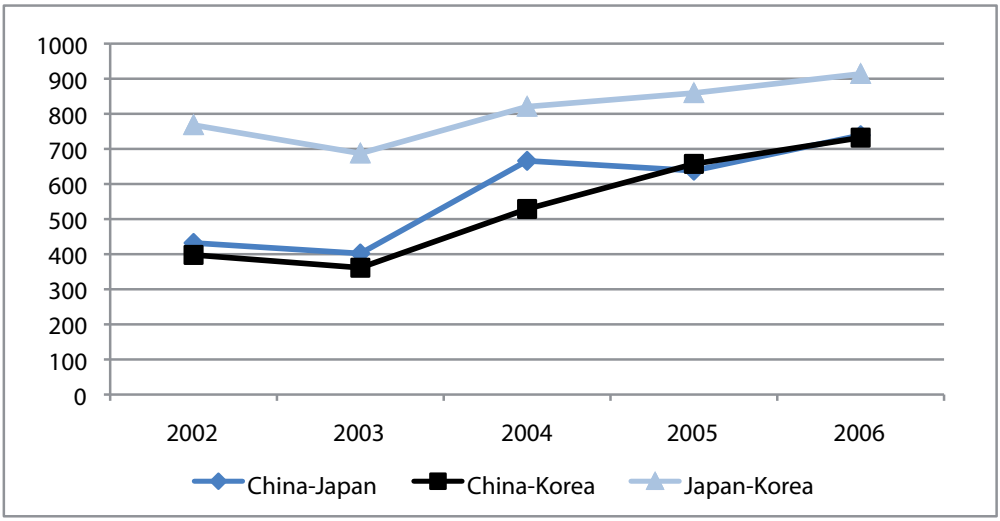
Source: Airports Council International (2008).

Though the data are rather old, passenger volume analyses of the PYSR countries reveals the following trends (Figure 2.10). In 2005, passenger flight volume in the PYSR countries totalled 424.5 billion persons-km (11.4% of global volume). Passenger flights among the three countries have increased annually by 23% over the last decade (Kim W-B *et al*., 2008). Passenger volume between Japan and Korea gradually increased to 9.1 million in 2006 (a 19% increase since 2002). Passenger volume between China and Korea, and China and Japan, rapidly increased to 7.3 and 7.4 million respectively in 2006 (a 84% and 71% increase respectively since 2002).[32] The China-Korea and China-Japan passenger volumes are catching up with the already large and established volume of the Japan-Korea route. Though the number of

flights and passenger volume for capital airports (Beijing-Seoul (Incheon)-Tokyo) overwhelm those of airports in the PYSR,[33] most analysts forecast a steady increase of flight passengers in the PYSR and an especially rapid increase of passengers between Korea and China.

Figure 2.10. **Total passenger volume: China-Japan, China-Korea, Japan-Korea, 2002-2006**

(Unit: 10,000 persons)



Source: Kim W-B *et al.* (2008).

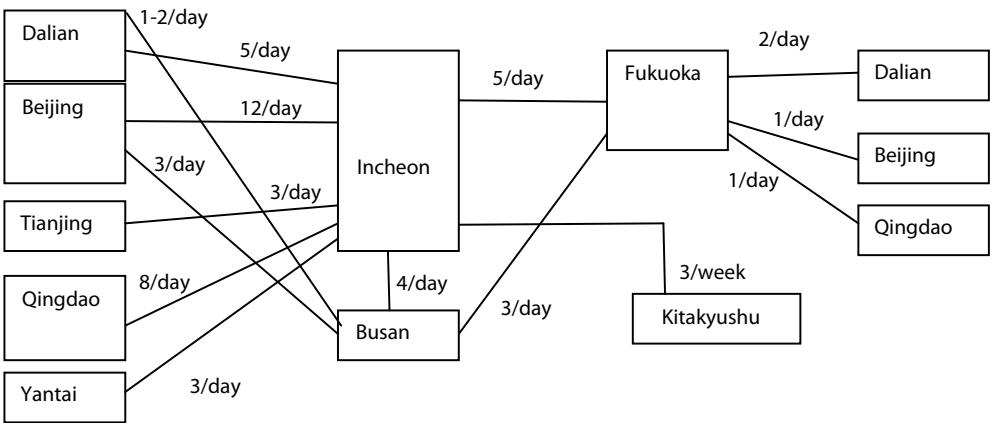
Korea's Incheon International Airport is the key airport in the PYSR (Figure 2.11).[34] In 2007 it was ranked 11th largest in the world based on its handling of 30.7 million international passengers (Airports Council International, 2008). The popularity of Incheon International Airport is due not only to its location, but also to its high quality services. The airport has won the Airports Council International's Best Airport award for four straight years (2006-2009) in the respected Airport Service Quality category.

The growth of ferry travel in the PYSR ports

Ferry services are important for connecting Chinese and Korean cities (Table 2.18). People can cross the Yellow Sea within 24 hours due to their close geographical distance. In 1990, the governments of Korea and China agreed to establish a new joint venture company (Weidong Ferry Co. Ltd., a Chinese corporation) to operate a car ferry between Korea and China. It

Figure 2.11. **The international airport network in the PYSR**

Number of flights per day



Source: adapted from each airports' website, accessed April 8, 2009.

started operating between Incheon and Weihai and has since added additional lines, such as Incehon-Quintdao and Incheon-Yantai. According to the company, its passenger numbers have increased from 100 000 in 1992 to 2 million in 2005.[35] Currently multiple companies manage 12 lines between China and Korea, nine of which connect Incheon and Chinese cities. Incheon is the most important city for ferry connections between China and Korea.

The marine traffic route is very important for Fukuoka and Bussan's internationalisation policies. The number of passengers travelling by sea between

Table 2.18. **Examples of ferry services between China and Korea, 2009**

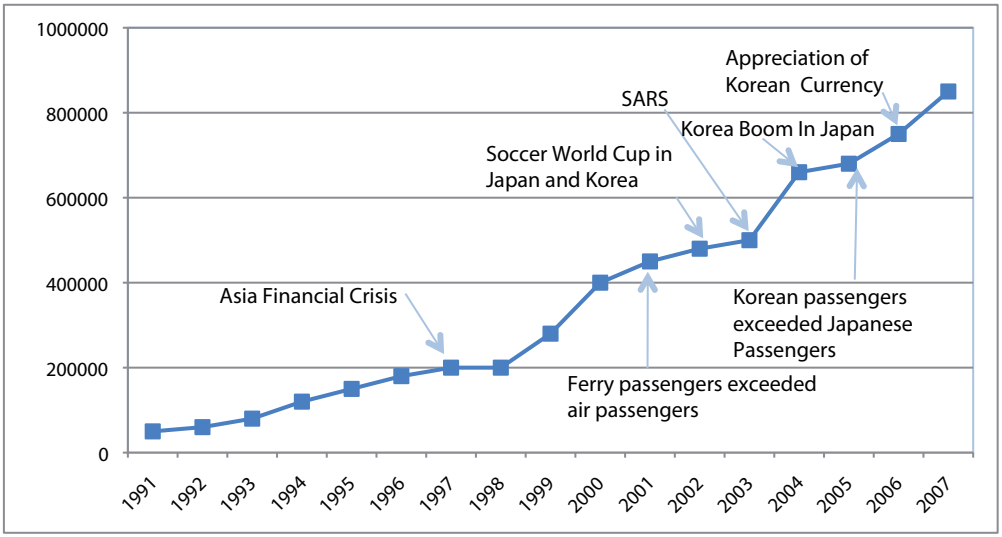
	Incheon/ Tianjin	Incheon/ Qingdao	Incheon/ Dalian	Incheon/ Yantai
Year of operation start	1991.12	1993.5	1995.1	2000.1
Ship bulk (G/T)	26 463	29 554	12 365	16 071
Capacity Passengers (no.)	604	450	555	342
Cargo (TEU)	249	280	125	245
Distance (miles)	460	338	292	283
Sailing time (hours)	25	15	17	15
Frequency of sailing	4 times/week	8 times/week	4 times/week	6 times/week

Source: OECD calculations based data derived from the website of each ferry company.

Fukuoka and Busan has been increasing strongly since the opening of the high-speed jet foil service in 1991 (Figure 2.12). Jet foil has contributed to the increase because it has substantially shortened travelling times and the fares are still cheaper than air travel (Table 2.19). The direct connections between city centres and the ports are another attraction of ferry travel. The Fukuoka-Busan route is the only case in Japan of a large volume of passenger traffic being managed by marine transport.[36]

Figure 2.12. **Passenger volume on Fukuoka-Busan ferries and jet foils, 1991-2007**

Numbers of passengers



Source: The Fukuoka Asian Urban Research Center (2008), available at *www.urc.or.jp/syuppan/kenhou/documents/19FukuokaBusan1.pdf.*

Table 2.19. **Transportation between Fukuoka and Busan, 2008**

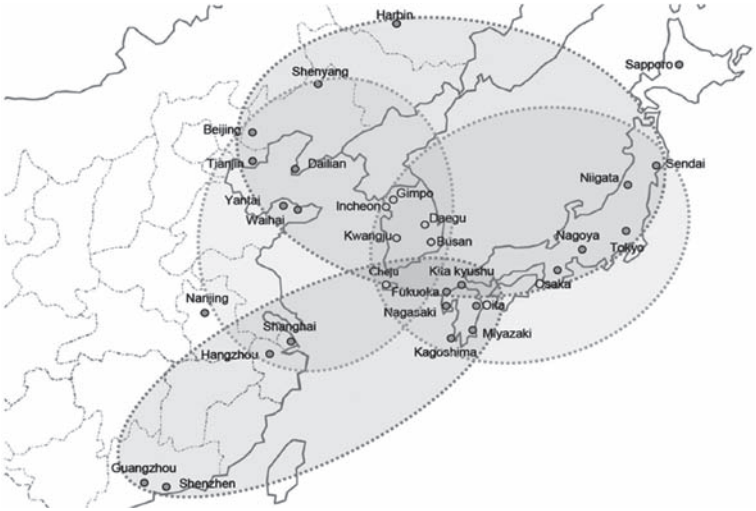
	Frequency	Time	Price/ round trip	Passengers in 2007 (thousand)
Jet foil	5-7/day	2 h 55	24 000 JPY	608
Ferry	1/day	5 h 30 11 h 30	17 100 JPY	233
Airplane	1-2/day	50-55 min	36 800 JPY	128

Source: The Fukuoka Asian Urban Research Center (2008), available at *www.urc.or.jp/syuppan/kenhou/documents/19FukuokaBusan1.pdf.*

Towards the expansion of the one-day business zone

The creation of a one-day round trip business zone would increase the geospatial significance of the PYSR and further promote trans-border linkages in the region.[37] For example, the Japanese government is promoting this in its national plan, which covers the PYSR. Within this provisional zone (Figure 2.13), round-trip flight time (6 hours) and business hours (4 hours) would fit into one working day (10 hours). Capacity-building and network changes within the airline system could play a crucial role in enhancing the attractiveness of the region by increasing the time available for face-to-face transactions (OECD, 2009).[38]

Figure 2.13. **Analysis of the prospective 1-day business zone in the PYSR**



Note: A one-day business trip zone is where the sum of flight time and four business hours is less than one working day (10 hours).

Source: Kim W-B *et al.* (2008).

Open-sky policies, which deregulate the airport market, will also help to expand the one-day business zone.[39] In Europe, open-sky policies have prompted the development of low cost carriers (LCC) whose strategy is to ensure low ticket prices by cutting costs as much as they can. This has meant connecting lines with cheaper secondary airports such as Stansted, 51 km from London's city centre. An LCC connection to a secondary airport has tended to have a strong influence on the region *(e.g.* increased employment and tourist arrivals). Given these gains, competition among airport cities will be harsher under open-sky policies.

Japan and Korea have agreed to promote aviation liberation based on the "Asian Gateway Initiative", which came into effect in August 2007 (except Narita and Haneda Airport in Tokyo's metropolitan area because of Japan's airport capacity problem here). To cope with the problem, Narita and Haneda airports are to be expanded in 2010. Kitakyushu Airport already has a high share of the LCCs operating on the domestic routes. Given the congestion in Fukuoka Airport, Kitakyushu Airport could also be a promising secondary airport for international routes. China and Korea will have an open-sky agreement in place from 2010 (currently the policy is only applicable to Shandong province of China and the whole of Korea). China and Korea are each positive about further liberalising and integrating their air traffic markets. Korea's attitude is partly due to its high speed railway operation since 2004, which has decreased its dependence on air traffic. This means its domestic air traffic market will soon be saturated. China is also gradually liberating its air traffic market; current infrastructure is not enough to support the rapid economic development and accompanying air traffic demand. China tries to compensate for the lag in air traffic infrastructure by using foreign capital.

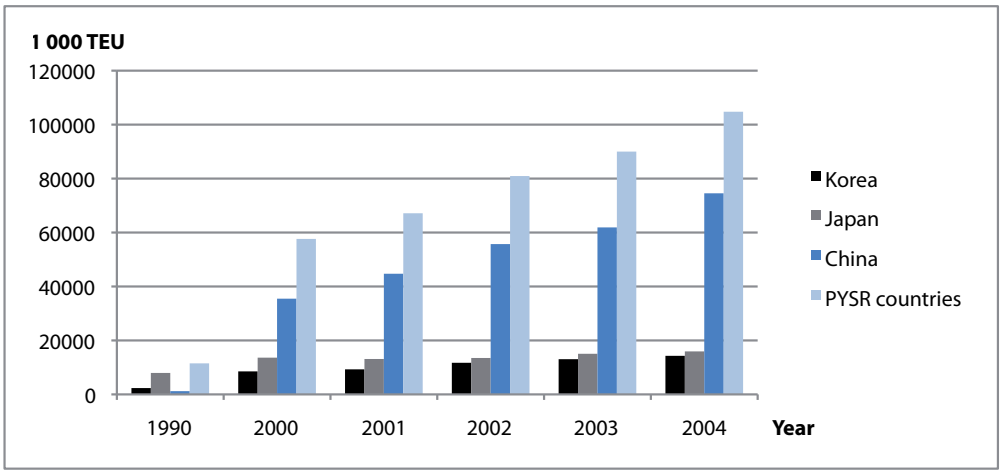
2.2.2 Transportation of goods

Port logistics: introduction

Economic development in East Asia has proceeded hand-in-hand with the development of a container business logistic system, which has supported the global value chain of MNEs and the accompanying increase in trade.[40] Regional scale manufacturing demands faster delivery and smaller inventories than would be possible under a globally oriented supply chain (Lee and Rodrigue, 2006). Sea transportation, and especially container cargo trade, has been key for the transportation of goods. The use of containers began about 30 years ago and has completely changed the world of logistics, by permitting the rapid transportation of large quantities of products. Container cargo transportation is currently substantial and also steadily increasing in PYSR countries. In 2004, container cargo volume in the PYSR countries was 104 million TEU (31% of global volume; Figure 2.14). Most analysts expect a steady increase of cargo volume in the PYSR because of the deepening economic integration. For example, the Korea Research Institute of Human Settlement expects cargo volume to increase in the PYSR more than four-fold by 2030.

Figure 2.14. **Container traffic in PYSR countries, 1990-2004**

1 000 TEUs



Source: Containerisation International Yearbook, 2005

Table 2.20. **Ranking of top 10 world ports in container throughput, 1980-2007**

Unit: million TEU

1980			2002			2007		
1	NY/New Jersey	2.0	1	Hong Kong	19.1	1	Singapore	27.9
2	Rotterdam	1.9	2	Singapore	16.9	2	Shanghai	26.2
3	Hong Kong	1.5	3	Busan	9.4	3	Hong Kong	23.9
4	Kobe	1.5	4	Shanghai	8.6	4	Shenzhen	21.0
5	Kaohsiung	1.0	5	Kaohsiung	8.5	5	Busan	13.3
6	Singapore	0.9	6	Shenzhen	7.6	6	Rotterdam	10.8
7	Saint John	0.9	7	Rotterdam	6.5	7	Dubai	10.7
8	Long Beach	0.8	8	Los Angels	6.1	8	Kaohsiung	10.3
9	Hamburg	0.8	9	Hamburg	5.3	9	Hamburg	9.9
10	Oakland	0.8	10	Antwerp	4.7	10	Qingdao	9.5
			16	Qingdao	3.4	17	Tianjin	7.1
			25	Tianjin	2.4	23	Dalian	4.6

Note: TEUs = twenty-foot equivalent units. One 20-foot container equals one TEU, and one 40-foot container equals two TEUs.

Sources: Containerisation International Yearbook 1980, 2002 and March 2008 Containerisation International.

Competition among the ports in the region

In terms of container throughput, the overwhelming trend is towards the absolute and relative growth of Asian ports, and the relative decline of European and North American ports (Table 2.20). East Asian ports compete amongst each other to become the regional hub. Their frequent change of ranking reflects the relative success of each port in this competition. In 2007, Busan was fifth, the largest of the PYSR port cities. The port worked as a hub port connecting the PYSR and North America, and handled 13.3 million TEU in 2007, 5.6 million of which was transhipped.[41] Chinese port cities such as Qingdao, Tianjin, and Dalian are rapidly catching up with Busan, respectively handling 9.5 million, 7.1 million and 4.6 million TEU in the same year.

The biggest change in the PYSR countries since 1980 has been the shift from a Kobe-centred to a Busan-centred port system. Busan succeeded in becoming the regional hub by continuously increasing its transhipment of cargo through exploiting the "weakness of China's port infrastructure and of Japan's port management" (Fremont and Ducruet, 2005) (Table 2.21). This westward movement of the centre has contributed to the rise of PYSR's strategic significance.[42]

Table 2.21. **Evolution of container throughput in Busan Port, 2003-2007**

	2003	2004	2005	2006	2007
Transhipment (TEU)	4 251 076	4 791 942	5 178 798	5 207 731	5 611 167
Total container throughput(TEU)	10 407 809	11 491 968	11 843 151	12 038 786	13 261 484
Share of transhipment	40.8%	41.7%	43.7%	43.3%	42.3%
Annual growth of transhipment	9.4%	12.7%	8.1%	0.6%	11.6%

Source: Busan Port Authority.

The PYSR's ports offer a diverse array of functions, from dedicated container hubs to general cargo hubs and feeder ports. Busan dominates Korea's other ports, handling more than 60% of Korea's cargo with China and 80% of Korea's cargo with Japan. Currently, transport between Busan and Qingdao is most active, followed closely by Busan-Tianjin. As for the China-Korea link, when trade between China and Korea began to develop in 1990, the first independent trans-Yellow Sea shipping service was launched between Incheon and Weihai in Shandong province. Following its success, Tianjin (1991), Qingdao (1993), Dalian (1995) and Dandong (1998) were all successively linked with Incheon. The ports on the Yellow Sea, such

as Gwangyang, Incheon and Pyeongtaek, are developing rapidly with the increased trade between China and Korea, taking advantage of the short distances and Seoul's massive hinterland (Lee and Rodrigue, 2006).[43] In terms of the Japan-Korea link, transport between Busan and Fukuoka is the most active, although Tokyo, Yokohama Nagoya, Osaka and Kobe are also important ports. As for the container trade between Japan and China, Yokohama and Kobe of Japan and Shanghai of China deal with the largest share, leaving little for Fukuoka and Kitakyushu. Even though Qingdao and Tianjin play an important role in exporting Chinese goods to Japan, neither port is much involved in importing Japanese goods.

Busan port's position as regional hub is now being challenged by the development of the Chinese ports, especially Qingdao, Dalian and Tianjin (Table 2.20). The significance of these Chinese ports is all the more notable if we look at the ranking of world ports in cargo tonnage (Table 2.22). Port development in many Chinese coastal cities is rapid, often with more than 20% of the annual growth in cargo volume; Busan is consequently losing its relative importance within the PYSR (Kim W-B *et al*., 2008). In 2002 it was

Table 2.22. **Ranking of top 20 world ports in cargo tonnage, 2002-2006**
million tonnes

2002			2006		
1	Singapore	335.2	1	Shanghai	537.0
2	Rotterdam	321.9	2	Singapore	448.5
3	Shanghai	238.6	3	Rotterdam	378.4
4	South Louisiana	196.4	4	Ningbo	309.7
5	Hong Kong	192.5	5	Guangzhou	302.8
6	Houston	161.2	6	Tianjin (China)	257.6
7	Chiba	158.9	7	Hong Kong	238.2
8	Nagoya	158.0	8	Qingdao (China)	224.2
9	Gwangyang (Korea)	153.4	9	Busan (Korea)	217.9
10	Ningbo	150.0	10	Nagoya	208.0
11	Ulsan (Korea)	148.4	13	Gwangyang (Korea)	202.4
12	Incheon (Korea)	146.2	15	Dalian (China)	200.5
13	Busan (Korea)	143.8	19	Ulsan (Korea)	161.1
17	Tianjin (China)	129.0			
20	Qingdao (China)	120.0			

Note: Shaded ports are the PYSR ports.

Source: AAPA, World port Rankings 2006, 2002.

third after Hong Kong and Singapore in terms of container throughput, but in 2003 Shanghai and Shenzhen raised their rankings and Busan fell to fifth. Since then the gap between the fourth port Shenzhen and Busan has been widening, reaching about 8 million TEU in 2007 (Table 2.20). The background to this is the increase of direct trade between China and the rest of the world and the accompanying decrease in potential tranship through Busan.[44] If this trend continues, the PYSR will experience another transformation in its port system, from a single hub system centred on Busan to a multiple hub system which includes some Chinese ports. Qingdao and Tianjin have already developed large-scale capacity and facilities in their ports (Table 2.23).[45]

Table 2.23. **Facilities of ten city ports in the PYSR**

		Kita-Kyushu	Fukuoka	Shimonoseki	Busan	Incheon	Ulsan	Dalian	Tianjin	Qingdao	Yantai
Berth length (depending on the depth)	-15	700			3 676			422	2 028	750	
	-14		330		1 200	300				1 030	873
	-13		600		600			332		690	
	-12	620					610				
	-11				500	1 160			366		
	-10	895		370		802			1 323		
	below 10			356							
Total terminal area (1 000 m^2)		683	370	45	3 070	688	202	560	343	900	672
Gantry cranes (no.)		10	7	1	55	14	6	1	40	60	8
Capacity (1 000 TEUs)		35	19	1	486	1	17	170	3 550	2 000	340

Sources: Hidekazu Ito (2008) and the cities' web pages.

Busan's primacy as a transit hub port and the fast developing Chinese ports mean that the relative status of Japanese ports has declined in the East Asian market. Two ports in Kyushu (Hakata Port in Fukuoka City and Kitakyushu Port) face common challenges. First, development of both ports as container ports has lagged behind other major PYSR and domestic ports. Unlike more advanced ports which deal with a variety of exporters and goods, both ports depend on a limited number of large exporters who want to send a large volume

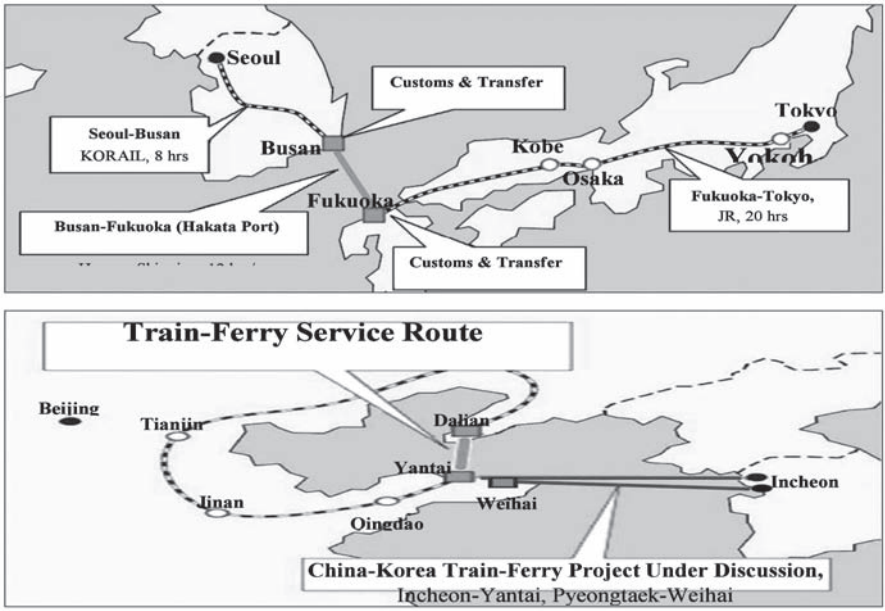
of goods and focus on price factors. This has prevented the ports from developing a variety of port logistics functions. Secondly, Kyushu's market size is small compared to other major PYSR and domestic port cities.[46] There is a limit to the growth potential of a port that does not expand its catchment area. Third, both ports have experienced declining trade with North American and European ports and increasing trade with closer Asian ports. Trade imbalances in terms of volume (*i.e.* an excess of imports over exports) mainly through the East Asian routes, decrease the efficiency of shipment and damage the attractiveness of the port. An effort should be made by both ports to expand their catchment area and increase the volume and variety of transported goods, especially exports.

Development of diverse marine transportation

An innovative sea transport system is being developed for the region's container trade. The advantage of containers is their universal standard size. Tsumori (2006) notes that the diffusion of containerisation has harmonised the business logistics system beyond the transportation mode and beyond borders. For example, all container transportation companies – not only container shipping companies, but also inland trucking companies and railway companies – are generally encouraged to have the same standard transportation system to fit the internationally standardised size and shape of a container. Many shipping companies now extend their business to the inland portion of transportation, responding to the shippers' demand for an integrated door-to-door service. They are also trying to reduce total costs by decreasing inland costs.[47] An integrated logistics operation is now crucial for the survival of shipping companies.

There are many examples of trans-border linkages involving multi-modal transportation systems in the region. A train-ferry system (TFS) (Roll On/Roll Off or RO/RO)[48] operates between Busan-Fukuoka, Shimonoseki-Qingdao, and Fukuoka-Shanghai (Figure 2.15). A similar system is also planned for Incheon-Yantai and for Dalian-Yantai. The TFS is more cost-efficient than air freight and faster than container shipping because it boards cargo on trucks or trailers directly onto the ship, without the need for a crane. For example, this system takes only 60 hours from Tokyo to Seoul, at 30% lower cost than air freight. Another advantage of TFS is that it is usually for both goods and passengers, making the service more frequent, punctual and immune from rolling and pitching, which is especially important for expensive fragile goods such as semi-conductors. Hakata Port has tried to take advantage of the East Asian vitality for its port development by crafting the "Hakata cross service", which connects Hakata with Busan and Shanghai (via the Shanghai Super Express; SSE),[49] and domestically with big ports such as Tokyo and Kobe. Japan Railway Freight is aligned with the Korea Railway Company for this service.

Figure 2.15. **Multi-modal transportation network in the PYSR: advanced example**



Source: Kim W-B *et al.* (2008).

The increasing global trade volume means that the main trend affecting the global logistics market is the prevalence of larger ships. Post-Panamax[50] container ships account for more than 60% of all ships, mainly those which work the long-distance trunk routes. Short to middle distance routes also have larger ships than ever. This raises the shipping threshold per port, and means that limited numbers of stopping-by ports with larger catchment areas are selected so as to decrease the occurrence of "less than container load" (LCL), which decreases the efficiency of the logistics system. Big companies, which tend to have big ships, promote alliances or mergers to increase competitiveness. With the dominance of bigger ships, on the other hand, the rise of intra-regional trade and value chain management by companies increases the demand for frequent, stable and speedy service by small to medium-sized feeder container ships suitable for short distance transportation.[51] Furthermore, the trade imbalances that tend to occur under a free trade system also contribute to LCL. Both Japan and Korea import more than they export in their trade with China in terms of volume. Therefore, LCL tends to occur in export containers going to China.[52]

In response to these shippers' demands, the transportation mode has been diversified from container ships to the smaller but more frequent RO/

RO. The aforementioned SSE delivers 12 foot containers[53] using an RO/RO ship between Hakata and Shanghai port; once the goods arrive in Hakata, the same company transhipps them to their final destination by rail or road. The aim is to expand the catchment area of Hakata Port. Hakata Port's proximity to East Asia improves shipping speed, increases frequency and lowers costs. This service has increased the number of containers transported from 130 in 2003 to 3 960 in 2007. It has great potential, but currently the SSE service operates only twice a week, mainly because of the rather small market size of the Kyushu area. Also, the connection between routes, for example from international to domestic, is not very smooth.

In response to the threat of losing transhipp demand through port competition, major ports took the initiative to maintain demand. This involved upgrading their logistic function, a process called value added logistics (VAL), which adds value to the transhipped cargo (Furuichi, 2006). VAL will support supply chain management and demand chain management which has been highly developed in East Asia. VAL requires more facility investment but stabilises port management. It also creates more employment opportunities in the region, contributing to economic growth. For example, Busan Port is aiming to provide a total logistics service, instead of just transhipping containers. It has a series of functions that de-bundles (splits apart), classifies, processes and stores transhipped cargo, delivers it to the final destination when requested by the original exporters and controls the remaining goods in stock. Automatic cargo recognition, automatic tracking of cargo route and real-time logistics information improves operation efficiency, shortens timescales, lowers costs and tightens security.[54]

Strong central and local government support for port logistics

Reflecting the importance of the logistics sector to their economy, each country has given high priority to developing transportation infrastructure and is trying to take advantage of the rapidly developing PYSR. Korea has planned mega-scale infrastructure investment in the PYSR in its comprehensive national territorial plan for 2006-2020. Japan is promoting super core ports (six ports) and core international ports (11 ports including Hakata, Kitakyushu and Shimonoseki). China also has similar strategies – among them, the expansion of Shanghai Port is outstandingly large scale. The port will become an international hub with 50 docks. In the PYSR, currently Qingdao, Tianjin and Kitakyushu are expanding their port capacities, while Busan is supposed to complete the expansion of a new port in 2015 at the projected expense of about USD 61.5 million. In this way, each country is competing to become the regional hub. Because of this expansion competition, there have been some concerns about duplicate and excessive investment, especially in port facilities. Accordingly, stakeholders surrounding the PYSR

are actively discussing the issue and developing measures for co-ordinating transport systems across borders.

National level dialogue has already begun on these issues. The three countries established the Trilateral Ministerial Conference on Transport and Logistics in 2006 to exchange information on international maritime transport and logistics and to develop a seamless logistics system in the PYSR countries. The three countries agreed an action plan at the first conference in 2006. The plan includes 12 actions, such as establishing an inter-connected logistics information network, standardising logistics equipment, conducting joint research etc. At the second conference in 2008, the three ministers exchanged information on implementation progress for each action and set three objectives for further co-operation: *(i)* a seamless logistics system; *(ii)* environmentally friendly logistics; and *(iii)* secure and efficient logistics. Director-general and director level working groups have also been established under this ministerial conference.

Local government strongly promotes port logistics within the region. For example, the city of Kitakyushu asked the national government to approve a "special deregulated district for international logistics" in 2003. The proposal aimed at opening 35 new companies in the city and creating 10 000 new jobs. The national government accepted part of the proposal, including deregulation of building approval in the port district, subsidy provision for accumulating business in the port, and inviting foreign researchers for facilitating knowledge exchange. Kitakyushu City is also designated as a "recycling port" and is developing international green logistics for dealing with recyclable resources (Box 2.5). Incheon City has also been very active in creating a triangular logistics network with China and Japan to revitalise the logistics industry. It has also developed its port by taking advantage of its designation as a "customs-free zone". A customs-free zone enjoys a tax privilege exempting goods traded within the designated area from custom duties and other taxes. The aim is to facilitate freight trading. Tianjin Port has also effectively promoted a free trade zone since 1991.

Soft policies, such as port management, can also increase trans-border linkages. The governance structure of a port affects the degree to which it can legally and practically increase competitiveness through co-operation.[55] Private involvement in port management can also contribute to the trans-border networking among ports in the PYSR. According to information from the Kitakyushu City Government, PSA International, which is involved with managing Kitakyushu, Incheon and Dalian ports, promotes a triangular network strategy. This places Kitakyushu Port as a hub connected to a trunk route towards North America with geographically remote Dalian and naturally disadvantaged Incheon as feeder ports. Local level co-operation is developed in this field.

Box 2.5. **A growing recycling trade**

A chronic lack of plastic and other materials in China and the increased need for recycling in Japan have contributed to the gradual emergence of a used goods/materials trade (Tateishi, 2006). For example, 7.1% of containers exported from Kitakyushu Port and 9.8% from Hakata Port consisted of materials for reuse, most of which was exported to China. Since 2002 the Japanese Government has begun to designate some ports as "recycling ports", which are developing the ability to store, recycle and trade the used goods. Kitakyushu was designated as one of the first of five such ports, based on its potential for co-ordination with the surrounding region. By promoting recycling ports, Japan is trying to create a "recycling-based society", revitalise the recycling industry for regional development on the coast where manufacturing is in decline, and decrease recycling costs and the environmental burden. The Japanese Government provides support for facility development and management of recyclable goods, and facilitates public-private partnerships. In response to this trend, Chinese port cities have also put more effort into developing the recycling industry. Qingdao started official co-operation with Kitakyushu in 2007; Tianjin followed in 2008. The most important aspect of the trade in recycled goods is to assure transparency, security and traceability to prevent contamination. This trade has great potential for redressing Japan's export-import imbalance and contributing to the development of an environmentally sound society.

