

Public Policy Research Funding Scheme

公共政策研究資助計劃

Project Number : 項目編號 :	2016.A3.009.17A
Project Title : 項目名稱 :	Construction of Mainland China - Hong Kong Economic Integration Index and Its Application to Facilitate Public Policy Research in Hong Kong 中國內地及香港經濟整合指數的制訂及其促進香港公共政策研究之應用
Principal Investigator : 首席研究員 :	Professor CUI Geng 崔耕教授
Institution/Think Tank : 院校 / 智庫 :	Lingnan University 嶺南大學
Project Duration (Month): 推行期 (月) :	12
Funding (HK\$) : 總金額 (HK\$) :	494,960.00

This research report is uploaded onto the webpage of the Public Policy Research Funding Scheme and Strategic Public Policy Research Funding Scheme for public reference. The views expressed in this report are those of the Research Team of this project and do not represent the views of the Government and/or the Assessment Panel. The Government and/or the Assessment Panel do not guarantee the accuracy of the data included in this report.

Please observe the “Intellectual Property Rights & Use of Project Data” as stipulated in the Guidance Notes of the Public Policy Research Funding Scheme and Strategic Public Policy Research Funding Scheme.

A suitable acknowledgement of the funding from the Government should be included in any publication/publicity arising from the work done on a research project funded in whole or in part by the Government.

The English version shall prevail whenever there is any discrepancy between the English and Chinese versions.

此研究報告已上載至公共政策研究資助計劃及策略性公共政策研究資助計劃的網頁，供公眾查閱。報告內所表達的意見純屬本項目研究團隊的意見，並不代表政府及／或評審委員會的意見。政府及／或評審委員會不保證報告所載的資料準確無誤。

請遵守公共政策研究資助計劃及策略性公共政策研究資助計劃申請須知內關於「知識產權及項目數據的使用」的規定。

接受政府全數或部分資助的研究項目如因研究工作須出版任何刊物／作任何宣傳，均須在其中加入適當鳴謝，註明獲政府資助。

中英文版本如有任何歧異，概以英文版本為準。

Final Report

Construction of Mainland China - Hong Kong Economic Integration Index and Its Applications to Facilitate Public Policy Research in Hong Kong

中國內地及香港經濟整合指數的制訂及其促進香港公共政策研究之應用

Hong Kong Institute of Business Studies, Lingnan University

A Research Report funded by the Public Policy Research Funding Scheme

(Project Number: 2016.A3.009.17A)

from the Policy Innovation and Co-ordination Office (PICO, the former Central Policy Unit)

of

the HKSAR Government

Executive Summary

Abstract in English

Economic integration between mainland China and Hong Kong has been constantly evolving over the past three decades. However, a deliberate evaluation of economic integration is difficult when it is not properly defined or measured. To facilitate the policy debate over the economic and social consequences of economic integration, we construct a Chinese mainland - Hong Kong Economic Integration index to measure the level of economic integration between the two economies from 1990 to 2016. This index consists of the key aspects of economic integration, including its driving forces, processes and consequences. The index is measured on a scale of 0 to 100 on an annual basis for twenty-six years. We find that the economies of Hong Kong and Chinese mainland have become highly integrated and interdependent on each other during the study period and that economic integration index is associated with several socio-economic indicators of Hong Kong in significant ways.

Keywords: Economic integration, Integration index, financial integration, Hong Kong, mainland China

Abstract in Chinese (中文摘要)

過去三十年，中國內地及香港經濟整合持續展開。為了能夠把經濟整合演化過程中那些範圍廣泛的經濟活動所出現的既複雜、甚至時而背道而馳的發展趨勢，總結為一個簡單及易明的圖畫，方便政策制定者及公眾人士參考，我們建立香港與內地經濟一體化指數，以衡量 1990 年至 2016 年兩個經濟體之間的經濟一體化水平。該指數由幾個經濟一體化的關鍵指標組成，包括其推動力，過程和後果。

該指數從 0 至 100 的等級衡量過去二十六年經濟一體化的成果。在研究期間，我們發現香港與內地經濟高度一體化和相互依存，經濟一體化指數在很大程度上與香港的一些社

