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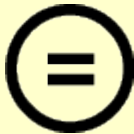
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국제학석사학위논문

**Possibility of Monetary Integration
between Mainland China
and Hong Kong**

중국과 홍콩간의 화폐 통합 가능성

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Possibility of Monetary Integration between Mainland China and Hong Kong

A thesis Presented

By

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to

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Abstract

Possibility of Monetary Integration between Mainland China and Hong Kong

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After Hong Kong returned to Chinese sovereignty in 1997, it keeps its own currency under the “One Country-Two System” policy. Recently, there are increasing economic ties between the two economies. Policies like the Closer Economic Partnership Arrangement (CEPA) and the Shanghai and Hong Kong Stock Connect were introduced. The Chinese government also announced that it will speed up the internationalization of RMB. As the economic ties between the two economies are getting closer, the purpose of this paper is to examine the possibility of monetary integration between Hong Kong and mainland China.

In this research, Optimum Currency Area theory is used to test the criteria of forming a monetary union between Hong Kong and mainland China. As China has high economic diversity, comparison on economic integration is made between three main economic regions (Bohai Economic Rim, Yangtze River Delta Economic Zone and Pearl River Delta Economic Zone) in mainland

China and Hong Kong.

The result of this research found that there are different levels of economic integration between economic regions in China and Hong Kong. The Pearl River Delta has the closest economic relationship with Hong Kong compared to other economic regions in mainland China and has the higher possibility of forming a monetary union with Hong Kong. However, the trade dependency of mainland China on Hong Kong is decreased by time. For further economic integration, there needs to be other kinds of cooperation between the two regions.

Keywords: Hong Kong, Mainland China, Monetary integration, Optimum Currency Area, China's Regional Economy

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I. Introduction

Since the return of Hong Kong to Chinese sovereignty in 1997, Hong Kong keeps its own currency under the principle of “One Country Two Systems”. In Hong Kong, Hong Kong Dollar (HKD) is the official currency and Renmibi (RMB) is a foreign currency.

In 2017, it is the 20th anniversary of Hong Kong’s handover from Britain to China. During these 20 years, Hong Kong and China economic relationship have been closer and there are also different types of economic and financial cooperation between Hong Kong and different regions in China. As the integration between Hong Kong and mainland China is deepened, would that be a higher possibility of having monetary integration between mainland China and Hong Kong? The integration of RMB and HKD can reduce the transaction cost in currency conversion and can spread a higher influence of Chinese currency to the world economics.

As China has high economic diversity and divided into several economic regions, comparing Hong Kong with whole China may not be able to give the whole picture of their economic relationship. As a result, three main economic regions in mainland China (Yangtze River Delta Economic Zone, Bohai

Economic Rim and Pearl River Delta Economic Zone) are picked to make comparisons. Optimum currency area (OCA) criteria pioneered by Mundell in 1961 is used to analyze the trade-off between the economies to join a monetary union.

The research question of this paper is “Do Hong Kong and the three economies regions (Yangtze River Delta Economic Zone, Bohai Economic Rim and Pearl River Delta Economic Zone) in Mainland China constitute an OCA?” The research is organized as follows. The second part of the research provides overviews on the economic relationship and development of Hong Kong and economic regions in China. The third section introduces the criteria of forming a monetary union and evaluates the condition of forming monetary integration between China, Yangtze River Delta, Bohai Economic Rim, Pearl River Delta and Hong Kong. Section four pointed out the barriers in monetary integration between Hong Kong and mainland China. Finally, section five concludes the whole research.

II. Monetary and Economic relationship between Hong Kong and China

1. Currencies inside Chinese territory

Renminbi (RMB) is issued by “People's Bank of China”, the central bank of mainland China, and is the legal tender of Mainland China. At the beginning stage of “reform and opening” policy, RMB adopted the dual exchange rate system. It was pegged with US dollar in 1994 and weight against a basket of currencies from 2005. In 2008, in order to stabilize the economics, the RMB was floated in a narrow margin around a fixed base rate determined by USD. After December 2015, Renminbi is weighted against a basket of 13 currencies including USD and Euro. There are more signs of RMB internationalization since 2007. It has created the “dim-sum” bond in Hong Kong in 2007 and started the Cross-border Trade Settlement Pilot Project in 2008. It has also developed RMB offshore centers in Hong Kong, Macau and other Asian countries.

Hong Kong Dollar (HKD) is the Hong Kong legal currency. Under

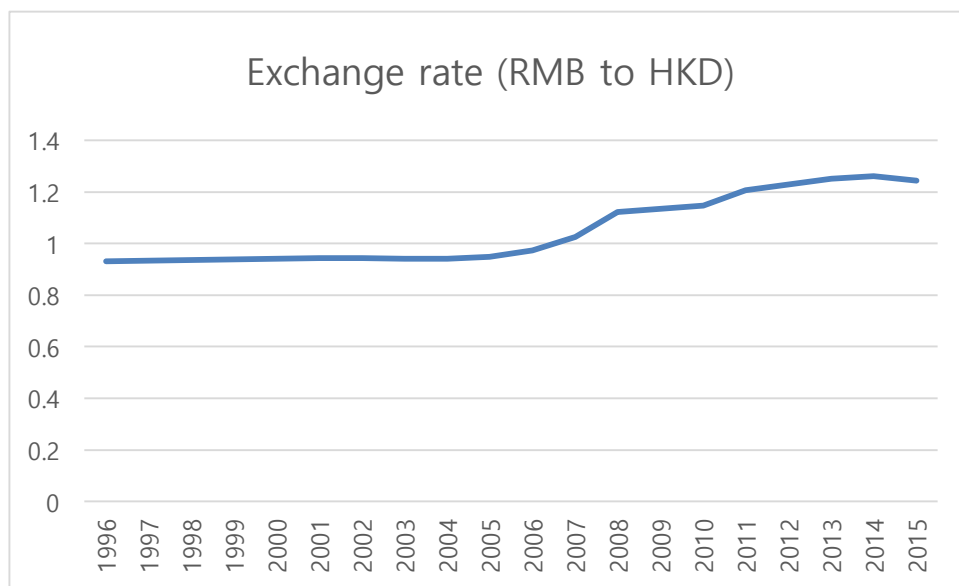
“One Country-Two System” policy, Hong Kong has its separate legal tender, monetary authority and policy from Mainland China. After Hong Kong’s turnover to China in 1997, China promised HK previous capitalist system and its way of life would remain unchanged for a period of 50 years. Since 1983 onwards, Hong Kong adopted the linked exchanged rate system. It is linked against USD at the rate of US\$1: HK\$7.75–7.85 since May 2005 onwards.

Macau Pataca (MOP) is the legal tender in Macao. Also, under “One Country-Two System” policy, Macao has its separate legal tender, monetary authority and policy from Mainland China. However, according to Chan K. (2001) most of the money in circulation inside Macao is actually HKD. MOP is pegged towards HKD at approximately HK\$1: MOP\$1.03 since February 2004. High circulation of HKD in Macao shows a high influence of HKD in Macau. If Hong Kong and mainland China form a monetary union, this also represents possible monetary integration between Macao and mainland China as well, so this research would mainly focus on the integration between HKD and RMB.

Figure 1 shows the historical exchange rate of RMB to HKD and since 2007 the exchange of RMB to HKD excess 1. According to Swift (2017), in December 2016 most of the international payment is dominated by USD and Euro. RMB usage has risen from 0.6% to 1.68% comparing to the figure in

January 2013, and ranked the sixth in December 2016. HKD ranked 9th and 1.31% of international payments used HKD to settle in December 2016. By adding up both the share of RMB and HKD, it is about 3% of total international payments. As a result, the integration of RMB and HKD would spread a higher influence of Chinese currency on the world economics.