The Organization for East Asia Economic Development (OEAED), which consists of ten port cities in the PYSR, also emphasises the importance of the logistic sector and has talked about the notion of "port partnership". It has created a working group for logistics which has had some success. The OEAED aims to introduce to member cities discounted fees for using the port facility and to simplify the custom information system. It also aims to network logistics information and the logistics business sector. Director-generals of port offices and the logistic business sector in ten cities participate in the working group. Incheon City, one of the members of the OEAED, is already discounting ship fees (by 20%) and is developing a database on infrastructure and logistics in ten cities. Bi-lateral relationships are also gradually being constructed. In 2007, Korea's Incheon Port Development Council and the Kitakyushu Port Promotion Council signed an exchange agreement to identify and develop joint projects. Both Incheon and Qingdao cities host a China-South Korea Logistics Centre, based on a private sector co-operation agreement between both countries.

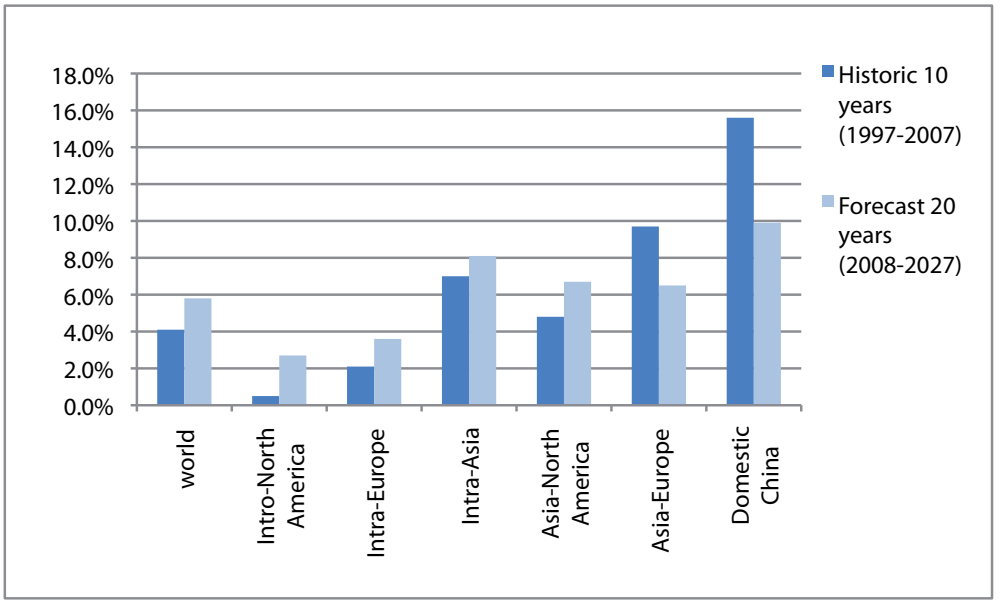
Airport logistics: an increase in air cargo

Transportation of goods by air is steadily increasing because of the demand from the high-tech sector, not only in Asia but all over the world. These products are small, light, valuable and require fast and vigilant delivery. Between 1997 and 2007, the air cargo growth rate within Asia was 7%,

much higher than the world average of 4.1%. The growth rate between 2008 and 2027 is projected to be 8.1%, again higher than the world average of 5.8% (Figure 2.16).

Incheon International Airport is the only air logistics hub in the PYSR, followed by Narita (Tokyo) Airport at the East Asia scale. Incheon International Airport has increased its volume of air freight and has been fourth largest in the world in 2008, while Tokyo's Narita International Airport has been falling in the rankings since 2005 (Table 2.24). Fukuoka Airport, a hub in Kyushu region, has increased its exports from JPY 682 billion in 1997 to JPY 751 billion in 2008, while increasing imports from JPY 230 billion in 1997 to JPY 895 billion in 2008 (Moji Customs, 2008). Electronics parts, including semi-conductors, comprise half of this trade. Even though the share of air cargo in China's total freight volume was below 10% in 2004, China's rapid economic growth and technological development will increase this share in the future. Similar to the trend in air passenger volume, China-Korea air freight is rapidly catching up with the already established Japan-Korea air freight volume. However, China-Japan freight volume is still the largest side of the "triangle" of trade among the three countries.

Figure 2.16. **Historical and forecast air cargo growth rates**



Source: Boeing Commercial Airplanes, *World Air Cargo Forecast 2008-2009.*

Table 2.24. **Ranking of top five world airports by cargo traffic, 2002-2008**

2002			2008		
Rank	Name	Cargo (metric tonnes)	Rank	Name	Cargo (metric tonnes)
1	Memphis	3 390 515	1	Memphis	3 695 438
2	Hong Kong	2 668 880	2	Hong Kong	3 660 901
3	Tokyo (Narita)	2 154 691	3	Shanghai (Pudong)	2 602 916
4	Anchorage	2 102 025	4	Incheon	2 423 717
5	Incheon	1 843 055	5	Anchorage	2 339 831
			8	Tokyo (Narita)	2 100 448

Source: Airports Council International.

2.2.3 Challenges and recommendations

In this section we have analysed the PYRS's airport and port transportation network. Co-ordination among each port and airport will make transportation within the PYSR smooth and contribute to the overall economic development of the region. The following are some challenges and recommendations for enhancing transportation in the region:

i. *Expand the one-day business zone.* The efficient use of existing airports will aid the expansion of the one-day business zone, helping to ease the fiscal strain facing these three countries. Promoting an open-sky policy will help to increase the use of existing airport infrastructure. In terms of the Japanese cities (Fukuoka and Kitakyushu) and Busan, fully developing ferry services and connecting these cities to their hinterland through high speed trains and highways would also help to expand the one-day business zone.

ii. *Develop and co-ordinate a multi-hub port system in the PYSR.* Each port in the PYSR should seek its own niche in response to the structural changes in the regional logistics system. Efforts towards creating a multi-hub port system requires further trans-border co-operation around transportation policies.

iii. *Upgrade the logistics function*: Value adding logistics (VAL) could be a key strategy for increasing ports' comparative advantage, allowing them to shift from simply transmitting goods to providing logistical services such as de-bundling, processing and customs clearance.

iv. *Achieve a good balance between exports and imports*: Port cities need to find new products to help mitigate the problem of under-used containers. Recycling materials, as promoted by Kitakyushu City, might be one possibility (see Box 2.5). Horizontal co-operation between the economy and trade and transportation sectors would also help address the problem.

v. *Expand ports' catchment areas*: Expanding a port's catchment area (the hinterland) by improving inter-modal connections is crucial for upgrading port status. The Seoul-Busan highway opened in 1970 and a high-speed rail line (KTX) opened to the public in 2004, helping to expand the catchment area of Busan Port.[56] Similarly, the completion of the integrated network of the Kyushu, East Kyushu and Cross Kyushu highways will expand the hinterland of Fukuoka (Hakata) and Kitakyushu ports. Kyushu Shinkansen, a high-speed rail link being built to connect Fukuoka, Kagoshima and Nagasaki, will likely accompany more efficient use of the existing railway and further expand the hinterland of Fukuoka (Hakata) and Kitakyushu ports. Tianjin and Beijing airports have a common strategy to share and complement the passengers and freight routes by developing highways and a bullet train between Tianjin and Beijing.

vi. *Deepen trans-border institutional harmonisation*: Differences in container chassis standards, lack of co-ordination among railway systems and different security regulations among the three countries are inhibiting the full integration of multi-modal trans-border logistics. In other words, standardisation in every area of logistics will be required if better

Box 2.6. **A trans-border port alliance in Europe: Copenhagen/Mälmo port**

Integrated management of the ports of Copenhagen (in Denmark) and Mälmo (in Sweden) is one of the most progressive global examples of trans-border co-operation. These ports have been managed by the Copenhagen Mälmo Port Authority (CMP) since 2001. The CMP is equally funded by the Copenhagen Port Authority (Denmark Government and City of Copenhagen Government) and by the Mälmo Port Authority (the City of Mälmo and private entities). By integrating these two ports beyond national borders, Copenhagen and Mälmo have tried to capture international recognition through expanded scale, and achieve efficient investment. Mälmo Port specialises in freight logistics while Copenhagen Port promotes the cruise industry. The integrated port is aiming to become the hub port for the Nordic and Baltic Regions, taking advantage of its location as an access point between Scandinavia and Western Europe. A number of international firms, including Toyota, Sony and Roland, have already located their main distribution centres at the port.

Source: OECD (2009).

and smoother transportation is to be achieved. CIQ (customs, immigration and quarantine) should also be aligned with the speed of logistics. These challenges need to be tackled as a region. In the OECD member countries, there are cases of trans-border port alliances (Box 2.6). Co-operation among national and local governments, and private sector involvement, are all necessary to bring about this standardisation, as seen in the case of the RO/RO line between Fukuoka and Shanghai.

2.3 Soft infrastructure: the socio-cultural network

Trans-border linkages do not only require hard infrastructure; they also depend on soft infrastructure such as human resources, culture and institutions for knowledge exchange (Table 2.25). Through soft infrastructure, people can exchange information and ideas, and develop mutual understanding and value systems to help unite a region. This section begins by describing existing assets, then analyses the role of tourism in promoting mutual understanding and an open-minded culture. Finally, we discuss academia as an institutional tool to facilitate the exchange of people and ideas.

Table 2.25. **The cultural challenges of trans-border co-operation**

Problem	Explanations
Communication	Lack of linguistic proficiency Moral concepts Behavioural patterns Customs/manners and routine behaviour Slowness in progress Mistrust Lack of genuine motivation
Customs, national traditions, habits & behaviour	
Cultural/political barriers	
Mentality and motivation	
Institutional levels	Different and/or overlapping powers Discrepancies in operational methods Different official languages
Bureaucracy	
Historical level	Prejudices Misinformation
Lack of mutual trust	Lack of mutual knowledge Different working methods
Instinctive attitudes	Traditional prejudices Unpleasant experiences, failures Ignorance creates mistrust

Source: van Run (2000).

2.3.1 Existing assets: human resources and life support infrastructure

A long history of cultural exchange

The coastal cities in the PYSR have a long tradition of cultural exchange. Between the seventh and tenth centuries, China, Japan and Korea maintained peaceful and co-operative relationships. According to Chen (2005), there is some evidence that the trans-border sub-regions today can be traced back to the China-centric tributary system and the geographic structure of maritime Asia after the early 1400s. Hamashita analysed the trade pattern of the Asia-Pacific area in pre-modern times and found there was frequent trade in the PYSR. He noted that "the states, regions, and cities located along the periphery of each sea zone were close enough to influence one another but too far apart to be assimilated into a large entity" (Hamashita, 1997). This level of historical connection helped build social capital (cultural links) while maintaining the diversity of the PYSR. This legacy is being reconsidered and revived in the contemporary context.

Currently, urban development projects based on trans-border historic activity prosper in the PYSR. For example, Incheon revived its Chinatown in 2001 in order to increase Chinese tourists. Busan City has also revived its "Special Zone of Chinatown", to increase tourists, shopping activities and cultural experiences. The project includes the establishment of a touristic-cultural centre and the improvement of the streets. It claims to be the largest Chinatown in South Korea. In 2004, Japan's Fukuoka City also revealed a plan to revive its Chinatown to increase the business and cultural connections with China. This was once the first Chinatown in Japan, but was later demolished. A large-scale event commemorating the ritual visits of Chosen Dynasty diplomats to Japan between the 17th and 19th centuries has been regularly held in both Korea and Japan to promote cultural exchange and tourism. These events involved collaboration among various stakeholders in Japan and Korea. In all of these cases, past trans-border activity is regarded as a regional asset for future trans-border activity.

The cultural gap between the three countries is closing, especially for the younger generations. Fashion and entertainment (movies, TV drama, music, comics and animation, see Box 2.7) are the main engines of a common culture. Some Japanese fashion magazines have better sales in China than in Japan.[57] Actors and singers often cross the border and are popular in neighbouring countries. The popularity of Korean dramas has contributed to the increase of Japanese tourists visiting Korea and they have also has been influential among China's young people. A Chinese music group topped the Japanese music scene in 2004. The Busan International Film Festival, first launched in 1996 and held annually since then, has grown into one of Asia's largest film festivals, with around 200 000 visitors since 2007. All these factors suggest that the gaps in life-styles and value systems are gradually being closed, especially among the young.

Box 2.7. **Collaborative film, drama and animation in China, Japan and Korea**

Young students from film schools in China, Japan and Korea collaborated to make an omnibus film sponsored by Yokohama City to commemorate the 150th celebration of the opening of its port. The film, *The Stories of Three Ports*, is to be screened in 2009. China created a story about Quingtao, Japan about Yokohama, and Korea about Incheon. The three countries also began collaborating on a TV drama in 2009, on a story about a legendary Chinese man who is supposed to have come to Japan, after passing though Korea, in search for medicine for eternal life. Collaborative animation-making has also occurred among companies from the three countries. This combines Japanese know-how with China and Korea's cost advantages, and enables regulations against foreign content to be bypassed (China and Korea have regulated the broadcasting of foreign animation programmes, mainly to support their domestic animation industry).

Source : Yokohama City (*www.city.yokohama.jp/me/keiei/kaikou/souzou/project/cultural/event-150movie.html*), accessed August 29, 2009.

Increasing exchange of human resources

Japan, Korea and China all have policies to increase their intake of highly-skilled foreigners and foreign students. Though the share of foreign residents in the total population is not large in most PYSR cities, the absolute number is large in many cities (Qingdao: 100 000; Tianjin and Incheon: about 40 000; Fukuoka and Busan: about 20 000; Table 2.26). Japan and Korea have a positive list system for immigrants, allowing only qualified immigrants to enter the country. In Japan, foreign residents increased from 1.5 million in 1998 to 2.2 million in 2008 (Ministry of Justice, 2009b). Foreign residents from China constitute the largest share (29.6 %), with Koreans forming the second largest group (26.6%) in 2008. Foreign residents in Korea increased from 182 788 in 1998 to 854 007 in 2008 (Korea National Statistics Office). In the past, Korea focused on accepting low-skilled immigrants, but recently it has been prioritising high-skilled immigrants. China also introduced work permits for foreigners in 1996 and established a permanent residence permit in 2004. According to the Bureau of Exit-Entry of the Ministry of Public Security, the number of foreign nationals in China was over 26 million in 2007. Their nationalities were mainly Korean (18.3%), Japanese (15.2%) and Russian (11.5%).

Labour force mobility in the PYSR is low. This highlights one of the distinctive features of the local labour market in the PYSR – population change can principally be attributed to domestic migration and demographic changes (*i.e.* births and death rates), rather than international migration. In fact, many cities in the PYSR mobilise labour forces internally. For example,

Table 2.26. **Population of foreign nationals in the PYSR cities, 1995-2006**

	Population of foreign nationals				Ratio of foreign nationals to the total population (%)			
	1995	2000	2005	2006	1995	2 000	2005	2006
Japan	1 362 371	1 686 444	2 011 555	2084 919	1.1	1.3	1.6	
Fukuoka	13 361	16 531	19 878	20 428	1.0	1.2	1.4	1.4
Kitakyushu	11 179	10 552	11 367	11 352	1.1	1.0	1.1	1.1
Shimonoseki	4 723	4 244	3 891	—	1.5	1.4	1.3	—
China	NA	NA	NA	NA	NA	NA	NA	NA
Dalian	NA	NA	NA	15 000	NA	NA	NA	0.3
Tianjin	NA	NA	NA	40 000	NA	NA	NA	0.4
Qingdao	NA	NA	NA	100 000	NA	NA	NA	1.3
Yantai	NA	NA	NA	10 000	NA	NA	NA	0.2
Korea	123 881	244 172	485 477	632 490	0.3	0.5	1.0	1.3
Busan	9 092	7 447	11 035	23 397	0.2	0.4	0.5	0.6
Incheon	12 529	8 801	13 600	39 463	0.4	0.7	1.2	1.5
Ulsan	2 944	3 926	4 243	10 494	NA	0.4	0.7	1.0

Sources: (a) Japan: Immigration Bureau of Japan "Statistics of foreign people who registered entry into Japan", Metropolitan Area Statistics Council's "Metropolitan Area Comparative Statistical Table" (each year's edition) and the cities' official websites; *(b)* Korea: Korea National Statistics Office, each city's statistical yearbook (2006 and 2001 editions); *(c)* China: arranged statistical materials on resident foreigners on the websites of the Public Security Departments of Dalian, Tianjin and Qingdao.

the foreign workforce in Kyushu, Japan, was 12 630 in 2006, only 3.3% of the total foreign workforce nationwide. Of these foreign workers, 73% came from East Asia and 14% from Southeast Asia (METI Kyushu Bureau, 2008). This low proportion of foreign workers can be explained by two factors: there are fewer foreign companies based in Kyushu than the three metropolitan areas (Tokyo, Osaka and Nagoya); and local companies in Kyushu employ fewer foreign people than other regions of Japan. Furthermore, a significant share of the new jobs in Tianjin City in 2006 were filled from inside Tianjin; 23% and 17.7% of workers were from rural areas and new college graduates in Tianjin respectively, whereas workers from outside the Tianjin area only comprised 1.2% (Tianjin City, 2006).

The basic infrastructure for foreign residents includes special schools for their children, bilingual hospitals and so on. For example, reflecting the close

human relationship between the Korean and Chinese coastal cities, Tianjin and Qingdao have several schools for Korean children, while Busan has two schools for Chinese children. On the other hand, Fukuoka has only one international bilingual school and one school for Korean children. A guide for foreign residents living in Fukuoka, issued by the Fukuoka International Exchange Foundation and written in English, Chinese and Korean, gives foreign residents information on housing, education and social welfare in Fukuoka. A similar service is provided on the Busan Metropolitan City website for residents speaking English, Japanese and Chinese. This kind of "soft" public support is an important service for all types of foreign resident.

Language barriers are gradually being reduced in the PYSR cities.[58] Busan and Fukuoka are trying to create a "no-translation zone" to strengthen the daily links between the two cities. Both cities have recently added both Korean and Japanese languages to street signs. The private sector, such as many large commercial facilities, also uses both languages on signs where necessary. In the long run, language will be less of a barrier as more young people learn the language of their neighbouring countries at school. For example, in April 2009, the Educational Bureau of the City of Seoul revealed that 278 out of 308 high schools teach Japanese as an optional second language, and 189 schools offer Chinese. In Japan, the Ministry of Education also revealed in 2007 that the number of high schools that teach Korean as a second language increased from 73 in 1995 to 286 in 2005. High schools teaching Chinese also increased from 192 in 1995 to 553 in 2005.

2.3.2 Tourism: a tool to promote the exchange of peoples and cultures

In a context where there is little human exchange across borders via migration, tourism is a potential first step for promoting mutual understanding among cultures and peoples in the PYSR. Tourism is also a sector from which both sending and receiving countries can benefit economically; tourists tend to pay local agencies in their home country to organise their trip, and they also spend money at their destination. In other words, a "win-win" situation can be easily achieved in this sector. Regions not only use price differentials to compete for tourists, but also by promoting their unique regional assets (Box 2.8). Mutual investment is not always required. As a result, generally, governments can co-operate more easily around tourism than around any other policy area.

The recent tourist boom in Asia is a promising sign for the region. Since 1990, global tourism has had three main pillars, Europe, America, and East Asia/Pacific. The World Tourism Organization (WTO) expects that the East Asia/Pacific region will be the second largest tourist destination (195 million tourists) by 2010. It forecasts that by 2020 the top three receiving regions will

Box 2.8. Some of the PYSR's unique regional tourism assets

Dalian, China: The flourishing coastal city of Dalian has a pleasant climate with clearly demarcated seasons. Cool summers and warm winters make the city an ideal holiday resort. Dalian abounds with natural resources. It is an important base for fruit and water production in China. Dalian is also known as the "home of track and fields" and the famous "soccer city." The port has many factories which produce handicrafts such as glassware and shell mosaics. Every year, Dalian attracts many regular international events and activities, such as the Chinese Scholar Tree, International Fashion Festival, Export Commodity Fair, and International Marathon Competition.

Tianjin, China: Historical changes over the past 600 years have made Tianjin a unique place, mingling both ancient and modern Chinese and Western styles. Tianjin is well situated for travel by land, sea or air and has become an international tourist destination and a base in northern China for chartered tourist planes. Tianjin has many advantages for travellers interested in commerce, antiques, local culture, study or tours centred on such things as preventative medicine or folk customs. In addition, it now only takes an hour to travel by car from Tianjin to Beijing on the new Beijing-Tianjin-Tanggu Expressway.

Fukuoka, Japan: The city of Fukuoka, also known as Hakata, is not only the Kyushu region's administrative and economic centre, but is also a terminal for air and rail travellers. The *Hakata Dontaku* is a colorful port festival held every summer. Highlights include a parade of children in traditional dress, men and women in fancy costume, and *te-odori* dancing (dancing with nothing in hand) through the streets. This event draws more than 580 groups and about 31 000 participants and is viewed by more than 2 million spectators.

Kitakyushu, Japan: Kitakyushu City is located in the northern part of Fukuoka and is the gateway to the Kyushu region. While Kitakyushu has become the largest heavy industry city in the Kyushu region, it is also the base for some major sightseeing spots. These include Moji Port (a special export port in the Meiji Era), Kokura (a castle town that was the starting point of the Nagasaki-Kaido Highway), and Yahata-Higashida, with its Space World and the Kitakyushu Museum of Natural History and Human History. This sightseeing city receives more than 10 million tourists each year.

Busan, Korea: As a major port city, Busan has a myriad of sea routes offering gateways to Japan and to the rest of the world. Busan also boasts beautiful natural scenery, with a landscape that includes a coastline with fine beaches, scenic islets and tall mountains. The Pusan International Film Festival (PIFF) is held annually and attracts movie enthusiasts from all over the world.

***Incheon, Korea*:** The first city in Korea to open its doors to the outside world, Incheon has played a major role in the modernisation of the nation. The city offers the closest access to the sea for those living in Seoul, and boasts beautiful islands offshore. On the islands of Sido and Modo, visitors can still find TV drama filming sets, which are now tourist attractions. The new Incheon Airport city offers a large selection of hotels in the beach areas and on the islands, as well as in the downtown area.

Sources : China National Tourist Office, Japan National Tourism Organisation, Korea Tourism Organisation.

be Europe (717 million tourists), East Asia/the Pacific (397 million) and the Americas (282 million). The global share of East Asia/Pacific will increase from 14.4% in 1995 to 25.4% in 2020; a faster growth rate than the world average (Table 2.27).

Table 2.27. **World tourism projections, 1995-2020**

	Forecasts (Millions)			Market share		Average annual growth rate
Destination	1995	2010	2020	1995	2020	1995-2020
World (total)	565	1006	1561	100.0%	100.0%	4.1%
Africa	20	47	77	306.0%	5.0%	5.5%
Americas	110	190	282	19.3%	18.1%	3.8%
East Asia/the Pacific	81	195	397	14.4%	25.4%	6.5%
Europe	336	527	717	59.8%	45.9%	3.1%
Middle East	14	36	69	2.2%	4.4%	6.7%
South Asia	4	11	19	0.7%	1.2%	6.2%

Source: WTO (2001), Tourism 2020 Vision.

More specifically, when looking at intra-regional tourism in China, Japan and Korea, the interconnection of the three countries are outstanding (Table 2.28). In 2008, Japanese and Koreans constituted 16.2% and 18.3% of tourists to China respectively. There is a strong bi-lateral flow of tourists between Korea and Japan. However, there are much fewer Chinese travelling to Japan and Korea than Japanese and Korean tourists to China. This suggests there is much potential for Japan and Korea to attract more Chinese tourists. According to the China National Tourism Administration (CNTA), 46 million Chinese travelled overseas from mainland China during 2008. The WTO forecasts that China will produce 100 million outbound tourists by 2020. The average spending by Chinese travellers is high in many places[59] and receiving countries can expect a big economic impact from Chinese tourists. It is highly likely that intra-regional tourism will increase because of China's rapid economic growth and the deepening business relationships among the three countries.

However, if we examine the more detailed regional picture, we can see that tourism within the PYSR has become rather stagnant because most tourists in the PYSR countries head to the capital regions, *i.e.* Tokyo, Seoul and Beijing. According to a JNTO survey (14 535 samples) in 2007-08, 58.2% of foreign tourists to Japan visited Tokyo, while 9.6% visited Fukuoka Prefecture. In Korea, compared to around 6 million foreign tourists to Seoul, Busan had

Table 2.28. **Intra-regional tourist movements, 2008 (China, 2006)**

Destination	Origin	Tourists (A)	Share (A/total inbound tourists)
China	Japan	1 831 188	16.2%
	Korea	2 068 726	18.3%
Japan	China	455 728	7.5%
	Korea	1 892 654	31.3%
Korea	China	417 593	9.0%
	Japan	2 302 360	49.6%

Note: China data are for 2006. There is some inconsistency of numbers between countries depending on the definition. Tourism statistics at city level are not well developed.

Source: calculated by the OECD based on the following statistics: Destination China, Ministry of Public Security, cited in China National Tourist Office (*www.cnto.org/chinastats.asp*); Destination Japan, JNTO (*www.jnto.go.jp/jpn/tourism_data/visitor_data.html*); Destination Korea, Korea Tourism Organization (*http://kto.visitkorea.or.kr/inout.kto?func_name=search*).

about 1.7 million foreign tourists in 2007 (CLAIR, 2008). Beijing is also the top-ranking city in China in terms of numbers of foreign tourists and the income they bring.

Tourism trends are not only influenced by the attractiveness of each destination, but also by the transport infrastructure, national policies (especially immigration control) and exchange rates. This point is illustrated by the example of Kyushu region in Japan. Kyushu region has had a steady increase of foreign visitors since 1998,[60] reaching 927 000 in 2007 (10.1% of all visitors to Japan). Korean visitors make up around 70% of total visitors to Kyushu. The rate of increase in 2006-07 was around 17%. This increasing trend of Korean visitors can be explained by many factors; the introduction of regular jet foil/ferry services between Hakata and Busan since 2003, visa exemptions for short-stay visitors, the appreciation of the Korean currency, the Kyushu tourism campaign, and institutional arrangements such as the establishment of the Organisation for Promotion of Kyushu Tourism in 2005. The increase of Chinese visitors to Kyushu can also be explained by Japan's relaxation of visa regulations. However, the recent appreciation of the Japanese currency has changed the direction of tourist flows. The decrease of Korean visitors to Kyushu has been affecting the Kyushu economy since the fast depreciation of the Korean currency began in July 2008 (METI Kyushu Bureau, 2008).

National and local tourism policies

The PYSR countries' tourism policies have generally focused on increasing the attractiveness of the region and decreasing the information and transportation costs for travellers. An annual ministerial meeting has been held since 2006 to promote tourism in the three countries. This established the Plan for Intra-Regional Tourism Development and set a target to increase intra-regional tourists from 12 million in 2005 to 17 million in 2010. Concrete measures include the joint promotion of a cruise route and the development of air traffic. The second meeting (2007) issued the Qingdao Declaration, which also addresses environmental considerations, and the use of tourism to decrease regional disparities in employment growth. The declaration emphasised the importance of youth exchange and private sector organisation, and strategies included the improvement of tourism statistics, the development of a circular tourist route and joint PR for international conferences. The Busan Declaration, issued after the third meeting (2008), re-emphasised this policy direction and further agreed on the joint development of a payment system using a smart card, joint tourism promotion and the establishment of a Management Committee for the Tourism Development of China, Japan and Korea. The Japanese and Korean governments have also agreed a visa exemption for short-term visitors to stimulate tourism. National level co-operation will be very effective, especially when Asia is at the centre of world attention during big events such as the Shanghai World Exposition in 2010, the World Championships in Athletics at Daegu in 2011 and the Asia Games at Incheon in 2014.

However, despite co-operating, the three countries also compete for international tourists. At the national level, each country has made considerable efforts to increase international tourists to their country. The Japanese and Korean governments are implementing strong tourism campaigns. Japan launched the *Visit Japan* campaign in 2003.[61] The Korean Government has delivered a campaign to capture the popularity in Japan and China of "Han-Stream" (Korean style, the cultural phenomenon represented by the big boom in Korean TV drama).[62] The Chinese government is also trying to increase the number of foreign visitors. In the 1990s it has stepped up its tourism promotion significantly, especially since "Chinese Tourism Year" in 1997.

At the local level, each city in the PYSR has developed a tourism policy. Fukuoka City's new basic plan (2003) aims to increase the numbers of international tourists who stay in the city from 333 645 in 2002 to 600 000 in 2015. Kitakyushu City's Tourism Promotion Plan (2006) wants to increase international tourists from 107 000 in 2006 to 200 000 in 2013. The city focuses on its attraction as an industrial tourism destination, given its long history as an industrial city.[63] Busan is also making a move to become a centre for medical tourism. Since 2008, Busan has equipped 300 medical centres with good

facilities to provide quality medical and language services for foreigners. Dalian and Yentai are also trying to increase international tourists and have both developed beach districts. The PYSR cities also have developed many cultural programmes and events based on regional traditions and strengths (see Box 2.8). However, more could be done at the local level to improve the infrastructure for international tourism. There is a need for a foreign language emergency service, a system for cashing international cards, and an international TV channel, as just a few examples. A more welcoming and accepting attitude by citizens could be also developed at the local level. The accumulation of internationally-oriented organisations in Fukuoka, such as the International Exchange Foundation, The Asian Pacific Children's Convention and the United Nations-HABITAT Fukuoka Office, will help raise citizens' acceptance of foreign visitors and cultures.[64]

Institutional co-operation across borders to boost tourism

Foreign visitors enter the country through the gateway cities, so-called port cities which have an airport and/or port. The challenge is how to encourage them to stay longer in the region. The development of a transportation infrastructure which connects gateway cities with the hinterland will be essential for inducing foreign visitors to visit more places in the region. At the same time, institutional co-operation between different local governments will help to create a "regional brand" image and to develop circular tourist routes. In Kyushu region, the Organisation for Kyushu Tourism Promotion was established in 2005 to promote tourism and economic development by building attractive tourist destinations and enticing more domestic and international tourists into the area.[65] Fourteen prefectures, several tourism associations and 104 private entities are members of the organisation and co-operate for a common purpose. In Korea, two cities and two provinces (Busan, Ulsan, Gangwon Province and Gyeongbuk Province) have organised a tourism promotion council to actively promote joint tourism business. The council plans joint marketing of the region, especially targeting the PYSR. The East Busan Tourist Complex project, which aims to become a "health resort", is trying to establish a south and east coast tourism belt, connecting cities along the coast.

The Tourism Promotion Organisation (TPO) is an example of an international network of cities for promoting tourism in the PYSR, although its activities are not limited to the PYSR. The TPO was established in 2002 by the government of Busan City and currently includes 68 cities and 40 civil organisations in 13 countries (including 21 in Korea, 14 in China and 13 in Japan). It promotes the TPO Traveller Card, which allows discounts in member stores in member cities, and there are plans to link TPO with a credit card. It also runs a student travel exchange project, promotes joint marketing and is creating cruise routes. The OEAED, which consists of ten port cities in the

PYSR,[66] has also established an inter-regional committee to discuss mutually beneficial ways of promoting tourism. It has designated 2009 as Pan Yellow Sea Year and various activities in member cities are being co-ordinated under this brand. Current discussions focus on the potential of the cruise ships which stop at many PYSR port cities (Box 2.9).

Box 2.9. **Potential of the cruise industry**

In 2007 the world cruise market was about 16 million passengers, of which the Asian share was rather small, at 4.7% (Ward, 2008). However, the cruise market in the Asia Pacific region is expected to grow by more than 40%, from 1.07 million in 2005 to 1.5 million by 2010, according to Ocean Shipping Consultants. Responding to the expected increase in demand, Costa Crociere, one of the largest cruise companies in Europe, entered the Asian cruise market in 2006. Royal Caribbean Cruise Limited, one of the largest American cruise companies, entered the Asian market in 2007 and established its Asia-Pacific headquarters in Singapore. In the PYSR, these and other companies sell cruise routes such as Shanghai-(Kagoshima)-(Nagasaki)-Fukuoka-Jeju-Shanghai and Shanghai-Fukuoka-Busan-Shanghai. The majority of passengers are Chinese, mostly middle to upper class with strong purchasing power. Fukuoka City has recently been included in the cruise circuit, mainly for shopping. Given the large economic impact of cruise ships on the cities at which they stop, there is stiff competition among port cities to attract these ships.

In 2009, one cruise company changed its stopping-off points from Naha, Okinawa to Fukuoka because the public and private sector in Fukuoka launched a co-ordinated campaign to attract cruise ships. Department stores and many other large scale stores prepared by accepting credit cards popular in China. Fukuoka Prefecture increased support for interpreters and ensured smooth transportation from the ship to destinations in the city. Immigration officials went on board and ensured the smooth landing of passengers at Fukuoka City. A joint campaign between Fukuoka and Busan cities was also very effective. Some estimate that Okinawa Prefecture lost around 12 000 of passengers and JPY 150 million by losing to Fukuoka.

Source: Ryukyushimpo (2009).