會經濟指標有著重大關聯。

關鍵字: 經濟一體化，整合指數，金融一體化，香港，中國大陸

Table of Contents

1. Introduction	7
2. Related Literature	9
2.1. Economic Integration.....	9
2.2. Motivation and Objectives	10
2.3. Challenges for Constructing an Economic Integration Index.....	12
2.4. Current Economic Integration Indices	12
2.5. Economic Integration of the Chinese mainland and Hong Kong	17
3. Economic Profiles and Linkage between Chinese mainland and Hong Kong	19
3.1. Geographical Perspective.....	19
3.2. Demographic Perspective	24
3.3. Economic Perspective.....	26
3.4. Trade between the Chinese mainland and Hong Kong	28
3.5. Direct Investment between Chinese Mainland and Hong Kong.....	38
3.6. Offshore RMB Business in Hong Kong	39
3.7. Flow of People	40
4. Economic Integration Index	46
4.1. Definition and Measurement of Economic Integration	46
4.2. Characteristics of the Mainland-Hong Kong Integration.....	47
4.3. Applications of the Index	50
5. Data and Research Methodology.....	51
5.1. Indicators of Economic Integration	51
5.2. Statistical Approach	60
5.3. Technical Aspects of the VECM	62
6. Economic Integration Index (Research Results/Findings)	64
7. Relationships between the Integration Index and Key Socio-Economic Indicators	68
8. Conclusions	74
8.1. Discussion.....	74
8.2. Policy Implications and Recommendations.....	75

List of Tables

Table 1: Summary of the Existing Economic Integration Indices	15
Table 2. The Estimated Journey Time from Lo Wu to Different Places of Hong Kong	20
Table 3. The Number of Arrival And Departure Passengers Passing Through The Lo Wu and Lok Ma Chau Control Points from 2007 to 2016.	21
Table 4. The Weekly Direct Flights between Hong Kong and Chinese mainland.....	24
Table 5. Ethnicity of Hong Kong	25
Table 6. Place of Birth	25
Table 7. Usual Language/dialect in Hong Kong	26
Table 8. Ability of Speaking Selected Languages in Hong Kong.....	26
Table 9. The Value and Share of Hong Kong's Re-export of the Chinese mainland.....	33
Table 10. Values and Proportion of Outward Processing Trade	35
Table 11. Trade in Services between Hong Kong and Chinese Mainland.....	37
Table 12. Direct Investment between Hong Kong and Chinese Mainland.....	39
Table 13. Offshore RMB business in Hong Kong	40
Table 14. Chinese Cities Covered under the Individual Visit Scheme	41
Table 15. Movement of People between Chinese Mainland and Hong Kong	43
Table 16. Indicators of Driving Forces of Economic Integration	53
Table 17. Indicators of Transmission Channel of Economic Integration.....	56
Table 18. Indicators of Consequences of Economic Integration	59
Table 19. Components of Mainland-Hong Kong Index.....	66
Table 20. Economic and Social Variables	69
Table 21. Sample of Key Indicators from 1990 to 2016.....	70
Table 22. Results of Long-run Equilibrium Relationships	711

List of Figures

Figure 1. Control Points between Hong Kong and Chinese mainland	22
Figure 2. Average Daily Vehicles through Various Control Points	22
Figure 3. Control Points between Hong Kong and Chinese mainland	23
Figure 4. Changes in Hong Kong's Domestic Exports to Chinese Mainland.....	29
Figure 5. Share of Hong Kong's Domestic Exports	29
Figure 6. Domestic Exports by Mode of Transportation	30
Figure 7. Major Suppliers of Hong Kong's Import from 1978 to 2016.....	31
Figure 8. Water Supply from Guangdong Province.....	31
Figure 9. Proportion of Spending by Mainland Visitors to Spending of All Visitors	44
Figure 10. Cross-Boundary Workers	44
Figure 11. Cross-boundary Students	45
Figure 12. Cross-boundary Marriage	45
Figure 13. Three Sub-indices of Economic Integration between Chinese Mainland and Hong Kong.....	67
Figure 14. The Overall Mainland-Hong Kong Index from 1990 to 2016	67
Figure 15. Relationships between the Economic Integration Index and Key Economic and Social Indicators.....	733

Layman summary on policy implications and recommendations

Layman's Summary (English and Chinese)

With the help of the Policy Innovation and Co-ordination Office (PICO) and designed by Hong Kong Institute of Business Studies, the Chinese mainland - Hong Kong Economic Integration index tracked and measured the level of economic integration of Hong Kong and mainland China on a scale of 0 to 100 between 1990 and 2016. We find that the economies of Hong Kong and Chinese mainland have become highly integrated and interdependent on each other during the study period and that economic integration index is associated with several socio-economic indicators of Hong Kong in significant ways.