Figure 1. Exchange rate of RMB to HKD from 1996 to 2015



Source: National Bureau of Statistics 2016

2. Economic relationships between Hong Kong and China

Starting from the “Reform and Opening-up” program in 1978, the economic gap between Hong Kong and mainland China has been narrowed. Mainland China has experienced rapid economic growth with around 10% annual growth in GDP. The speedy economic growth makes it spread a higher influence in the international society. In 2010, mainland China has overtaken Japan as the second-largest economy in the world after the United States. According to table 1, it shows the GDP of major cities in China and Hong Kong in 1995, 2005 and 2015. The total GDP and GDP per capita of China have increased 10 times from 1995 to 2015. Shanghai and Beijing have surpassed Hong Kong in GDP, while there is still a significant gap in GDP per capita.

Before 1980s, the economic relationship between Hong Kong and mainland China was limited because of the close economy of mainland China and differences in their economic system. Ruled under communist party, China followed the socialist economic policy on planned economy and has limited economic integration with the outside world. While Hong Kong was ceded to Great Britain after the Opium War, Hong Kong developed its capitalist market economy under British administration. Bilateral Economic

relationship was limited to small amount of trade and remittance between relative.

Table 1. GDP of main cities of Mainland China and Hong Kong

Year	1995		2005		2015	
(in RMB)	GDP (hundred million)	GDP per capita	GDP (hundred million)	GDP per capita	GDP (hundred million)	GDP per capita
Shanghai	2,499	2,500	9,248	9,248	25,123	103,795
Beijing	1,508	45,933	6,970	73,856	23,015	106,497
Shenzhen	842	32,800	4,950	60,801	17,503	157,985
Hong Kong	12,081	196,241	14,869	218,247	19,258	263,609
China	61,340	5,091	187,319	14,368	689,052	50,251

Note: Average exchange rate (100HKD to RMB): 2015(80.34) 2005(105.30) 1995(107.96)

Source: National Bureau of Statistics, Shenzhen Bureau of Statistics, Guangzhou Bureau of Statistics, Hong Kong Census and Statistics Department

Since 1980s, the “Reform and Opening-up” program had attracted Hong Kong investment in mainland and the economic interaction between Hong Kong and mainland China increased. In 1980 and 1984, China has opened up five Special Economic Zones to attract foreign investments under cheap labor and beneficial policies. The five Special Economic Zones are Xiamen, Shantou, Shenzhen, Zhuhai and Hainan. Due to the cheap production

cost, most of Hong Kong manufacturing sectors shifted to mainland China, while Hong Kong started to develop its tertiary industry. Benefited from its geography advantage to China and international background, Hong Kong service and financial industry developed rapidly. Hong Kong was the main bridge between China and the outside world. At the beginning stages of “Reform and Opening-up” program, the outside world remained vigilant against the Communist China. As Hong Kong has well developed legal systems, foreign investors used Hong Kong as a base in investing in China. The processing trade between the two places was prosperous and Hong Kong was the entrepot of mainland China.

After Hong Kong return to the Chinese regime in 1997, there are deeper economic cooperation between the two regions. Although two sides still keep their own economic policies and currencies, there is increasing government level cooperation between them. In 2003, Closer Economic Partnership Agreement (“CEPA”), a free trade agreement, was launched. The three areas covered by CEPA are trade in good, trade in services and trade in goods and investment facilitations. Benefited by the launch of CEPA, the trade between Hong Kong and mainland China have increased. In 2005, mainland China surpassed the United States and become the largest destination of Hong Kong domestic exports (Hong Kong Census and Statistics Department, 2016). In

2004, the “Pan-Pearl River Delta Cooperation Framework Agreement” was signed to promoting cooperation between nine provincial regions (Fujian, Jiangxi, Hunan, Guangdong, Guangxi, Hainan, Sichuan, Guizhou and Yunnan) with Hong Kong and Macao.

China also has a dominant share in Hong Kong service trade. In 2015, it accounts for around 40% of total service trade in Hong Kong. It is mainly contributed by tourism and financial services sectors. Also, mainland is the largest source of tourist market and account of 77% total visitor in 2015. (Hong Kong Tourism Board, 2016) In 2003, Hong Kong economic had been hurt by the broke out of Severe Acute Respiratory Syndrome (SARS). The mainland government introduced the “Individual visit Scheme” to allow citizens of certain mainland cities to visit Hong Kong individually rather than in groups.

In financial market, over 950 mainland companies were listed in Hong Kong to raise capital. (Hong Kong Trade Development Council, 2016). Table 2 shows China-related stocks market capitalization in Hong Kong main board. There are increasing market share of China-related stocks from 1995 to 2015. H shares and Red Chip both shares around 20% in total market share and the total market Capitalization of China-related stocks is 42%. In November 2014, Shanghai – Hong Kong Stock Connect was launched to enable two-side stock

market access. In 2016, the total northbound trading is 745 billion RMB and the southbound trading is 827 billion HKD (Hong Kong Exchanges and Clearing Limited, 2017). Similar program between Hong Kong and Shenzhen was also launched in December 2016.

Table 2. Market Capitalization of China-related Stocks in Hong Kong Main Board

Year-end (HK\$ mil)	H shares		Red Chip		All	
	Market capitalization	% of market	Market capitalization	% of market	Market capitalization	% of market
1995	16,464	0.70%	110,702	4.71%	127,166	5.42%
2005	1,280,495	15.78%	1,709,961	21.08%	2,990,456	36.86%
2010	5,210,325	24.88%	4,380,687	20.92%	9,591,012	45.80%
2015	5,157,110	21.11%	5,137,713	21.03%	10,294,823	42.15%

Source: Hong Kong Exchanges and Clearing Limited (2017)

3. Literature Review

The closer economic cooperation between Hong Kong and Mainland China has attracted scholar investigation on the economic integration between the two regions. Most of the research found that there is a closer economic

relationship between the two regions especially on trade sector, while Hong Kong has a closer correlation in output growth and inflation rate with outside world especially with the United States.

Quah (2011) found that Hong Kong trade linkages with the United States and Japan had dropped from 20% in 1984 to 10% in 2009 while trade with China had increased from 15% in 1984 to 50% in 2009. Cheng, Ching and Wan (2012) investigated on the gain and loss of political and economic integration on Hong Kong and found that political integration didn't have any impact on Hong Kong economy while economic integration is benefit to the Hong Kong economy and raised the GDP by about 4%. He, Liao and Wu (2015) measured Hong Kong's variance decompositions of transitory shocks from 1985 to 1997 and 2003 to 2013. It showed that the United States still has a major influence in transitory shock to Hong Kong. However, in long run effect of permanent shocks, mainland China and Hong Kong shared a stronger co-movement. Mainland China may affect the future growth of the Hong Kong business environment.

During the early stage of return, numbers of scholar have discussed the possibility of monetary integration between Hong Kong and mainland China. Tsang (2002) discussed different possible forms of monetary integration between two regions including pegging HKD to RMB instead of USD and

create a new currency to peg RMB and HKD. Researchers also considered forming an OCA in greater china region including Taiwan and Macao. Bystrom, Olofsdotter and Soderstrom (2005) tested the criteria of forming OCA with 10 regions in mainland China, Hong Kong and Macao using the data from 1992 to 2002. It found that the 10 regions in mainland China were getting closer to be optimum currency area (OCA) after 2000. However, the correlation between Hong Kong, Macao and regions in China was lower than the intra-mainland China regions. A later research conducted by Li, Wang and Deng (2011) tested the possibility of monetary integration between mainland China, Taiwan, Hong Kong and Macao using the OCA index. They found that the cost of forming OCA between four regions decreased over time and concluded that it is practicable to form an OCA between the four regions.