The co-operation between Fukuoka and Busan cities has had more benefits than simply cementing relationships. The two cities have run a joint tourism campaign – Asia Gateway 2011 – since 2008. The campaign includes co-management of a single website, planning of new tourism circuit and collaboration in music, art and movie scenes. Asia Gateway, a joint website presenting Fukuoka and Busan cities as a single tourism area, was launched in 2009. It features tourist attractions in both Japanese and Korean, and creates an image of the two cities as "neighbouring towns", not as foreign towns. Local newspaper companies from both cities manage the website. The

campaign is designed to coincide with the opening of the KTX Busan-Seoul high-speed rail line in 2008[67] and Kyushu Shinkansen in 2011. Expanding the hinterland will increase the importance of these gateway cities. Both cities are also promoting the Japan-Korea Scenic Byway project and have jointly conducted a feasibility study of self-drive car-tours between Fukuoka and Busan. The relationship is becoming more diverse: in 2009, Busan city and the medical associations of Fukuoka City established a formal co-operative relationship to vitalise medical tourism.

The PYSR's governments and private sector companies will find that trans-border co-operation will increase their opportunities. Furthermore, tourism can facilitate grassroots understanding at the citizens' level. More tourists will increase mutual understanding and *vice versa*. This virtuous cycle is expected to help create a regionally-unified identity and to further trans-border co-operation in other fields.

2.3.3 Academic institutions: exchanges of people and ideas

Academic institutions can promote long-lasting regional co-operation by facilitating the flow of researchers, students, knowledge and information across borders (see Box 2.10 for a European example). They can also link with the private sector to stimulate regional innovation. Exchanging knowledge helps to create new ideas and stimulates the joint production of new knowledge. Therefore, academic institutions such as universities are important soft infrastructure for promoting trans-border co-operation.

Academic institutions tend to concentrate in the capital region of each country. However, the coastal cities in the PYSR have also accumulated various academic institutions through national government aid and on their own initiative. In total, there are about 130 universities in the PYSR's ten cities (Table 2.29). Among them, Kyushu University in Fukuoka city has a comprehensive international strategy to improve the academic status of Asian universities. The university established a Korean Research Centre in 1999 with financial assistance from the Korean Organisation for International Exchange, and established the Asia Centre for Policy Recommendation in 2005, which organises symposia for Japan, Korea and China. The university has also been involved in the Asia University President Conference since 2000 and has held the University Summit.

Foreign students also tend to concentrate in the capital region of each country. The PYSR cities received 5-15% of the country's total foreign students in 2006 (Table 2.30). In Japan, foreign students in the Kyushu region have been steadily increasing, especially as the region has two major universities that accept many foreign students. In 2007, the number of foreign students at Kyushu was 12 516 (10.6% of total foreign students in Japan), more

Box 2.10. **Trans-border co-operation by universities in Öresund**

The Öresund Region, which spans Sweden and Denmark, has 12 universities, around 150 000 students, 12 000 researchers and 6 500 PhD students. Since 1997, 14 higher education institutions in the region have been participating in the Öresund University, which is a voluntary co-operation between most universities on both sides of the Öresund Sound which separates Sweden from Denmark. The basic idea is to specialise through the synergy effect and common use of university resources. The institution is not only a leading actor in formal scientific research and education, but also in the creation of a new institution to promote informal networking activities and information sharing for economic activities. Working in collaboration with researchers, business leaders and policy makers throughout the region, the university has helped identify critical growth clusters and facilitate the development of networking associations in each of those clusters such as medical and pharmaceutical, IT, food and environment business sectors. The Medicon Valley Academy, IT Öresund, Öresund Food Network, and Öresund Environment, established with the help of Öresund University, are playing an important role in promoting networking and integration across the region.

In addition to helping set up networking organisations in each sector, the Öresund University and the other relevant regional actors have also set up an umbrella organisation to help build links across the multiple industry clusters. This initiative, called the Öresund Science Region, was formally launched in 2001 and brings together four sectoral organisations. This umbrella organisation aims to promote integration across borders in the region and provides a strong basis for ensuring extensive networking. Thanks to their efforts, the RegioStar EU award was recently given to the Öresund Science Region.

Source : OECD(2009), OECD(2003a).

Table 2.29. **Universities and students in the PYSR**

	Universities	Nos. of students		Universities	Nos. of students		Universities	Nos. of students
Tokyo	89	471 638	**Seoul**	49	501 415	**Beijing**	79	578 206
Fukuoka	11	71 957	Busan	22	237 908	Dalian	N/A	N/A
Kitakyushu	9	21 816	Incheon	9	65 391	Tianjin	46	371 136
Shimonoseki	5	N/A	Ulsan	3	27 739	Qingdao	25	264 917
						Yantai	N/A	N/A

Note: University refers to "schools of regular higher education". "University student" includes adult regular undergraduates and college students.

Source: Japan: data for 2008, basic statistics on schools; Korea: data for 2008, Center for Educational Statistics; China: *Chinese Statistics Yearbook 2008* and *Qingdao Statistics Yearbook 2008* (data are for 2007).

than double the number in 2000.[68] Kyushu local government, private associations, and non-profit organisations provide much support for foreign students, including internships in Japanese companies, scholarships and recruitment support.[69] However, foreign students need support for employment by Japanese companies. In 2007 only 428 foreign students were employed in Kyushu companies after graduation (only 4.2% of the national total, which is lower than Kyushu's national share of foreign students, at 10.6%).[70] Korean universities in the PYSR cities also increased foreign students from 1 880 in 2005 to 3 277 in 2008. The Korean government plans to attract 100 000 foreign students to the country by 2010. According to Korea's Ministry of Education, Science and Technology, the number of scholarships available to foreign students will jump to 2 450 in 2010 and 3 000 by 2012, up from 1 500 in 2008. Universities will receive a combined USD 2 million to open more English-only and Korean-language classes. Additionally, foreign students will get help finding work in Korea as rules will be eased for student visa holders. China is also trying to become a leading destination for international students. The government earmarked USD 71 million (CHY 500 million) for scholarships in 2008, up 40% from 2007. The number of foreign students studying in China reached a record high of more than 195 000 in 2007, a growth rate of 20% each year.

The co-operation between Busan and Fukuoka has been deeper than other cities. The universities in the Kyushu and Busan areas established a trans-border consortium in 2008, sharing curricula and academic degrees. This involves 13 universities from the Kyushu area and 11 universities from the Busan area co-operating for human capital and academic development. Among them, Busan and Kyushu universities have a special agreement to hold joint lectures and exchange professors. Dongseo University in Busan,

Table 2.30. **Number of foreign students in the PYSR, 2006**

	Number	%		Number	%		Number	%
Japan	117 927	100.0%	Korea	22 624	100.0%	China	160 000	100.0%
Tokyo	39 520	33.5%	Seoul	6 610	29.2%	Beijing	46 529	29.1%
Fukuoka	4 000	3.4%	Busan	2 023	8.9%	Tianjin	10 155	6.3%
Kitakyushu	1 600	1.4%	Incheon	1 000	4.4%	Dalian	5 000	3.1%
Shimonoseki	100	0.1%	Ulsan	N/A	N/A	Qingdao	2 000	1.3%
						Yantai	500	0.3%

Sources: Japan: Website of the Japan Student Services Organisation (*www.jasso.go.jp/study_a/oversea_info_korea_f.html*), Korea: Website of the National Institute for International Education (*www.jasso.go.jp/study_a/oversea_info_korea_f.html*), China: "Study in China", material of the Chinese Service Center for Scholarly Exchange, and the China Education Yearbook (*www.cscse.edu.cn/Portal19/default787.htm*).

the Busan Development Institute, and Kyushu University's Research Center for Korean Studies signed an agreement in 2008 to establish the provisionally named Busan-Fukuoka Supranational Business Institute. This trains personnel to work immediately in the Southern Korean Peninsula/Kyushu economic sphere. This will be the first joint Japanese-Korean venture for operating an educational institute. The institute will provide instruction in attracting logistical centers, new industries, as well as international financing, to train people employed in the business area.

Local policy advocacy think tanks also help promote trans-border co-operation. The Fukuoka Asia Urban Research Institute and the International Centre for the Study of East Asian Development (ICSEAD) play this role for local governments in Fukuoka and Kitakyushu. Both think tanks are open to international perspectives and conduct high quality research in the East Asia and Kyushu region. ICSEAD especially provides the Organization for East Asia Economic Development (OEAED) with key intellectual support. The Busan Development Institute has a co-operative relationship with the OEAED. Most other PYSR cities also have local think tanks for their policy development.

Training facilities, such as the Kitakyushu International Technology Cooperation Association (KITA), also have great potential for promoting further co-operation. KITA was established in Kitakyushu City in 1980 and by 2008 had run courses on environmental policy and technology for over 5 000 people from 130 countries. This is partly prompted by Kitakyushu City's strategy for linking environmental co-operation with developing Kitakyushu's environmental businesses.

2.3.4 Challenges and recommendations

As we have seen, in general, the socio-cultural network in the PYSR is moving forward, however there is further potential to be tapped. The following are the challenges and recommendations we have identified for the socio-cultural policy field:

- *Overcome the language barrier.* Language skills are a basic precondition for trans-border co-operation. Constant educational efforts are required at the academic and grassroots citizen levels. Multilingual signs in public places also help overcome language barriers.
- *Improve the living and visiting environment for foreigners.* Basic support infrastructure, such as medical care and emergency response, should address the issue of language barriers and other difficulties facing foreigners. There is a variety of detailed services that foreigners need but that residents do not notice, such as international cash card facilities. Dialogue between the city residents, government,

private sector and foreigners who visit the city would increase awareness of these needs and improve the living environment for foreigners.

- *Redress the tourism imbalance and promote regional branding.* Finding ways that Japan and Korea can attract the explosive expansion in Chinese tourists will be key for addressing the region's unbalanced tourism structure. Joint efforts can be very effective, such as the successful joint campaign by Fukuoka and Busan for attracting cruise ship passengers. By co-operating as a region, relatively unknown port cities in the PYSR could increase their appeal as tourist destinations.
- *Improve the PYSR's multi-lateral academic network.* There are many issues, such as the economy, transportation and the environment, which could be effectively addressed at the regional level. Strengthening the multi-lateral academic network will help solve these regional challenges. At the same time, such a network would help to increase student exchange and contribute to the multi-cultural capacity development of future generations. Individually and bi-laterally, therefore, there are many examples of trans-border knowledge production. However, the problem is that the PYSR lacks a multi-lateral academic network at the regional scale. A PYSR multi-lateral institutional arrangement should be developed to facilitate the flow of ideas and human capital for creating new knowledge and values in the PYSR. Deepening the relationship from a simple exchange of knowledge towards the joint production of knowledge is also essential for creating a unified regional image and facilitating co-operation among PYSR cities.[71] To deepen the linkages, joint knowledge production based on this mutual understanding will be required. Examples include the promotion of joint research and co-patenting. Networking among local think tanks, for example, would also contribute to the analysis of PYSR linkages and better co-operation among PYSR cities.

2.4 Towards environmental co-operation in the PYSR

The PYSR has been experiencing rapid industrialisation and economic growth. This has had significant environmental impacts, some of which are of regional concern (OECD, 2007a). Dust and sand storms are caused by desertification in remote inland China and Mongolia, and dust is having serious impacts in Korea and western Japan, especially during the dry spring season when the dust hovers densely across the PYSR causing problems for car drivers and people's daily activities. Trans-boundary air pollution is another concern. Acid rain is still a problem in Korea and Japan, despite their increased regulation of SO_2 emissions. This is partly due to China's heavy use of coal for power generation (OECD, 2007a). Pollution in the Yellow Sea is also of concern, causing marine water degradation and drifting waste. In

addition, major cities in the PYSR face some serious urban environmental challenges. Traffic congestion and air pollution, water scarcity, poor surface water quality and the need for solid waste treatment are all common problems as rapid urbanisation and population concentration proceed.

Looking beyond the regional boundary, there are global environment issues which are of relevance to the region. The obvious example is climate change. Total greenhouse gas (GHG) emissions from human activities have increased considerably since the beginning of the industrial revolution, and are projected to increase further as the global economy grows. The consequences will be an average rise in global temperature, which in turn will cause sea level rise and increasing climate instability, among other impacts. As the major urban agglomerations in the PYSR are coastal and located within the tropical typhoon zone, they are especially vulnerable to hazardous climatic events. Thus, climate change is of direct concern to the PYSR. This section describes regional environmental issues first, and then common urban environmental issues among the PYSR cities. We then review the global challenges, especially climate change, and finally we make some policy recommendations.

2.4.1 Region-wide environmental collaboration in the PYSR

Urban environmental challenges and major achievements

Urban areas in the PYSR share the common features of rapid demographic concentration and agglomeration. In the past, China, Japan and Korea were all densely populated countries with a huge portion of the population living in rural areas. When these countries began to industrialise, they experienced mass migration into urban areas, which eventually merged to form big agglomerations. This rapid industrialisation has caused many environmental problems, especially air pollution from road traffic congestion. This problem was particularly serious in the 1970s in Japan, when citizens suffered from air pollution due to congested traffic and gas emissions from factories. At that time, pollution abatement was one of the country's top social and political priorities. Since the 1980s, rigid regulations have drastically abated air pollution problems in Japanese cities. The same was true of Korea: air pollution became a serious problem in the 1980s when massive motorisation began, and Korea also abated air pollution during the 1990s.[72]

Water pollution is another serious issue for the PYSR's major cities. Rapid industrialisation and urbanisation have led to untreated waste water flowing into rivers and lakes. This situation is exacerbated by the over-use of upstream water, driven by increased water demand from various urban activities and improving living standards. The situation is especially serious in the Chinese

cities of the PYSR, since rainfall is low in northern China. Solid waste treatment is another acute issue. As the urban population increases, and as citizens' consumption levels rise, the volume of solid waste is expanding. In Korea, for example, total waste generation increased 55% between 1997 and 2003 (OECD, 2006a). Much of the increase derives from industrial waste, notably construction and demolition works. Korea's urban landscape is changing significantly, causing many houses to be demolished and building materials to be treated. China is following the same path. Between 1995 and 2004, China's total volume of waste increased by 80%, much of it from urban areas. Much of the urban waste is stored temporarily, waiting for final treatment (OECD, 2007a).

Many of the major cities in the PYSR have experienced, and are still experiencing, industrialisation based on manufacturing and heavy industries. Energy-intensive sectors such as steel, chemistry and cement require intense electric power, much of which comes from coal burning. Heavy industries require huge amounts of water and raw materials, and also produce industrial waste. These cities suffer from many environmental problems, and are trying hard to find solutions. However, there is a concern that regulation would reduce the competitiveness of these cities' core industries. In this regard, the experiences of Japan and Korea offer us good examples of sustainable growth in the local economy and urban environment. In the 1980s, major metropolitan areas in Korea suffered from air pollution, especially from high levels of SO_2 emissions from heavy industry. During the 1990s, they reduced these pollutants dramatically, and the Korean economy enjoyed robust growth at the same time. Seoul, for example, reduced SO_2 levels to less than half between 1997 and 2003 (OECD, 2006a). Currently, Seoul metropolitan area is introducing a unique market mechanism to reduce SO_2 emissions further. In 2005, the Special Act on Metropolitan Air Quality Improvement came into effect, which introduces a total pollution load target and allocates an emission ceiling to major emitting plants. Each emission source must comply with the target, and the emission rights can be traded on the market. Seoul has set itself an ambitious target of reducing total pollutant emissions by almost half in a decade (OECD, 2006a).

Korea has another encouraging experience to share, this time in water quality management. Thanks to heavy public investment in waste water treatment facilities, sewage coverage in Korea has improved remarkably in a short time. The national sewage coverage rate increased from 45% in 1995 to 84.5% in 2005, which is now above the OECD average (OECD, 2006a). Furthermore, the Chong-ghe Chon project in Seoul has revitalised an urban river flowing through the city's central districts, while avoiding the negative impacts of demolishing highways over the river (Box 2.11).

Box 2.11. **Multiple environmental targets: the Chon-ghe Chon project in Seoul, Korea**

Once regarded as a virtual sewer, the Chon-ghe Chon River runs through Seoul. In 2002, Seoul City developed a plan to revitalise the river. The total concept included the demolition of highways, creation of riverside promenades and water quality improvements.

After intensive discussions involving more than 4 000 public meetings and workshops with local residents and businesses, the project started in 2003, and was completed within just two years. In order to mitigate the impact of highway demolition on traffic, the public transport system was strengthened and a rapid bus system created to link subway stations. Surface water quality was improved by pumping in groundwater and water from other rivers.

The environmental benefits of the project are wide-ranging. Water quality has been enhanced, and the riverside has become a major Seoul tourist attraction. Air quality has improved due to the demolition of the highways. It also proved effective in mitigating global warming. Summertime temperatures have decreased and a breeze has been created along the riverside.

Source: CLAIR (2007).

Box 2.12. **Kitakyushu City, Japan: sustaining growth and the environment**

Kitakyushu is the core city in one of Japan's major industrial clusters. The city's main industries are coal, steel, cement and petrochemicals. Until the 1970s, the city suffered from severe air pollution and dust, poor water quality in the harbours, and an industrial waste disposal problem. In the 1960s Kitakyushu was stigmatised as the dirtiest city in Japan. Prompted by citizens' activities and public opinion, Kitakyushu initiated huge efforts to tackle these environmental problems.

Through intensive collaboration among the business sectors, local universities and civil society, Kitakyushu cleaned up the city without sacrificing the economic competitiveness of local industries. The heavy industry sector has responded positively, investing in cleaner production plants, reducing air pollutants from the production process, enhancing recycling of waste water, and transforming solid waste into usable materials. Air pollution levels have significantly improved, but at the same time the total output of manufacturing has increased several folds. The city has applied an innovative policy of "cleaner production". This involves reducing raw materials, enhancing recycling, and introducing process innovation into the product cycle. Policy methods are a combination of environmental regulations and incentives, with R&D assistance and collaboration with local academics. As a result, nowadays heavy industry plants in Kitakyushu have achieved quite efficient resource use and have a smaller environmental footprint.

Source: OECD(2008a).

In Japan, Kitakyushu City provides another positive example of environmental improvement (Box 2.12). Kitakyushu has managed to ensure the economic competitiveness of its domestic industry while improving its urban environment.

As noted above, major cities in the PYSR have experience in tackling common urban environmental problems. Although they are at different development stages, their experiences can be shared with others. Chinese coastal cities can learn from the Japanese and Korean experiences, which have successfully met environmental challenges whilst maintaining economic growth. Korea recorded the highest economic growth of all OECD countries in the 1990s, whilst simultaneously achieving a series of environmental objectives, including air pollution control, water quality management, and waste disposal. Cities in Japan and Korea can also learn from each other, since both have achieved high economic standards; citizens' concerns are now shifting to higher environmental requirements.

Multi-lateral collaborative frameworks for tackling trans-border environment issues

Trans-border environmental issues require a region-wide response. Recognising the importance of trans-border collaboration in environmental issues, policy makers in the PYSR are formulating policy dialogue frameworks at multiple levels of government.

TEMM and EANET

In 1999, China, Japan and Korea established the Tripartite Environment Ministers Meeting (TEMM). The members are the environment ministers of the three countries, and its agenda includes global and regional environmental issues like climate change, trans-border air pollution, marine litter, and dust and sandstorms (DSS). TEMM is held annually, and the latest meeting was organised by the Korean government in December 2008 on Jeju Island. At this meeting the three countries agreed to continue collaboration and augmentation of activities for the next decade. In response to recent severe DSS problems in Northeast Asia, the three countries discussed regional co-operation for addressing DSS under the TEMM framework. At the 2007 TEMM meeting, members had already agreed to start joint research on DSS from 2008.

Since 2001, another trans-border network at the central government level has been working on acid rain under the East Asian Network on Acid Rain (EANET). EANET consists of 13 East Asian countries including China, Japan and Korea, and its main function is to maintain a monitoring network on acid rain in East Asia. Intergovernmental meetings and scientific advisory committees are held annually, and several capacity building programmes are conducted for participating countries.

NEAC

The Northeast Asian Conference on Environment Co-operation (NEAC) was established in 1992 by China, Japan, Korea, Russia and Mongolia. It covers a wide range of shared environmental topics. Recently NEAC has been outreaching to local government to share and disseminate local initiatives.

NEAR

The Association of Northeast Asia Regional Governments (NEAR) is a network of 65 sub-national governments of six countries in Northeast Asia. From Korea, all the Korean provincial governments (*Do*) and two designated metropolitan governments (Busan and Daegu) participate in the network. From Japan, ten prefecture governments are members, from Aomori to Shimane in coastal Japan. The permanent secretariat is located in Pohang City in Korea. The association created an environment sub-committee in 1998, consisting of 21 sub-national governments from Korea, Japan, Russia and Mongolia. Its major activities include information exchange on trans-border environmental issues, such as cleaning up sea drifting waste and protecting migratory birds. China's provincial governments do not participate in the environment sub-committee.

NEASPEC

The North East Asia Sub-regional Programme for Environment Cooperation (NEASPEC) was established in 1992 by several international organisations such as the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the Asian Development Bank and the World Bank. NEASPEC's main objective is to promote environmental co-operation in Northeast Asia, and the member countries include Japan, Korea, China, Mongolia and Russia. It has been functioning as a policy dialogue platform for senior officials of member countries, and it meets annually. Its priority areas are trans-border air pollution monitoring and data collection, technology transfer and capacity building for government officials.

NOWPAP

The North West Pacific Action Plan (NOWPAP) is one of UNEP's global programmes on monitoring networks for the marine environment. It has been working since 1994, and involves co-operation among China, Japan, Korea and Russia. The Yellow Sea is included in NOWPAP's activity area, and maritime pollution monitoring is conducted jointly by participant countries. One of its main concerns is the drifting litter problem, and coastal surveys

are underway for building a region-wide database. The NOWPAP organises International Coastal Cleanup Campaigns in collaboration with member state governments and citizens of coastal cities. The regional offices, known as Regional Coordinating Units, are located in Busan City in Korea and Toyama City in Japan (NOWPAP, 2008).

OEAED

The Organisation for East Asia Economic Development (OEAED) is a city network of 10 cities in the Pan Yellow Sea Region (see Chapter 3). One of the main pillars of the OEAED is the environment, and its goal is to make the Pan Yellow Sea Region a leading environmentally-friendly region. A working committee on the environment has been established under the OEAED, and it exchanges good practice among member cities and seeks synergy amongst their eco-business sectors. Unlike the other organisations mentioned above, which mainly focus on environmental protection, the OEAED seeks synergies between environmental issues and business in the PYSR. However, in recent years it has expanded its activities to include trans-border environmental protection issues. In 2008, the OEAED adopted a new programme to tackle the drifting litter problem, and it plans to promote seashore clean-up campaigns among member cities.

Bi-lateral environmental collaboration in the PYSR

At the central government level, bi-lateral dialogue is conducted under the umbrella of TEMM. At the sub-national level, while few municipalities have established concrete environmental collaboration programmes, some cities (mainly Japanese), are actively engaged in offering technology assistance to neighbouring Asian cities (Box 2.13).

A salient example of trans-border bi-lateral collaboration comes from Fukuoka City. The city and Fukuoka University have jointly developed technology for a low-cost solid waste landfill plant. This semi-aerobic waste treatment, called the Fukuoka method, reduces pollutant gas emission from landfill sites, and has low maintenance costs. This system has been introduced into Malaysia, where it has significantly reduced environmental impacts. Fukuoka City has also hosted engineers from other Asian countries for training, in collaboration with JICA. One of Fukuoka's other advantages is the presence of UN-HABITAT, whose Asian office is based in Fukuoka City. Since 2001, UN-HABITAT has conducted a technology assistance programme in Weifang City in Shandong Province of China. The project aims to transfer the Fukuoka method to Chinese engineers, with the assistance of Fukuoka City. The Fukuoka method is also spreading to other Asian countries, such as Vietnam.

An Environmental Technology Exchange Programme has been organised among Korean provinces (*Do*) and Japanese prefectures since 1993. Eight sub-national governments are participating.[73] This exchange programme covers various urban environmental issues, including an ozone warning programme and management and monitoring of surface water quality.

2.4.2 Global climate change agenda and collaboration in the PYSR

In 2007, the Intergovernmental Panel on Climate Change (IPCC) released recent findings on GHG emissions and climate change. According to these reports, CO_2 emissions from human activities increased by 80% between 1970 and 2004. As a result, CO_2 levels in the atmosphere had risen to 380ppm (parts per million) in 2005; the highest level in the history of human civilisation. This

Box 2.13. **Kitakyushu City: sharing its expertise**

Since 1980, Japan's Kitakyushu City has operated a training centre called KITA for training Asian engineers. It functions as a training centre for JICA (the Japan International Cooperation Agency), and implements technical assistance programmes. These training programmes are quite broad, from pollution control technology, recycling and energy efficient production processes to governance, such as environment protection policy implementation, monitoring and law enforcement, and citizens' participation. It has accepted more than 5 000 trainees from Korea, China and other Asian countries. Kitakyushu's history of fighting pollution gives it the expertise to run these programmes. There are many experts and engineers in the field of energy conservation engineering, recycling, and pollution control available from local industries. Collaboration with educational institutes, including universities, is deeply rooted. Active citizen participation in eco-friendly activities has also provided the city with enormous expertise. Kitakyushu's active engagement in environmental assistance is widely recognised, and the city received an award from UNEP in 1990.

Kitakyushu City is also targeting bi-lateral city level co-operation within the PYSR. In the 1990s, the city assisted Dalian City in China to introduce a cleaner production system. Kitakyushu and Dalian have been friendship cities since 1979; based on this linkage, Kitakyushu helped Dalian prepare a master plan for pollution control, human resource investment and the improvement of plant facilities. In 2007, the city drew up an agreement with Qingdao City for bi-lateral co-operation in promoting recycling industries. The concept, called the "Eco-town Project", is to enhance recycling of home appliances and other waste materials through establishing a recycling industry zone. In 2008, Kitakyushu signed a similar agreement with Tianjin City. The main components of this assistance are business dialogue between engineers in the recycling industries of both cities, developing a master plan for a recycling system and monitoring, and capacity building of local officials in recycling regulations.

Source: OECD (2008a).

unprecedented CO_2 level has already caused a rise in global average temperature of 0.74° Celsius during the 20th century. The IPCC projects that the global temperature is projected to rise a further 4°C if the global economy keeps depending on fossil fuels as its major energy source. Global warming will have various impacts on the atmosphere and oceans. The volatility of precipitation will increase, creating extreme weather events and severe droughts. In short, the basic conditions on which human activities depend will change considerably (IPCC, 2007).

It is estimated that in 2008, more than half of the global population was living in urban areas (OECD, 2008b). More than three-quarters of carbon emissions come from urban areas (IPCC, 2007). Urban areas therefore play a decisive role in global CO_2 emission control. Urban areas are prone to natural disasters in the wake of global warming, such as extreme dry weather, heatwaves, wildfires, and water shortages. This is especially true for cities located in semi-arid zones or densely populated cities with scarce water resources. Coastal zones are vulnerable to sea level change and extreme events like high tides and hurricanes. An OECD study of the impacts of climate change on coastal cities shows that in the 2070s, 150 million people will be exposed to coastal floods, with an estimated asset loss of USD 35 trillion. This is mainly explained by the combination of sea level rise and rapid urbanisation in the coastal areas of developing countries (OECD, 2007b).

National and local policies on climate change

Based on their recognition of these threats, three governments in the PYSR are pursuing policy initiatives to ensure low carbon urban structures and energy efficient cities, as described below.

Japan

Japan ratified the Kyoto Protocol in 2002 under the UN Framework Convention on Climate Change, which set a reduction target of greenhouse gas emissions of 6% from the base year of 1990. In order to achieve the target, the Japanese government released the *Environmental Action Plan 2008,* which highlights its major policy initiatives for creating a low carbon society. Many of these are urban initiatives (Box 2.14).

Japan is one of the most energy efficient societies in the OECD. Energy consumption per capita is significantly lower than the OECD average, and almost half that of the US (OECD, 2008b). However, total CO_2 emission levels are still larger than the base year of 1990 due to rising living standards and expanding economic activities. In 2004, the CO_2 emission from energy use was 9.5 tonnes per capita, slightly less than the OECD average of 11.1 tonnes (OECD, 2007a). The business sector and households are responsible

Box 2.14. **Japan's programme for low carbon cities**

The *Environmental Action Plan 2008* consists of five pillars:

i. Achieving the Kyoto Protocol: practical policies to reduce Japan's GHG emissions by 6% from 1990 levels. Major policy methods involve traffic control, logistics efficiency, energy efficiency of housing and buildings, urban greening and so forth.

ii. Adaptation to global warming: policies will involve modifying the urban structure in the long-term. The major concern is how to establish a low carbon urban structure and low carbon traffic and logistics networks. The key issue is coherent policy in land use and public transport design, aiming towards a compact urban structure and car-free daily activities.

iii. Clean and sustainable national assets: policies consist of physical programmes in various environmental issues, including urban heat island initiatives.

iv. Environmentally friendly choices: the plan recommends changes to current lifestyles for both citizens and business sectors, and the establishment of a sustainable socio-economic system in Japan.

v. Global assistance: recommends active engagement with aid activities for developing countries, through technical assistance and knowledge dissemination.

Source: MLIT (2008).

for one-third of all CO_2 emissions. In 2008, the Japanese Government issued the *Development Plan for Urban Life*, which made low carbon cities central to the agenda. Under this plan, the Japanese Government will create low carbon cities through promoting compact city structure, energy efficient and durable buildings, and public transport. Six cities were selected as eco-model cities which will initiate innovative good practices for becoming low carbon cities.[74] Of the PYSR cities, Kitakyushu has been selected as an eco-model city.

As for climate change adaptation, it is predicted that rising temperatures will cause sea level rise and a wilder atmosphere, including powerful typhoons, heavy rains and flooding. The consequences for urban areas of Japan will include extreme high tides, inundation of low level zones and serious damage to underground urban infrastructure. Responding to these increasing future threats, the Japanese Government released *Climate Change Adaptation Strategies to Cope with Water-related Disasters due to Global Warming* in June 2008.

At the municipal level, many major cities in Japan have established climate change strategies, involving various policy tools for creating low carbon cities. In the PYSR, both Kitakyushu and Fukuoka have clear CO_2 reduction

plans. Kitakyushu City has a long-term target to reduce CO_2 emissions by 50% by 2050. Its short-term target is to reduce CO_2 density (CO_2 emission level per household, in the housing sector) by 10% by 2010 from the 2002 level. Fukuoka City does not have a long-term target, but its short term targets are to reduce CO_2 emissions by 8% (for households), and 14% (for businesses) by 2010 from the 2004 baseline (Kitakyushu City, 2006; Fukuoka City, 2008).

Korea

Korea has ratified the Kyoto Protocol, but does not have binding GHG reduction targets. In the 1990s Korea experienced a rapid increase in CO_2 emissions, accompanied by robust economic growth. Between 1990 and 2003, Korea's CO_2 emissions from the energy sector almost doubled. The CO_2 emission from energy use was 9.6 tonnes per capita, which is bigger than Japan's. Korea's industrial structure is still energy-intensive, and the country is one of the largest GHG emitters per unit of GDP of all OECD countries (OECD, 2006a; 2007a).

In order to reverse this trend and transform the country into an energy efficient, low carbon society, Korea has rolled out several comprehensive action plans since 1999. In September 2008, Korea introduced the new *Comprehensive Action Plan for Climate Change*, for the target period of 2008-2012. This is based on the President's message to bring Korea toward "low carbon green growth", and set the two-pronged target of economic growth and CO_2 reduction. The key concepts for achieving the target are technology innovation in new energy and support for R&D, but the action plan also introduced several urban policy agendas. One salient pillar of the action plan is the reduction of CO_2 emissions from the traffic sector through promoting public transport and a modal shift.[75] According to the action plan, rail's share of traffic will be doubled by 2019, both for passengers and freight. A bus rapid transit system (BRT) and light rail train (LRT) will be extended to major cities. Another pillar of the action plan is to improve the energy efficiency of housing and buildings. An energy efficiency certificate system will be phased in. Currently, the certificate only applies to public buildings, but it will cover new houses and buildings, and will then ultimately include existing buildings.

All Korea's provinces (*Do*) and provincial cities are preparing climate change master plans.[76] Under the master plan, each sub-national government should build a GHG inventory within its boundary and estimate the potential GHG reductions of key programmes. For example, Busan and Ulsan are focusing on CO_2 reduction from industry sectors by applying the ESCO (Energy Saving Company) programme. Incheon's government plans to enlarge the renewable energy sector by building tidal energy and wind power plants. In 2007, *Model Cities Responses to Climate Change* were designated

by the Korean government. Model cities set GHG reduction goals and identify policy tools to achieve their goals. Busan aims to reduce GHG emissions by 10% between 2005 and 2015, and is applying an emissions trading system among public agencies. Ulsan's target is that its GHG emission levels in 2012 will be the same as in 2005 (Ministry of Environment Korea, 2009).