「香港與內地經濟一體化指數」由嶺南大學香港商學研究所設計，政策創新與統籌辦事處支助，以 0-100 分為標準，追蹤及量度自 1990 至 2016 年香港與內地經濟一體化的程度。在研究期間，我們發現香港與內地經濟高度一體化和相互依存，經濟一體化指數在很大程度上與香港的一些社會經濟指標有著重大關聯。

Acknowledgement

鳴謝

This research project (Project Number: 2016.A3.009.17A) is funded by the Public Policy Research Funding Scheme from the Policy Innovation and Co-ordination Office of the Hong Kong Special Administrative Region Government.

1. Introduction

Over the last several decades, the economic integration of the Chinese mainland and Hong Kong has evolved along with the economic development of the Chinese mainland (张俊森, 伍晓鹰, 姚先国, 李宏彬, & 吴延瑞, 2009; 饶美蛟 & 陈广汉, 2002). However, it is difficult to evaluate this economic integration without a comprehensive, objective, precise, and timely index to facilitate the policy debates on the economic and social consequences of economic integration, resolve the acute outstanding issues, and inform plans for the long-term economic development of Hong Kong. Existing indices of economic integration focus on the regional integration of Europe (i.e., the European Union), the North American Free Trade Act (NAFTA), the Association of Southeast Asian Nations (ASEAN), Africa, or Asia. There are also many studies of the individual facets of the integration of the Chinese mainland and Hong Kong, such as the trading patterns, financial links, flow of investments, cross-border consumption, and output synchronization. Nevertheless, a comprehensive, objective, and scientific index for measuring and updating the complicated structure of mainland-Hong Kong economic integration is not yet available. Such an index would offer policymakers and the public a simple and intuitive picture of the complicated and sometimes contradictory developments in the wide-ranging economic activities that make up economic integration. This study fills this gap.

The popular indicators that measure economic integration in other regions are important references for the construction of a new index. However, this study also addresses the nature and special features of economic integration in a “one country-two systems” context. After reviewing the literature on the different aspects of the economic integration of the Chinese mainland and Hong Kong, including its driving forces, processes, and consequences, this study develops a suitable measurement instrument. Using data collected over the last three decades, a standard statistical method, i.e., principal component analysis, is used to construct the index. We evaluate and demonstrate the index’s role in facilitating policy research by

conducting an empirical study. Specifically, we investigate whether a long-term and causal relationship has existed over the past few decades between the degree of economic integration and various important economic, social, and political issues, including economic growth, the unemployment rate, property prices, income disparity, social mobility, satisfaction with the government, and ethnic identity.

2. Related Literature

2.1. Economic Integration

Economic integration is a broad and complex relationship in which two or more countries, regions, or economic entities become increasingly interrelated and interconnected through the promotion of free and fair trade. Although economic integration is often referred to as the expansion of trade, there is no single definition. One of the earliest definitions of economic integration was given by Tinbergen (1954), who distinguished *negative integration*, the removal of barriers and restrictive instantiations and the introduction of freedom for economic transactions, from *positive integration*, the adjustment and establishment of new policies and institutions promoting integration and endowed with coercive power. Balassa (1961) refined the definition of economic integration by defining it as both a *state* and a *process* that enables member countries to achieve a variety of common goals through joint or integrated actions that could not as easily be achieved by unilateral measures.

Building on Balassa's perspective, many researchers have viewed integration as a *process* of removing discriminatory barriers between different economic entities (Maksimova, 1976; Mennis & Sauvart, 1976; Molle, 2001; Pelkmans, 1984; Pinder, 1969). For instance, Pinder (1969) defined economic integration as the outcome of a process that shaped members into the whole. In examining the integration of European countries, he regarded economic integration as a process of *union* and argued that economic integration is the gradual removal of discriminatory barriers between member countries. In a similar vein, Kahnert (1969) considered integration as a progressive process of eliminating the economic barriers that exist on national borders. Mennis and Sauvart (1976, p. 75) noted that integration is a process whereby boundaries between nation-states become less discontinuous, leading to the formation of more comprehensive systems. Maksimova (1976) interpreted economic integration as a process of developing deep and stable relationships in the division of labor

between national economies.