After global financial crisis, there are also rising discussion on the suitability of maintaining the peg system in Hong Kong. Hong Kong adopted the linked exchanged rate system and HKD is linked against USD at the rate of US\$1: HK\$7.75–7.85. Zheng and Luk (2012) pointed out that the inconsistency and conflict between mainland China and US monetary policies and exchange rate would hurt Hong Kong economy. The former president of Hong Kong Monetary Authority Yam Chi Kwong (2012) also questioned at the involuntary quantitative easing in Hong Kong affected by the United

States monetary policies.

4. Regional Economy of China

China is a huge country with several economic regions and diverse economic development. To have a deeper understanding on the OCA relationship between Hong Kong and mainland China, apart from focusing on Hong Kong relationship with overall mainland China's data, HK relationship with economic regions in Mainland China can give a better picture on their economic relationship and the possibility of monetary integration. In this research, three main economic zones, Yangtze River Delta Economic Zone, Bohai Economic Region and Pearl River Delta Economic Zone are picked to test its economic relationship with Hong Kong.

Table 3 shows the social and economic indicator of the three main economic zones in 2015. The three regions share over 55% of mainland China GDP and 80% of mainland China trading. They have high influence on the overall Chinese economies. Increasing economic and financial integration with these three regions can show a positive possibility of monetary integration between Mainland China and Hong Kong. Among three of the

zones, Bohai Economic Region has the largest area (19%) and the highest population (23%), followed by Yangtze River Delta (2.2%, 11.6%) and Pearl River Delta (0.56%, 4%). In economic prospective, Bohai (28%) has the largest contribution to mainland GDP than Yangtze (20%) and Pearl (9%). Despite of its small area and population, Pearl River Delta has the highest per capita GDP. Yangtze River delta has the highest share of export and import while Bohai region import more than it exports.

Table 3. Social and economic indicators of main economic zones in China (2015)

Year (2015)	Yangtze River Delta	Bohai Economic Region	Pearl River Delta	China
Area	21.5 (2.2%)	186.28 (19%)	5.48 (0.56%)	963.41
Population('0000)	15,931 (11.6%)	31,547 (23%)	5,874 (4%)	137,462
GDP (hundred million. RMB)	138,126 (20%)	191,628 (28%)	62,268 (9%)	689,052
Per capita GDP (RMB)	86,327	60,743	106,005	50,127
Export (million USD)	8,105 (36%)	3,476 (15%)	6,088 (27%)	22,749
Import (million USD)	5,525 (33%)	5,028 (30%)	3,664 (22%)	16,820

Source: China, each provinces and cities statistical yearbook (2015)

Yangtze River Delta Economic Zone

Yangtze River Economic Zone included Shanghai municipalities and other 26 cities located at southern Jiangsu, eastern and southern Anhui, eastern and northern Zhejiang. According to Yangtze River Delta Urban Agglomeration Development Plan released by the State Council in 2016, the cities included are Nanjing, Wuxi, Changzhou, Suzhou, Nantong, Yancheng, Yangzhou, Zhenjiang, Taizhou in Jiangsu Province, Hefei, Wuhu, Maanshan, Tongling, Anqing, Chuzhou, Chizhou, Xuancheng in Anhui Province, Hangzhou, Ningbo, Jiaxing, Huzhou, Shaoxing, Jinhua, Zhoushan and Taizhou in Zhejiang Province.

Table 4. Industrial Structure of Yangtze River Delta Economic Zone

RMB(,000 million)	Primary	Secondary	Tertiary
1978	180.57 (24%)	436.17 (57%)	142.99 (19%)
1990	860.55 (23%)	1857.87 (49%)	1042.43 (28%)
2000	3488.14 (10%)	24045.42 (67%)	8544.37 (24%)
2010	7460.87 (4%)	116591.83 (69%)	44144.88 (26%)
2015	8385.47 (5%)	70693.95 (44%)	81052.53 (51%)

Source: China, each provinces and cities statistical yearbook (1991,2001, 2010, 2015)

Table 5. Major Industry Groups of Yangtze River Delta Economic Zone in 2015 (% share of total industrial value-added)

Shanghai	Jiangsu Province	Anhui Province	Zhejiang Province
Computer, communications and other electronic equipment (17%)	Electronic and Telecommunications (12.6%)	Electrical equipment and machinery (11.3%)	Electrical equipment and machinery (9.4%)
Automotive manufacturing (16.7%)	Raw Chemical Materials and Chemical Products (11.2%)	Non-metal mineral products (6.6%)	Textile industry (9%)
General equipment (8%)	Electrical Equipment and Machinery (10.9%)	Raw chemical materials and chemical products (5.6%)	Raw chemical materials and chemical products (8.1%)

Source: Hong Kong Trade Development Council (2016)

Yangtze River Delta Economic Zone was not chosen to be opened at the beginning of the economic reform. Compared to Special Economic Zone in the Pearl River Delta region, there were limited opening policies in the Yangtze River Delta. The GDP growth of the region is comparatively slower than Pearl River Delta and national level before 1990. The economic growth of the Yangtze River Delta started from the development of the Pudong New Area in Shanghai in 1990. Many policies used by special economic zones are used to attract foreign investment. Additional preferential policies were also provided to Pudong new area, including Shanghai was allowed to set-up a

stock exchange.

Table 4 shows the Industrial structure of Yangtze River Delta. The share on primary sector decreased over time. Yangtze river delta is transforming from secondary sector to tertiary sector during 2010s. The share of secondary sector dropped from 69% in 2010 to 44% in 2015 while the share of tertiary sector increased from 26% to 51%.

Table 5 shows the main industry groups of Shanghai, Jiangsu, Anhui and Zhejiang Province. It reflects that the main industry in the regions is electronic equipment production. The region also concentrates on chemical products production. Shanghai is a base of automotive manufacturing and the main financial center in mainland China. Other cities like Hangzhou in Zhejiang Province is the base of e-commerce business.

Bohai Economic Zone

According to the state council guideline on Bohai Area regional development cooperation (2016), Bohai Economic Zone is comprised of Beijing, Tianjin municipalities, Hebei, Shanxi, Liaoning and Shandong provinces and the Inner Mongolia autonomous region. Using Beijing and Tianjin municipalities as the center and supported by other sub-provincial and prefecture-level cities like Dalian, Jinan, Shijiazhuang and Hohhot.

Bohai Economic Rim is rich in natural resources and the base of heavy industry in China in producing machinery, iron and steel. Coastal cities like Dalian Tianjin and Qingdao were opened in 1984 to overseas investment.

Table 6. Industrial Structure of Bohai River Delta Economic Zone

RMB(,000 million)	Primary	Secondary	Tertiary
1978	207.45 (21%)	587.2 (60%)	180.54 (19%)
1990	1086.18 (22%)	2322.18 (46%)	1624.19 (32%)
2000	3585.4 (14%)	12204.26 (46%)	10666.49 (40%)
2010	10354.39 (8%)	61642.15 (50%)	50486.22 (41%)
2015	13552.17 (7%)	83356.45 (43%)	94719.62 (49%)

Source: China, each provinces and cities statistical yearbook (1991,2001, 2010, 2015)

Table 6 shows the Industrial structure of Bohai River Delta. Bohai is also transforming its industrial structure from secondary sector to tertiary sector. The share of secondary and primary sector decreased by time while the share of the tertiary sector is increasing.

Table 7 shows the main industry groups of Shanghai, Jiangsu, Anhui and Zhejiang Province. It reflects that the main industry in the regions is heavy industry. Tianjin and Hebei is specialized in manufacturing of metals products. Shanxi and Inner Mongolia focused on coal mining and processing. The largest industrial group in Liaoning is processing petroleum, coking and nuclear fuel. More, motor vehicles production is the main industry in Beijing.