China

China ratified the Kyoto Protocol in 2002, but does not have a binding GHG reduction target. Currently, China is the world's second largest GHG emitter after the US, and it will soon be the largest (OECD, 2007a). The CO_2 emission from energy use was 3.6 tonnes per capita in 2004, which is about one-third of the OECD average, but the figure has more than doubled since 1990 (OECD, 2007a). China's approach to climate change is well addressed in its principle of "common but differentiated responsibilities" under the United Nations Framework Convention for Climate Change (UNFCCC). The notion is that China will try hard to tackle the common global problem of climate change, but not by setting a cap on GHG emissions. In June 2007, the National Development and Reform Commission (NDRC) of the Chinese Government released the *National Climate Change Programme*. In this policy statement, China addresses control of GHG emissions, and promises to reduce energy consumption per unit of GDP (energy intensity) by 2010 by 20% from 2005 levels (OECD, 2007a). This programme also describes how China will promote a "circular economy" involving resource-efficient industries and enhanced recycling of materials. In August 2008, the Chinese government developed its Circular Economy Promotion Act, which came into effect in January 2009.

China's climate change strategy focuses on energy efficiency in the power generation and industrial sectors. The Chinese Government introduced the Renewable Energy Act in 2006, and has promoted the renewable energy sector and invested heavily in wind power and solar energy. Between 2005 and 2008 China's wind power capacity increased tenfold, and China now has Asia's largest wind power capacity, almost seven times that of Japan (Global Wind Energy Council, 2009). The National Climate Change Programme aims by 2010 to raise the share of renewable energy, including hydropower, to become 10% of total energy supply (OECD, 2007a). On the other hand, China does not seem to emphasise GHG emission reduction in the household, business and traffic sectors, which are the main targets of OECD countries. Neither growing urban agglomerations, nor living standards are mentioned, except that China recognises that birth control and low fertility make a significant contribution to mitigating global GHG emissions.

Trans-border local networking for climate change

Climate change is a typical global issue and so is the concern of international society. Many international organisations and dialogue mechanisms are dealing with this issue, including the UNFCCC and the OECD. At the same time, however, local networking at the global level is also playing a big role. This is because cities are major sources of CO_2 emissions. Recent data on the OECD countries show that the major culprit in CO_2 emission increases is shifting from industry to housing, buildings and transport sectors (OECD, 2008b). Industry has managed to reduce CO_2 emissions through innovation and investment, while the CO_2 emissions from the remaining sectors are still increasing. Policy makers in OECD countries are focusing on how to curb emissions from housing and buildings, transport, and the daily activities of businesses and citizens. The CO_2 emissions and daily activities of people are inter-related, as total energy efficiency is affected by where people live, where offices are located, where and how they go shopping, and how they commute to offices. Energy efficiency is also affected by type of residence, physical insulation, heating systems and public utilities. Thus a place-based, holistic approach is required.

Recently, climate change experts are increasingly focusing on the role of cities and various worldwide urban networks have been expanding. Local governments have a wide range of policy tools which can effectively reduce CO_2 emissions. Public transport and traffic management can reduce automobile use. Building codes and permits can promote energy efficient housing and commercial buildings. Waste management and recycling can reduce total waste disposal, which may result in CO_2 reduction through the product cycle. As global climate change becomes an acute issue, cities are more actively engaging in global networks. Some of the active examples are listed below.

C40

C40 is a global city network of major metropolitan cities, and its main aim is to initiate actions to reduce GHGs in member cities. The main function of this network is information dissemination on each other's strategies and good practice in various policy initiatives. This network was established in 2005 on the initiative of the city of London, and it currently has 40 metropolitan cities and 13 affiliate major cities. Most of the member cities are capital cities, and Asian members include Beijing, Seoul, Tokyo and Shanghai. In May 2009, Seoul hosted the biennial C40 summit, and issued the Seoul Declaration in which member cities committed to transform themselves into low carbon cities (C40, 2009).

ICLEI

The International Council for Local Environmental Initiatives (ICLEI) is a wide-ranging city network on environmental issues and the sustainable development of cities, involving more than 700 cities worldwide, including 63 Asian cities (39 member cities in Korea; 21 in Japan; one in China – Shenyang). In 1993, it started a worldwide activity called Cities for Climate Protection (CCP), focusing on climate change initiatives. The main objective of CCP is to assist cities to reduce GHG emissions. CCP provides a comparable inventory database for each member city to help identify local strategies for GHG reduction. This network also uses a standardised manual for monitoring CO_2 emissions in cities. Each city is required to adopt the resolution at its assembly when it wants to join the CCP network. CCP evaluates the performance of member cities through peer reviews and publishes its results. The network includes a variety of local government levels; for example in Korea, both cities and provinces (*Do*) are members, and local urban districts (*Gu*) also participate as independent members. The same is true for Japan, with prefectures, cities and a ward of Tokyo metropolitan government (*Ku*) being members. Within the PYSR, Busan, Ulsan, and Jeju Province are ICLEI members, while only Kitakyushu participates in the ICLEI from Japan (ICLEI Korea, 2008).

UCLG

The Urban Cities and Local Governments (UCLG) was established in 2004 as a global network of local and regional governments. Their main priorities are global social issues such as gender equality, the Millennium Development Goals, social inclusion, decentralisation and self governance. Sustainable development, including climate change, is one of its key issues. Korean cities are actively engaged with the UCLG. The Jeju government hosted the UCLG congress in October 2007, where mayors and local representatives of the network released a declaration focusing on further efforts to reduce GHG emissions and implement local action plans. Japanese members of UCLG are limited to Hamamatsu City, and Chinese members are Shanghai, Tianjin City and Hunan Province.

2.4.3 Challenges and recommendations

Enhancing horizontal and vertical collaboration structures

Horizontal environmental collaboration across borders can enhance the global status and visibility of cities involved. Since each city is trying hard to differentiate itself from others, unique environment initiatives may play an effective role. This is more meaningful for cities which are not prominent

capital cities. A good example is Kitakyushu in Japan; once the country's most polluted industrial city, it now sells itself as the most eco-friendly city. This message is even being sent abroad, attracting attention from around the world.

The government of Japan has released a guidebook for local environment co-operation, which points out possible benefits for municipalities (Ministry of Environment Japan, 2005). One of the major findings was that benefits are mutual; apart from the benefits for recipient cities, donor municipalities can also gain much through environment co-operation activities. For example, youth collaboration programmes will bring educational benefits for local students in donor cities, because they will study environmental issues deeply enough to teach their counterparts. It is also expected that trans-border collaboration may function as a catalyst for better local governance. When receiving foreign trainees, city governments collaborate with local companies and universities to provide training programmes. Exchange of grassroots activities can bring closer collaboration among governments, the private sector and civil society.

While discussions at the central level tend to focus on policy frameworks and regulatory systems, collaboration at the local level can deal with more pragmatic issues like monitoring, policy implementation, and capacity building of administrative staff. Of these, the most important aspects are policy implementation and monitoring. For instance, though the Chinese government has recently developed many environment regulations, lack of staff power and technical knowledge is hampering effective law enforcement at the local level. Thus, sharing experiences at the local level is quite useful. Local municipalities often face similar challenges across the PYSR, such as capacity building of officials, negotiation with local plants, public participation and so forth.

In the meanwhile, a series of OECD workshops and conferences on cities and climate change, including the OECD Milan conference in 2008, have also highlighted the importance of vertical co-operation between central and local governments on climate change issues (OECD, 2008b). Society can tackle climate change effectively when there is synergy between central and local initiatives. Central governments could play the role of catalyst, activating existing bi-lateral and multi-lateral networks, and facilitating broader participation by other cities across borders. They can also collaborate with local governments already actively engaged in global city networks and extend the linkages to other cities. Trans-border regions in EU have salient experience to share. In February 2009, more than 350 cities in the EU signed the Covenant of Mayors, committing them to reduce CO_2 emissions by at least 20% by 2020. This initiative is a good example of trans-border practice involving close collaboration among pioneering municipalities, national governments and the EU committee for regional issues. It would be worth establishing a similar holistic network in the PYSR, and central governments could take the

lead in this direction by exchanging views on establishing region-wide urban networks. Japan has also a good example of vertical collaboration across different levels of government. In December 2008, the Japanese government established the Promotion Council for Low Carbon Cities (PCLCC), which brings together "eco-model cities", other municipalities, prefectural governments, and central government ministries. The major agenda of this council is to promote not only integrated policy support for eco-model cities by central government, but also international linkages between eco-model cities and other city-level climate change activities abroad.

Creating a region-based platform to address climate change

There are few trans-border city networks which specifically address climate change in the PYSR. While there are several global city networking systems, they tend to either be confined to capital cities (C40), skewed to particular countries (UCLG), have a worldwide focus (ICLEI), or are not focused on region-specific climate change issues.

This is arguably to do with the varying development stages of the three countries. While Japan and Korea are OECD members and their living standards are mature, China is still at the rapid industrialisation and urbanisation stage. This brings significantly different senses of urgency on climate change. Japan and Korea have overcome urban pollution, and climate change is now becoming a major concern for their citizens. For their Chinese counterparts, climate change seems less acute than air and water pollution, and waste disposal. For example, SO_2 concentrations in urban China, despite falling significantly in the 1990s, have begun to deteriorate again since 2002, and air quality in Chinese cities remains among the worst in the world (OECD, 2007a). Is it therefore still too early to visualise trans-border linkages in the PYSR on climate change issues?

However, abatement of global CO_2 emissions is not achievable without the efforts of China.[77] In Japan, Kitakyushu City has top-class energy efficiency technologies in steel, cement and other heavy industries. Korea also has energy efficient heavy industry sectors (SERI, 2008), located in coastal cities such as Ulsan City. Both Japanese and Korean cities have well developed energy efficient urban design and public transport. If these advanced technologies were transferred to their Chinese counterparts, China could make a quantum leap in achieving energy efficiency, thereby reducing CO_2 emissions significantly. Such collaboration would be beneficial for China, as it will allow the country to reduce energy consumption and improve the efficiency of its industries. This kind of progress will benefit not only the PYSR, but eventually the whole global community too. It would therefore be essential to establish a region-based dialogue platform to share experiences of Japan and Korea with China in controlling CO_2 emissions.

Wider participation by stakeholders

Both Japan and Korea's experiences show the importance of citizens' participation in environmental activities. A crucial point here is that better policy implementation can be achieved only when a wide range of citizens participate in environment protection activities. In Japan, Kitakyushu City has been promoting citizens' participation in environmental monitoring, energy saving and recycling campaigns. In Korea, the water quality of urban rivers recovered significantly in the 1990s, thanks to the engagement of Korean citizens in monitoring and reporting (OECD, 2006a). The Korean government is further promoting "green governance", which includes bottom-up decision making among citizens and wider participation among local communities and businesses (Ministry of Environment Korea, 2002). Good examples in the PYSR include the river cleaning campaigns in Korea's Ulsan and Gimhae cities (Box 2.15). In China, environmental NGOs are mushrooming, and a growing number of citizens are participating in various environmental activities (OECD, 2007a).

Box 2.15. **Citizen participation: river cleaning campaigns in Korea**

"This is your responsibility": the urban river cleaning campaign in Ulsan City

As Ulsan City has many heavy industries, the water quality in the rivers has been a big concern for citizens. In 2000, the city started a river cleaning campaign involving a unique programme of stakeholder participation. The riverside was divided into one kilometre sections, and each section was allocated to a civil group or a local company for cleaning. In addition, citizens organised voluntary monitoring teams, checking for and reporting on illegal dumping. Within five years, the river environment was enhanced dramatically.

Residents' proactive initiatives: the Daepo River Project in Gimhae City

Gimhae City is located on the outskirts of the Busan metropolitan area. The Daepo River, which supplies drinking water resources to the Busan area, runs through the city. The river was heavily polluted in the 1980s by industrial and livestock wastewater. In 1997, local residents organised a task force for river improvement. Each citizen contributed money to create an environmental protection fund, and a women's association organised a campaign to reduce detergents. They also formed river watchdog teams, and patrolled day and night to monitor illegal dumping and waste discharges. In 2002 these activities achieved an agreement among local residents, central government and the Mayor of Gimhae which gives local residents primary responsibility for maintaining the river's water quality.

Source: Ministry of Environment Korea (2002).

These good practices can be disseminated throughout the PYSR, where citizens' environmental awareness has huge potential. Participation across borders and sharing experiences in practical activities will be key. Officials and citizens can visit each others' campaign sites and see daily activities for themselves. It is thus recommended that local governments upgrade existing collaboration programmes towards a solid framework to encourage wider participation from their citizens.

Notes

1. Compensated Gross Tonnes; a commonly-used unit in shipbuilding.
2. OECD calculations using data from trade databases of the Korea International Trade Association (KITA), The classification of industries is based on HS (Harmonized System) Korea 2-digit code.
3. In terms of four-digit SITC (the Standard International Trade Classification by UN) code.
4. This model is also variously known as "vertical specialisation", "slicing the value chain", "international production sharing" or "outsourcing" (Athukorala and Yamashita, 2006).
5. Greenaway *et al.* (1995) admitted that vertical IIT is more related to traditional trade theories of comparative advantage, whereas horizontal IIT falls much more within the remit of modern trade theories.
6. According to Aturupane *et al.* (1999), 85% of trade between EU and the Eastern European economies comprised vertical IIT between 1990 and 1995.
7. This model was initially suggested by Akamatsu (1961) and developed further by Bernard and Ravenhill (1995), Kojima (2000) and Kasahara (2004).
8. These include Hong Kong, South Korea, Chinese Taipei and Singapore.
9. These include Thailand, Malaysia, Indonesia and Philippines.
10. Kwan (2002) insists that Japan still has the most advanced export structure of all Asian countries, while China is still flying at the rear of the formation, with the NIEs and ASEAN being tightly bunched in the middle.
11. This is commonly used to measure the international trade specialisation of a country. For more details about RCA, see Balassa (1965) and Laursen (1998).

12. The correlation coefficient is an index to measure the strength of the relationship between two variables. If correlation coefficients show 1.0 and -1.0, they respectively indicate a perfect positive and negative relationship. If the coefficient shows 0.0, it means no relationship between two variables. In this section, if the correlation coefficient is nearing 1, it implies that two countries have increasingly similar export structures. Yet, if the index is approaching -1, it means that the export structures of the two countries are diverging.

13. SITC is a classification of goods used to classify the exports and imports of a country to enable comparing different countries and years. The classification system is maintained by the United Nations. SITC has hierarchical structure comprising from 1-digit to 5-digit codes. One-digit code is the broadest classification and five-digit is the narrowest one.

14. As the need to respond quickly to local requirements is growing in importance, more Japanese and Korean affiliates have started to create an extensive local supply chain in China. According to a 2003 survey by Korea Industrial Economics and Trade (Kim J-K *et al.*, 2006), the share of local procurement of parts by Korean manufacturing affiliates in China rapidly increased from 26.5% to 45.6% between 1996 and 2003, while the share of parts directly imported from Korea significantly decreased, from 64.7% to 36.9%.

15. Annual survey by the Japan Bank for International Cooperation (JBIC) in 2008. This series of surveys have been conducted since 1999 on Japanese manufacturing companies with three or more overseas affiliates. The 2008 survey received 620 responses (a 63% response rate) and was based on multiple choice questions.

16. Multiple answers were allowed in these surveys.

17. R&D-related FDI inflows into China have surged in recent years. The accumulated R&D investment of MNEs in China had reached approximately USD 4 billion by June 2004, while the number of foreign-affiliated R&D centres reached 700 by the end of 2004. Although the first R&D centre of MNEs dates back to 1993, most known projects arrived after China's accession to the WTO in 2001 (UNCTAD, 2005).

18. Eight provinces in the Korean PYSR produced 3.8 million units, accounting for 97.4% of national production. The four Chinese provinces in the PYSR and Japanese Kyushu generated 1.4 million (20.3% of national production) and 1 million (9.1% of national production) units respectively.

19. This section is largely based on Jung and Lee (2007) and Kim W-B (2008).

20. Yangtze River Delta, Pearl River Delta and Tianjin respectively account for 40%, 16.8% and 15.1% (Jung and Lee, 2007).

21. *Keiretsu* refers to a unique Japanese form of corporate organization. A keiretsu is a grouping of affiliated companies that form a tight-knit alliance to work toward each other's mutual success based on an intimate partnership (Source: *http://searchcio-midmarket.techtarget.com/sDefinition/0,,sid183_gci518852,00.html#*).

22. Unlike two other clusters, the formation of Shandong automobile cluster was driven by parts suppliers.

23. This section is largely based on Kim W-B *et al.* (2005).

24. In fact, in 2003, Kyushu recorded a trade deficit in automobile parts with Korea.

25. In the case of Toyota Kyushu, 70% of its production is exported to North America, 15% goes to the domestic market, and the remainder to other countries.

26. This distance is between Fukuoka City and Toyota City in Aichi prefecture of Toukai area.

27. Out of 405 Korean firms operating businesses in Shandong Province of China as of the end of 2006, 57.5% (233 firms) invested less than USD 1 million, whereas only 6.2% (25 firms) conducted investment larger than USD 10 million (Song, 2007).

28. Rappaport and Sachs (2003) suggest that the coastal concentration of metropolitan areas in the United States captures a present-day contribution to productivity and quality of life. Counties with centres within 80 kilometres of an ocean coast had faster than expected annual population growth in the period 1960-2000 (OECD, 2009).

29. Using IMF trade statistics, Radelet and Sachs (1998) made it clear that lower transportation costs facilitate economic development.

30. East Asia has a sea in the middle of it, which makes cargo transport costs cheaper than in NAFTA (Fujita, 2007b).

31. Kyushu Electric Power (40%), Nihon Telecom (20%), NTT Communications (20%) and Korea Telecom (20%).

32. A direct air passenger service between Korea and China only started in 1994.

33. For example, Tokyo/Narita airport had 10 flights per day to Beijing and 15 flights per day to Incheon in April 2009.

34. On the Korea-Japan link, flights between Fukuoka and Incheon have recently more than doubled compared to 2002. The Incheon-Kitakyushu route opened in March 2009 and is the only international route for Kitakyushu Airport, which opened to the public in 2006. For Korea-China links, Incheon-Beijing is the most important route. However, multiple airports in Tianjin, Dalian, Yantai, and Weihai generated demand that was comparable to Beijing airport in 2005 (Kim W-B *et al.*, 2008b).

35. Information from the company website, *www.weidong.com*, accessed 29 August 2009.

36. In 2008, Hakata seaport (Fukuoka) was the largest in Japan in terms of the arrival/departure of foreign passengers (539 723); Shimonoseki was the third largest (212 381). Ranking by total passenger traffic (arrival/departure of both

foreigners and Japanese) places Hakata seaport first (825 939) and Shimonoseki second (245 430). In contrast, Fukuoka airport deals with 2 125 783 passengers (including 858 643 foreigners), making it the fifth largest in Japan (Ministry of Justice, 2009a).

37. Kim W-B *et al.* (2008) propose the introduction of an air shuttle service (which has been successful between Haneda-Guimpo) and a special no-visa/multiple visa system for facilitating the one-day business zone.

38. Arita and McCann (2000) suggest that a one-day round trip is the crucial spatial extent for many types of information exchanges within much of the semiconductor industry in the United States.

39. The US was the first country to introduce open-sky policies and is still one of the most advanced countries in its degree of deregulation. As of 2005, there were 100 open-sky agreements worldwide, some of which involved multiple countries. Integration of air traffic in the EU has also promoted deregulation of the market (Policy Research Institute for Land, Infrastructure and Transport, Ministry of Land, Infrastructure and Transport, 2006).

40. As mentioned in Section 2.1, parts trade is increasing in the PYSR. Fujita (2007b) describes the typical trade as follows: "Japan first produces intermediate goods (processes goods and parts), which are partly exported. A significant portion of the exported intermediate good is imported back to Japan either as final goods or intermediate goods with higher values. Finally, using intermediate goods, which are partly produced in Japan and partly imported, Japan produces final goods, which are partly exported. Thus, Japan represents a typical country with *improvement trade*, where a lot of intermediate goods are moving back and forth between Japan and other countries (mostly the countries in East Asia)." The transportation network, including marine and air, is intensively used for supporting this improvement trade.

41. Tranship is the shipment of goods to an intermediate destination, and then from there to yet another destination.

42. For example, Hakata Port (Fukuoka) increased its strategic importance by switching its main connection point from Kobe to Busan, which has a direct link to the rest of the world. Japanese exporters often preferred Busan for managing export goods, due to Japan's rather expensive domestic marine and inland transportation.

43. Busan's good accessibility to world markets is not necessarily an advantage in bilateral direct trade with China. Shipping distances and inefficient inland logistics undermine Busan's trade with China compared to ports directly on the Yellow Sea (Lee and Rodrigue, 2006).

44. The tranship rate in 2005 was as high as 43.7% in Busan. Busan captured traffic from Japan and Northern China. Chinese ports in the PYSR directly linked to Busan, which then distributed Chinese goods to North America and Europe (Fremont and Ducruet, 2005). If Busan port loses tranship cargo, its total

container throughput will dramatically decrease. Because it has also played a role as hub port for Japanese shippers since 1990s, the logistics strategies of Japanese shippers will influence the future of Busan port (Tsumori, 2006).

45. Much literature has analysed the issue of a hub-feeder system versus direct port calls. Liner service network design tends to move from a pure cost-driven exercise through a hub-feeder system to a more customer-oriented differentiation exercise which is better supported by direct port calls (even for the bigger vessels). (Notteboom, 2004).

46. The hinterland of Fukuoka and Kitakyushu ports is the Kyushu region. Though the data are rather old, more than 90% of the goods that the Kyushu/Yamaguchi region exported and imported went through Kyushu ports in 2003 (Ministry of Land, Infrastructure and Transport, 2005).

47. According to Notteboom (2004), the portion of inland costs in the total costs of container shipping can range from 40% to 80%.

48. The train-ferry system was introduced in the UK in 1850 and has also been developed in the Baltic coastal countries. A TFS connecting Germany and Russia was opened at the end of 2006 (Kim W-B *et al.*, 2008).

49. With the explosive growth in China-Japan container demand, an express container transport system between Hakata and Shanghai, called the Shanghai Super Express (SSE), was established in 2003. This cuts by half the shipping time between Tokyo and Shanghai (from 8 to 4 days).

50. "Panamax" ships are of the maximum dimensions that will fit through the locks of the Panama Canal. An increasing number of ships are built precisely to the Panamax limit, in order to transport the maximum amount of cargo in a single vessel. Post-Panamax ships are those which are bigger than the Panamax limit.

51. According to Notteboom (2004), there are strong indications that the range of 5 500 to 6 500 TEU will be the most competitive vessel size for the time being, as these ships offer more flexibility in terms of the number of potential ports of call. For shipping companies, a system of more loops with smaller vessels carries less risk and could therefore eventually turn out to be a cheaper option than running very large vessels on only a few loops.

52. In 2004 Japan's LCL rate was 18.8%. The LCL rate in Hakata Port was as high as 29.1% in 2000, gradually decreasing to 23.7% in 2004 (Tsumori, 2006). The LCL rate for Hakata's exports was about 40% between 1999 and 2004, which means an excess of imports over exports. As for Korea, Kim W-B *et al.* (2008) calculated that approximately 25% of the export/import containers in 2004 were LCL and that LCL weight dramatically grew to approximately 40% for export containers and shrunk to 4.6% for import containers in 2007.

53. A 12 foot container is smaller than the international standards, which can be either 20 or 40 feet. The smaller size is a response to the need for small scale but frequent delivery.

54. The Logistics Centre for Japan is established in Busan as a storage and stock point of Chinese goods to be delivered to Japan. J&K Logistics (headquartered in Tokyo), a logistics consultant company, manages the total process for six Japanese companies.

55. In Japan, local government plans local airports and ports, while national government approves the local plans. Northern Kyushu ports (both Fukuoka and Kitakyushu) are designated as international core ports by the national government. In Korea, on the other hand, the national government directly plans airport and port development. Based on the national plan, a local agency implements the development. Busan has been developed as an international transhipment hub port and Incheon and Ulsan are regional core ports. The Chinese national government plans and implements the development of airports and ports in major cities, while in other cities port development is up to local government.

56. The railway connecting Seoul-Busan is a trunk railway, annually transporting more than 12 million tonnes of freight. KTX is a high-speed train for passengers only. The new line establishment for KTX and electrification of the existing line between Busan and Seoul has increased the efficiency of rail freight traffic. According to the journal Invest Korea, by freeing up other tracks the KTX is estimated to expand national freight capacity by 5%, and results in savings of USD 1.85 trillion annually by cutting travelling time and logistical costs. (*www.investkorea.org/InvestKoreaWar/work/journal/content/content_main.jsp?code=4320101*)

57. The fashion magazine *Ray* is one example; 40% of articles are written in Japan while the remaining 60% are written locally in China. The main readers are women in their 20s and 30s (Kanda, 2006).

58. Korean immigrants in China numbered 1.92 million in 2002. Living mostly in northern China and speaking both Korean and Chinese fluently, they act as a bridge between Korea and China. One of the important reasons that many Korean companies invest in Northern China is said to be the existence of these immigrants (Seki, 2004).

59. CNTA estimates that average spending of Chinese travellers per person is USD 6 000 in the US. The Japan National Tourism Organisation (JNTO) Director reported in 2009 that Chinese visiting Japan spent twice as much as other travellers.

60. "Foreign visitor" in this context means foreigners who entered Japan through Kyushu ports and airports.

61. The *Visit Japan* campaign is a public-private initiative that started in 2003 and aims to attract 10 million international tourists by 2010 (a 60% increase over 2003). Japan includes in its key market 12 nations/regions, including Korea and China. Seventy per cent of international visitors were Asians in 2007; as the Asian economy continues to grow, so will expectations that an Asian tourism boom will occur in the 2010s. The national government also established its Action Plan for Tourism in 2003, which sees the Visit Japan campaign as the core project for

delivering the "Japan Brand" abroad. National government enacted the Tourism National Promotion Basic Law in 2006 and established the Japan Tourism Agency in 2008. Its programme includes improving the speed of visa issuing, speedy entry/exit at all airports, and promoting international conferences in Japan.

62. In 2003, the Korean government also unveiled a plan to attract 10 million international tourists. The plan included co-operation with China and Japan to create a tourist transport network among the three countries, increase international flights etc. To implement this, the Department of Culture and Tourism (now the Department of Culture, Sports and Tourism) established its second five-year plan for tourism promotion (2004-2008). Co-operation with the PYSR countries was re-emphasised in the plan. In 2005, the department set up a policy directive "C-Korea 2010" based on 3Cs (content, creativity, and culture). In the document, "Striving for a touristic hub in Northeast Asia" is one of the three policy objectives. In spite of the change of administration, Korea continues its efforts to increase international tourists.

63. Industrial tourism involves visits to firms with a core business that is non-tourism related. Industrial tourism offers visitors an opportunity to learn about the product, the production process and the historical background.

64. The UN Habitat Fukuoka Office is the only international organisation based in Fukuoka City. It promotes socially and environmentally sustainable towns and cities and facilitates civil participation in urban development. The UN Habitat Fukuoka Office holds an annual international conference on Habitat Day, to which it invites foreign experts and mobilises citizens for solving urban problems in Asia.

65. The operational plan consists of four strategies, *(i)* to increase the attractiveness of the destination; *(ii)* to entice domestic tourists from the metropolitan areas of Japan; *(iii)* to attract international tourists from East Asia; and *(iv)* to build an institutional framework for promoting the tourism strategy. The income comes from membership fees, members' donations, contributions from prefectures and grants from national government. Most of the budget is spent on strategy and enticing domestic tourists.

66. The OEAED will be discussed in more detail in Chapter 3.

67. KTX began operating on part of the planned route in 2004, but connected to Busan in 2008.

68. The private Ritsumeikan Asia Pacific University in Oita Prefecture has 2 352 foreign students, making it second in Japan for the number of foreign students. Kyushu University (national) in Fukuoka Prefecture comes ninth, with 1 171 foreign students.

69. The services provided to foreign students by the NPO university consortium include guaranteeing foreign students to help them rent apartments, plus lending them subsistence and housing support.

70. In 2008, the Japanese government approved 11 040 applications to switch from a study visa to a work visa. Chinese and Korean applicants constituted 69.3% and 12.3% respectively. Almost 68% work in translation, interpretation, sales, information management and international management and 64% work in small and medium companies (Ministry of Justice, 2009). In 2007, a three-way collaboration involving national government (METI and Ministry of Education), university and businesses established the Asia Human Capital Programme, which provides foreign students with a package involving a Japanese language course, internship, and special education tailored to business needs. This programme aims to help foreign students to find a job in Japanese companies (METI Kyushu Bureau, 2007).

71. Even though Busan and Fukuoka have a regular technician exchange programme, they put little effort into developing joint research programmes. A transition is needed from the exchange of knowledge to the joint production of knowledge.

72. The total number of automobiles has increased fourfold in Korea in the last decade (OECD, 2006a).

73. Busan City, Jeonnam, Gyeongnam, Jeju provinces from Korea. Fukuoka, Yamaguchi, Nagasaki, and Osaka prefectures from Japan.

74. In 2009, an additional seven cities were selected as eco-model cities.

75. CO_2 emissions from the traffic sector more than doubled during the 1990s in Korea, and the trend is continuing, with a 12.7% increase between 2000 and 2005 (Ministry of Environment Korea, 2008).

76. These master plans are expected to be finalised at the end of 2009.

77. The Chinese economy is already larger than Japan's in terms of PPP (purchasing power parity). Some estimate that China is already the top CO_2 emitter in the world, replacing the United States (Netherlands Environmental Assessment Agency, 2007).

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Annex 2.A

Threshold test: methodology and dataset

Most researchers (*cf.* Greenaway *et al.*, 1995; Fontagne and Freudenberg, 1997: Fukao *et al.*, 2003; and Ando 2006) often use the decomposition-type threshold method to identify different forms of intra-regional trade. This method decomposes bi-lateral trade into three components by trade patterns: one-way trade (OWT), vertical intra-industry trade (VIIT) and horizontal intra-industry trade (HIIT).

In order to obtain the share of each type of trade for the industry concerned, three steps are required. The first step is to identify whether bi-lateral trade of commodity *k* involves one-way trade or intra-industry trade by using the equation below. M_{ijk} and X_{ijk} represent the value of country *i*'s imports and exports of commodity *k* from and to country *j*, respectively. Bi-lateral trade of commodity *k* is regarded as one-way (or inter-industry) trade if the equation holds and as intra-industry (or two-way) trade otherwise. The rational of this equation is that if the minority flow (for example imports) shows less than 10% of the majority flow (exports in this case), the minority flow cannot be considered significant as it does not represent a structural feature of trade (Fontagne and Freudenberg, 1997).

$$\text{Min}\,(M_{ijk}, X_{ijk}) / \text{Max}\,(M_{ijk}, X_{ijk}) \leq 0.1$$

The next step is to identify whether intra-industry trade of *k* commodity is horizontal form of intra-industry trade or vertical form of IIT by using the concept of relative unit prices. The basic assumption underlying this concept is that relative prices reflect relative qualities and hence products sold at a higher price must be of higher quality than those sold more cheaply (Greenaway *et al.*, 1995). In this regard, if the equation below is satisfied, trade of commodity *k* is regarded as horizontal IIT as a small range of price differentials of commodities represents trade in goods with similar quality but different attributes. On the other hand, if the unit-price gap of trade of commodities is outside a certain range (the threshold percentage to distinguish between horizontal and vertical IIT is usually 15% and 25%), the traded

commodity will be differentiated by quality and, accordingly, is considered as vertical IIT. UV_{ijk}^{X} represents the average unit value of commodity *k* exported from country *i* to country *j*, while UV_{ijk}^{M} expresses the unit value of commodity *k* imported from country *i* to country *j*.

$$\frac{1}{1.25} \leq UV_{ijk}^{X} / UV_{ijk}^{M} \leq 1.25$$

As a last step, the share of three different trade patterns for the aggregated commodity *k* is calculated as in the following equation. The N-type of trade patterns represents one-way trade (OWT), vertical IIT (VIIT) and horizontal IIT (HIIT). The aggregation of three different threshold-based indexes should be 1 or 100% (Fukao *et al.*, 2003).

$$S_k^N = \sum_j \ (X_{ij}^N + M_{ij}^N) / \sum_j \ (X_{ij} + M_{ij})$$

Where N = OWT, VIIT, HIIT

The table below summarises the methodology. For calculating the threshold-based index; most papers use HS (Harmonised Commodity Description and Coding System) six-digit level data.

Table 2.A.1. **Classification of three different trade patterns**

Trade patterns	1st equation (degree of trade overlap)	2nd equation (disparity of unit value)
One-way trade (OWT)	$\text{Min}(M_{ijk}, X_{ijk}) / \text{Max}(M_{ijk}, X_{ijk}) \leq 0.1$	Not applicable
Horizontal intra-industry trade (HIIT)	$\text{Min}(M_{ijk}, X_{ijk}) / \text{Max}(M_{ijk}, X_{ijk}) \leq 0.1$	$\frac{1}{1.25} \leq UV_{ijk}^{X} / UV_{ijk}^{M}$
Vertical intra-industry trade (VIIT)		$UV_{ijk}^{X} / UV_{ijk}^{M} \leq 1/1.1.25$ OR $1.25 \leq UV_{ijk}^{X} / UV_{ijk}^{M}$

Sources: Fukao *et al.* (2003).