Another groups of researchers have viewed integration as a *state*, that is, the absence of the forms of discrimination referred to in Balassa's definition. Price equalization, equal treatment without discrimination, and the creation of common markets are the major characteristics of this state (Holzmann, 1976; Swann, 1996). For example, Swann (1996) argued that economic integration was "a state of affairs or a process that involves the combination of previously separated economies into larger arrangements." Alternately, Holzmann (1976) characterized economic integration as free trade between two regions such that the prices of all similar goods and factors of production are equalized. From a theoretical point of view, he viewed economic integration as occurring when two national markets formed a common market in which the economic cycles, stock prices, and factors of production tend to move together.

Other researchers have viewed economic integration as a *means* to improve national welfare (Jovanovic, 2006; Robson, 1998). Robson (1998) noted that integration can improve the efficiency and increase the use of resources. Likewise, trade is treated as a means to increase welfare and economic growth (Jovanovic, 2006, p. 8). Therefore, economic integration can foster the free movement of goods and the factors of production.

Clearly, there is no agreed upon definition of economic integration. It can be categorized as a driving force, a transmission channel, or a consequence of processes that (1) eliminate economic barriers to trade and investment, (2) liberate the factors of production, and (3) encourage resource allocation and efficiency of production among various economic entities (Krieger-Boden & Soltwedel, 2013).

2.2. Motivation and Objectives

Economic integration between the Chinese mainland and Hong Kong has evolved over

the past few decades, leading to immense changes in the social and economic landscapes of both Guangdong Province and Hong Kong. Integration is generally regarded as a tremendous economic success, because it has sped up the economic restructuring of Hong Kong and fostered economic growth in the region (Hsiao, Steve Ching, & Ki Wan, 2012; Li, Liu, Lam, & Wang, 2011; Y. Sung, 2004).

However, there are concerns that integration has also created economic and social challenges. For example, economic integration has been viewed as the cause of Hong Kong's stagnant technological progress and declining competitiveness (Li et al., 2011; Tsang & Cheng, 1997). Research has also suggested that economic integration between the mainland and Hong Kong is declining as Hong Kong-invested labor-intensive industries and producer services on the mainland face fierce competition from local suppliers (Chan, Yung and Chung, 2014). Furthermore, there is evidence that the outflow of people and economic activities from Hong Kong to the mainland that characterized the early years of integration is being replaced by an inflow of people and economic activity from the mainland to Hong Kong. Consequently, the mainland may no longer be providing Hong Kong people, especially the younger generation, with as many opportunities for promising careers (Lui, 2014). Recent tensions between mainlanders and the people of Hong Kong created by the inflow of people and capital from the mainland have also raised concerns about the public's views of economic integration (GPG (Global Property Guide), 2009; Yep, 2012).

A comprehensive evaluation of the economic and social effects of economic integration on Hong Kong is urgently needed, both to solve the acute outstanding issues and to set out plans for long-term economic development. However, a deliberate evaluation of economic integration is difficult when there is no clear definition or measurement instrument. For this reason, it is imperative to create a comprehensive, objective, precise, and timely index that can define and measure the economic integration of the Chinese mainland and Hong Kong.

Therefore, the objectives of this study are as follows.

1. Develop a framework that defines and analyses the economic integration of Mainland China and Hong Kong
2. Develop indicators that measure the various aspects of economic integration of Mainland China and Hong Kong
3. Develop a construction method for the mainland China–Hong Kong economic integration index that measures the development of the economic integration of mainland China and Hong Kong over time.
4. Demonstrate the applicability of the Mainland China-Hong Kong economic integration index in facilitating policy research
5. Evaluate the long-term and causal relationships between the degree of economic integration and various important economic, social and political issues, including economic growth, unemployment rates, property prices, income disparity, social mobility, satisfaction with the government and ethnic identity.