Table 7. Major Industry Groups of Bohai River Delta Economic Zone in 2015 (% share of total industrial value-added)

Beijing	Tianjin	Hebei	Shanxi	Liaoning	Shandong	Inner Mongolia
Motor vehicles (22.3%)	Smelting and pressing of ferrous metal (15.3%)	Manufacturing and processing of ferrous metals (22.3%)	Coal Mining and Dressing (47.5%)	Processing of petroleum, coking and nuclear fuel (9.9%)	Raw chemical materials and chemical products (10%)	Coal mining and processing (15.7%)
Communications equipment, computers & others (12.1%)	Communication equipment, computers & other electronics (9.2%)	Production and supply of electric power & heat (6.1%)	Electric Power, Heat Power Production and Supply (13%)	Smelting and pressing of ferrous metals (9.6%)	Processing of food from agricultural products (7.7%)	Production and supply of electric power and heating power (10.2%)
Electrical equipment and machinery (4.5%)	Manufacture of general and special machinery (8.6%)	Manufacture of metal products (6%)	Smelting and Pressing of Ferrous Metals (6.6%)	Processing of food from agricultural products (8.7%)	Manufacture of general purpose machinery (6.1%)	Processing of agricultural side-line food (8.7%)

Source: Hong Kong Trade Development Council (2016)

Pearl River Delta Economic Zone

Pearl River Delta is located at the southern part of China adjacent to Hong Kong and Macau. It consisted of nine cities, Guangzhou, Shenzhen, Dongguan, Foshan, Zhongshan, Jianmen, Zhuhai, Huizhou and Zhaoqing, in Guangdong province. With smallest area and population than the other two economic zones, the Pearl River Delta contributed 9% of total GDP in mainland China and one fifth of trade in mainland China. The Guangdong provincial government proposed to establish the Pearl River Delta Economic Zone to enhance cooperation inside the zone in 1994. A larger regional cooperation called Pan-Pearl River Delta is launched in 2004 including nine provinces in eastern, central and western China as well as Hong Kong and Macao. The nine provinces are Guangdong, Fujian, Jiangxi, Hunan, Guangxi, Hainan, Sichuan, Guizhou and Yunnan. (Macao Economic Services, 2016)

The Pearl River Delta rapid economic development is benefited by its coastal location and the close geographical relationship with Hong Kong and Macau. It has a higher level of economic integration with Hong Kong than the other two regions. It is the first region opened by China government. Two (Shenzhen and Zhuhai) out of five special economic zones are location inside the region. The beneficial policies have attracted lots of foreign investor to invest in Pearl River Delta and made it one of the fast growing regions in

China.

Table 8. Industrial Structure of Pearl river Delta Economic Zone

RMB(,000 million)	Primary	Secondary	Tertiary
1978	55.31 (29.8%)	86.62 (46.6%)	43.92 (23.6%)
1990	153.78 (15.3%)	441.65 (43.9%)	411.45 (40.9%)
2000	458.3 (5.4%)	4009.14 (47.6%)	3954.8 (47%)
2010	809.78 (2.1%)	18317.3 (48.4%)	18748.36 (49.5%)
2015	1116.89 (1.8%)	27136.63 (43.6%)	34014.26 (54.6%)

Note: 1978 (Guangdong Province data)

Source: China, each provinces and cities statistical yearbook (1991,2001, 2010, 2015)

During the early phase of economic reform, Pearl River Delta transformed itself from agriculture society to labor intensive manufacturing industry and use Hong Kong as entrepot for importing material under the “front Shop, back Factory” phase. Pearl River Delta is famous for being the world factory in producing shoes and clothing. Table 9 shows the main Export Commodities of Guangdong Province in 2000, 2010 and 2015. In 2000, the main export items were labor-intensive products like garments and clothing. By 2010 and 2015 the top rankings export items were occupied by

electronic equipment. From 2000s, Pearl River Delta has transformed its manufacturing sector mix from garments and clothing products to machinery and high tech products. The influence of labor-intensive products was decreased and replaced by work require skill-labor.

Table 9. Main Export Commodities of Guangdong Province in Value (US,0000)

	2000		2010		2015	
	Item	Value	Item	Value	Item	Value
1	Garments and Clothing Accessories	989,924	Data Processing Equipment	4,639,340	Hand-held or Vehicle-mounted Cordless	4,974,279
2	Footwear	453,360	Garments and Clothing Accessories	2,767,070	Data Processing Equipment	4,169,423
3	Toys	408,433	Hand-held or Vehicle-mounted Cordless	2,532,393	Garments and Clothing Accessories	3,962,660
4	Textiles	333,461	Furniture	1,352,521	Furniture	2,071,092
5	Plastic Articles	260,678	Footwear	1,247,484	Precious Metal and Jewelry	1,542,947

6	Boxes and Bags, Travel Goods	196,269	Textiles	1,001,231	Footwear	1,522,551
7	Furniture	188,613	Static Converters	885,017	Lights and Lighting Apparatus	1,372,896

Source: Guangdong Province statistical yearbook (2001, 2011, 2016)

Pearl River Delta is strong in light and high technology industries. Table 8, it shows the industrial structure of the Pearl River Delta. In 1978, 29.8% of GDP is contributed by the primary industry. During 2000s, primary industry is replaced by a steady increase in secondary and tertiary industry. In 2010s, the tertiary industry replaced secondary industry as the main GDP contribution to the economics. Table 10 shows the major industry groups in 2015. The major industry in Guangdong province is communication equipment and computers.

Table 10. Major Industry Groups of Pearl river Delta Economic Zone in 2015 (% share of value-added industrial output)

Guangdong Province	%
Communication equipment, computers and other electronic equipment	22.1%
Electrical machinery & equipment	9.2%
Raw chemical materials and chemical products	5.1%

Source: Hong Kong Trade Development Council (2016)

III. Conditions of monetary integration between China and Hong Kong

1. Optimum Currency Area (OCA) Criteria

OCA theory was developed by the Mundell in 1961. According to Horvath (2003), OCA discussed the selection of an exchange rate regime and provided insight to measure the trade-off between the economies to join a monetary union. It is fundamental to the design of the Economic and Monetary Union of the European Union (EMU). The benefit of monetary integration would be reducing the risk of exchange rate fluctuation and the transaction cost of exchanging the currency while the cost is losing the monetary policies autonomy.

Based on literature review, the below criteria was defined to determine the desirability of OCA. They are the degree of economic integration, openness (McKinnon, 1963) and business cycle synchronization (Kenen, 1969). This research is conducted based on each of the criteria to test the degree of economic integration between Hong Kong and regions in mainland China. Data on GDP, FDI, trade, Consumer Price Index are collected from

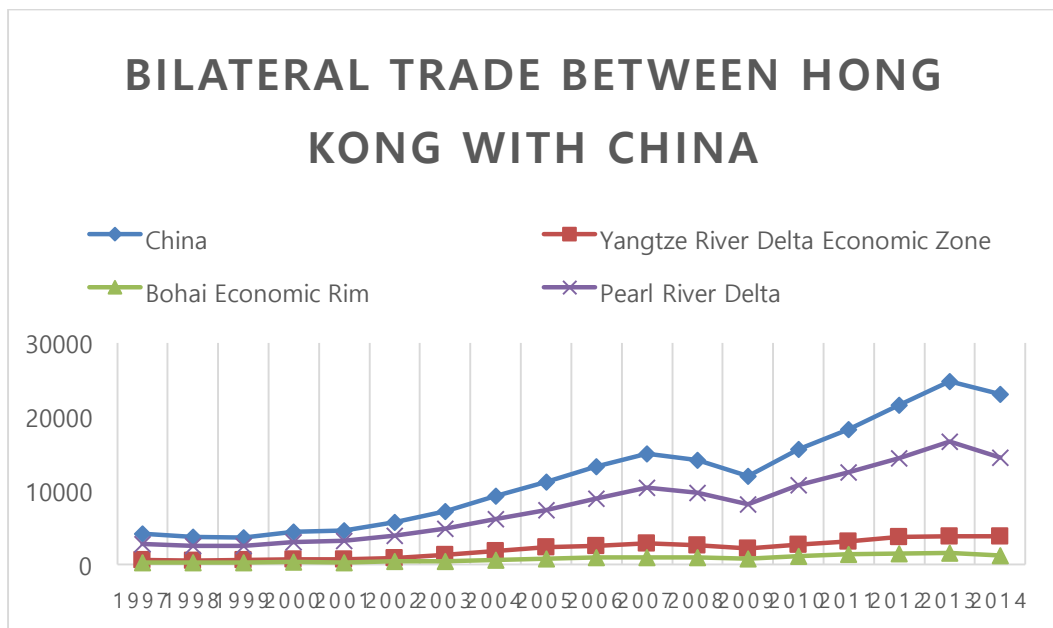
China state and province statistical yearbook from the period 1997 to 2015.