Chapter 3

Trans-border institution building

3.1 General understanding of trans-border governance

As globalisation blurs national boundaries and blunts the state's power to lead development strategies, many OECD countries see regions as the core economic actors and have concentrated on enhancing national competitiveness by using regional capacities. The tide of globalisation has forced the state to weaken its grip on the flow of capital, labour and goods across borders, and decreased its traditional role of redistributing national resources to lagging regions. In fact, many OECD member countries are shifting the paradigm of regional development policy from one of subsidising resources to achieve balanced regional development, to the enhancement of local competitiveness and the creation of regional wealth (OECD, 2009). Strategies for achieving this have also changed from conventional sectoral approaches to place-based integrative development strategies. As such, the region has emerged as a leading player in resolving individual countries' complicated economic and social problems.

This regionalisation trend has catalysed a proliferation of horizontal regional governance systems. More competences have been devolved to local governments to design their own development policies. The private sector has also increasingly taken part in the provision of public services, commonly in the form of Public-Private Partnerships (PPP). In these drastic shifts, the conventional approach based on command and control has proven ineffective for regional development for several reasons (OECD, 2003a). Instead, a more horizontal and vertical governance system is urgently required, to encourage diversity and promote co-operation among all relevant stakeholders in regional policy, including central government, municipalities and the private sector. Thus, the multilevel governance scheme across and beyond levels of government has been recognised as one of the central elements in territorial policy making (OECD, 2004) and has been rapidly established in many OECD countries (Cha *et al*., 2003). In particular, after the substantial dilution

of the state's influence on regional policy since the EU's emergence as a supra-national institution, most regions in European countries have actively sought multi-layer regional governance systems to directly link to the EU and hence mitigate intervention from the state (Armstrong and Taylor, 2000). The EU's structural fund is a key instrument for enabling municipal governments in the EU to foster partnerships with local actors and pursue their own regional development policies (see Annex A for more).

Although the perception of "regional governance"[1] could be applied to every regional level, it is frequently applied to metropolitan areas which form so-called "area-wide economic zones" with adjacent regions (OECD, 2000). The metropolitan area tends to expand its functional influence beyond the original institutional area to benefit from economies of scale and the agglomeration effect as well. In this process, however, metropolitan areas also encounter typical urban problems such as congestion, pollution and social segregation, which they need to address properly. In most cases, these problems cannot be effectively solved by restricting the target area to an administrative region as metropolitan areas have already begun to functionally expand. The process to resolve these urban problems tends to be complicated as there are more conflicting interests among such diverse groups in the wider economic region. Hence, a political procedure via appropriate governance schemes which promotes the participation and co-operation of relevant actors is crucial.

Managing metropolitan challenges through a well-organised governance scheme could involve a spectrum of models ranging from "heavy" to "light" depending on the scope of the reform (OECD, 2006b). At the heavy end is the creation of a metropolitan government or the amalgamation of municipalities, in order to reshape governance structures to fit to the functional economic area. At mid position is the establishment of co-operative arrangements such as inter-municipal joint authorities, usually on a voluntary basis. At the light end is the installation of informal co-ordination bodies such as strategic planning partnerships, often relying on existing networks of relevant actors.

Building governance systems across national borders can be also understood in this context. Trans-border regions typically suffer from the fragmentation of markets, labour forces and institutions (OECD, 2004). The border usually constitutes a significant barrier to creating the optimal economic size of the region and, hence, decreases the competitiveness of the region. Similar points can be made regarding sub-optimal technology diffusion, lagging social capital development and a disconnected labour market and infrastructure. The establishment of a functional trans-border region aims to address these weaknesses and maximise the benefits of an integrated region. In turn, trans-border governance[2] can bring policy coherence to the trans-border region by reducing fragmentation among different stakeholders across borders. Accordingly, the objective of trans-border governance is very similar to intra-national

governance, since the latter also aims to bridge the mismatch between functional regions and political jurisdictions within a country (OECD, 2003b). However, in reality, there are more practical impediments to developing productive trans-border governance than intra-national governance. Even within the same country, the construction of horizontal co-operation systems often tends to encounter obstacles to incorporating the different interests of different actors harmoniously. Governance frameworks covering different countries are even more complex and the process is inevitably gradual.

In the following, we first describe the general governance structures of the three PYSR countries and then analyse vision (Section 3.2) and strategies of both central and local governments in the PYSR for trans-border collaboration (Section 3.3). We subsequently analyse bi-lateral and multi-lateral intercity linkages programmes in the region (Section 3.4) and finally evaluate the current trans-border governance framework in the PYSR (Section 3.5).

3.2 Institutional background of the three PYSR countries

The three countries in the PYSR share common traits in their institutional framework. As a unitary state, they had all established a highly centralised political system and have since undergone rapid decentralisation. They actively promote intergovernmental collaboration by using a long-term national spatial planning system. However, the convergence toward decentralisation in the three countries has taken different forms and is occurring at an uneven pace due to the mediating influence of the varied historical and contemporary political contexts of each country (Chen, 2005).

3.2.1 Japan's governance framework

Decentralisation in Japan

Since the 1990s, Japan has significantly transformed the responsibilities of central and local governments through drastic reforms. The role of central government has been shifting from directly influencing local policies to setting frameworks for and monitoring the performance of local governments, while local governments are increasingly responsible for identifying local needs and providing local services directly. Japan had long been politically and administratively centralised, with power concentrated in the capital city (Chen, 2005). However, this centralised system has recently faced extensive challenges. As civil society grew up, there were mounting requests for building locally-adapted communities where citizens are able to live comfortably. As the recognition of the improved capability of local actors proliferated, the fiscal autonomy of local government increasingly gained ground. In addition, as the economy matured

and entered a long period of stagnation, there were increasing demands to employ locally-initiated, rather than centrally-driven, economic development strategies.

Prompted by these domestic concerns, Japan's decentralisation process advanced rapidly and was finally embodied in the Decentralisation Package Law in 1999. This first reform rebalanced the conventional vertical relationship between the central and local governments. Notably, by abolishing the "Agent Delegated Function" system with which the state had asked local governments to implement national policies on its behalf, many jurisdictions of central government – such as town planning decisions – were transferred to local governments. Central government was mainly required to give guidelines which were not legally binding on local governments. Subsequently, in 2004, the second stage of the decentralisation, called the "Trinity Reform," was enacted. This reform was largely aimed at the devolution of public finance, which consisted of three elements.[3] Through this reform, central government transferred a substantial share of tax resources to local governments with fewer national earmarked grants, so that local governments could have more discretion to pursue their own regional policies. More recently, in 2006, the Act for the Promotion of Decentralisation Reform established the Committee for the Promotion of Decentralisation Reform, which acts as a key body to discuss further decentralisation.

The structure of local government

Local government in Japan has consisted of a two-tier system since 1921, with prefectures as the upper level and municipalities as the basic unit of local government. Prefectures in Japan take four different forms (*To, Do, Fu* and *Ken*).[4] They are divided among 47 regions with an average population of 2.7 million and an average area of 8 041 km^2, although their size and scale differ greatly by region (MIC, 2007). Meanwhile, as of March 2009, there were 1 777 municipalities in Japan, comprising three different forms (*Shi, Cho and Son*),[5] with an average population of 71 901 and an average area of 213 km^2. The disparity in size of municipalities is even greater than that of prefectures.

Prefectures and municipalities in Japan are mutually independent and the legal relationship between them is impartial. The role of each authority varies according to its function. While municipalities focus on the provision of daily local services to residents such as health care, social insurance and waste collection, prefectures provide public services to cover a wider region and facilitate communication between the central government and the municipalities.

Intergovernmental collaboration

The Ministry of Land, Infrastructure and Transport (MLIT) has been fully responsible for regional development policy in Japan since it was formed in 2001 by merging four different ministries,[6] although some significant

areas of regional policy still remain in other ministries.[7] One of the most important tools for the MLIT to horizontally integrate regional policies across ministries and facilitate vertical co-ordination with local governments is to establish the long-term National Spatial Plan (NSP). The coverage of the plan is not limited to spatial concerns, but also reaches socio-economic concerns that influence spatial structure. The NSP has two levels: *(i)* the national level, which involves long-term goals for national spatial development and principles for setting regional planning; and *(ii)* the regional level, which involves formulating strategies to address region specific development agenda.

In order to implement this two-tier planning system, the Japanese government designated eight functional regions for spatial planning in 2006 and, in line with this measure, constituted a Council for Regional Planning for each region. In fact, the district and the number of prefectures in Japan have not changed since its adoption in 1889. However, there is increasing pressure for collaboration at prefectural level, as traditional prefectures cannot properly address gaps between the functional and administrative areas, while more autonomy has been allowed to local authorities in the process of decentralisation. To respond to this need and to facilitate co-operation between prefectures, a "regional bloc" which groups several prefectures into a single functional area has been identified as an effective instrument. A spatial planning system based on this regional bloc is pushing ahead strongly. A typical regional bloc, sharing close relationship in terms of nature, economy and culture, is diverse in scale; from Hokuriku region (3.1 million of population) to Capital City region (42.2 million). The process of this regional planning has significantly helped to improve Japan's regional governance system, as various stakeholders – including the regional offices of the central government, local governments and business entities – have participated on an equal footing in the Council for Regional Planning and have shared a common vision for their community.

Municipal governments in Japan have also had a greater tendency to co-operate with each other. Japan's municipalities are legally allowed to take many co-operative measures to enhance the efficiency of local services provisions. The establishment of associations such as the "Wide-area union"[8] with neighbouring local governments is a common example of municipal co-operation. However, a more increasing form of co-operation at the municipal level is amalgamation. In order to address demographic shifts, as well as the fiscal constraints which have worsened during the economic stagnation, the central government has promoted the merger of municipalities throughout the country, providing financial incentives.[9] This policy has had substantial impact. The number of municipalities fell more than 40%, from 3 232 in 1999 to 1 777 in 2009.

3.2.2 Korea's governance framework

Decentralisation in Korea

Korea was a highly centralised state throughout its very long dynastic history. Even after the foundation of the republican government in 1945, this legacy of centralisation was maintained until the late 1980s for the sake of rapid economic development. As a strongly centralised unitary state, Korea's central government exercised extensive influence over most policy areas of local governments. During the 1990s, however, the Korean government undertook a sweeping decentralisation reform. The rising tide of globalisation led to the recognition that local authorities need to become independent and responsible actors to directly address local needs in order to survive global competition. Furthermore, as the democratisation process in Korea continues, there is more political backup for the devolution of power to the sub-national government. In order to respond to these requests, the Korean government revised the Local Autonomy Act in 1988 to provide legal foundations for the re-establishment[10] of local assemblies in 1991 and the direct election of local chief executives in 1995. Succeeding governments have followed through this decentralisation process. In 2004, the *Five-year Comprehensive Plan for Decentralisation* was established, setting 47 strategic goals to promote local autonomy. In 2006, the Jeju Province Special Autonomous Act was established to integrate all branches of central government into Jeju Province government. Superintendents of local educational authorities were also directly elected by residents in 2008 to secure educational autonomy.

These achievements in local autonomy have helped to respond better to local needs, as well as to build more balanced relationships between central and local governments. Decentralisation in Korea, however, is not yet matured and there are some areas to be improved. For instance, in spite of continuous demands for fiscal decentralisation, local governments in Korea still depend considerably on earmarked funds from central government, having little discretion over tax. The expenditure of sub-national government in Korea since the 1990s has stabilised at around 40% of whole of government expenditure, which is quite large compared to unitary states like France. However, the share of local tax income among total tax revenues is only 20%, even after the decentralisation reform of the mid 1990s. This fiscal imbalance has been covered by tax sharing agreements and intergovernmental transfers from central government (OECD, 2001).

The structure of local governments

Korea also has a two-tier structure of local government. The upper level government consists of 16 administrative units: Seoul Special City, six metropolitan cities and nine provinces (*Do*). The lower level governments comprise

230 bodies:[11] 72 cities (*Si*), 91 counties (*Gun*) and 67 autonomous districts (*Gu*). While the *Si* and *Gu* are urban municipalities, the *Gun* is a rural unit of government. In 2003, the average population of cities, counties and autonomous districts was 274 000, 61 000 and 325 000 respectively (KLAFIR, 2005). In terms of population size, municipalities in Korea seem to be very large[12] as a basic unit for providing public services compared to other OECD countries such as Germany (3 400) and France (1 700) (OECD, 2001).

A significant share of local government's work is still delegated from the central government, while a key part of the central government's function is implemented by its special agencies at local level. According to a survey by the Korean Institute for Public Administration (KIPA) in 2001, of the total number of government operations (41 603), only 27% (*i.e.* 11 363) were directly performed by local government. In addition, of those local operations, only 55% (6 306) were identified as purely local affairs, leaving 45% of work which was delegated from central government (KRILA, 2005). In addition, like Japan, the central government in Korea has developed many special local agencies to carry out its key local functions.[13] Many ministries have established affiliated administrations or regional branches to implement their regional policies, while delegating many inconsequential functions to local governments.

Intergovernmental collaboration

In the broader sense of territorial development policies, many ministries in Korea have been involved, and have sometimes competed with each other to lead the process. In order to address this matter more effectively, the Presidential Committee on Balanced National Development was established in 2004 under the direct authority of the president. The committee, composed of eight ministers and 18 external experts, has played a key role in setting strategic direction and prioritising investment in nationally significant regional development projects. Despite some criticisms, including its strong attachment to the goal of balanced development, this committee has been successful in ensuring collaborative horizontal partnership and guaranteeing long-term policy consistency in Korea.

For the narrower sense of territorial policies, however, the MLTM acts as the leading co-ordinating body.[14] The MLTM builds consensus on regional development plans with other ministries, taking advantage of competence to establish the long-term Comprehensive National Development Plan (CNDP). The CNDP is formulated on a 20-year basis[15] and is the primary instrument to achieve Korea's goal of creating a territorial policy. This long-term plan allows the MLTM to gain support from other ministries for the measures to implement it. From the 4th CNDP, approved in 2006, the MLTM has focused on wider participation from local governments in the formulation process with several sets of financial and administrative incentives, diverging from previous top-down and pre-designed features of the plan.

More recently, as a practical tool to implement the CNDP's bottom-up approach, the Korean government has thrust forward the introduction of "area-wide economic blocs" and the establishment of local-level spatial planning corresponding to these new regional blocs. In 2008, the Korean government announced so-called "5 area-wide economic blocs" which divide the whole territory into five sub-economic blocs (except two regions, the mountainous north-east area and Jeju Island).[16] Each of these regions, with a population of more than 5 million, constitutes two or three provinces (or provincial cities) which share similar historic, economic and social contexts. In order to guide co-operation among provinces in the same bloc, an autonomous regional headquarters, rather than a permanent supra-province body, will be installed in each region. This autonomous organisation will create a regional development plan for each bloc, as well as promoting horizontal co-operation among local governments.

Korea's plan to build "area-wide economic blocs" will significantly boost collaboration between provincial governments in Korea, whose communications and partnership had been inactive. However, it is worth mentioning that several OECD countries, including the UK, France and Germany, which are strongly promoting wide-area regional blocs, have already established supra-provincial executive bodies with authority to promote co-operation and settle disputes between provincial governments (Box 3.1).

Box 3.1. **Area-wide regional blocs in the OECD countries**

UK: The Greater London Authority

The Greater London Authority (GLA) was established in 2000. Its territory represents the previous metropolitan county of London, which is 1 580 km² with 7.4 million inhabitants. It covers 32 boroughs (municipalities) and the City of London. The GLA is run by an assembly and a mayor. The assembly is composed of 25 members directly elected every four years. The mayor is also directly elected by a proportional representation electoral system with preferential voting. He is the real executive of the GLA, the assembly principally having the role of reviewing executive decisions. The GLA is responsible for developing strategies in the domains of transport, spatial planning, economic development, health, culture, and the environment. It is also responsible for the management of public transport. To help in these different tasks, the GLA is assisted by four functional agencies: Transport for London for public transport, the London Development Agency for economic development, the Metropolitan Police Authority and the Fire and Emergency Planning Authority. All in all, the GLA staff total about 600 people. The GLA has no financial resources of its own, except revenues derived from road pricing (introduced by the mayor in 2003) but which represent only a very small part of a total budget of more than GBP 7 billion. The bulk comes from a precept levied on the boroughs' council tax (a local tax) and grants from the central government, the largest part of which is spent on public transport.

Box 3.1. **Area-wide regional blocs in the OECD countries** *(continued)*

France: *The contrats d'agglomération*

France has been one of the countries which are most consistent in pursuing policies to create metropolitan institutional arrangements. This process has accelerated since 1999 when the central government established metropolitan authorities in the 150 largest urban areas. In addition to creating these new *communautés urbaines* and the *communautés d'agglomération*, central government drafted specific model agreements that urban areas must adopt and projects that urban areas must undertake if they want to receive government grants. These have been specified in two 1999 Acts on national territorial planning and inter-municipal co-operation. Following these two acts, councils for *communautés urbaines* and *communautés d'agglomération* must approve a so-called territorial project. This territorial project is a five to ten-year plan which concerns infrastructure, economic development, social housing, culture, environment, etc. at the metropolitan level. But it is more than a plan since it specifies the amount of funding and details all the operations to be performed to achieve the plan's objectives. Once approved by the *communauté* council, the project is then discussed with the central government. When it is approved by the central government, there is an agreement signed between it and the *communauté*, called a *contrat d'agglomération*. This agreement guarantees that the central government will finance some of the actions decided in the territorial project (there are therefore negotiations between the central government and the *communauté* regarding government funding). In addition the law states that the *contrat d'agglomération* must also be signed by the regional council. This means that the actions envisaged in the *contrat d'agglomération* will also be financed by the region and as such will be part of the *contrat* de Plan, a larger five-year agreement signed by the central government and the region. Moreover, this means that European structural funds will feed the general budget of the territorial project.

Germany: The *Verband Regio* Stuttgart

The *Verband Regio* Stuttgart (VRS) was created in 1994. It is a regional government body which covers the metropolitan area of Stuttgart. It comprises 2.7 million inhabitants, 3,654 km², 179 municipalities (the city of Stuttgart being the largest by far with about 1/5 of the VRS population) and 5 counties (*kreise*). The VRS is administered by a regional assembly of 90 members, directly elected by a proportional representation electoral system for a five-year term. While the President, appointed by the assembly, is honorary, the actual head of the VRS, also appointed by the assembly, is the General Director who serves an eight-year term. He runs an administration of about 40 people. The VRS does not have many responsibilities: regional planning, public transport, business promotion and marketing are the main ones. Among them, public transport is by far the most important, the VRS serving as the public transport authority (*Verkerhsverbund*) for the whole metropolitan area. The budget of the VRS is very small (about EUR 260 million in 2005) and comes entirely from other government sources (Federal, *Lande*, *kreise* and municipalities) as it has no resources of its own. The bulk of its expenditure (85%) goes on public transport. As a consequence, the VRS is a very weak government body. Even though it was established 12 years ago, its existence is still contested by local governments. However, some positive elements, besides the good management of public transport, can be pointed to: it acts as a go-between among local governments, it has been able to gradually produce a "metropolitan attitude" among public and private actors in the region and it has helped in promoting the Stuttgart metropolitan area abroad.

Source: OECD (2007b), *The Territorial Review of Randstad Holland, Netherlands*, OECD, Paris.

3.2.3 China's governance framework

China's decentralisation of public expenditure

China's governance system is still greatly influenced by the legacy of the planned economy era, although the country has made remarkable progress in reconfiguring the state to adapt to an increasingly market-driven economy in the last few decades (OECD, 2007a). Therefore, central government in China still dominates the planning process for regional development policies (Zhao and Zhang, 1999). In particular, the National Development and Reform Commission (NDRC) has played a key role in making capital investment decisions in China, taking advantage of its responsibility to establish a long-term national plan for economic and social development (OECD, 2006a). This plan, which is also known as the five-year plan (FYP),[17] is still the most important blueprint in China, setting policy targets and guidelines for territorial development policies.

In terms of public expenditure, however, China has become highly decentralised. Major responsibility for the provision of local services such as education, social welfare and health lies with sub-national governments. The local share in total public expenditure and revenue exceeds that of all OECD countries (OECD, 2006a). In 2001, local government in China received more than half of all public revenue and spent about 70% of all government expenditure. These figures are even higher than those of federal states such as Canada (45% for revenue and 62% for expenditure). Along with this fiscal system, central government in China also makes up an exceptionally small share of public employment. Among the 33 million public jobs in China in 2002, only 6% (2 million) were in central government (OECD, 2007a). This figure is far lower than the unitary state of France (54%) in 1999 and even the federal state of the US (14%) in 2000.

The structure of local government

As a unitary state, China has four sub-national tiers: provinces (including provincial level regions and municipalities), prefectures (and cities), counties and townships. At the provincial level, there are 31 administrative bodies: 22 provinces, five autonomous regions and four provincial status municipalities.[18] These provinces are very large; 23 out of 27 provinces (and autonomous regions) each have more than 20 million inhabitants[19] and four municipalities directly administered by central government had an average population of 16.8 million in 2004 (OECD, 2006a). Each province or provincial region is in turn divided into 50 prefectures and 283 cities, with an average population of 3.7 million. These cities often include rural areas much bigger than the urban core and thus are not "cities" in the strictest sense. The next tier is a county, one of the most important local units in China along

with provinces (OECD, 2007a). In 2003, there were about 2 800 counties, each with an average population of 600 000. Counties are then divided into townships, the lowest local government level, which constituted about 43 000 units, each with an average population of 30 000 in 2003.

Intergovernmental collaboration

The most notable feature of multi-level governance in China is its so-called "nested hierarchy" (Skinner *et al*., 1999). In other words, interactions within the government hierarchy are bi-lateral, involving only two levels. Central government deals directly with the provincial level, which in turn deals with the prefecture level, and so on. For instance, the State Council, the highest organisation of the state administration, sets out the detailed division of functions and powers related only to provincial governments. Similarly, provinces delegate the management of lower levels to the next tier down of prefecture government (OECD, 2007a). This system aims to give flexibility to local entities, with the central government retaining the power to exercise unified leadership over the work of local governments.

Along with this vertical co-ordination system, the Chinese government has developed so-called *ad hoc* leading groups to facilitate horizontal consensus-building and policy implementation across governments and party. The leading groups do not directly formulate policies and are also not responsible for policy operation. The State Council makes decisions about all state-level regional development programmes[20] and the state ministries are responsible for carrying out those programmes. The leading groups, however, have strong influence on the policy-making process of those regional programmes as they represent the consensus of the leading members of the relevant state agencies (OECD, 2007c). Following the Chinese convention of reproducing the state level institution at the sub-national level, leading groups for each programme were established in the provinces, prefectures and cities as well. The design processes of the Western Region Development (WRD) programmes illustrate the role of the leading groups well. In 2000, the Communist Party of China (CPC) initiated the programme by setting up the State Council Leading Group. This group proposed implementation guidelines for the WRD. Based on these guidelines, relevant ministries developed strategies and investment projects, while they received inputs from provincial governments and their leading groups. Following collective consultations, the proposals for the WRD were finally approved by the State Council and were released by the NDRC.

This planning process, combined with the monitoring system in China, creates strong incentives for regional development at the local level and is often acknowledged as being the key factor in China's economic takeoff (OECD, 2007c). Several planning systems, including the five-year plan, set targets in terms of economic and regional development at all local levels.

Next, the so-called "cadre management system", which emerged in the mid-1980s as an alternative Chinese civil service system, measures the performance of local governments in implementing these targets, generating competition between local entities (Edin, 2003). Local leaders, as well as government officials, seek to attract investment and develop the local economy in order to increase their financial resources. As an incentive to meet their goals, the central government gives more discretion to local leaders, including extra-budgetary funds and extra staff, especially in faster growing areas.

3.3 Vision and strategies for trans-border collaboration

Trans-border governance in the PYSR has emerged since the 1990s as a key regional agenda. Both state and local governments across borders have started to realise that the harmonisation of authorities among the three PYSR is a pre-requisite for economic success in the region. They are increasingly convening together to settle the local issues arising from rapid economic integration. Before the rise of the Chinese economy, discussions on trans-border co-operation were mostly bi-lateral, between Japan and Korea. However, as China has increased its influence in this region since the 1990s, more complicated forms of trans-border collaboration have emerged.

3.3.1. State visions for collaboration in the PYSR

Japan's vision

Since the start of the 2000s, Japan has experienced strong demand to change its national spatial structure. Japan's population growth has slowed dramatically, more value is being placed on environmental conservation in parallel with economic maturity, and regional competition has intensified beyond national boundaries. In 2008, in order to respond to all these demands, the Japanese government timely created the new dimension of National Spatial Plan (NSP), setting several key strategic objectives. Among them, of special interest in terms of trans-border co-operation is the objective of "seamless exchange and collaboration with other East Asian countries".[21] This objective has three goals (MLIT, 2008a): *(i)* strengthening the competitiveness of Japanese industry within the East Asian production network; *(ii)* developing human resources to tackle common challenges in East Asia, such as environment protection, and expediting cultural exchanges; and *(iii)* forming territorial infrastructure, such as transport and communication, to support seamless exchanges within East Asia. In order to achieve this last goal, the MLIT has prioritised creating a so-called "one-day business trip zone" (Section 2.2; see also Box 3.2) in which people, goods and information could flow smoothly within East Asia (MLIT, 2008b).

In preparing the Regional Spatial Plan based on the new planning system (note in Section 3.2), all eight regions and their councils are seriously taking account of co-operation with neighbouring countries. In particular, the enthusiasm of the Kyushu region for taking advantage of the East Asia network has outstripped that of the other regions. Indeed, Kyushu has exhibited the highest so-called "Asian degree" (or Asian share) in almost all its economic activities among key regions in Japan (METI Kyushu Bureau, 2007). Based on its geographical and cultural proximity, the Kyushu region has built a very strong network with neighbouring East Asian countries, particularly China and Korea. Kyushu is transforming itself into one of the core Japanese economies by reinforcing its role as gateway to Asia (Kim W-B, 2000). Attracted by its unique advantages as well as a sharp increase in economic exchanges with China, many companies from the capital and other leading regions of Japan have shifted their manufacturing operations to Kyushu.[22] The Kyushu region is thus setting the pace of trans-border collaboration with East Asia for the other regions in Japan. In fact, Kyushu Regional Spatial Plan, established in 2009, clearly stated that the first and most significant objective, out of the seven strategic ones to realise Kyushu's new image, is "to place Kyushu as a frontrunner of Japan's co-operation with East Asia".[23]

Box 3.2. **The Asian Gateway Initiative**

Japanese government launched "the Asian Gateway Initiative" in 2007 under the strong leadership of the previous Japanese Prime Minister of Abe, after having several discussions centering on the Council for the Asian Gateway Initiative established in 2006. This strategy sets out the vision of making Japan a gateway nation bridging Asia with the rest of the world. In order to achieve this goal, Japanese government established three philosophies: *(i)* to make Japan a country that people want to visit, study, work and live in, *(ii)* to maintain and further deepen an open regional order with an emphasis on the economy, *(iii)* to build relations of mutual understanding and trust while respecting the region's diversity. Based on these, Japanese government set the following ten items as priority factors in realizing the Asian Gateway Initiative: changing in aviation policy to achieve "Asian open skies", implementing a program for streamlining trade measures, restructuring policy for foreign students in order for Japan to serve as a hub for a human resource network in Asia, opening up further universities to the world, creating a financial and capital market highly attractive to Asian customers, transforming agriculture into a successful growth industry during the time of globalization, creating an "Asian gateway special zone", implementing policies in line with a comprehensive strategy for "creative industries", promoting Japan's attractiveness overseas, and finally strengthening Japan's central role in promoting regional study and co-operation for solving common problems.

Source: The Council for the Asian Gateway Initiative, 2007

Korea's vision

Throughout the "development era" begun in the 1960s and running well into the 1980s, Korea deployed an export-oriented and centrally-organised heavy industrialisation policy, favouring the so-called *Gyeongbu* development corridor between the capital region (*Gyeong*)[24] of Korea and Busan (*Bu*)[25], the largest trading port city in Korea (Kim Y-W, 2001). Between 1966 and 1990, Seoul and Busan's combined share of the national population grew from 17.9% to 33% (OECD, 2001). The capital region itself occupies only 11.8% of the national territory, but accounted for 46% of the nation's population, 55% of all manufacturing firms and 88% of all headquarters of large enterprises of Korea in 2003 (Lee, 2004). The continuing influx of population and industries into this *Gyeongbu* corridor has resulted in significant regional imbalances and caused several socio-economic concerns. Coupled with this issue, in the 1990s Korea also faced growing demand to search for a new spatial policy. As decentralisation deepens, local governments are gaining more competence to direct their own regional projects. In addition, as China has rapidly grown, many provinces in Korea – especially in the west coast region – have drastically expanded economic ties with Chinese coastal provinces.

Responding to these pressures, the Korean government brought out a series of new regional development policies. Notable amongst these was its national mega-scale "west coast development plan", starting from the mid 1990s, to shift the development axis to the west coastline and signal an end to the conventional *Gyeongbu* development axis. Although this plan was intended to mitigate the striking disparity of development among provinces, its more important goal was to intensify economic exchanges with China through a locally-driven approach. This pragmatic plan has paid off. By receiving continuous heavy investment for infrastructure and greater local autonomy, Korea's west coast provinces, which had long fallen behind the rest of the nation, have substantially closed the regional gap. These provinces have become some of the most important trading partners for China's east coastline across the Yellow Sea. According to Chen (2005), this project was by no means coincidental, given China's launch of its Bohai Rim initiative at that time.

Korea's 4th CNDP for 2006-2020 reflects well these structural changes in territorial policy. This plan sets five objectives for achieving a dynamic and integrated national territory; among them, the "open territory"[26] strategy directly aims to promote economic integration with the neighbouring countries of China and Japan. Its basic concept is to create an open territorial axis across Korea's three coastal areas (*i.e.* the west, south and east coasts), often referred to as the reverse π as this indicates the shape of the three coastal development axes.[27] According to this plan, the western coastal axis will be nurtured as a new economic centre responding in particular to China's growth, while the southeast coast will retain its conventional manufacturing sector as a driving force of the region's economy.

China's vision

Chinese central government has increasingly shifted its development priorities along its coastline, from the southern part of the Pearl River Delta (PRD, including Shenzhen City, Guangdong Province and Hong Kong) and Yangtze River Delta regions (YRD, including Shanghai City, Jiangsu and Zhejiang Provinces), to the northern part of the Bohai Rim area (or Jing-Jin-Ji area, including Beijing City, Tianjin City and Hebei Province; see Chapter 1 for detailed location). In the 1980s, China strategically nurtured the development of the PRD through the so-called "Shop Front, Warehouse Back" strategy. This implied that Shenzhen, a Special Economic Zone (SEZ) in mainland China, specialised in manufacturing by taking advantage of cheaper labour costs, whereas Hong Kong, which borders with and feeds capital to Shenzhen, focused on trading with Western countries. During the 1990s, however, China diverted its development resources to the YRD with strong political backing from central government. The YRD has experienced outstanding growth after the Shanghai Pudong area was designated as an SEZ. Since then, it has been recognised as one of the best investment places globally.[28]

Since the late 1990s, the Chinese central government has been accelerating the development of the Bohai Rim, recognising the strategic importance of the region in the context of increasing economic interdependence with Korea and Japan. One of the most prominent R&D networks in China has been constructed between the capital city of Beijing and its neighbour city of Tianjin. About 200 universities, 800 research centers and 400 000 technicians are clustered in this area (Kim J-K, 2007). Especially during the Beijing Olympics in 2008, a huge scale of investment from central government was concentrated in the Bohai Rim. Even before this move, Shandong Province had implemented a series of locally driven measures to attract specifically Korean companies following diplomatic normalisation between China and Korea in 1992 (Chen, 2005). Although, in general, economic progress in the Bohai Rim has not been as remarkable as that in the YRD and the PRD, nonetheless it is certain that the Bohai Rim is emerging as a leading economic region in China (Kim W-B, 2007b).

This pattern of Chinese regional development strategy is clearly envisioned in the 11th Five-Year-Plan (2006-2010) which was approved in 2006 by the National People's Congress. According to this plan, Chinese government will continuously promote the Eastern coast region to take lead in economic development of China, while encouraging the rise of Central and Western region to attain balanced development among regions (NDRC, 2009). In particular, in order to amplify development capacity of Eastern region, Tianjin's Special Economic Zone (called Binhai New Area) coupled with Shanghai's Pudong area will be intensively developed as a new economic core with massive investments from China's central government. In the meanwhile, in

pursuit of this regional strategy, the 11th FYP clearly emphasized the significance of collaboration with neighbouring countries of Japan and Korea. The plan urges local provinces in Northeast coastline to speed up their market opening and strengthen local transportation infrastructures to facilitate economic and technological co-operation across borders.