2.3. Challenges for Constructing an Economic Integration Index

Economic integration is a complicated concept that encompasses different aspects of economic activities (Dreher, Gaston, & Martens, 2008). This makes it difficult to define and measure as a single and unified concept. The “one country, two systems” context of this research setting further complicates the issue, as the economic integration between mainland China and Hong Kong has features that differ from the features of other regional agreements such as the European Union (EU) and the North America Free Trade Agreement (NAFTA).

2.4. Current Economic Integration Indices

Most of the literature on economic integration indices has focused on regional economies other than the Chinese mainland and Hong Kong. This includes, for example, studies of

NAFTA (Acharya, Rao, & Sawchuk, 2002), the EU (Dorrucci, Ioannou, Mongelli, & Terzi, 2015; König & Ohr, 2013; Krieger-Boden & Soltwedel, 2013), Africa (UNECA, 2016), and Asia (B. Chen & Woo, 2010; Cheung, Yiu, & Chow, 2008). There are globalization indices that measure the economic, social, political, and cultural integration of individual economies in relation to the rest of the world, including the G-Index by the World Markets Research Centre, the CSGR Globalization Index by Warwick University, the Handbook on Economic Globalization Indicators (OECD, 2015), the KOF Index of Globalization, the Maastricht Globalization Index (MGI) by Universiteit Maastricht, the New Globalization Index, The Global Index by the University of Bamberg, and the A T Kearney/Foreign Policy Magazine Globalization Index. The following is a brief introduction to each of these indices. A summary is also given in Table 1.

- **G-Index** (Randolph, 2001): This index, designed by the World Markets Research Centre, evaluates 185 countries based on six indicators. It focuses on economics, as 90% of the indicators are economic. It measures regionalization and internalization (economic connectivity between countries) rather than globalization (of development of a country's economy).
- **CSGR Globalization Index** (Lockwood & Redoano, 2005). This index measures the integration of 112 countries during the 1982 to 2004 period. The measurement is based on 16 economic, social, and political indicators. The social dimension is divided into two sub-dimensions: people and ideas.
- **Handbook on Economic Globalization Indicators** (OECD, 2015). The handbook focuses on the economic aspects of globalization, using statistical indicators.
- **KOF Index of Globalization** (Dreher et al., 2008). This index covers 207 countries from 1970 until today. The measurement is based on 23 countries. It includes economic, political, and social indicators. The KOF Index divides the economic dimension into two

sub-dimensions: economic flow and economic restrictions.

- **Maastricht Globalization Index** (Pim Martens & Raza, 2009; P Martens & Zywiets, 2004). The MGI includes indicators covering economic, social, political, and environmental dimensions. It also considers globalization's ecological dimension. It covers 117 countries for the 2000 to 2008 period. The social dimension is divided into the technological dimension and social/cultural dimension.
- **New Globalization Index** (Vujakovic, 2009): This index measures globalization in 70 countries using 21 indicators for the 1995 to 2005 period, with a focus on the social dimension. More specifically, this index has four dimensions including economic integration, socio-technical interconnectedness, cultural globalization, and political globalization. It includes indicators of socio-technical interconnectedness and cultural globalization.
- **The Global Index** (Raab et al., 2008): This index includes 31 indicators covering economic, social and political dimensions with a focus on the social dimension.
- **A T Kearney/Foreign Policy Magazine Globalization Index** (AT Kearney, 2001): This index includes 12 indicators covering economic, social, and political dimensions, with a focus on the economic dimension.

Table 1: Summary of the Existing Economic Integration Indices

Index	G-index	A.T. Kearney/Foreign Policy Globalization Index	CSGR Globalisation Index	KOF index of Globalization	Maastricht Globalisation Index (MGI index)	The Global Index	New Globalisation Index (NGI)	OECD, Handbook on Economic Globalisation Indicators
Organization	World Market Research Centre (WMRC)	A. T. Kearney/ Foreign Policy Globalization Index	Center for the study of Globalization and Regionalization, University of Warrick, UK	ETH Zurich, Switzerland	Maastricht University, The Netherlands	University of Bamberg, Germany	Vienna University of Economics and Business, Vienna, Austria	OECD
years	2001	1971-2005	1982-2004	1970- current	2000-2008	1970-2002	1995-2005	
number of countries	185	72 (2005), 62 (2004)	112 (2014 has overall rating)	207 (2017)	117	97	70	
Total number of indicators	6	12	16	23	11	31	21	
ECONOMIC DIMENSION	90%	50%	35%	36%	20%	31%	37%	
no. of indicators	4	2	4	8	3	8	9	
<i>Trade</i>	✓	✓	✓	✓	✓	✓	✓	
<i>FDI (Actual Flow)</i>	✓	✓	✓	✓	✓	✓	✓	
<i>Portfolio Investment</i>	✓	✓	✓	✓	✓	✓	✓	
<i>Restriction on Trade and Capital</i>	✗	✗	✗	✓	✗	✓	✗	
SOCIAL DIMENSION	10%	40%	33%	37%	40%	62%	31%	
no. of indicators	2	6	9	11	4	20	8	
<i>Information flow (spread of idea)</i>	✓	✓	✓	✓	✓	✓	✓	
<i>Personal Contact</i>	✓	✓	✓	✓	✓	✓	✓	
<i>Cultural proximity</i>	✗	✗	✗	✓	✗	✓	✓	