1.1 Degree of economic integration

According to Cavoli and Ramkishan (2007), high and growing level of economic integration is required for monetary integration between two economics. The amount of bilateral Trade and FDI is used to check the degree of economic integration between Hong Kong and mainland China.

Trade

Figure 2. Amount of bilateral Trade between Hong Kong with China (,000 million)



Source: China, each provinces and cities statistical yearbook (1997-2015)

Figure 2 shows the trend and table 11 shows the amount of bilateral trade between Hong Kong and regions in China. There is an increasing number of bilateral trade from 4,209 hundred million in 1997 to 21,376 hundred million in 2014. The increasing trade relationship is contributed by the WTO accession in 2001 and the “Closer Economic Partnership Agreement” (CEPA) between Hong Kong and mainland China in 2003. Under CEPA, it allows Hong Kong companies and Hong Kong based foreign company to have zero-tariff in exporting manufacturing goods that meet the rule of origin. In the service sector, preferential access to markets is also allowed to Hong Kong firms with lower investment requirement.

Table 11. Amount of bilateral Trade between China and Hong Kong (,000 million)

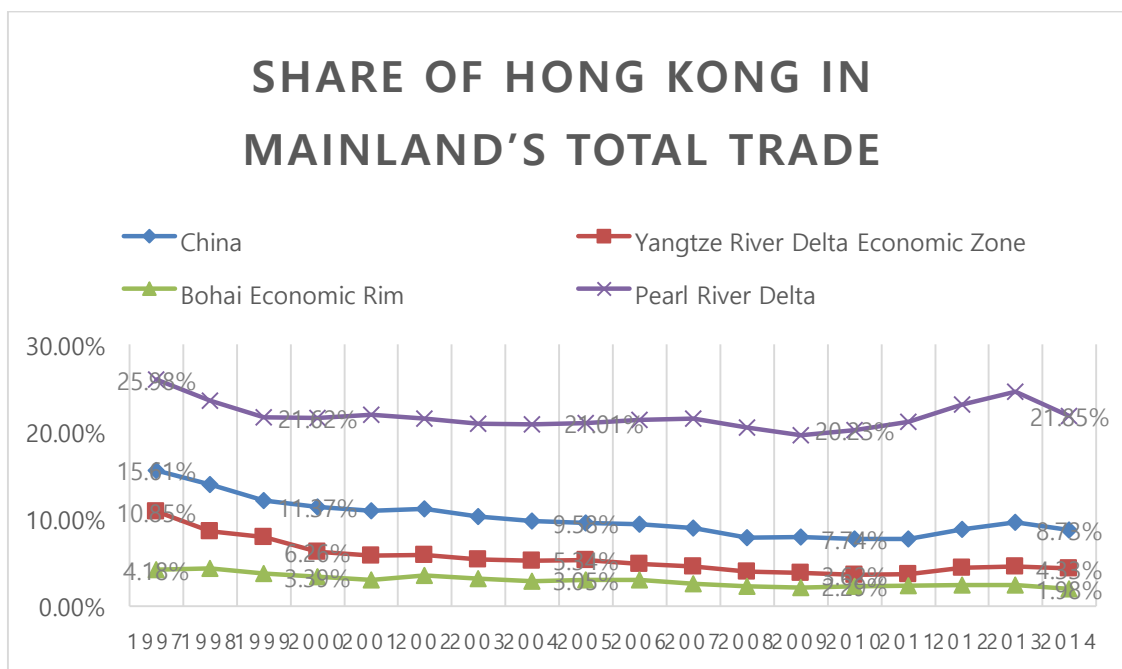
Year	China	Yangtze River Delta Economic Zone	Bohai Economic Rim	Pearl River Delta
1997	4,209	592 (14.06%)	269 (6.39%)	2,802 (66.58%)
2000	4,466	682 (15.27%)	336 (7.51%)	3,045 (68.18%)
2005	11,198	2,321 (20.73%)	809 (7.22%)	7,365 (65.77%)
2010	15,608	2,727 (17.47%)	1,110 (7.11%)	10,747 (68.18%)
2014	23,078	3,820 (16.55%)	1,257 (5.45%)	14,449 (62.61%)

Source: China, each provinces and cities statistical yearbook (1997-2015)

Pearl River Delta (62.61%) has the highest amount of bilateral trade

with Hong Kong than Yangtze River Delta Economic Zone (16.55%) and Bohai Economic Rim (5.45%). Pearl River Delta accounts for over half of all bilateral trade between Hong Kong and mainland China. After launching the “Reform and Opening-up” program, Pearl River Delta has developed itself into manufacturing center in China with Hong Kong as its important trading partner and investor. The close geographic relationship of Hong Kong and Pearl River Delta has benefited the outward processing trade between the two regions.

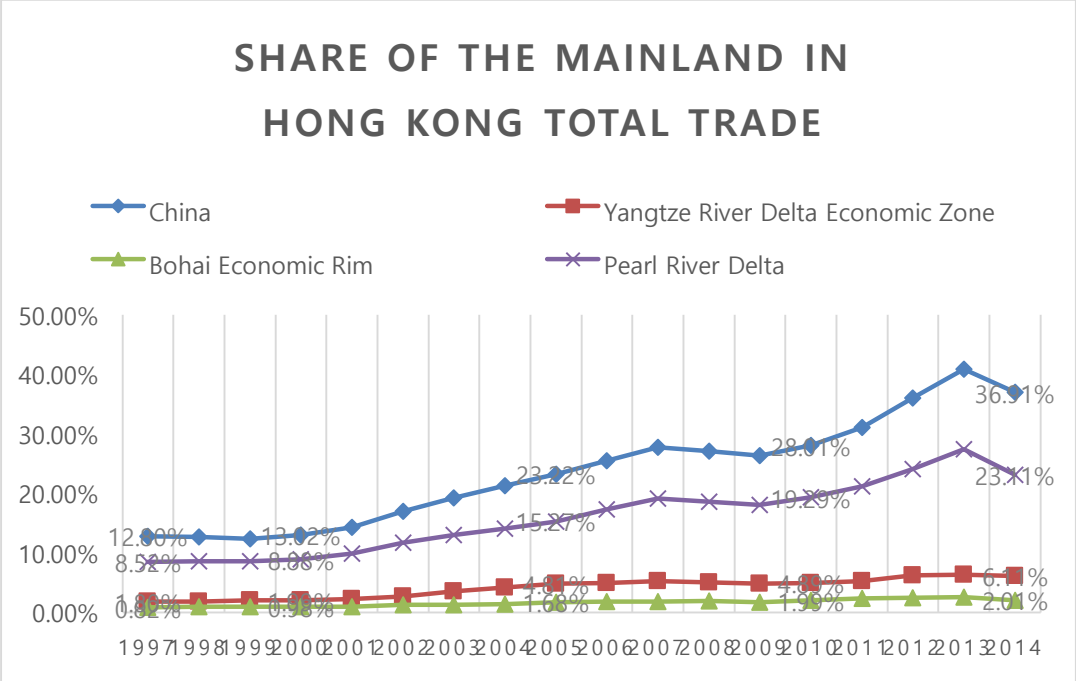
Figure 3. Share of Hong Kong in mainland’s total trade



Source: China, each provinces and cities statistical yearbook (1999-2015)

Figure 3 shows the share of Hong Kong in mainland's total trade. The share of Hong Kong trade in Pearl River Delta remain stable at around 20%. However, the proportion of Hong Kong trade have been decreased in overall mainland China data (15.61% in 1997 to 8.78% in 2014), Yangtze River Delta (10.85% in 1997 to 4.33% in 2014) and Bohai Economic Rim (4.18% in 1997 to 1.98% in 2014). This shows the signs that other regions in China have diversified their trading partner.