3.3.2 Municipalities' strategies for collaboration in the PYSR

Japanese port cities' strategies

Fukuoka – which is one of the two primary cities on the northern tip of Kyushu along with Kitakyushu City – has claimed to be the gateway to East Asia based on its extensive historical, commercial and cultural ties with China and Korea (Chen, 2005). As the largest city in Kyushu, Fukuoka City has staked out various bold plans: to become "an Asian business hub" for its manufacturing, "the place where all of Asia meets" for its airport and "creating the future of Asia" for its convention industry. Fukuoka has indeed carried out its gateway function to connect Kyushu with the other PYSR regions, investing massively in its transportation infrastructure. In particular, to become a key nodal point in the PYSR while enjoying favourable relations with Tianjin and Dalian cities in China, Fukuoka is seeking strong strategic partnerships with Busan, which is located only 200 km away (one-fifth of the distance between Fukuoka and Japan's Capital of Tokyo). In fact, a substantial portion of Fukuoka's Asian hub strategies are linked with the city of Busan. For instance, the "Japan-Korea scenic byway" project is pursued jointly with Busan City to create a unified tourist zone in the Korea-Japan (or Japan-Korea) Strait and to enhance public relations.

Kitakyushu, despite being smaller than Fukuoka City, is ahead in fostering and co-ordinating inter-city linkages in the PYSR. Back in 1991, before other cities in Japan paid serious attention to international exchanges, Kitakyushu proposed and hosted the first "East Asian City Conference" and has continuously served as a secretariat city for the Organization for the East Asia Economic Development (OEAED) since 2004, when it was subsequently enlarged to the conference (see Section 3.4 for more). Kitakyushu City also built the Kitakyushu International Techno-co-operative Association (KITA) in 1980 to dispatch experts in environmental issues to and train local officials in that field from developing countries in East Asia. This initiative was driven by its remarkable achievements in environmental industry as well as its bold aim to become the capital city of the environment under the slogan "From grey city, to green city". Kitakyushu city has made an active environmental collaboration with Dalian, Qingdao and Tianjin of China. On the other hand among the other major port cities in the PYSR, Kitakyushu has built very close ties with cities of Incheon and Dalian, intending to create a triangular logistics network with them.

One notable achievement in promoting trans-border municipality exchanges in overall Kyushu has been the establishment of Kyushu Economy International (KEI) in 2001, in which **both cities** of Fukuoka and Kitakyushu agreed to be equal partners as formal members.[29] KEI, closely collaborating with private enterprises, aims to achieve the autonomous development of the Kyushu region through expanding economic ties with the other two PYSR countries. Yet, the activities of KEI go beyond the economic realm to include human resources exchanges, tourism exchanges and the distribution of information to and from Kyushu.

Korean port cities' strategies

Busan, the principal gateway to the Korean Peninsula, is now seeking to become the maritime capital of Northeast Asia, combining its strength in logistics with its growing reputation as a tourist destination and convention city (Busan City, 2008a). Busan is well connected to most cities in Northeast Asia, in particular those in Japan, thanks to its favourable location. The number of international ferry passengers travelling between Busan and the three major ports in Japan (Hakata, Shimonoseki and Osaka) increased by 41.4% between 2003 and 2006, at an annual average rate of 13.8% (Section 2.2).[30] Of all foreign visitors to Busan in 2005, Japanese visitors accounted for 43.8% (Kum, 2008). In order to take advantage of these trends as well as to compete jointly with other mega economic zones in East Asia, Busan has actively promoted economic integration with Fukuoka City in Kyushu. In 2006, on the initiative of private sectors in both cities, the Busan-Fukuoka Forum was built as a less formalised partnership. This forum, hosted annually by each city in turn, brings together 11 leaders from each city representing business and academic circles to vitalise inter-region exchanges. Further to this effort, Busan City agreed with Fukuoka City in 2008 to create a Supra-regional Economic Zone across the Japan-Korea Strait which located between two cities. As a key instrument to realise the potential of the Busan-Fukuoka economic zone, two cities jointly established the Busan-Fukuoka Economic Cooperation Council and held its first meeting in Oct. 2008 (Box 3.3). In the meanwhile, as of 2007, Busan has established sister city relations with 20 overseas cities in 17 countries; of these, two cities (Shimonoseki in 1976 and Fukuoka in 1989) are from the Japanese PYSR.

Incheon has traditionally served as Korea's another gateway for economic exchange, thanks to its strategic location on the Yellow Sea and its well-developed logistics infrastructure. In particular, after the Chinese economic boom of the 1990s, Incheon's significance as a trade node drastically increased. To seize this opportunity, Incheon has set its sights on becoming an important Northeast Asia logistics hub (Incheon, 2008).[31] As one of the core strategies to realise this goal, the city government is pushing to create

Box 3.3. **Busan-Fukuoka Economic Council**

The Council is founded to promote economic exchange between Busan and Fukuoka and set priority for joint projects which will bring mutual benefits. The Council meets on a quarterly basis and both cities will rotate the meeting. This Council is comprised of following seven organizations respectively from both cities, led by mayors.

- Busan: Busan City Government, Busan Chambers of Commerce and Industry, Busan Employers' Federation, Busan Tourism Association, Busan Development Institute, Busan Techno Park, the Asian Institute for Regional Innovation
- Fukuoka: Fukuoka City government, Fukuoka Chambers of Commerce and Industry, Fukuoka Foreign Trade Association, Fukuoka Convention and Visitors' Bureau, Kyushu Economic Research Institute, Kyushu Advanced Science and Technology Research Centre, Fukuoka Economic Association

The Council set three phases to expand its regional coverage. In first stage, the Council will be joined only by Busan City and Fukuoka City. Yet, in second stage, it will be enlarged to include Ulsan City and Kitakyushu City. Lastly, in third stage, the Council will represent whole Kyushu area and Southeast coast region of Korea. Of notable feature is that this Council is closely working with pre-existing bodies for economic integration of two cities, such as Busan-Fukuoka forum and Korea-Japan Kyushu Economic Cooperation conference. The Council is currently conducting its first joint research project (a study on promoting the creation of the Busan-Fukuoka supra-regional economic zone) with supports from Busan Development Institute and Kyushu Economic Research Institute.

Source: Busan City, 2008b

a triangular logistics network connecting Incheon with Dalian in China and Kitakyushu in Japan. In fact, these three cities already co-operate closely under the umbrella of the OEAED logistics division, holding regular officials' meetings and promoting container cargo exchanges. Also, in 2007, the Incheon Port Development Council and Kitakyushu Port Promotion Council signed an exchange agreement. In further efforts to become a hub, Incheon has fostered sister city relations with 14 cities in 10 countries, two of which are from the PYSR (Tianjin in China and Kitakyushu in Japan). Incheon also hosts the Incheon-China festival annually to promote more active cultural exchanges with Chinese shores across the Yellow Sea.

Chinese port cities' strategies

The practical participation of Chinese coastal cities in the trans-border sub-region of the PYSR began as early as 1984, when the central government designated 14 coastal cities, including five cities in the Bohai Rim (Tianjin, Dalian,

Qinhuangdao, Yantai and Qingdao), as favoured open localities for foreign investment (Chen, 2005). As these cities receive more competence to provide preferable administrative and financial incentives to new capital inflows, an increasing number of companies from Japan and Korea have been attracted to this area, necessitating close co-operation among municipal governments across borders.

Tianjin has gained increasing significance as a key node to link the Chinese Bohai Rim with the global economy because of its proximity to Beijing, its recently expanded port facilities and its strong backing by central government. In particular, through the establishment of the Binhai New Area, the Tianjin City government is actively seeking regional co-operation with the Japanese and Korean PYSR and, in 2006, signed a co-operation agreement with Korea's Incheon Free Economic Zone. Tianjin City has taken a leading role in forging a domestic regional league among the cities of the Bohai Rim. In 1986, the Bohai Rim Mayor Joint Conference was formed with 15 coastal cities as members under the strong stewardship of the Tianjin City government. Its members had expanded to 37 cities by 2008 and Tianjin City has still served as the conference chair since its inception. In the meantime, of the 27 sister city programmes Tianjin had established by 2008, three were with Japanese cities and one was in Korea.[32]

Dalian, serving as a heavy industrial base in Liaoning Province, plans to become a key international hub port for Northeast Asia. According to Liaoning Province's economic development plan ("Five-point and One-line") in 2005, Dalian will be nurtured as core shipping centre for the Bohai Rim, based on the favourable location of its Dayaowan Bonded Port for connecting the hinterland of Inner Mongolia with the bordering countries of Japan and Korea. Dalian has long been eager to reinforce trans-border collaboration with Japanese and Korean regions in the PYSR. Reflecting this, as of 2008, the combined number of Japanese (3 800) and Korean (2 200) firms in Dalian constituted 48.3% of total foreign companies. Also, eight Japanese cities are currently operating their liaison offices in Dalian to support economic exchanges. Dalian is one of the original member cities of the OEAED and has played a leading role in the organisation's logistics working group. Dalian also led the formation of the Liaoning Costal City Economic Commonwealth in 1985 which currently has seven member cities[33] and promotes common economic development in the region. In the meantime, Dalian has built 16 sister city programmes, of which two are in the PYSR (Kitakyushu and Incheon).

Qingdao, the largest city in Shandong Province, has deepened economic integration with the PYSR since the mid-1990s by positioning itself as a massive production base and export outlet for declining Japanese and Korean labour-intensive industries. The Qingdao city government has implemented a series of measures to attract investment, in particular from Korea, including the designation of several Special Economic Zones and the provision of

well-connected transportation infrastructure. This local initiative has significantly helped to link Qingdao and other port cities in the PYSR more closely, and to step up further integration. Qingdao has established extensive sister city relations with most major port cities in the Korean and Japanese parts of the PYSR.[34] Taking advantage of these active economic exchanges with Korea and Japan, Qingdao is accelerating the establishment of a Port-of-Entry strategic partnership with its hinterland cities. In order to expand the "pull effect" of its port on the hinterland economy, Qingdao has opted for the open policy of ports clearance and has introduced a train-ferry multimodal transport service. With these efforts, the number of Qingdao Port's strategic partners reached 18 cities or regions by the end of 2007.[35]

3.4 Expanding inter-city linkages in the PYSR

As decentralisation and globalisation hit the shores of all the sub-national regions in the PYSR, local governments have unleashed various efforts to strengthen inter-city linkages across borders. In particular, the ten key port cities around the PYSR have played a leading role in constructing dense trans-border inter-city linkages. Their interest in facilitating community building across borders seems to be more urgent and driven by more practical incentives than engagements at state level in the PYSR.[36] With strong support from public organisations specialised in inter-city linkages from each country, these ten cities have exhibited a rapid expansion of bi-lateral sister city programmes and have also actively engaged in building several multi-lateral city linkages.

3.4.1 Public organisations supporting inter-city linkages

Each country in the PYSR has established a similar public organisation which aims exclusively to support the internalisation and trans-border co-operation of its local governments. In Japan, the Council of Local Authorities for International Relations (CLAIR) was established in 1988. China subsequently formed the Chinese International Friendship Cities Association (CIFCA) in 1992, while Korea created the Korean Local Authorities Foundation for International Relations (KLAFIR) later in 1994. As a joint association of local authorities, these organisations were founded as a collaborative effort by both upper-tier and lower-tier local governments across their own country with substantial financial assistance from central government. In the case of KLAFIR, for instance, of a total annual budget of EUR 6 million in 2007, the upper-tier and lower-tier local governments contributed 40% and 33% respectively, while the Ministry Of Home Affairs and Security (MOHAS) provided the remaining. In addition, these three organisations have alternately hosted annual trilateral conferences on local government since their inception in 1999 in order to strengthen networks and address common agendas for co-operation.[37]

These organisations act as facilitators for the sister city affiliations of their local governments with counterparts across the border. They maintain a large database of international exchange information, help match potential or interested parties overseas and provide administrative advice to reach an agreement on sister city or friendly-city relationships. These organisations also operate their own programmes to promote trans-border co-operation with local governments in neighbouring countries. One of the most common programmes is to invite and train foreign officials and technicians for various fields including environment and economy. For instance, the CLAIR runs the Japan Exchange and Teaching (JET) programme which promotes increasing mutual understanding between Japan and other countries by inviting foreign individuals to work in local authorities in Japan. Entering its 22nd year in 2008, this programme has seen significant growth, from its original 848 participants (from 4 countries) in 1987 to 4 682 participants (from 38 countries) in 2008 (CLAIR, 2008).

3.4.2 Bi-lateral city linkages in the PYSR

Sister cities in the three PYSR countries have increased so dramatically since the 1990s, to the point that it could be described as "compressed growth", and revealing the intensified economic integration in the PYSR (Yang, 2008). In Korea out of 246 local governments (16 provinces and 230 municipalities), 75.6% (186 local governments: 16 provinces and 170 municipalities) were engaged in 547 sister city relations with 532 cities in 51 countries as of 2008 (KLAFIR, 2007; Table 3.1). Of these, more than 80% of exchanges (461 ties) were formed after the 1990s. China shows a similar trend. By the end of 2008, Chinese provinces and cities had established 1 586 sister cities with 368 provinces and 1 143 cities in 124 countries. Of these, 37.8% (600 pairs) were forged during the 1990s and 40.4% (641 pairs) were established in this century (Table 3.2). In the meantime, Japan shows somewhat different pattern. Its total number of overseas sister city agreements showed 1 562 as of March 2008 (CLAIR, 2008).[38] This number was sharply increased throughout the 1990s, to expand at an annual growth rate of 6.7% (from 844 in 1990 to 1 407 in 2000). However, it has been relatively stagnant in the 2000s, growing at only 1.5% annually between 2000 and 2007.

Bi-lateral inter-city linkages in the PYSR have also showed a strong regional concentration on their neighbouring countries. For Korea, China and Japan jointly constitute almost half of the inter-city linkages, respectively accounting for 32.0% (175 ties) and 15.0% (82 ties) as of 2008 (Table 3.1). Of notable one is that the share of sister city relation of Korea with the PYSR cities is remarkably high: 58 ties with cities in the Chinese Bohai Rim (33.1% of Korea's total ties with China) and 13 ties with cities in Kyushu area (15.9% of Korea's total ties with Japan). Japan shows lesser regional concentrations to its neighbouring

countries. According to the CLAIR (2008), of 1 562 sister-city affiliations as of 2008, about 30% were formed with the PYSR countries: China accounted for 20.9% with 326 agreements, while Korea had 7.6% with 118 ones. Unlike Korea, however, Japan has built the largest number of affiliations with the US (437 ties, 28%). On the other hand, a similar pattern can be seen in China. Although the number of sister city relations with Japan and Korea ranked 1st (238 ties) and 3rd (104 ones) respectively, it only represented 21.6% of total sister city relations of China. US placed 2nd in building inter-city linkages with China (186 ties: 11.7% of total ties). Among the four provinces of the Bohai Rim, all provinces except Tianjin City showed higher share of sister city relations with Japan and Korea than the national average (21.6%): Tianjin, 4 pairs out of 22 relations (18.8%); Shandong 36 pairs out of 140 relations (25.7%): Hebei 17 pairs out of 56 relations (30.4%); and Liaoning, 26 pairs out of 80 relations (32.5%).[39]

Table 3.1. **Korea's sister city relations with the PYSR countries**

Number of sister city agreements and its share by countries

Period	Sub-total	With Japan	(%)	With China	(%)	Japan + China	(%)
1960s	10	1	10.0%	0	-	1	10.0%
1970s	17	9	52.9%	0	-	9	52.9%
1980s	59	17	28.8%	0	-	17	28.8%
1990s	249	32	12.9%	102	41.0%	134	53.8%
2000s[1]	212	23	10.8%	73	34.4%	96	45.3%
Total	547	82	15.0%	175	32.0%	257	47.0%

Note: [1] 2000s: covers between 2000 and 2008.

Source: OECD calculations using data from KLAFIR website (*www.klafir.or.kr*).

Table 3.2. **China's sister city relations with the PYSR countries**

Number of sister city agreements and its share by countries

Period	Sub-total	With Japan	(%)	With Korea	(%)	Japan + Korea	(%)
1970s	20	14	70.0%	0	-	14	70.0%
1980s	325	103	31.7%	0	-	103	31.7%
1990s	600	88	14.7%	51	8.5%	139	23.2%
2000s[1]	641	33	5.1%	53	8.3%	86	13.4%
Total	1 586	238	15.0%	104[2]	6.6%	342	21.6%

Notes: [1] 2000s: covers between 2000 and 2008. [2] The mismatch of numbers between Tables 3.1 and 3.2 (especially, China-Korea) is mainly due to different categorizations of sister city relations.

Source: OECD calculations using data from CIFCA website (*www.cifca.org.cn*).

Previously, sister city affiliations in the PYSR had been initiated by simple network-building between local authorities across borders. The exchange of people and culture was the most common approach. Sometimes, inter-city linkages had been driven by the personal interests of local leaders, but these were often interrupted if they resigned (KLAFIR, 2007). In recent years, however, substantial changes to bi-lateral networks are being made in the PYSR. An increasing number of local governments are pursuing project-oriented collaboration. Instead of being good-will exchanges as in the past, local authorities are pushing ahead to run common projects for mutual benefit. They delegate a market survey team, run joint ventures in agriculture and the environment, collectively develop industrial complexes and take turns to host investment fairs. One exemplary case of project-based inter-city linkages in the PYSR is the Kitakyushu-Dalian linkage. The Japanese Government and the UN have supported the Dalian Environmental Model Zone plan through Kitakyushu's international environmental co-operation initiative. It was the first international co-operation project to be organised by a local government through the Japanese government's Official Development Assistance (ODA). In addition, the stakeholders of inter-city co-operation have also been widened. Local governments are strongly encouraging the participation of NGOs and civil societies in the region through disseminating information and even providing financial assistance. Table 3.3 indirectly shows this shift of objectives to seek for sister city relations in the PYSR. According to KLAFIR (2007), although half of all the Korean local authorities' inter-city linkages still involve the simple exchange of people, 14.3% of them in 2007 (670 cases) were engaged in economic exchanges.

Table 3.3. **Objectives of Korean local authorities' inter-city linkages, 2007**

Number of cases and share by objectives

		Exchange of people	Exchange of culture	Exchange of economy	Exchange of sports	Others[1]
No. of cases	4 664	2 362	684	670	374	574
Share	100%	51%	15%	14%	8%	12%

Note: [1] "Others" includes holding working-level meetings and attending international conferences.

Source: KLAFIR (2007).

3.4.3 Multi-lateral city linkages in the PYSR

Over the past two decades, the inter-city linkages which have proliferated in the PYSR have tended to be bi-lateral; multi-lateral inter-city linkages are not as common. However, as economic integration in the region expands, the

agenda has started to be more complicated in which multiple parties need to participate. The institutional capacity of local actors to engage in sophisticated dialogue channels is also improving. Accordingly, multi-lateral linkages in the PYSR have recently made substantial progress. Below we describe three cases of notable multi-lateral linkages in the PYSR.

Organization of East Asia Economic Development (OEAED)

The OEAED is one of the most active multi-lateral city networks in the PYSR. Established in 1991 to link six port cities (two cities each from three PYSR countries),[40] on the initiative of Kitakyushu City in Japan, it expanded to ten key port cities in 2004.[41] The OEAED aims to create a new area-wide economic zone for further development of member cities as well as the whole PYSR through the facilitation of exchange of economy, culture, human resources and technology among its participants. In order to realise this vision, the OEAED sets the following five goals to achieve (OEAED, 2008): *(i)* Realise FTAs for limited areas that go beyond the mere abolition of tariffs, including streamlined customs procedures in the ports of member cities; *(ii)* ensure a harmonious balance between environmental protection and industrial activities through the creation of a new recycling-oriented society; *(iii)* expedite the development of cross-national industrial clusters and the establishment of business-support systems with deregulation; *(iv)* promote tourism by executing large-scale campaigns such as Pan Yellow Sea Year and strive to establish a Pan Yellow Sea brand; and *(v)* encourage academic exchanges among major technical universities in member cities.

The OEAED has established the Organization Council involving a mayor and a business leader representative[42] from each city. This holds a biennial meeting hosted by member cities in turn.[43] Under the council, the OEAED has also set up four working groups which are alternately chaired by four different member cities:[44] manufacturing, environment, logistics and tourism (Box 3.4). Since its inception, these working groups have held annual meetings with the active participation of local officials and businessmen, producing substantial and practical outcomes. For instance, during the first meeting in 2005 the logistics sub-committee suggested forming a "port partnership" between the harbour bureau directors of the ten cities; in the second meeting in 2006 a new project was launched to construct a database of the ten cities' airports and seaports.

There are two notable features of the OEAED's activities. First, it is driven on the initiative of local governments and the role of central government is limited. The central government of each country does not regularly attend plenary or sub-committee conferences,[45] and neither does it have any members on the council. Secondly, the OEAED is oriented towards business missions in the fields of manufacturing, logistics and tourism, although it does also value the exchange of people and culture in the region. It has held

a regular forum for business leaders along with a mayors' summit from the beginning, but has rather weak co-operation with academic circles. For instance, the participation of local universities in the OEAED is inactive compared to other multi-lateral linkages in the PYSR, even though the OEAED's activities are backed up by the local research institute of International Centre for the Study of East Asian Development (ICSEAD).[46]

Box 3.4. **Key projects of the OEAED's four working groups**

Manufacturing unit: Developing business infrastructure; building networks for small and medium-sized enterprises by holding CEO meetings; promoting business-academia collaboration; forming industrial clusters in the fields of semiconductors, automobiles and robotics.

Environment unit: Building an environment co-operation network; creating an environmental model region by standardizing environmental regulation; international collaboration on recycling.

Logistics unit: Constructing a smooth logistics system by establishing a Pan Yellow Sea intercity logistics Council; constructing a logistics information system by building authentication and pre-customs management systems.

Tourism unit: Building a tourism information network; holding an "East Asia tourism forum for ten cities"; co-operation with the TPO (Tourism Promotion Organization); implementing tourism brand strategies through joint PR activities; developing tourism software by issuing tourist cards common to all ten member cities; promotion of youth school trips.

Source: OEAED, 2008.

Yellow Sea Rim Economic and Technology Conference (YSRETC)

The establishment of the YSRETC was discussed during the ASEAN+3 Summit in 1999 and soon materialised. In 2000, ministers[47] responsible for each country's industry policies agreed to establish the YSRETC with the following three objectives: the expansion of trade and investment, the promotion of technology transfer, and the facilitation of human resources exchanges among the three countries. The conference has been held annually since its first conference in Fukuoka in 2001. Member cities and provinces of this conference are very extensive but mostly correspond to the geographical coverage of the PYSR. Members of the Korean side included Gwangju and Daejeon on Korean members of the OEAED.[48] The Chinese side adds Shanghai City and Jiangsu Province on Chinese members of the OEAED. Japan's member regions are confined to Kyushu, which corresponds to Japan's membership of the PYSR.

This conference has following unique features in governing trans-border co-operation. First, unlike the OEAED, it has been driven by the central

governments of each country, although their counterpart in Japan is the regional bureau of METI *(i.e.* the Kyushu bureau of METI). Secondly, this conference has focused primarily on business issues. A wide range of economic actors across borders participate in the conference, including businessmen and their associations, research institutions and public corporations for promoting investment.[49] These business representatives regularly meet during the Yellow Sea Rim Business Forum, which is held annually as a back-to-back event of the conference. Here they discuss practical projects, including the establishment of common research funds, the installation of internship programmes for technical college graduates and the regular hosting of investment and product fairs. Lastly, this conference has a well-established co-operative network among industries-researchers-universities through the formation of forum of the Pan Yellow Rim University Presidents in 2005. This forum is held jointly with the conference, with a broad membership from local universities and research institutions. This forum is dedicated to the exchange of human resources among member organisations and established an important MOU in this regard in 2008.[50] According to the MOU, this forum will create a human resource committee to handle the Student Exchange Programs (ESP) directly in the region, will operate joint-degree and dual-degree programmes among member organisations and will run pilot internship programmes for local college graduates.

Japan-Korea (or Korea-Japan) Strait Governors' Summit (JKSGS)

This summit, like the OEAED and YSRTEC, has a relatively short history but has contributed significantly to connecting the two different local coastal areas across the Korea-Japan (or Japan-Korea) Strait. It was established in 1992 in collaboration with four south coast regions of Korea and three prefectures in northern Kyushu in Japan.[51] This series of summits has been held every year, alternating between Japan and Korea, and reached its 18th term in 2009. This forum aims to maintain a historically and geographically close relationship between provinces across the Japan-Korea (or Korea-Japan) Strait by developing a complementary economic bloc and promoting information sharing in the fields of tourism, sports and culture. This summit also established a forum for regional research institutions in 1994 to support the governors' meeting and has held working group meetings consisting of senior officials from each local government twice a year in order to implement summit directives.

The local authorities involved in the summit have carried out various joint projects, such as high-school student exchange programmes, environmental technology exchanges especially concerned with acid rain, and residents' friendship events. One of its most significant achievements so far is to facilitate the regular operation of a high-speed ferry and train-ferry intermodal

connection between the cities of Busan and Fukuoka. According to Kim W-B (2007a), compared to other multi-lateral dialogue channels in the PYSR, this summit is more coherent and practical both in terms of its organisation and agenda, as fewer sub-national authorities are involved in this organisation, which simplifies the institutional complexities of trans-border co-operation.

3.5 Challenges and recommendations

Despite their short history, trans-border local governance schemes in the PYSR have had remarkable achievements. As we have seen, trans-border integration in the PYSR are primarily facilitated by local business initiatives. The private sector has led economic integration in the PYSR to exploit the hierarchy of technologies and factor prices in the region. As a response to this integration, local governments are seeking to build good trans-border governance structures in order to contain economic success within the PYSR and elevate the region's performance. Building on the tide of global decentralisation processes, they no longer wait for state subsidies but are looking beyond their national territories to form alliances with complementary local economies across borders. The eagerness of local governments to construct inter-city networks in the PYSR, whether bi-lateral or multi-lateral, is rapidly increasing. More promisingly, there is local political determination to build trans-border communities in the PYSR; these are the cornerstones on which inter-city linkages will be founded and extended.

Recommendations for sub-national governments

However, despite notable attainments to date, good trans-border governance building in the PYSR will require more efforts (Rozman, 2004). Here, we summarise our recommendations to sub-national governments for reinforcing trans-border governance structures in the PYSR:

i. Share a common vision for trans-border community in the PYSR. Currently, stakeholders' views of their community's future in the PYSR are not coherent (Kim J-K, 2007). Public authorities and residents in the PYSR have differing concerns. In many cases, despite their quantitative achievements, the sister city agreements in the PYSR have not been incorporated into the region's long-term common strategic goals. Inter-city linkages in the PYSR are generally still at the early stages of community building. However, without a sense of common destiny, collaboration across borders could remain mere repetition of simple exchanges of good will, resulting in unstable linkages (Yang, 2008). Conducting a joint project would be a good starting point for building a common vision. Practical projects including the operation of maritime logistics information system and the creation of

region-wide tourism website could be catalysts for promoting wider participation of stakeholders across borders and accordingly creating mutual understanding among them.

ii. Identify a complementarities among development strategy for cities in the PYSR. Most cities in the PYSR have created their own development strategies to augment their influence in relation to other cities in the region (Kim W-B, 2000). They tend to see their partners, both across and within borders, as competitors in a zero-sum game. Accordingly, duplicated investment and unnecessary competition often occurs, and aligned co-ordination among cities is rare. For instance, Fukuoka City has kept aloof from participating in the OEAED led by Kitakyushu City, while the latter has barely participated in the Asia Pacific City Summit, initiated by the former. This is despite the fact that the two cities jointly form the same metropolitan region in Fukuoka Prefecture and are within 60km of each other. Furthermore, most port cities along the PYSR coast claim to be a logistics hub for Northeast Asia. Tianjin, Qingdao and Busan have recently and simultaneously committed mega-scale capital investments to enlarge their port capacities to fulfil this goal. Dalian strives to be a second Rotterdam in Northeast Asia, whereas Incheon also claims to be a major air-based logistics hub. If some members perceive that they could stand alone or fail to recognize the benefits of engaging in city networks, then those networks will be stagnated or, in the worst case, fallen apart. In this regard, cities in the PYSR should seek complementarities in their development strategies. They need to specialise in fields in which they have their own advantages and pursue competitiveness for the whole region rather than individual cities.[52] Frequent dialogue among relevant parties could help to mitigate excess competition and harmonise the use of existing assets. Objective analysis could also help to a better division of roles among cities and a consistent development strategy for the PYSR.

iii. Strengthen institutionalisation in the PYSR. Community building would be easier if there were more similarities in legal and institutional systems across borders. If differences prove substantial, they can be bridged with the help of a legal framework for co-operation at the sub-national level. Inter-city networks in the PYSR, however, have relied heavily on voluntary agreements between cities which are not legally binding. In addition, there are still many discrepancies between China-Japan and China-Korea, although their institutional compatibility has increased since China opened up to the world. To some extent, trans-border governance without institutional change or formalised agreements can be efficient as it would possibly incur less time and resources (Kim W-B, 2007a). These spontaneous inter-local economic interactions, however, can be undermined by the informal

nature of transactions, which are subject to political change at both the domestic and international level. Accordingly, this could hamper the growth of mutual trust, increasing the fragility of trans-border co-operation.

iv. Secure financial resources for cities in the PYSR to build trans-border collaboration. Lack of funds is hampering the sustainability of inter-city linkages in the PYSR. In order to promote more active participation from stakeholders in building a trans-border community, financial incentives need to be ensured. The provision of funds would correct the market failures induced by a border that prevents related actors from collaborating. The EU community's INTERREG programme is the most well-known example of this approach (OECD, 2006b; Annex A). However, the PYSR has not set up meaningful regional financial organisations or even a special fund, despite many discussions on this subject. Currently, small projects such as simple human resources exchange and training are financed by local governments. Yet, most projects for building trans-national communities surely require much larger scale funding from both external and internal sources. One possible solution to address insufficient funds could be the use of Official Development Assistance (ODA) programmes. Kitakyushu uses the Japan International Cooperation Agency (JICA) programmes for technology transfer to Asian countries. Korea's national ODA agency – Korean International Cooperation Agency (KOICA) – also actively promotes environmental collaboration with developing countries.

Recommendations for central governments

On the tide of globalisation, local governments often find themselves fiercely competing, rather than collaborating, with each other. They tend to pursue their own development strategies which do not sufficiently consider their unique advantages and hence are not often compatible with the national level strategy. In this regard, the more active role of all central governments in the PYSR to co-ordinate collaboration among local governments across borders is encouraging. In fact, the PYSR central governments have been much less eager to build trans-border inter-city linkages, while local governments have on the whole been keen on expediting exchanges across borders. Although central governments have partly engaged in trans-border governance, as is the case for YSRTEC, their roles and influence are limited. For insance, there is still no regular trilateral dialogue channel among the three ministries responsible for territorial policy in each PYSR country,[53] whereas several multi-lateral co-operation structures are already in place between local governments from the three PYSR countries. Although a bottom-up

approach to building inter-local co-operation is still valid and indispensable, at least for the initial stage of trans-border community building, a more state-led and top-down approach is also certainly required. We therefore suggest the following recommendations to central governments in the PYSR:

i. Recognise fully the importance of the PYSR as a unique unit which can bring regional competitiveness and national economic growth. Based on this, central governments in the PYSR need to play an active facilitation role to construct vertical governance scheme. Through expediting a wide array of dialogue channels with local governments, central governments could help local governments to avoid the competition trap and instead pursue complementarities.

ii. Ease and align regulations which hinder harmonious collaboration, as another way of strengthening vertical governance structures. Areas would include customs and immigrant procedures to promote smooth flow of people and goods in the PYSR. Comprehensive national and regional spatial planning will be also useful instruments to bring concerted efforts of local governments to construct sustainable trans-border community in the PYSR.

iii. Facilitate horizontal strategic dialogues amongst themselves, whilst strengthening vertical governance schemes. The following could be considered:

- Creating a trilateral dialogue forum, at ministerial level, on a trans-border regional development strategy to enhance consensus on the PYSR's future. In doing so, they could take advantage of existing bi-lateral dialogue mechanisms on territorial and urban issues between central governments in the PYSR (i.e. China-Japan, Japan-Korea and Korea-China).

- Increasing the use of the OECD as a platform to facilitate dialogues. The OECD has several multi-lateral policy dialogue platforms involving both member and non-member countries. An adaptation of these institutions will enable central governments in the PYSR to exchange wider views with each other and other OECD member countries as well.

- Participating collectively in dialogue channels which have been driven by local governments. The Union of Baltic Sea (UBC) would be a good example in this field. It constitutes over 100 coastal cities in the Baltic Sea area and works through intense collaboration with national governments and the EU supra-national government.

Notes

1. Pierre and Peters (2000) define regional governance as "the regional political system which emphasizes participation of various interest groups of region to draw consensus and co-operation for obtaining social and economical goal of region, departing from traditional way of control and management from central government."

2. OECD (2004) defines trans-border governance as "the establishment of and adherence to a set of incentives, norms and organizations that are set up to co-ordinate policy making in a region where the functional area of economic activities does not coincide with the geographical pattern of political jurisdictions".

3. Namely, a decrease or abolition of national earmarked grants, a decrease of block grant funds allocated through the Local Allocation Tax (fiscal equalisation scheme among regions), and an increase of local taxing powers through the transfer of some national tax revenues to local government (OECD, 2005).

4. *To* (Tokyo metropolitan), Do (Hokkaido), Fu (Osaka and Kyoto). The rest are *Ken*.