Table 1: Summary of the Existing Economic Integration Indices and the Dimensions Included (Cont.)

POLITICAL DIMENSION	0%	10%	33%	27%	20%	7%	32%	
no. of indicators	0	4	3	4	3	3	4	
ENVIORNMENTAL DIMENSION	X	X	X	X	20%	X	X	
no. of indicators	0	0	0	0	1	0	0	
Geographical Adjustment	X	X	✓	X	✓	X	✓	
Indicator Normalization	✓	✓	✓	✓	✓	✓	✓	
<i>details of normalization</i>		Normalize indicators from 0 (lowest) to 1 (highest) within a year. The drawback is the analysis of the variation of the index for a particular country has little significance.	Panel Normalization	Panel Normalization (1970-2007); Percentile Value (2008-)	Panel Normalization	Panel Normalization	Panel Normalization (95% values applied)	
Indicator weights	Assigned	Assigned	PCA and arithmetic mean	PCA	Equal weight	PCA	PCA	
Indicator	One-dimensional index	Composite index	Composite index	Composite index	Composite index	Multidimensional indices	Multidimensional indices	Statistical indicator

2.5. Economic Integration of the Chinese mainland and Hong Kong

Studies of the economic integration of the Chinese mainland and Hong Kong can be grouped into four categories. The first group analyzes the factors and processes of economic integration (王亚平, 1999; 张玉阁 & 郭万达, 2013; 林凌 & 冯苏宝, 2003; 陈可焜, 2003; 殷舒, 2003). For instance, Y. W. Sung (1992), Ho and So (1997), and Zhang (2005) studied the economic factors that drove foreign direct investment (FDI) from Hong Kong to the mainland, and Yang (2006) analyzed patterns in the cross-border movements of people for work, business, school, shopping, and leisure. The challenges facing Hong Kong due to integration with the Chinese mainland have also been discussed (Yang, 2006; 张玉阁 & 郭万达, 2013; 李罗力, 2004; 夏丽丽 & 闫小培, 2004; 梁潔芬 & 盧兆興, 2014). For instance, 李罗力 (2004) argued that the three main obstacles to the economic integration of the Chinese mainland and Hong Kong are the different perspectives of policy makers in Hong Kong and the Chinese mainland, varying infrastructure and industry development, and institutional barriers.

The second category includes studies of trade patterns and FDI and the role of outward processing industries (Ash & Kueh, 1993; Chan, Choi, Siu, & Wong, 2003; RAN & LI, 2006; Tuan & Ng, 1995). For instance, 张洪天 (1997) provided an overview of the development in trade between mainland China and Hong Kong since 1949 and emphasized the importance of their economic integration. 张俊森 et al. (2009) studied the integration of the mainland and Hong Kong from the perspective of Hong Kong's total factor production (TFP) and suggested that Hong Kong's TFP improvement can be attributed to mainland effects, specifically, market size and resource reallocation effect. 袁持平 and 吴肯浩 (2005) analyzed the pattern of FDI between Hong Kong and Guangdong province including its effects and future development.