Figure 4. Share of the mainland in Hong Kong's total trade



Source: China, each provinces and cities statistical yearbook (1999-2015)

Figure 4 shows the share of the mainland in Hong Kong's total trade. It can be found that mainland China trade proportion in Hong Kong is at increasing trend and Pearl River Delta region accounted for 23.1% of Hong Kong's total trade in 2015. Yangtze region accounted for 6.11% and Bohai region shares was 2.01%.

Over, it shows that there is a strong trade linkage and stable interdependence in the trade relationship between Pearl River Delta and Hong Kong than other economic regions in China. Hong Kong trade dependence on mainland China was increased while mainland trade dependence on Hong Kong was dropped.

Foreign Direct Investment (FDI)

Table 12. Proportion of Hong Kong source FDI

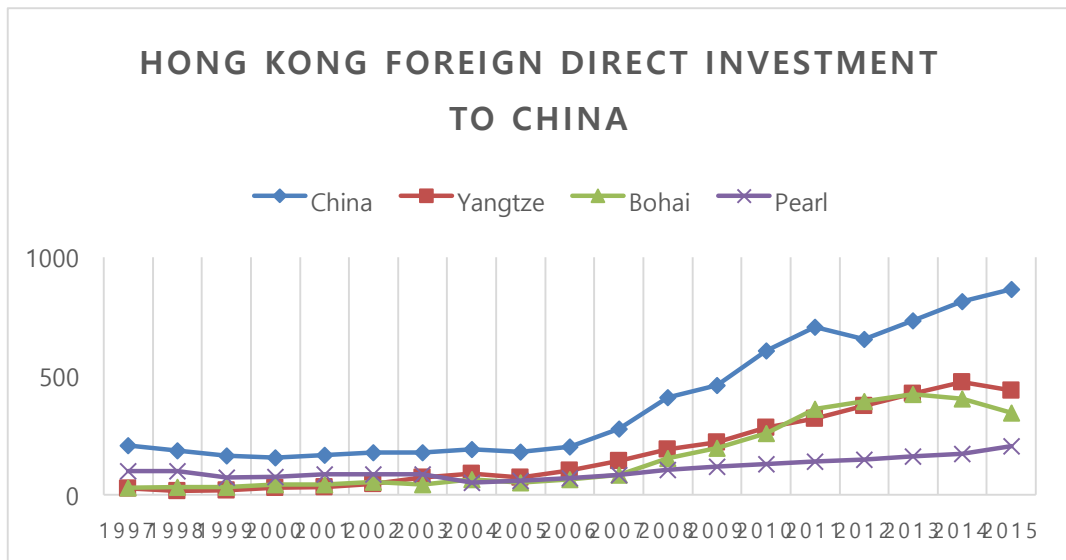
	China	Yangtze	Bohai	Pearl
1997	46%	32%	28%	69%
2000	38%	21%	36%	61%
2005	30%	25%	23%	47%
2010	57%	62%	50%	64%
2015	68%	60%	56%	76%

Source: China, each provinces and cities statistical yearbook (1999-2015)

The amount of FDI flow between the two economies also shows their

economic closeness. According to Barrell and Pain (2007), FDI is not only a method to increase firm productions but also a channel in transferring knowledge, capital and technology. As a result, FDI can show the economic integration between two regions.

Figure 5. Amount of Hong Kong Foreign Direct Investment to China (Ten thousand USD)



Source: China, each provinces and cities statistical yearbook (1999-2015)

Tables 12 and figure 5 shows the share of Hong Kong source FDI to the total FDI received in mainland China and shows that Hong Kong source FDI into China increased through time. In 2015, Hong Kong FDI account for over half of all regions FDI received. Yangtze River got the highest amount of FDI

from Hong Kong in 2015 followed by Bohai Economic Zone and Pearl River Delta. All three regions show a close relationship with Hong Kong at FDI.

Moreover, Hong Kong is also the largest receiver of China's Overseas Direct Investment. There are also increasing ODI flow from mainland China to Hong Kong and in 2015 61.5% of total ODI of China went to Hong Kong.

1.2 Openness

According to McKinnin (1963), an open economy is more suitable to use fixed exchange rates and is a better candidate for the monetary union.

Table 13 shows the degree of openness of Mainland China and Hong Kong. It is found that Hong Kong (2015: 331%) is a highly open economy that has a higher degree of openness than China (2015:36%). Among three economic regions in China, Pearl River Delta (98%) is the most openness region and has the highest degree of openness than Yangtze River Delta (2015: 54%) and Bohai Economic Rim (2015: 28%). It is also found that the degree of openness in mainland China peaked in 2006 and keeps decreasing after then. It shows a sign of China adjusting of its consumption and exporting structure.

Table 13. Degree of Openness (2000-2014) (Total trade to GDP)

Year	China	Yangtze River Delta	Bohai	Pearl River Delta	Hong Kong
1997	34%	32%	32%	139%	228%
1998	32%	33%	30%	126%	217%
1999	33%	38%	31%	126%	216%
2000	39%	49%	38%	131%	250%
2005	62%	93%	48%	155%	331%
2006	64%	98%	49%	158%	343%
2007	62%	97%	48%	152%	343%
2008	56%	87%	47%	129%	349%
2009	43%	68%	35%	106%	316%
2010	49%	76%	40%	115%	360%
2011	48%	73%	40%	111%	367%
2012	45%	67%	37%	109%	360%
2013	43%	61%	36%	108%	356%
2014	41%	59%	34%	98%	349%
2015	36%	54%	28%	87%	331%

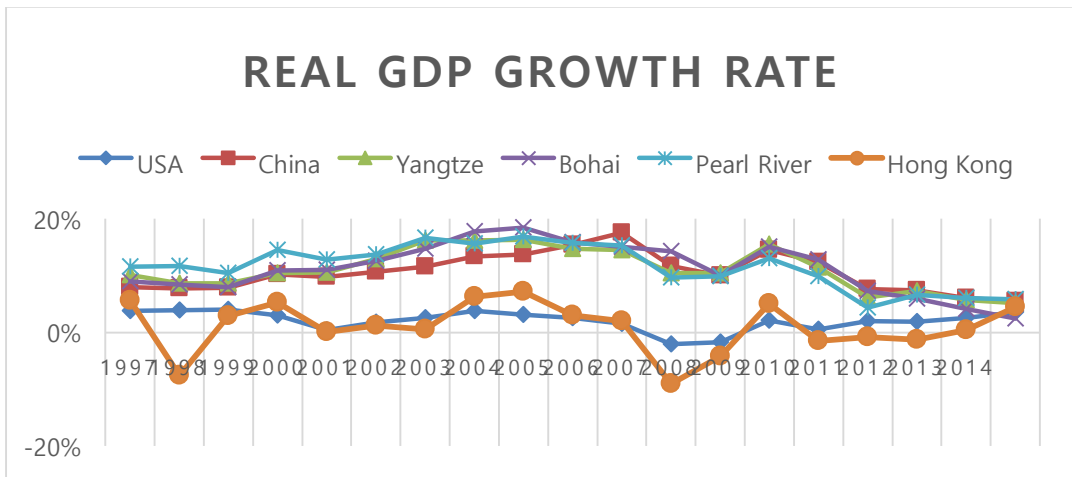
Source: China, each provinces and cities statistical yearbook (1999-2015)

1.3 Business Cycle Synchronization

According to Cavoli and Ramkishan (2007), high degree of business cycle synchronization is important for monetary integration. It is because monetary policy autonomy has to scarify under the monetary union. So, it is important to have same business cycle that the common monetary policy would

be appropriate to the economies.