5. *Shi* (cities, 782 units), Cho (towns, 827 units) and *Son* (villages, 195 units) have no overlapping administrative jurisdictions. *Shi* is divided into four sub-sets according to the number of residents: 17 Designated cities (including cities of Fukuoka and Kitakyushu), 35 Core cities (including city of Shimonoseki), 44 Special cities and 686 Ordinary cities.

6. They are the National Land Agency, the Hokkaido Development Agency, the Ministry of Construction and the Ministry of Transport. Recently, the MLIT extended its capacity to tourism and was renamed Ministry of Land, Infrastructure, Transport and Tourism.

7. For instance, the Ministry of Economy, Trade and Investment (METI) is responsible for regional economic development; the Ministry of Internal affairs and Communication (MIC) is in charge of the fiscal equalisation scheme for local governments; and the Ministry of Agriculture, Forestry and Fishery (MAFF) has jurisdiction over rural development.

8. The first Wide-area Union was formed in April 1996 from eight towns and villages in Ono county of Oita Prefecture and a total of 82 regional agreements for the unions had been established by March 2004 (CLAIR, 2006).

9. Based on the New Special Merger Law of 2005, some incentives will be given to the merged municipalities until the end of March of 2010 (OECD, 2009).

10. The Local Autonomy Act was established in 1949 but was suspended in 1961.

11. Figures from the official website of the Korean Ministry of Public Administration and Security: *www.mopas.go.kr*.

12. This is owing to the amalgamation of urban and rural regions in the mid-1990s in Korea. This reform has allegedly contributed to reduce regional disparity and enhance efficiency of public goods provisions.

13. In July 2008, the Korean government announced mid-term plans to devolve considerable power from these special agencies to local governments.

14. After government structural reorganisation in 2008, the MLTM took on more responsibility for territorial development policy by absorbing duplicated functions from other cabinet ministries such as the former Ministry of Fisheries and Maritime Affairs.

15. The CNDP was formulated for a 10-year basis but the term was extended to 20 years from the 4th CNDP in 2006 (MLIT, 2007).

16. These are Capital, Chungcheong, Jeolla, Daegu-Gyeongbuk and Busan-Ulsan-Gyeongnam.

17. The 1st FYP was established in 1953 with the target year of 1953-1957 and most recent one is 11th FYP for 2006-2010.

18. The four municipalities are Beijing, Shanghai, Tianjin and Chongqing.

19. Henan and Shandong provinces alone have almost 100 million inhabitants each.

20. In the 1990s, while the Chinese government continued its pro-coastal development strategy, it also began to recognise the importance of preventing excessive regional gaps. In this context, regionally co-ordinated development became one of the main ideas of the 9th Five-Year Plan (1996-2000). After that, a series of regional development programmes was adopted: Western Region Development in 2000, Revitalising Northeast China in 2003 and The Rise of the Central Region in 2006 (OECD, 2007a).

21. The other important objectives are the formation of sustainable regions, the formation of a disaster-resilient territory and the management and succession of the beautiful environment (MLIT, 2008b, available at *www.mlit.go.jp/common/000019219.pdf*).

22. Toyota and Nissan, two major car manufacturers in Japan, have moved a significant portion of their production to the Kyushu area since the beginning of the 1990s (see Chapter 2.1). Thanks to this relocation, automobile industries in Kyushu now have the most up-to-date plants and equipment in Japan (KIM W-B *et al.*, 2005).

23. In order to achieve this goal, the plan subsequently involves three tools: *(1)* establishing an attractive international frontier to strengthen the relationship between East Asia and Japan; *(2)* building industrial clusters that are competitive in global markets; and *(3)* developing links of region-wide infrastructure between Kyushu, other regions and East Asia.

24. It consists of Seoul City, Incheon City and Gyeonggi Province. The distance between Seoul City and Busan City is 450 km.

25. Busan City, coupled with Ulsan City and Gyeongnam Province, has traditionally served as the manufacturing base for Korea's heavy industries including automobiles and shipbuilding.

26. The other objectives are the following; a balanced territory, a welfare territory, a green territory and a unified territory.

27. The northern border of Korea is confronting with North Korea.

28. In 2008, of the 500 largest MNEs worldwide, 80% were located in the YRD and 50% were operating in Shanghai (Chen and Karwan, 2009).

29. The formal members of KEI are six prefectures in Kyushu, two cities and 10 other quasi-government agencies such as the Japan Tourist Association in Kyushu (Chen, 2005).

30. Information from the Busan Port International Passenger Terminal (in Korean): *www.busanferry.com/conv*.

31. Incheon also claims to be a hub city for the financial and high-tech industries.

32. Kobe, Yokkaichi and Chiba city in Japan and Incheon in Korea.

33. They are Dalian, Dandong, Yingkou, Jinzhou, Huludao, Panjin and Chaoyang.

34. Sister cities of Qingdao are Shimonoseki, Fukuoka and Kitakyushu in Japan and Incheon, Pyeongtaek, Gunsan and Busan in Korea.

35. Qingdao Port also attracted 84 000 TEUs of railway containers from its hinterland in 2007, an increase of 26.7% over the previous year.

36. This can be illustrated, albeit indirectly, by the language options of official government websites in the PYSR. While the websites of all central governments in the PYSR in charge of territorial policy provide English as the only alternative to their native languages, all official websites of the key port cities except that of Tianjin City provide information in the languages of two other countries in the PYSR, as well as in English.

37. The 1st conference was held in Korea in 1999 hosted by KLAFIR and the 11th conference was recently held in China in 2009 hosted by CIFCA.

38. This figure includes sister city relations of both prefectures and municipalities.

39. More specifically, Tianjin City: 3 for Japan and 1 for Korea, Shandong Province: 18 for Japan and 19 for Korea, Hebei Province: 14 for Japan and 3 for Korea, and Liaoning Province: 19 for Japan and 7 for Korea. This is calculated by the OECD using data from CIFCA website (*www.cifca.org.cn/web/YouChengTongJi.aspx*).

40. They are Qingdao and Dalian of China, Kitakyushu and Shimonoseki of Japan and Incheon and Busan of Korea.

41. Four cities added later are Tianjin and Yantai of China, Fukuoka of Japan and Ulsan of Korea.

42. Normally, the chairman of each city's chamber of commerce represents a business leader.

43. The first conference was held in Kitakyushu in 2004 and Ulsan City hosted the 3rd conference in 2008.

44. In 2008, the chairs of the working groups were as follows: Manufacturing – Yantai, Environment – Kitakyushu, Logistics – Tianjin, Tourism – Busan.

45. During the 2nd logistics committee meeting in 2006, the vice-minister of MLIT of Japan attended to give his keynote speech, which was a rare occurrence for OEAED activities.

46. The ICSEAD is a Kitakyushu City-affiliated research institute.

47. They were from Ministry of Commerce (MOC) of China, Ministry of Economy, Trade and Industry (METI) of Japan and Ministry Of Commerce, Industry and Energy (MOCIE) of Korea.

48. Hence, the Korean members of the YSRTEC are cities of Busan, Incheon, Gwangju and Daejeon and provinces of Gyeonggi, Chung-nam, Jeon-nam, Jeonbuk and Gyeong-nam.

49. Japan External Trade Organization (JETRO) of Japan, China Council for the Promotion of International Trade (CCPIT) of China and Korea Trade-Investment Promotion Agency (KOTRA) of Korea actively join this conference.

50. See YSRUPF (2008) for more details of the memorandum.

51. The original members of the summit were Gyeongnam do, Jeonnam do, Jeju do and Busan city (Korea); Fukuoka, Nagasaki and Saga Prefectures in the Kyushu area of Japan. Later in 1999, Yamaguchi Prefecture from Chugoku region also joined.

52. This situation can be described as "Co-opetition": a hybrid of co-operation and competition. "Co-opetition" may apply in the situation where two or more entities are cooperating and competing simultaneously (Brandenburger and Nalebuff, 1996). For example, automobile companies often establish "strategic alliances", in which innovative projects are jointly pursued, while at the same time competing fiercely over conventional products.

53. However, there are several trilateral dialogue channels involving in relevant ministers from the three PYSR countries, including an environment ministers' meeting, trade ministers' meeting, culture ministers' meeting and maritime ministers' meeting.

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Annex A

Comparative analysis of trans-border co-operation in OECD countries

OECD member country experiences could provide useful lessons for East Asia(Table A1). For example, European and North American cases tell us that borderlands come to the fore under increasingly globalised markets. Their peripheral and remote location from the national centre has tended to leave border regions underdeveloped. Legal and institutional factors have erected barriers to the smooth flow of people and goods across borders in order to protect domestic (mainly security) interests. However, with increasing pressure for free trade and integrated markets, borders are now increasingly being re-defined as bridges or communication channels, rather than barriers. This brings new economic opportunities for border regions. There are different degrees of border openness across Europe and North America.[1] In the US-Canada case, tightened border control after the "9/11" attack on the US has hampered the smooth trans-border flow of people and goods. In the US-Mexico case, other issues such as illegal immigration and drug trafficking, have made governments fearful of open borders. In Europe, many barriers to the movement of people and goods have been lifted through measures such as the Schengen Convention. In Europe, virtually all border regions are involved in some type of trans-border co-operation activity. There are more than 70 such arrangements, operating under names like "Euroregions" or "Working Communities" (Perkmann, 2007).

In this annex we introduce and compare trans-border co-operation in Europe and North America. Our main objective is to understand the different types of trans-border co-operation, and use several case studies to identify common factors that contribute to sustainable trans-border co-operation.

Table A.1. **Examples of trans-border regions**

Region	Countries	Population
Europe		
Vienna-Bratislava Core region	Austria, Slovak Republic	2 922 000
Baltic Sea Region/Finland Gulf	Sweden, Germany, Finland, Estonia, Lithuania, Latvia, Poland, Denmark, Russia, Belarus, Norway	150 000 000
Öresund Region	Denmark, Sweden	3 555 000
RegioTriRhena	Switzerland, France, Germany	2 200 000
Meuse-Rhine Euregion	Belgium, Netherlands, Germany	3 794 000
Carpathian Euroregion	Poland, Hungary, Romania, Slovakia, Ukraine	16 000 000
Frankfurt – Slubice	Germany, Poland	1 000 000
Pyrenees Work Community	France, Spain, Andorra	17 800 000
Americas		
Detroit-Windsor Metropolitan region	US, Canada	4 775 000
San Diego-Tijuana cross-border region	US, Mexico	4 072 200
El Paso-Ciudad Juarez	US, Mexico	1 800 000
Puerto Iguazu-Foz do Iguaçu-Ciudad del Este	Argentina, Brazil, Paraguay	700 000
Tabatinga-Leticia-Santa Rosa	Brazil, Colombia, Peru	100 000
Asia		
SiJoRi Growth Triangle (Singapore, Johor/ Malaysia, Riau Archipelago/Indonesia)	Singapore, Malaysia, Indonesia	34 000 000
Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT)	Indonesia, Malaysia, Thailand	19 000 000
Emerald Triangle	Cambodia, Laos, Thailand	4 365 000
East ASEAN Growth Area (BIMP-EAGA)	Brunei Darussalam, Indonesia, Malaysia, Philippines	57 500 000
Africa		
Lomé-Cotonou-Lagos Corridor	Togo, Benin, Nigeria	10 000 000
ZMM-Growth Triangle	Zambia, Malawi, Mozambique	8 000 000
Maputo Development Corridor (Johannesburg, Pretoria, Middelburg, Nelspruit, Maputo)	South Africa, Mozambique	7 700 000
Livingstone-Victoria Falls	Zambia, Zimbabwe	115 000

Source: Donovan (forthcoming).

1. Europe: rules and incentives for trans-border co-operation

Given the large number of small countries contained within the region, Europe has accumulated many rules guiding trans-border transaction and exchange. The free movement of goods and people was first envisaged in the Treaty of Rome (1957). In the 1960s and 1970s, various bi-lateral and multi-lateral governmental commissions were established to deal with issues such as local trans-border spatial planning and transport policy. As early as 1971, the Association of European Border Regions (AEBR) was founded by 10 border regions. On the initiative of the Council of Europe, 20 European counties concluded the Convention of Madrid (1980), a framework convention which defined trans-border co-operation as a "spontaneous form of networking between local authorities" of neighbouring countries.[2] The introduction of the single market in 1993, based on the *1986 Single European Act*, the progressive implementation of the 1985 Schengen Agreement and the 1990 Schengen Convention, all pushed ahead the economic integration of border regions. For example, the European Union's *acquis communautaire*[3] defines the status of trans-border commuters, requiring border workers to be subject to the laws of their country of employment. This entitles them to the same access to jobs, working conditions and certain social benefits as the nationals of their country of employment. The OECD Tax Convention on Income and Capital, on which most bi-lateral taxation agreements are based in the OECD member countries, states that it is the country of residence that has the right to tax all workers. The EU also set uniform standards for the different education systems of member countries in order to allow employers to assess a foreign employee's skills. EU regulations include rules for mutual recognition of qualifications and training, such as official authorisations, licenses and other evidence of formal qualifications regulated by law or industrial requirements.[4] On a more practical level, student exchange is actively promoted, with EU funding for student exchange programmes and general agreement among the Nordic countries in 1996 on cost reimbursements to promote student exchange.

The introduction of the Interregional Co-operation Programme (INTERREG) had a considerable impact on the development trajectory of most trans-border co-operation initiatives. Trans-border initiatives have become increasingly embedded in highly institutionalised networks of public administration from the local, regional, and central to the European level. Formal or semi-formal organisations are often necessary for co-ordinating activities. Because of co-ordination difficulty and accompanying time delays in the implementation of a project, local networks have increased the importance in the delivery of INTERREG-funded projects (Box A.1). Some cases are introduced in this section, two of which are rather geographically limited (Boxes A.2 and A.3), and one of which is comparable to the PYSR in terms of geographic scale (Box A.4).

Box A.1. **INTERREG: An EU cross-border programme**

The main goal of INTERREG initiatives is to ensure that national borders are not a barrier to the balanced development and integration of the European territory. According to the EU, the isolation of border areas has been two-fold. Firstly, borders cut off border areas from each other economically and socially and hinder the coherent management of ecosystems. Secondly, borders have been neglected under national policy, with the result that their economies have tended to become peripheral within national boundaries

Within this context, the EU began the INTERREG programme in 1990, gradually expanding the focus area:

- INTERREG I: 1990-1993
- INTERREG II: 1994-1999
- INTERREG III: 2000-2006

Under the present Cohesion Policy 2007-2013, the INTERREG programme comes under European Territorial Co-operation. It is funded by the European Regional Development Fund (ERDF). The Cohesion Policy 2007-2013 has a budget of EUR 308 billion (in 2004 prices). Of this, 2.5% is allocated to European territorial co-operation objective and 1.8% is for cross-border co-operation.

For cross-border co-operation, NUT31 level regions are eligible along all the land-based internal borders and some external borders, and along maritime borders separated by a maximum distance of 150km. Cross-border co-operation embraces a larger geographical area than INTERREG III, mainly as regards maritime co-operation (Cohesion Policy 2007-2013 commentaries and official texts, January 2007). According to the regulation governing the ERDF, the assistance is focused on the development of cross-border economic, social and environmental activities through joint strategies for sustainable territorial development, and primarily:

i. By encouraging entrepreneurship, in particular the development of SMEs, tourism, culture and cross-border trade.

ii. By encouraging and improving the joint protection and management of natural and cultural resources, as well as the prevention of natural and technological risks.

iii. By supporting links between urban and rural areas.

iv. By reducing isolation through improved access to transport, information and communication networks and services, and cross-border water, waste and energy systems and facilities.

v. By developing collaboration, capacity and joint use of infrastructure, in particular in sectors such as health, culture, tourism and education.

Box A.1. **INTERREG: An EU cross-border programme** *(continued)*

In addition, the ERDF may help promote legal and administrative co-operation, the integration of cross-border labour markets, local employment initiatives, gender equality and equal opportunities, training and social inclusion, and sharing of human resources and facilities for R&D. Once approved, then a co-financing ceiling rate of between 75% and 85% is applied. Thanks to the programme, there are currently hardly any border areas inside the EU in which public authorities are not involved in some kind of co-operative initiative with their counterparts.

[1] *Note:* the Nomenclature of Territorial Units for Statistics (NUTS, for the French *nomenclature d'unités territoriales statistiques*), is a geocode standard for referencing the administrative divisions of countries for statistical purposes. The NUTS region is based on existing national administrative subdivisions. The thresholds (minimum population of 150 000 and maximum population of 800 000) are used as guidelines for establishing the NUT3 regions, but they are not applied rigidly.

Source: EU web page (*http://ec.europa.eu/regional_policy/interreg3/*).

Box A.2. **Case: Öresund**

The Öresund region has a history of Danish and Swedish interaction that is several centuries old. Fifty years of a free Nordic labour market and about a decade of free movement of people within the EU was not able to achieve the high level of integration across both sides of the Örseund Strait, even though Nordic trans-border ties reduced the need for bi-lateral co-operation during the 1970 and 1980s when trans-border networks in mainland Europe were still in an embryonic state. For example, at the beginning of the 1980s, Öresundkontakt was founded as a contact for firms that wanted to settle in the region. The primary impetus for economic integration within this region came from researchers, policy makers and some business leaders who recognised the significant economic potential of greater economic integration. The main regional players throughout the integration process have been the Greater Copenhagen Authority (now the Capital Region of Denmark) in the metropolitan area of Copenhagen and Region Skane in the metropolitan area of Skane, both of which were founded in 1999.

A more concrete political project began in 1991 when the Danish and Swedish governments finally approved and signed an agreement to build a combined railway and motorway bridge. The overall goal of the Öresund trans-border project is to create and consolidate a functional area of 3.5 million inhabitants – considerably bigger than Stockholm, Oslo or Helsinki – and achieve economies of scale and scope through regional integration. In 1994, the Danish and Swedish governments agreed to work out a common environmental programme for the Öresund Region. This sets regional environmental quality goals and aims to strengthen co-ordination between Denmark and Sweden on environmental matters, with the long-term aim of making the region one of the cleanest city-regions in Europe. In 1999, for the first time, the two national governments expressed their common vision and objectives in the

Box A.2. **Case: Öresund** *(continued)*

joint document *Öresund: A Region is Born*. The Öresund project is compatible with both the Danish strategy of making the national capital a competitive urban pole in northern Europe and the Swedish goal of becoming a southern gateway to continental Europe. Öresund has a concentration of firms in adjacent sectors, research laboratories and universities. The opening of a bridge between Copenhagen (Denmark) and the neighbouring Malmö (Sweden) in July 2000 increased trade and exchange between the two significant regions of Zealand (Denmark) and Skane (Sweden).[5] The bridge has had a direct impact on movement patterns in the region. For example, Danes are moving to live in Skane and commute to Denmark. The significance of the project is reflected not only in the regional policy emphasis given to Öresund in both countries, but also in the EU's support, notably through INTERREG, which considers Öresund a flagship programme and has funded it since 1996.

The Öresund Committee, established in 1992, is the most prominent effort to build regional co-operation and networking across the Öresund among local and regional politicians. The committee allows for political trans-border co-operation among local and regional authorities on both sides of the Öresund. It is financed by the members and hosts the secretariat for the EU INTERREG III A programme. The two national governments have an observatory role. The committee meets at least twice a year, and the executive committee at least four times a year. The annual work programme sets the framework, and the executive committee can establish *ad hoc* political working groups. The goal is to enhance the integrated development of the region and trans-border co-operation on all levels. The committee functions as a political platform, a meeting place, catalyst and network builder, rather than as a regional government. However, in 2007, the institutional structure of the Öresund Committee was strengthened, and policy formulation was given increased emphasis. This has resulted in a strategic vision for the Öresund in 2008 that will lead to a common development strategy in the coming years. The committee operates as a loosely-bound umbrella organisation covering and connecting the many diverse trans-border activities.

Academic co-operation and cluster-making in the Öresund region is very advanced. The Öresund Region includes 12 universities, around 150 000 students, 12 000 researchers and 6 500 PhD students. Fourteen higher education institutions in the region participate in the Öresund University, a voluntary co-operation between most universities on both sides of the Öresund which has been operating since 1997. The basic idea is to achieve specialisation through synergy and the common use of university resources. The institution is not only a leading actor in formal scientific research and education, but also in the creation of an institution to promote informal networking activities and information sharing for economic activities. Working in collaboration with researchers, business leaders and policy makers throughout the region, the university has helped identify critical growth clusters and facilitate the development of networking associations in each of those clusters. These include medical and pharmaceutical, IT, food and environment businesses. The Medicon Valley Academy, IT Öresund, Öresund Food Network, and Öresund Environment, established with the help of Öresund University, are all playing an important role in promoting networking and integration across the region.[6] In addition to helping set up networking organisations in each

Box A.2. **Case: Öresund** *(continued)*

sector, the Öresund University and the other relevant regional actors have also set up an organisation to help build links across the multiple industry clusters. This initiative, called the Öresund Science Region, was formally launched in 2001 and brings together four sectoral organisations. The umbrella organisation aims to promote integration in the trans-border region and provides a strong basis for ensuring extensive networking. Thanks to their efforts, the Öresund Science Region recently received a RegioStar EU award.

The commitment of the national governments is especially apparent in labour market policy. Ministers from both the Danish and Swedish government have the unique responsibility for enhancing an integrated, well-functioning labour market in the region. Öresund Direct was created on the joint initiative of both governments to provide access to information on job opportunities on either side of the strait. It also provides comprehensive and practical information about all aspects of moving and commuting: taxes, housing, social security, living costs, education and other related matters. There is a call centre in Copenhagen and a one-stop information office in Malmö. An internet site spans the two. The one-stop shop in Malmö is run as a partnership of different public authorities, including the Public Employment Office, Social Insurance Office, the Country Administration in Skane and the Tax Authority in Malmö City. The efficiency and effectiveness of the Malmö office is ensured through cost-sharing and close, continuous contact with the mother organisation by councillors from respective authorities.

Businesses in the region have also organised a variety of trans-border associations to promote knowledge and networking activities. These include the Öresund Business Council, the Öresund Chamber of Commerce, Business-Bridge and Venture-Cup Öresund. A project for integrating urban development and transportation infrastructure, called IBU (Infrastructure and Urban Development), is also being promoted. This project will explore how to create a sustainable transportation system and how to develop the Öresund Region in a sustainable way. It will also look at several possible development scenarios for the Region that will eventually form the basis for a common Öresund Regional Development Strategy.

The Öresund Region remains ahead of most trans-border initiatives in Europe in its creation of a steering committee, its fiscal agreements for the bridge project and the co-operation of higher education institutions. The nearly 14 500 commuters from Southern Sweden to the Copenhagen Capital Region represents a sevenfold increase in the ten years between 1997 and 2007.[7] As both population and economic integration both increase, it is estimated that the number of daily commuters across Öresund will increase from 17 600 individuals per day in 2007 to approximately 56 000 in 2025.

However, there appear to be relatively few cross-Öresund initiatives by civil society, at least on a formal institutional level. The seeming lack of involvement by civil society organisations activities may imply that efforts to promote trans-border activities are rather top down, and not rooted in the needs of civil society.

Sources: OECD (2009), OECD (2003b), and the websites of trans-border organisations mentioned in the text.

Box A.3. **Case: Other European trans-border examples**

Regio TriRhena (France-Germany-Switzerland): Regio TriRhena is located right in the heart of Europe, covering parts of Southern Alsace (France), southern Baden (Germany) and north-western Switzerland. This area is the southern part of the EuroRegion Upper Rhine, which entitles it to take part in the INTERREG programmes. The area is characterised by strong economic interdependence based on complementarities. The pool of skilled labour, the excellent transport infrastructure and cluster effects all integrate the overall area. Companies' needs for specialised labour, especially in the chemical and pharmaceutical sectors, combined with the wage differences among the three countries, have facilitated trans-border commuting and migration to neighbouring countries.

The large trans-border labour migration and high degree of functional integration have been made possible by various trans-border agreements. The region has a long history of trans-border co-operation dating back to the Central Commission for Navigation on the Rhine River created at the Congress of Vienna in 1815. This grew out of national governments' initiatives around common concerns about transport and the environment of the Rhine River. General trans-border co-operation was officially launched in 1975 when an agreement between the French, German and Swiss governments to formalise trans-border activities came into force. This was one of the first inter-governmental agreements on trans-border co-operation in Europe. The result of this agreement, the Bon Treaty, was the French-German-Swiss Government Commission, which consists of three national delegations. It co-ordinates economic, transport, environmental, cultural and media policies. These regulatory elements still dominate overall trans-border co-operation at the national level. In 1998, the Upper Rhine region introduced a trans-border "parliament", the Upper Rhine Council, with 73 elected representatives.

Local-level trans-border co-operation dates back to 1963 in the City of Basel when a group of business, university and political representatives founded the Regio Basiliensis Association.[8] The aim was to unify the Greater Basel Area, including Southern Alsace and Southern Baden, to actualise great development potential. These regional associations formed a co-ordination committee that later decided to create the Council of the RegioTriRhena in 1995, a 60-member council bringing together representatives of cities, municipalities, economic organisations and universities that meet at least twice a year. The council operates in parallel and complementary to the nationally-agreed Upper Rhine Council that covers a much bigger area and consists of delegations from three countries. Today trans-border co-operation in the region covers many tasks, involves diverse entities and has a shared vision. This area is an example of the most developed trans-border co-operation in Europe.

Vienna-Bratislava (Austria-Slovak Republic): Strictly separated until 1989 by the Iron Curtain, the Vienna-Bratislava region embarked on a path of rapid integration after the opening of the border. This process has proved largely beneficial for both sides. Only 55km apart, the two cities are the closest capitals in the world. Most indicators show regional convergence. While nominal GDP per capita in Bratislava was less than 20% of Vienna's in 1995, it approached 30% in 2002 and is supposed to reach around 50% in 2015. The enlargement of the EU and the

Box A.3. **Case: Other European trans-border examples** *(continued)*

ensuing integration of the Central and Eastern European markets into Western Europe directly affect the region. With a surface area of around 30 000 square kilometres, 4.5 million (2001) inhabitants and an economy the size of Ireland's, the region has the potential to develop from a periphery of the EU into a major hub in Central Europe.

One trans-border activity that has been particularly stepped up over the last half decade has been the collaboration between the industrial parks in Vienna and Bratislava. With support from the EU programme, industrial parks in Bratislava collaborate with the Austrian Technology and Innovation Centre in Eisenstaedt. Inward investment agencies in Vienna and Bratislava have experimented with jointly attracting multi-national companies to the entire area. There are joint actions planned between the Bio-Centre and automobile cluster projects in Vienna and Slovakian partners. In terms of creating a learning region, REGILON is a platform for co-operation among universities and R&D institutions from bordering regions of Austria, the Slovak Republic, Hungary and the Czech Republic. It focuses on facilitating collaboration with business in other region and incubating collaborative projects and joint events.

In this region, EU programmes such as INTERREG have developed incentives for trans-border regions to co-operate, but clarifying policy priorities and building sustainable trans-border institutions are still in their early stages. The first policy challenge is integrating and enlarging a trans-border labour market. A trans-border labour market policy is still in its infancy and is mainly pursued in connection with the INTERREG initiative. Although limited in scale, informal networks between certain local labour market offices from both sides have emerged. The second policy challenge is to build a learning region with a highly educated workforce and a dense network of firms and clusters. The third issue is the transport infrastructure, which tends to be slow, unreliable, disrupted and badly connected to national and international networks.

There have been other obstacles to establishing regional trans-border institutions in this region. Firstly, though both regions have a common history, the separation of the last 40 years has left a weak trans-border network. Secondly, institutional differences between Austria and the Slovak Republic are quite significant, and there are no supra-regional integration frameworks. Thirdly, the region lacks large infrastructure to symbolise integration, such as the bridge that links Southern Sweden to Eastern Denmark. Neither has the region set up a stable and formalised trans-border governance framework.

Sources : OECD (2003a), and the websites of trans-border organisations mentioned in the text.

Box A.4. **Case: The Baltic Sea Region (BSR)**

The Baltic Sea Region (BSR) has a long tradition of regional co-operation. The Hanse League, which began in the 12th century and prospered into the 15th century, linked together cities in Northern Europe and the Baltic Sea Region and demonstrated the interconnections among sea, trade and city prosperity. However, in more recent history, the Cold War era divided the BSR and prevented regional co-operation as a whole. After the fall of the Cold War system, the BSR proceeded towards greater integration and unity. In 2004, the enlargement of the European Union to include Poland and the Baltic Sea countries of Estonia, Latvia and Lithuania, created a new geopolitical advantage in the BSR. Today, the BSR covers eight EU member states: three Nordic countries (Denmark, Finland and Sweden); three Baltic countries (Estonia, Latvia and Lithuania); the northern parts of Poland and Germany; as well as the western regions of Russia and southern coastal regions of Norway. Though their present levels of economic and social development differ depending on their history, economic growth is prevalent overall. Russia's role is especially crucial in the BSR: St Petersburg is the biggest and fastest growing city in the BSR and also the biggest university city. In addition, St Petersburg is the largest polluter of the Baltic Sea.

The EU has focused efforts on BSR development, especially since 2004 EU enlargement. The EU has crafted a Northern Dimension Policy which has covered the BSR since 1998. Northern Dimension Policy Framework Documents were adopted in 2006 as a regional expression of the EU/Russia Common Spaces. The policy focuses on economic co-operation, security and justice, research, education and culture, environment and natural resources, and social welfare and health. The EU strategy for the Baltic Sea Region is currently to co-ordinate the efforts of the various actors in the BSR (member states, regions, financing institutions, the EU, pan-Baltic organisations, non-governmental bodies etc.) so that they can promote more balanced development within the region. The objectives include environment, economic development, accessibility and attractiveness, and safety and security. Several convergence, competitiveness and co-operation programmes are co-financed by the European Regional Development Fund (ERDF) for the period 2007-2013.

The Baltic Sea is vulnerable and unique in its ecology, being by far the largest brackish water reservoir in the world. Environmental concern about the sea is demonstrated in the many environmental activities in the BSR. The 10 countries making up the Baltic Sea Region, along with the European Commission have developed Baltic 21 in response to the UN-endorsed global strategy to promote sustainable development (Agenda 21). The BSR is the first region in the world to adopt common goals for sustainable development. Many local municipalities in these countries have also established their own local Agenda 21. The Union of Baltic Cities (UBC) has promoted its own Agenda 21 since 2000 and is currently committed to a new Agenda 21 Action Programme 2004-2009. The Baltic Sea Environmental Award is bi-annually given to the UBC member city which has shown the best results regarding Agenda 21 activities.

As for city-linkages, there are two very active associations. First, the Union of the Baltic Cities (UBC) was established in 1991 as the first major sub-national BSR organisation. It now represents 106 cities with a total population of more than 20 million citizens in 10 countries

Box A.4. **Case: The Baltic Sea Region (BSR)** *(continued)*

bordering the Baltic Sea. Its mission is to be a meeting place for cities in the BSR, to carry out joint activities and to raise the cities' views, problems and political aims. The UBC is a decentralised network organisation with a very wide array of activities. Its policy priorities are to promote cities' interests in European decision-making, sustainable development, democracy and participation, common identity and co-operation in the BSR, as well as the rather new themes of an integrated European Maritime Strategy and an EU Baltic Sea Strategy.

High-level decision-making is done through bi-annual general conferences, supported by an executive board consisting of one city from each BSR country, the UBC President and the UBC Presidium. The decentralised structure is co-ordinated by the UBC Secretary General and UBC Secretariat, located in Gdansk, Poland. The main practical work is respectively and independently carried out by 13 commissions and networks (business co-operation, culture, education, energy, environment, gender equality, health and social affairs, information society, sport, tourism, transportation, urban planning, youth issues). Activities of the UBC are mainly financed by membership fees as well as subsidies from individual states, cities and corporate bodies.

Baltic Sea Region's capital cities and large metropolitan cities have also established a joint network called the Baltic Metropoles (BaltMet) in 2002. The network is spearheaded by 11 city mayors and Helsinki has served as chair since 2003. Its central goal is to improve the competitiveness of the Baltic Sea Region through linking together the key players in the region (big cities, universities and colleges as well as business representatives) into one entity. The collaborative focus areas are innovation promotion, regional identity building and marketing, infrastructure and sustainable development, and integration and capitalisation of urban expertise, according to the Action Plan 2008-2010.

The regular Mayors' Meeting is the decision-making body of the network, defining the action plans and electing the Chair City and the Vice Chair City for the network. The chairmanship period lasts for two years with the possibility of extension. The Chair City functions as the secretariat of the network during the chair period. The Chair City regularly convenes the Officials' Meeting, which consists of representatives from the member cities, to prepare the Mayors' Meeting and implement its decisions.

The operational costs of the network are covered by the participating cities. The secretariat function is financed by the chair. Member cities fund activities on an *ad hoc* basis and EU-funding is used effectively. The Secretariat and the Chair Cities are responsible for overall co-ordination, while co-ordinating cities take the initiative for developing and implementing each project with other member cities.

The strength of the BSR lies in the close co-operation between BSR organisations at all levels, like the Council of the Baltic Sea States (states), Baltic Sea States Sub-regional Co-operation (regions) and the UBC and Baltmet (cities).

Source : the websites of trans-border organisations mentioned in the text.