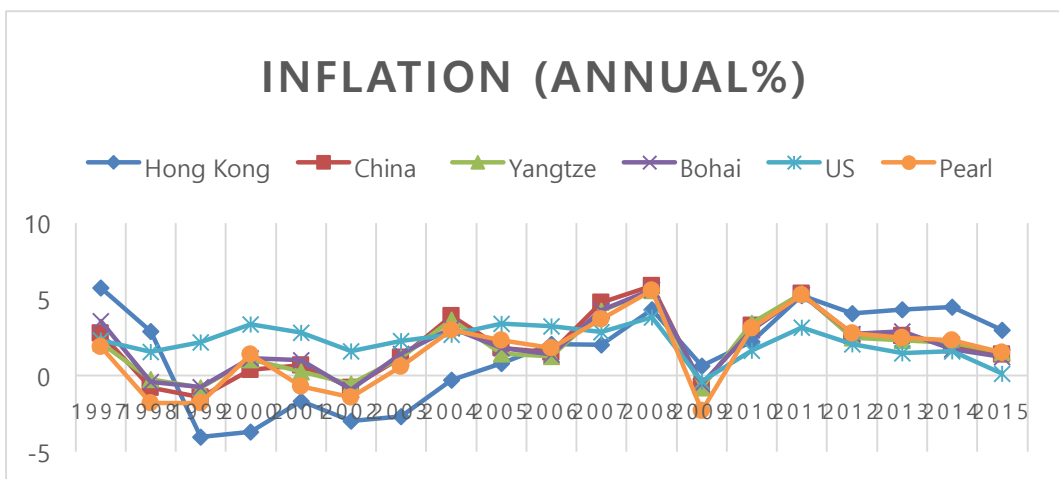
Figure 6. Real GDP growth rate of Mainland China, Hong Kong and the United States



Note: 1997 as base year

Source: China, each provinces and cities statistical yearbook (1999-2015), World Bank

Figure 7. Inflation rate of Mainland China, Hong Kong and United States



Source: China, each provinces and cities statistical yearbook (1999-2015), World Bank

Figure 6 showed the real GDP growth rate of the United States, Mainland China and Hong Kong. Regions in China shows similar GDP growth rates. While Hong Kong has similar growth rate with the United State and suffered transitory shocks from the world in 2008 Euro crises and 2009 global financial crises. Figure 7 showed the annual inflation rate of Mainland China, Hong Kong and the U.S. There is a similar trend in inflation movement between Mainland China regions, Hong Kong and the United States especially during the global crisis in 2009.

Table 14 shows the correlation of GDP growth rate and table 15 shows the correlation of inflation rate between Hong Kong, regions in mainland China and the United States in three periods. Period 1 (1997-03) represents the correlation between two areas at the beginning stage of Hong Kong returning to China. Period 2 (2004-2009) marked the start of CEPA between mainland China and Hong Kong. Period 3 (2010-2015) marked the current economic correlation during the period of recovery from the global financial crisis. The higher the correlation means the more synchronize the regions are. It is found that the correlation among three regions in mainland China is significant in both GDP growth rate and inflation.

For GDP growth rate, the correlation between Hong Kong and three regions increased from period 1 to period 2 but decreased from period 2 to

period 3. Yangtze River delta and Pearl River delta have a higher correlation with Hong Kong where Bohai has the lowest correlation with Hong Kong. The drop in correlation in period 3 is mainly contributed by the limited GDP growth of Hong Kong dragged by the weak external demand from the global financial crisis.

In inflation correlation, the correlation between Hong Kong and three regions increased by time. In period 3, Pearl River delta has the highest correlation with Hong Kong followed by Yangtze Delta and Bohai Economic regions. In addition, although there is considerable high correlation between mainland China and Hong Kong, the United States still has higher correlation than mainland china with Hong Kong in both period 2 and 3 in GDP growth rate and inflation rate.

Table 14. Correlation of Hong Kong, China and the U.S. in GDP growth rate

<i>(97-03)</i>	<i>Hong Kong</i>	<i>China</i>	<i>Yangtze</i>	<i>Bohai</i>	<i>Pearl River</i>	<i>USA</i>
Hong Kong	1					
China	0.18421549	1				
Yangtze	0.11061577	0.8755973	1			
Bohai	0.08969708	0.96633743	0.96328377	1		
Pearl River	0.08639542	0.93539254	0.88464726	0.94036228	1	
USA	-0.0013135	-0.6440314	-0.4265011	-0.5924336	-0.432186	1

<i>(04-09)</i>	<i>Hong Kong</i>	<i>China</i>	<i>Yangtze</i>	<i>Bohai</i>	<i>Pearl River</i>	<i>U.S.</i>
Hong Kong	1					
China	0.53537218	1				
Yangtze	0.96937769	0.62957893	1			
Bohai	0.75282035	0.52218105	0.87900474	1		
Pearl River	0.94908999	0.73515339	0.97614544	0.83138013	1	
U.S.	0.97006797	0.60110284	0.98908493	0.84377343	0.96185396	1

<i>(10-15)</i>	<i>Hong Kong</i>	<i>China</i>	<i>Yangtze</i>	<i>Bohai</i>	<i>Pearl River</i>	<i>U.S.</i>
Hong Kong	1					
China	0.18027769	1				
Yangtze	0.29782447	0.98309165	1			
Bohai	0.07000846	0.99006788	0.95438845	1		
Pearl River	0.40004158	0.92477853	0.97130029	0.8678094	1	
U.S.	0.65861122	-0.6117215	-0.5015172	-0.683901	-0.3910272	1

Source: China, each provinces and cities statistical yearbook (1999-2015), World Bank

Table 15. Correlation of Hong Kong, China and the U.S. in inflation rate

<i>(97-02)</i>	<i>Hong Kong</i>	<i>China</i>	<i>Yangtze</i>	<i>Bohai</i>	<i>Pearl</i>	<i>U.S.</i>
Hong Kong	1					
China	0.644863	1				
Yangtze	0.595173	0.952348	1			
Bohai	0.630321	0.982967	0.97166	1		
Pearl	0.352445	0.864338	0.956291	0.89537	1	
U.S.	-0.2928	0.411106	0.508197	0.479593	0.648252	1

<i>(03-08)</i>	<i>Hong Kong</i>	<i>China</i>	<i>Yangtze</i>	<i>Bohai</i>	<i>Pearl</i>	<i>U.S.</i>
Hong Kong	1					
China	0.665622	1				
Yangtze	0.640952	0.997072	1			
Bohai	0.687532	0.986504	0.986112	1		
Pearl	0.835037	0.946937	0.939341	0.952392	1	
U.S.	0.887546	0.427028	0.410374	0.476554	0.69375	1

<i>(09-15)</i>	<i>Hong Kong</i>	<i>China</i>	<i>Yangtze</i>	<i>Bohai</i>	<i>Pearl</i>	<i>U.S.</i>
Hong Kong	1					
China	0.758796	1				
Yangtze	0.742531	0.996341	1			
Bohai	0.771857	0.992712	0.978802	1		
Pearl	0.835101	0.974211	0.976034	0.959759	1	
U.S.	0.809811	0.932981	0.921643	0.937111	0.916089	1

Source: China, each provinces and cities statistical yearbook (1999-2015), World Bank

The result shows a mixed finding on the business cycle synchronization between Hong Kong and mainland China. There is a high degree of correlation in inflation rate, but diverse result in GDP growth rate. It also shows Hong Kong has a higher correlation in GDP growth with the United State than mainland China. It can be explained that the openness of the Chinese economy is relatively low than the Hong Kong economy. Hong Kong suffered more shocks from outside economies. Moreover, the high degree of correlation in inflation rate between Hong Kong and mainland is resulted from the close trade relationship between the two regions that Hong Kong depends on imports from mainland for its daily requirements. Price level increases in mainland China would affect the price level in Hong Kong through trade.

To conclude, table 16 shows the overall result of the OCA criteria. It is found that the possibility of monetary integration between Hong Kong and mainland China has increased through time. Pearl River Delta and Hong Kong are the best candidate of forming an Optimum Currency Area. They have a higher level of economic integration in trade and FDI. Also, both regions are found to have a high degree of openness. Mainland China and Yangtze River Delta data found a high degree of FDI relationship and some levels of integration in trade and the degree of openness with Hong Kong. Bohai

Economic Rim least fit to form an OCA, as it has a low degree of trade and also limited degree of openness.

Table 16. Summary table on integration level

	Mainland China	Yangtze River Delta	Bohai Economic Rim	Pearl River Delta
Degree of Economic integration -Trade	Medium	Medium	Low	High
Degree of Economic integration -FDI	High	High	High	High
Openness	Medium	Medium	Low	High
Business Cycle Synchronization	Medium	Medium	Medium	Medium

The high level of economic integration between Pearl River Delta and Hong Kong is contributed by the geographical closeness and cooperation policy. Pearl River Delta has the closest distance to Hong Kong. It is around four hours' distance between Hong Kong and cities in Pearl River Delta. Also, two infrastructure constructions, Hong Kong-Zhuhai-Macau Bridge and Hong Kong and Guangzhou high-speed railway, is under construction. According to Invest HK (2015), the transportation time will shorten to two hours after the

completion. It would further encourage the trade of goods and people movement between these two regions.

Moreover, there is rich governmental cooperation between the two regions. Pan-Pearl River Delta Cooperation is set up with Hong Kong, Macau, nine provinces in Pearl River Delta to enhance regional cooperation. Also, Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone is set-up at Shenzhen to develop service industry in mainland China. As a result, there would be higher level of integration between Hong Kong and Pearl River Delta in future.

IV. Barriers to the monetary integration between Mainland China and Hong Kong

The above result shows that there are good reasons for promoting the monetary integration between Hong Kong and mainland China. However, there are also barriers in the monetary integration that mainland China financial openness is limited.

“One country, two Currencies” is a unique monetary system in China. According to Barandiaran and Tsang (1997), they argued that the situation in

China cannot be compared with the economic and monetary integration in Europe because of the differences in its political system. Hong Kong is well preserved as one of the freest economies in the world with limited government intervention and HKD is freely convertible but the economic and financial openness of China is still limited and RMB is not yet a freely convertible currency. This creates difficult to form a monetary union between the two regions.

Hong Kong is a small and open economy and its economic development depend on the outside world. It is better for Hong Kong to have monetary integration with places that have closer economic relationship. However, due to the special historical background and geographical factors of Hong Kong. It is found that although Hong Kong has close economic relationship with China, it also experiences high financial influence from the world. To account for the cost and benefit of Hong Kong, it is not only about the share of trade and capital flow with mainland China but also with countries other than China. Moreover, as Hong Kong is one of the financial centers in the world, it needs a stable and open currency for providing financial services. Although there are increasing internationalization of RMB, RMB is yet not an open currency. Forming monetary union with mainland China will make Hong Kong lose its international financial market position.

For mainland China, the continued existence of the HKD benefit mainland China as a source of foreign exchange earnings and store-of-value (Tsang, 2002). The openness of the mainland financial market is still limited as stable financial situation is important to the Chinese government. Hong Kong is used as the main off-shore market of RMB. It is served as a jump-board for mainland China to integrate with the outside world and obtaining FDI. According to Minikin and Lau (2012), the “One Country-Two System” policy makes Hong Kong the most trusted offshore market for RMB to enter and leave the mainland China. As Hong Kong has well developed financial infrastructure and international background, it is an ideal testing environment for RMB internationalization and also capital account liberalization. It seems that the monetary integration does not fit the short term needs of the two economics.

V. Conclusion

The research result fits the hypothesis that the increasing economic and financial integration between mainland China and Hong Kong gives rise to the suitability of forming an OCA in China. Pearl River Delta and Hong Kong are the best candidate of forming an Optimum Currency Area and the main driver

of economic integration. There is close economic integration in trade, FDI and similar level of economic openness between the two regions.

However, with the opening of the mainland market and the improvement in trade-related services, it is found that the trade dependency of mainland China on Hong Kong has been decreased. The degree of openness of China has also decreased since 2006. This would threaten the further economic integration between the two regions if the trade dependence of mainland China on Hong Kong is kept decreasing. Apart from trade, other forms of cooperation in services and financial sector should be needed to strengthen the economic integration between the two regions.

Moreover, in economic grounds there are good reasons for promoting the monetary integration between Hong Kong and mainland China. Nevertheless, due to underdevelopment and closeness of the mainland financial market. It can be predicted that it is hard for the integration in recent years. As RMB is yet not an open currency, Hong Kong may lose its influence in the international financial market. Mainland China may also lose good testing-ground for its monetary openness and encounter higher economic instability.

As long as China has a closed financial system and RMB is not fully

convertible, the attempt on monetary integration is difficult. In future, when the Chinese economy is more open with the internationalization of RMB and sustainable economic integration between Hong Kong and China that would make the monetary integration more practicable.

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국문초록

중국과 홍콩간의 화폐 통합 가능성

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1997 년, 홍콩이 중국 정부로 반환된 이후 일국양제(一國兩制, 한 나라 두 제도)의 원칙으로 인하여 홍콩은 기존의 화폐를 보존하게 되었다. 최근 두 지역의 경제 관계가 날로 밀접해 짐에 따라 두 지역은 <포괄적경제동반자협정>(CEPA)을 체결하였으며, 상하이 및 홍콩 주식거래 상호 연동 체제를 도입하였다. 그 외 중국 정부는 위안화 국제화에 박차를 가하겠다고 선언했다. 이처럼 두 지역의 경제 관계가 날로 밀접해지는 상황에서, 본 논문은 두 지역 통화동맹의 형성 타당성에 대해 연구하였다.

본 논문은 최적통화지역 이론을 통하여 홍콩과 중국이 통화동맹을 형성할 수 있는 타당성에 대해 검증하였다. 중국 경제의 다양성으로 인해 본 논문에서는 홍콩과 중국 3 대 경제지역(환보하이 경제권, 창산자오 경제권, 주산자오 경제권)의 경제일체화에 대해 비교분석하였다.

연구 결과에 따르면 홍콩과 중국의 각 경제권 간의 경제일체화수준은 다르다. 기타 경제권과 비교했을 때 홍콩 경제와 관계가 가장 밀접한 경제권은 주산자오 경제권이며, 해당 두 지역이 화폐동맹을 형성할 가능성이 가장 높다. 또한 홍콩에 대한 중국의 무역 의존도가 낮아졌다는 결론도 도출되었다. 경제일체화를 추진하기 위해서는 두 지역의 더욱 다양한 협력이 필요하다.

핵심어: 홍콩, 중국, 화폐 통합, 적정통화지역, 중국의 지역경제

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