2. North America: a focus on economic integration

The North American Free Trade Agreement (NAFTA) between the United States, Canada and Mexico came into force in 1994 and introduced new governance structures. The NAFTA emphasised market mechanisms through private property protection and foreign investor rights. Many traditional local government regulations and guidelines have been reinterpreted as non-tariff barriers to trade. These include sub-national rules on licensing, environmental standards, zoning, limiting the number of businesses through needs tests, demanding performance requirements or employee training. Under the NAFTA, cities have no representation at the negotiating or dispute resolution table (Warner and Gerbasi, 2004). Though the NAFTA framework has facilitated active economic co-operation, it has not contributed much to strengthening local co-operative governance framework in the region. Data from the office of the US Trade Representative (USTR) show that the overall value of intra-North American trade more than tripled, from USD 297 billion in 1993 to USD 930 billion in 2007. Regional business investment in the United States rose by 117% between 1993 and 2007, as compared to a 45% rise in the 14 years prior. Trade with NAFTA partners now accounts for more than 80% of Canadian and Mexican trade, and more than a third of US trade. Though national government commitment was important at the start, trans-border co-operation has been promoted through a bottom-up approach driven by provincial and local level initiatives, especially in the US-Canada case (Boxes A.5 and A.6).

Box A.5. **Case: US-Canada**

The United States and Canada share the world's longest undefended border, 8 891 kilometres of terrestrial boundary, including small portions of maritime boundaries on the Atlantic, Pacific, and Arctic coasts, as well as the Great Lakes. Canada resembles the United States in its market-oriented economic system and high living standards. Both countries have strong economic ties, being each other's largest trading partner. Trans-border regional co-operation is intense, especially in the Great Lakes Region (GLR) and Northwest Region (NWR). This is rooted in trans-border economic ties and environmental challenges such as water management in the Great Lakes and coastal management of the Pacific Ocean. Early environmental co-operation was led by central governments. For example, both central governments established the International Joint Commission in 1909. Though central governments are still present today, regional and local level commitment for trans-border co-operation has flourished since the late 1980s, due to their increased stake and capacity. Away from the capitals of Washington DC and Ottawa, the border region is emerging as a "laboratory for experimentation" proposing and lobbying new policy for the national agenda.

Box A.5. **Case: US-Canada** *(continued)*

Great Lakes Region (GLR)

The Great Lakes are the largest group of freshwater lakes on earth. They are located in eastern North America, on the Canada-United States border. The Great Lakes states and the Province of Ontario comprise one of the most integrated border regions in the US/Canada, given the network of both bi-lateral and multi-lateral linkages that connect jurisdictions bordering the basin. Trans-border communities like Detroit-Windsor and Buffalo-Niagara are tightly-knit both economically and socially, with more than 300 000 people from both countries crossing the border every day to work, shop and visit family and friends. The Great Lakes Region (GLR) manufactures 60% of the continent's steel and 60% of the automobiles. The environmental impact on the Great Lakes of such active economic activity has been serious, however. The Great Lakes are used not only to supply drinking water to tens of millions of people in the GLR, but also as a major mode of transport for bulk goods and as a source of enjoyment for boating and tourism. Reflecting their importance, the Great Lakes were recognised as a "national treasure" in an Executive Order by President Bush in 2004.

At federal government level, the International Joint Commission (IJC) was established under the 1909 Boundary Water Treaty between Canada and the United States to prevent and resolve disputes over the use and quality of boundary waters, to advise Canada and the United States on water resources questions, and to approve and set conditions for the operation of projects in boundary waters that affect levels and flows on either side of boundary. The commission is a permanent, bi-national, independent, and unitary body consisting of six members: three from Canada and three from the United States. The Great Lakes Water Quality Agreement was first signed in 1972, expressing the commitment of Canada and the United States to restore and maintain the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem. The IJC has been monitoring and assessing progress promoted under the agreement and advising governments on matters related to the quality of the boundary waters of the Great Lake system.

Co-operation among states and provinces is very active and important in the GLR. The Great Lakes Commission is the platform for discussion among the eight Great Lake states of the United States and the Canadian provinces of Ontario and Québec. It aims to promote the orderly, integrated and comprehensive development, use and conservation of the water and related natural resources of the Great Lakes basin and St Lawrence River. The commission was established by joint legislative action of the Great Lake states in 1955 and was granted congressional consent in 1968. Under the US Water Resources Development Act of 1986, diversion of water from the Great Lakes Basin requires the approval of all eight Great Lakes governors through the Great Lakes Commission. A Declaration of Partnership established associate membership for the Canadian provinces in 1999 and thus made the commission a trans-border platform. From that point, the eight governors and the premiers of Ontario and Québec negotiated and in 2005 finally signed the Great Lakes-St Lawrence River Basin Sustainable Water Resources Agreement and the Great Lakes-St Lawrence River Basin

Box A.5. **Case: US-Canada** *(continued)*

Water Resources Compact to prevent most future water diversions from the Great Lakes. The compact was not only approved by the related states legislatures, but also the US Congress, and made law by President George W. Bush in 2008. The 2008-2010 Work Plan focuses on four areas: ports and navigation, clean energy, coastal community development, and tourism/recreation. The Great Lakes Observing System (GLOS) is organised through co-operation by the US and Canadian federal, state and provincial agencies as well as academic institutions, non-governmental organisations and commercial interests across the region.

The Council of Great Lakes Governors was convened in 1983 to encourage and facilitate environmentally responsible economic growth. The council began as an organisation for environmental stewardship but has since developed more of a focus on economic development. In 1988, the governors signed a regional Economic Development Agreement, marking a change in the council's orientation from an agreement-based to a project-based organisation. In 1989 they established the Great Lakes Protection Fund, the first multi-state foundation dedicated to improving the environment. They also established shared trade offices around the world and have promoted many projects, such as for pollution prevention and the Brownfield Project. The council also assists the governors and premiers in co-ordinating activities under the Great Lakes Charter of 1985, a voluntary non-binding agreement through which the Great Lakes states and provinces co-operatively manage the waters of the Great Lakes.

Despite the variety of efforts over the past decades, until recently, almost none has involved municipal leaders. To represent the voice of the cities, the Great Lakes and St Lawrence Cities Initiative (GLSCLCI) was established in 2006. The GLSCLCI is a trans-border coalition of more than 50 mayors and other local officials who work actively with federal, state and provincial governments to advance the protection and restoration of the Great Lakes and the St Lawrence River. In 2008, a memorandum of co-operation was signed by the GLSCLCI, Ontario Government, and Ontario Great Lakes municipalities. The Ontario government agreed to consider the recommendations of the GLSCLCI on implementing the Canada-Ontario Agreement Respecting the Great Lakes Basin. The vertical relationship is more effectively promoted in this case.

Northwest Region (NWR)

Trans-border co-operation in the NWR is centred on British Colombia Province in Canada and Washington State in the United States. British Colombia and Washington State signed an Environmental Co-operation Agreement and established an Environmental Co-operation Council (ECC) in 1992. The ECC and its taskforces have been actively dealing with a number of critical trans-border environmental issues such as flooding of the Nooksack River, the Abbotsford Sumas Aquifer, and air/water quality issues in the Columbia River Basin. In 2005, British Colombia and Washington signed a Memorandum of Understanding to enhance trade opportunities and create stronger ties between the two jurisdictions. The memorandum pledged that the two governments would extend co-operation in the areas of trade, 2010 Olympic and Paralympics Winter Games, environment, tourism, technology, education and transportation. It also established annual joint cabinet meetings.

Box A.5. **Case: US-Canada** *(continued)*

Multi-lateral coast-wide co-operation is also flourishing. Recently, states and provinces all along the west coast, from Canada through the United States to Mexico, established a partnership called the West Coast Collaborative. Involving leaders from federal, state and local government, the private sector, and environmental groups, it aims to reduce diesel emissions by raising awareness, sharing information and implementing projects that are regional in scope. In 2008, a new Pacific Coast Collaborative agreement between British Colombia, Washington, California, Oregon and Alaska was established to address climate change. It shares a common vision of Pacific North America as a model of innovation and sustainable living in the "Pacific Century" that creates new and growing economic opportunities for the citizens and a model for sharing best practices, a framework for co-operative action, a forum for leadership, and a common voice on issues affecting the Pacific coast region.

Economic collaboration is also outstanding, reflecting the awareness that NWR ranks 11th among the world's leading industrial economies, with a combined population of more than 18 million and an annual gross regional product of over USD 350 billion. The Pacific Northwest Economic Region (PNWER) was established in 1991 as a statutory, public/private partnership composed of legislators, governments and businesses in the five northwest states (Washington, Oregon, Idaho, Montana and Alaska), two western Canadian provinces (British Colombia and Alberta) and the Canadian territory of Yukon. They formulate and promote action plans on key issues affecting the region, such as energy, transport, health care and natural resources. In terms of transport, the International Mobility and Trade Corridor Project (IMTC), a regional bi-national planning coalition, has been actively promoted by the Whatcom Council of Governments and other IMTC participants. It comprises representatives from the US and Canadian transport agencies, inspection agencies, border jurisdictions and industries dependent on trans-border mobility. Since 1997 they have worked together on co-ordinated system management, identifying improvements and partnerships to advance projects. They have improved planning and data collection, promoted infrastructure improvements, and updated operations, policy and staffing at the border. The 2010 Olympics at Vancouver/Whistler will drive further co-operation across the border.

The British Colombia/Washington State partnership on enhanced driver's licenses is a particularly interesting case that shows the strength of trans-border "regional" collaboration in helping avoid or resolve bi-national disputes and providing "laboratories" for policy innovation. In 2004 the United States adopted the Western Hemisphere Travel Initiative (WHTI), requiring everyone entering or re-entering the United States to present a valid passport or other secure identity document. This threw the citizens of the border region into confusion as only an estimated 23% of Americans and perhaps 55% of Canadian held passports. More than 32 000 vehicles cross the BC-Washington border every day and more than 1.3 million trucks cross the border each year. Border congestion was estimated to cost USD 60 million a year. The economy and society of the border region were dependent on the efficient flow of goods and people across the border. Uncertainty over the WHTI passport requirements was likely to have a negative impact on trans-border traffic. To assure

Box A.5. **Case: US-Canada** *(continued)*

smooth and efficient legitimate travel and trade while maintaining national security, both British Colombia and Washington State decided to upgrade driver's licenses so that they could be used as valid identity documents instead of passport. Since 2008, the enhanced driver's licenses have been used as alternative identity documents. The idea was born from a bi-lateral meeting, advocated and developed through bi-lateral and multi-lateral trans-border organisations such as the PNWER. This idea has spread, set the agenda within central government and driven national action.

Source : PRI (2008) and the websites of trans-border organisations mentioned in the text.

Box A.6. **Case: US-Mexico**

The California-Mexico region has been linked across the centuries by immigration, economic integration and culture. Millions of Californians, recent arrivals and long established families, have their roots in Mexico. The San Diego-Tijuana border area is the largest bi-national metropolitan area between the United States and Mexico. It comprises San Diego County (California) and the *municipios* of Tijuana, Tecate and Playas de Rosarito (Baja California, Mexico) and includes over five million people. Historically both San Diego and Tijuana were once part of the Mexican territory until the end of the US-Mexico war in 1848. In 1965, Mexico's *maquiladora* programme began (an incentive programme for foreign companies to locate assembly and manufacturing facilities in Mexico), with the first plant being set up in Tijuana. Since then, many assembly plants, called *maquiladoras*, have been established on the Mexican side of the US-Mexican border zone, taking advantage of the NAFTA and cheap labour from Mexico to export products mainly to the United States. The *maquiladora* industry was very successful in the 1980s and 1990s, leading to over 3 703 *maquiladoras* being registered in Mexico by December 2000. Incentives for *maquiladora* factories were first given only to the border region, but later expanded to inland Mexico. However, because of their geographical proximity, around 60% of *maquiladoras* were still located in border regions in 2006. Trade between Mexico and the US increased along with the development of these *maquiladoras*. Reflecting the close economic ties of the border region, in San Ysidro crossing – the world's busiest land border crossing, where US Interstate 5 crosses into Mexico at Tijuana – more than 17 million vehicles and 50 million people entered the United States in the 2005 US fiscal year. The great majority of these were workers of Mexican or US nationality commuting from Tijuana to jobs in and around the greater San Diego area, which implies that both San Diego and Tijuana is a functionally integrated economic area. Southbound traffic is also thriving, due to workers travelling to *maquiladoras* in Mexico and those purchasing services which are cheaper in Tijuana than San Diego, such as medical care and vehicle repairs.

Box A.6. **Case: US-Mexico** *(continued)*

The trans-border co-operation originated through an initiative by national governments, against a background of increasing economic interdependency. The presence of national government is still strong, however. Examples include the Border Environment Co-operation Commission (BECC) and the North American Development Bank (NADB), which were established as part of the NAFTA in 1993. They help the border region cope with the lack of environmental infrastructure and potential environmental pressures stemming from the NAFTA. They also aim to increase economic activities in the border region under NAFTA. The BECC works with states and local communities to develop environmental infrastructure projects such as water supply, solid waste management, air quality improvement and clean energy. The NADB finances the projects that the BECC approves. By March 2009, the BECC had certified 152 projects (77 in the US, 75 in Mexico) which will cost an estimated USD 3.2 billion; the NADB has contracted more than USD 920 million in loans and/or grant resources to support the implementation of 122 of those projects (BECC/NADB, 2009). Both the Mexican and US central governments have made equal financial and institutional commitments to the NADB. The Board of Directors of BECC/NADB consists of three representatives from each government, a representative of a border state from each country, and a representative of the general public from each country who has resided in the border region since 2004. In spite of this progress, however, the sense of shared regional identity is rather weak compared to the US-Canada case. This may partly be due to the differences in economic development. Co-operation at regional and local levels has not yet flourished as much as in other regional cases either.

Source: the websites of trans-border organisations mentioned in the text.

3. Comparative analysis: categorising trans-border co-operation

There are many ways to classify trans-border co-operation. The clearest demarcation relates to the *spatial* scale:[9]

- Co-operation by neighbouring countries: this type deals with regional challenges across borders between neighbouring countries, such as Öresund and San Diego-Tijuana. Regional context matters the most in these cases, which can be described as micro-trans-border regions.
- Co-operation involving several countries: larger-scale co-operation, often where large natural resources such as oceans and lakes are shared, *e.g.* the Baltic Sea and Great Lakes regions.
- Global co-operation: deals with global challenges, such as climate change and free trade promotion.

Focusing on the *main drivers* of trans-border integration, Perkmann (2007) divides trans-border co-operation into two streams: *(i)* market-driven integration based on the proliferation of economic and social relationships; and *(ii)* policy-driven integration based on the building of co-operative relationships between public and other bodies that share certain interests. The former type generally takes advantage of the persistence of borders, where accentuated trans-border differentials (*e.g.* different wage and capital costs) stimulate trans-border activities, as in US-Mexico. The latter tries to overcome border barriers such as inconsistent regulations.

The OECD has focused on trans-border *governance* and classified major trans-border co-operation into four groups (OECD, 2006a). This categorisation was based on two variables: *(i)* the governance system's thematic outreach (the co-operation field to be addressed through linkage); and *(ii)* the degree of institutionalisation of trans-border organisation.

i. *The joint implementation of single projects*. This is embryonic trans-border co-operation, in which transportation and environment are the most commonly-addressed projects because of their trans-border nature. At this stage, there is no institutionalisation. An example is Vienna-Bratislava.

ii. *Governance by mono-thematic commission,* based on a sectoral approach. Again the sectors addressed tend to be mainly transportation and environment. Flexible networks might occur but formal institutionalisation does not. Examples from North America include San Diego-Tijuana and Windsor-Detroit.

iii. *Governance by babushka* (a Russian doll consisting of multi-sized dolls): multiple levels of formal organisations are involved with co-operation across many fields. However, no central organisation is institutionalised. Thus, they are loosely connected by a shared vision. Examples are Öresund[10] and RegioTriRhena.

iv. *Governance managed by a catch-all institution*. The institution covers a wide array of policy fields and is highly institutionalised at the regional scale.[11] Examples are EUregions, such as the EUregion Meuse-Rheine and the EUregion Pro Europe Viadrina. An appropriate governance structure is chosen to fit the characteristics and needs of the regions.

Blatter (2004) also analysed the trans-border institutions in Europe and North America and grouped trans-border co-operation into four groups: commission, connection, consociation and coalition. Compared to the OECD analysis, he looks more at institutionalised co-operation and the variety of existing institutions. His variables for classification are: *(i)* instrumental or identity-providing (determined by function, motivation, and a crucial element

for collective action); and *(ii)* territorial governance or functional governance (determined by the structural pattern of interaction, sectoral differentiation, functional scope, geographic scale and institutional stability). Each variable consists of a set of factors. On the one hand, instrumental institutions tend to use "rules" to reduce the uncertainty of related entities and promote economic integration. They tend to be institutionalised through the integration of public and private/non-profit sectors and cover a narrow set of tasks at multiple geographic scales. As a result, they are a very fluid type of governance. On the other hand, identity-providing institutions use "symbols" for collective action backed-up by a sense of shared destiny. They tend to be institutionalised by the public sector and cover a broad range of tasks within clear-cut geographic areas. As a result, they are a very stable type of governance system.

4. Comparing European and North American trans-border co-operation

We have compared Europe and North America with the above factors in mind. This raises the following four points. First, regional identity tends to be the backdrop to trans-border co-operation in Europe. This might be because many countries in Europe are generally at a similar level of development and belong to the EU, which pursues solidarity and cohesion. On the other hand, North America co-operation tends to be more centred on rather pragmatic issues such as economic interdependence and the accompanying environmental interdependencies of both regions. This economic interdependency takes two forms. The US-Canada relationship tends to involve complementing each other's strengths by combining different techniques and skills, possibly because both countries share the same level of economic development. However, the US-Mexico linkages are mainly motivated by the difference of factor prices, reflecting their different levels of economic development, as in the San Diego-Tijuana linkage. As Kim and Lee (2005) suggest, a sense of regional identity helps to lose the sense of border, while economic interdependencies help to ensure that borders persist as complementarities come from differences in both countries. In a situation of economic interdependency which takes advantage of factor price differences, any motive to keep wages low in the other country perpetuates social tensions across the border and is not economically sustainable in the long run.[12]

The second point is that Europe and North America have different legal and socio-political structures. In general, European countries and US-Canada do not differ much in their legal and political structure, even though some countries are federal and others are unitary states. However, the US and Mexico, and some western European countries and new EU member countries, do have political and legal asymmetries, reflecting their different histories and levels of economic development. These asymmetries make the multi-faceted development of trans-border co-operation especially difficult.

Thirdly, governance structures, especially the balance between local and national governments, are starkly different. Trans-border co-operation in Europe, which was generally initiated by national government, has shifted focus towards local governments following the EU's promotion of multi-level governance. As a result of this shift, more integrated place-based policies are often crafted in trans-border institutions. Europe's trans-border activity is strongly promoted by the local public sector backed by upper tier governments. Strong involvement by the public sector has often led to the clear definition of geographic scale, usually following their administrative jurisdiction. In North America, the presence of national government is still strong compared to the EU. Municipal government involvement tends to be in the early stages (*e.g.* the US-Mexico border region and Great Lakes region). Another characteristic is the strength of private sector involvement. In general, trans-border activity in North America is issue-specific, its geographic scale is fuzzy, and there is strong involvement by national government and the private sector in spite of the rather weak presence of local governments.[13]

Finally, while Europe is keener on an umbrella organisation that covers different initiatives, North America favours separate bodies for dealing with specific topics (OECD, 2003a). In other words, Europe tends to take a place-based integrative approach while North America generally takes a function-oriented approach. The European style of trans-border co-operation has often created organisations that cover many and diverse policy fields in a target area within complex governance structures. There tends to be a high degree of administrative complexity and public sector dominance. In contrast, the North American continent has developed more pragmatic and flexible governance structures, more focused on a few objectives such as water resource management and infrastructure financing, and involving relatively active participation of the private sector and non-governmental organisations.

Table A.2 summarises the various types of trans-border co-operation. However, this is a thematic categorisation and clearly no real-life case fits these idealised categories exactly. The trans-border co-operation observed in the Pan Yellow Sea Region is closest to the category of "economic interdependency (factor price)" in Table A.2. The major driving force of regional linkages is the private sector, which has established intensive manufacturing networks. No strong formal governmental framework for supporting trans-border co-operation has been established. Inter-governmental co-operation is in the early stages and has no binding structure. In the terms of the OECD (2006a), these collaborations only involve the "joint implementation of single projects". In sum, there is a clear asymmetry between deepening functional economic linkages and the developmental status of the political co-operative framework.[14] Effective governance structures will be needed if the PYSR wants to develop more as an integrated region.

Table A.2. **Thematic categorisation of trans-border co-operation**

Factors \ Motivation	Regional identity or common value	Regional identity or common value	Economic interdependency (factor price)	Economic interdependency (technology)
Example	TriRhena, Öresund	Baltic Region, US-Canada	San Diego-Tijuana	US-Canada
Leader	Public sector (especially local government)	Public sector	Private sector's strong involvement	Private sector's strong involvement
Scope	Multi-faceted (place-based integrative approach)	Narrow (function-based approach)	Narrow (function-based approach)	Narrow (function-based approach)
Geographic scale	Clear-cut	Fuzzy	Fuzzy	Fuzzy
Temporal stability	Stable	—	Unstable in the long run	Stable
Institution	Mono-centred, hierarchy, Multi-faceted	Poly-centred, network, issue focused	Poly-centred, network, issue focused	Poly-centred, network, issue focused

Source: OECD.

5. Lessons from existing linkages

The OECD (2006a) has identified four major factors that are crucial to the development of trans-border co-operation: a culture of co-operation (intention to engage in co-operation and ease of co-operation); legal framework; financial aspects; and distribution of responsibilities. Of these, a culture of co-operation is the foundation of co-operation. The more similar the political system of co-operating countries, the easier co-operation will be. If a culture of co-operation exists, this can be supported by an appropriate governance structure which includes a legal framework and the clear distribution of responsibility. Financial aspects are also important as drivers or incentives for co-operation in the short and long run (Box A.7).

The previous section described how the different types of trans-border co-operation depend on the economic and political structures of each country. It also described some of their shared characteristics. We have drawn out some lessons for effective trans-border co-operation based on the OECD's findings in 2006, the classifications and each case study in this annex,

Box A.7. **Four critical aspects of trans-border linkages**

The prevailing culture of co-operation: Co-operation across national borders is not only the technical inter-linkage of two or more different systems of governance. It also has to bring together different people and social systems with differing systems of values. Therefore the culture of co-operation that exists (or may emerge) in a multinational metropolitan area is most decisive for any approach towards metropolitan governance across borders. It is principally centred on two questions: *First*, what role are local actors willing to concede to their potential partners on the other side of the border in the management of the region? This is the basic question concerning the will to engage in co-operation. *Second*, how easy will it be to co-operate? Language problems or different standards in culture, politics, etc., can provoke long delays in the administration and implementation of technical questions and cause frustration among co-operating actors.

Legal aspects: Establishing a system of metropolitan governance across borders means institutionalising one set of co-operation agreements across several different jurisdictional systems. Co-operation is easier if the different legal systems in a metropolitan area share some similarities. This is, for example, the case for co-operation among Scandinavian countries, whose legal systems are relatively similar. If differences prove substantial, they can be bridged with the help of bi- or multi-lateral agreements. They provide a legal framework for co-operation at the regional level and enable direct co-operation at the sub-national level (*e.g.* the creation of trans-border associations assembling several municipalities). Over the second half of the 1990s these agreements have mushroomed, especially in Europe.

Financial aspects: In the absence of a higher level of government that could promote co-operation in a multinational region, incentives have to be provided to enhance co-operation. The supply of financial funds is a way to correct a market failure induced by a border that prevents actors from co-operating. The ambition of funds trying to address this problem is to initiate economic activities (including a reasonable return of investment). In Europe, the INTERREG programme is the most prominent example of this approach. Besides availability (and accessibility) of *external* funds, the establishment of a trans-national system of governance also requires sufficient *internal* funds.

Distribution of competences: Co-operation is dependent on having a partner with decision-making authority. It is obstructed if a metropolitan area belongs to countries with strongly diverging constitutional set-ups and differing distribution of competences. Take the example of a region which spans one federally-organised country and one centrally organised country. In this case, administrative competence can fall into the hands of local municipalities on the one side, whilst on the other side it rests with the de-concentrated agencies of the national government. Or, assume that the overall distribution of power is balanced: partners are of roughly equal "weight", yet they have different strengths and skills. These situations complicate co-operation, as different sets of actors from differing levels of governance have to be assembled for every problem. They can result in a situation where, for example, the establishment of a trans-border industrial park has to be managed by the local authority of the one side together with a national ministry on the other.

Source: OECD (2006a).

i. A shared sense of common identity is a precondition for any trans-border co-operation. This identity can come from physical/material interdependency (*e.g.* economic and environmental), or regional identity based on historical and cultural factors.[15] It often happens that a co-operative activity starts based on physical interdependency, but a regional identity later develops, or *vice versa*. Both factors influence each other in the process of strengthening a sense of common destiny, which leads to more effective trans-border co-operation.[16] This also suggests that essential drivers for trans-border co-operation are not only the free movement of goods and services, but also the free movement of ideas, usually accompanied by the free movement of people.

ii. National or supra-national governments play a leading role in establishing trans-border co-operation. This implies that the positive involvement of higher level governments is indispensable, especially when co-operation is becoming established. In Europe, EU support and subsidies were pivotal for facilitating trans-border co-operation in many regions. In North America, even though trans-border co-operation was led by private interests, the strong support by national government was regarded as key for the emergence of a trans-border region. National government was needed to legitimise and facilitate co-operation (Blatter, 2003; Thant, 2007). National government can: *(i)* remove barriers to trans-border integration, for example through decreasing and aligning regulations under its jurisdictions; *(ii)* mediate the different interests of sub-regional governments; and *(iii)* provide an enabling environment for sub-regional governments, for example by providing financial incentives and framing "meta-governance" (Box A.8).

iii. The development of trans-border co-operation also needs an appropriate governance structure, one which goes beyond seminars or fora. Though informal relationships ensure flexibility, institutionalisation brings temporal stability to trans-border co-operation. Both vertical and horizontal governance, including the private sector and citizen organisations, are essential.

iv. Physical infrastructure is often a key driving force for promoting further co-operation. Physical infrastructure, mainly transportation and telecommunications, enables the efficient flow of goods, services and ideas. This is why the EU cohesion programme has focused on removing physical barriers in trans-border regions and promoting a trans-national highway network.

v. Last, but not least, the socio-cultural network, *i.e.* soft infrastructure, is also very important for the development of co-operative relationships.

Soft infrastructure consists of human and social capital. People who are attuned to crossing borders can contribute to the integrated development of trans-border region and are necessary assets for collaboration. Social capital includes network-oriented facilities such as universities, open-minded cultures and urban amenities that accommodate the needs of people crossing borders. They are drivers of trans-border co-operation.

Box A.8. **Roles for meta-governance**

The concept of meta-governance implies the management of government and the governance process using a range of mechanisms. To successfully manage this complex set of policies and institution, it has been recommended that the entity responsible for metagovernance:

- ensures the compatibility or coherence of different governance mechanisms and regimes;
- acts as the primary organiser of the dialogue among policy communities;
- deploys a relative monopoly of organisational intelligence and information with which to shape expectations;
- serves as a "court of appeal" for disputes arising within and over governance;
- seeks to re-balance power differentials by strengthening weaker forces or systems in the interests of system integration and/or social cohesion;
- tries to modify the self-understanding of identities, strategic capacities, and interests of individual and collective actors in different strategic contexts and hence alter their implications for preferred strategies and tactics; and
- assumes political responsibility in the event of governance failure.

Source: Jessop (2000), cited in OECD (2006b).

Notes

1. Martinez (1994) categorised border relations into four groups depending on the degree to which border regions are penetrated: alienated borderlands (*e.g.* the Korean border); co-existent borderlands (*e.g.* inner border of former Soviet Republics); interdependent borderlands (*e.g.* US-Mexico); and integrated borderlands (post-Schengen EU countries).

2. An additional protocol in 1994 allowed the transfer of trans-border agreements from public international law to the administrative law of the states concerned.

3. The total body of EU law.

4. Certain professionals, such as lawyers, veterinarians and architects are regulated by EU directives which state that a person who is formally qualified to exercise a profession in a member country shall, upon application, be similarly qualified in other member countries, sometimes with probation or traineeship.

5. The bridge is managed by the bi-national Öresund Bridge Consortium.

6. With the help of Öresund University, Medicon Valley Academy (MVA) started as a publicly-funded initiative in 1997. It is a regional and bi-national network organisation for developing a medical and pharmaceutical cluster. It organises conferences, workshops and seminars and provides a PhD programme. IT Öresund, founded in 1999, is a co-operative organisation for Danish and Swedish actors in the IT industry and for developing an IT cluster. It markets the cluster both regionally and globally and connects new ideas to venture capital to help create new firms. Öresund Food Network aims to create synergies between public and private research and among companies in the agro-alimentary sector. Öresund Environment, established in 2000, is attempting to build links between research, the business community and the public sector in the environment field.

7. Trans-border commuting traffic remains limited, although it has risen steeply in the last decade, and the Öresund Region is not yet an integrated and functional labour market. The number of trans-border commuters represents around 0.65% of the regional labour force in Copenhagen, a modest share compared to domestic commuting and other trans-border regions in Europe.

8. Trans-border co-operation in the Upper Rhine region is rather like Russian *matrioshka* dolls: the Regio Basiliensis lies within the Regio TriRhena, which lies within the EUregio Upper Rhine.

9. The infrastructure supporting trans-border co-operation is sometimes divided into regional public goods (such as a trans-border railways and highways) and global public goods (such as WTO rules) (Fourie, 2006). Fourie also claims that the infrastructures for the latter tends to be institutional and regulatory, i.e. soft policies.

10. Öresund actually has a central institution called the Öresund Committee. But it should be noted that the committee is solely a platform for discussion. However, the committee currently expands the authority.

11. The centralised institution tends to be seen as the zenith of trans-border linkages. However, we should note that some institutions are solely regarded as administrators of EU funds, and are simply bureaucratic, lacking local participation. In this case, the institution is characterised by administrative complexity and public sector dominance.

12. The principle of economics predicts that factor prices will be equalised sooner or later as long as free movement of the factor is allowed.

13. However, it should be noted that the US-Canada cases show strong leadership by province-level governments.

14. This does not mean that national government played no role in bringing about economic integration. Each country played an important role by promoting economic policy, which was export-oriented in nature. However, these economic policies did not have a perspective of region-to-region co-operation across the border.

15. Reasons for a regional identity or material interdependency are diverse: resolving the practical difficulties created by the existence of border (*e.g.* border crossing); finding solutions for trans-border problems (*e.g.* environmental issues such as air and water quality); gaining information about issues which may affect neighbouring regions (*e.g.* the impact of a big development project on land use and transportation); assuring appropriate scale in the pursuit of economic efficiency (*e.g.* delivery of public services and global competition).

16. In the case of European trans-border co-operation, the motives for co-operation have changed over time. In the early stages, in the 1960s, government-led motives such as infrastructure planning, the development of trans-border transportation facilities, and the sharing of public service delivery were dominant. A new concern for the environment gradually grew out of pressure from citizens. In the late 1970s and early 80s when European integration stagnated, an idealistic push for European integration promoted trans-border co-operation. After the introduction of the single market and the accompanying increased global competition, economic interests facilitated co-operation, supported by the incentives of EU subsidies. Trans-border activities have largely increased throughout Europe since 1990s.

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OECD Territorial Reviews

Trans-border Urban Co-operation in the Pan Yellow Sea Region

The Pan Yellow Sea Region (PYSR) covers the coasts of northern China (Bohai Rim), western and southern Korea and south-western Japan (Kyushu). It has been one of the fastest growing economic zones in East Asia since China's opening in the early 1990s, thanks to the region's extensive manufacturing and transportation networks. Development has been driven by cities such as Dalian, Qingdao and Tianjin in China, Busan and Incheon in Korea, and Fukuoka and Kitakyushu in Japan.

However, the PYSR has not yet fully utilised its assets nor reached its potential for growth. Further economic integration has been hindered by excessive competition and inadequate co-operation within the region. The regional transportation system requires structural changes to be integrated, especially in the container transportation market. Deepening the region's social and cultural network remains a challenge. And environmental concerns are increasingly attracting attention. This report analyses these factors and assesses a wide range of policies to improve the PYSR's competitiveness and integration.

In particular, the report examines the PYSR's trans-border governance system, which has emerged since the 1990s as a key regional policy agenda. The harmonisation of authorities within the region is a prerequisite to achieving economic success and addressing the PYSR's diverse challenges. A comparative analysis of trans-border co-operation in OECD countries in Europe and North America is also included in an annex. This report will be of special interest to policy makers, researchers, NGOs and others active in trans-border development or Asian economic development.

The *Territorial Review of Trans-border Urban Co-operation in the Pan Yellow Sea Region* is integrated into a wider programme of national territorial reviews undertaken by the OECD Territorial Development Policy Committee. The overall aim of the territorial review series is to provide practical policy advice to national governments. The trans-border cases previously reviewed include Oresund (Denmark/Sweden) and Vienna-Bratislava (Austria/Slovak Republic).

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