The third category investigates the co-movement of some important macro and micro

economic indicators as a measure of the economic integration of the mainland and Hong Kong. For example, Tsang and Ma (2000), Genberg, Liu, and Jin (2006), and Gerlach-Kristen (2009) studied business cycles and inflation synchronization on the mainland and in Hong Kong. Wu (2000), Cavoli and Rajan (2007), and Lei and Tam (2010) investigated the convergence of output and income on the mainland and in Hong Kong. Nieh and Yau (2004), Cheng and Glascock (2005), He, Leung, and Ng (2008), and 马经 (2009) examined the links between the financial markets in the mainland and Hong Kong. Li et al. (2011) examined the growth attributes of mainland China and Hong Kong, including input growth, adjusted scale effect, technical progress, and efficiency growth. 曹龙骢 and 张渝敏 (2007) discussed the integration of the Shenzhen and Hong Kong stock markets.

The fourth category explores the economic effects of integration. For example, Wang and Schuh (2000) used simulations to show that economic gain could be achieved by further liberalizing the mainland's trade policies. Y. Sung (2004) quantified the economic benefits and costs of integration. Hsiao et al. (2012) used a panel data approach to evaluate the benefits of politically and economically integrating the mainland and Hong Kong. Tsang and Cheng (1997) and Lui (2014) examined the challenges created by integration. 张俊森 et al. (2009) studied the economic effects of integration on Hong Kong's economic growth and TFP. Their findings demonstrated the importance of institutional development for economic integration and the critical role of the resource possibility frontier of the Hong Kong economy.

Despite these studies, there is no comprehensive, straightforward, and timely index for measuring the different aspects of the mainland-Hong Kong economic integration. Such an index is necessary to solve the outstanding issues and to facilitate plans for long-term economic development. This study fills this gap by creating a comprehensive, objective, precise, and timely index that defines and measures the economic integration between the Chinese mainland and Hong Kong.

3. Economic Profiles and Linkage between Chinese mainland and Hong Kong

The *economic distance* between two places reflects differences in factor costs such as labor wages and technological development, which are key components of regional economic integration (Ghemawat, 2001). Hong Kong is located next to Guangdong province and has efficient transportation routes providing economic access to the Chinese mainland. In addition, the cultural proximity of the Chinese mainland and Hong Kong facilitates the process of economic integration.

From the perspective of Hong Kong, accelerating economic integration with Guangdong is conducive to the long-term maintenance of its strategic position (毛艳华, 2007). The slowdown in the world economic growth and increasingly competition from Taiwan, Singapore, South Korea, and the Chinese mainland have had a significant impact on Hong Kong's economic growth and development. In addition to these external factors, its irrational industrial structure including constraints on industrial upgrades and high operating costs, have weakened Hong Kong's competitiveness. One way of balancing these external and internal negative factors is for Hong Kong to actively participate in regional economic cooperation (殷舒, 2003). This cooperation will certainly contribute to the prosperity and stability of Hong Kong in the future (左连村 & 张小兰, 2007). From the perspective of Guangdong, economic cooperation with Hong Kong has already become an indispensable element of its development. To maintain its current strong development, a deeper cooperation that fully exploits both regions advantages is needed. Therefore, the economic integration of Guangdong and Hong Kong is an inevitable part of economic development (殷舒, 2003).

3.1. Geographical Perspective

Hong Kong, situated on the southeast coast of China, is a special administrative region of China. It is connected to the Chinese mainland by land, sea, and air. On October 1, 1910,

the Guangzhou-Kowloon Through Train became the first cross-border rail transport between Hong Kong and the Chinese mainland. According to the MTR Corporation, the estimated travel times between Lo Wu and the shopping hub Tsim Sha Tsui and the financial center Central are 49 and 61 minutes, respectively (Table 2). The Lok Ma Chau Spur line opened on August 15, 2017 and directly connects to the Shenzhen metro, further enhancing intercity transportation integration and reducing travel times between Hong Kong and the Chinese mainland. At present, the Lo Wu Control point is the most popular boundary control point (BCP) for passengers. The average annual number of passengers coming in or going out of Hong Kong via rail from Lo Wu and Lok Ma Chau has increased from around 1 hundred million in 2007 to 1.44 hundred million in 2016 (Table 3).

Convenient road and rail transportation fosters the economic integration of Hong Kong and nearby cities. In fact, a metropolitan cluster has formed in the Pearl River Delta (PRD) metropolitan region, which includes three principal cities, Hong Kong, Guangzhou, and Shenzhen, and a number of smaller cities supporting various industries such as Zhongshan, Zhuhai, Huizhou, Dongguan, and Macao. This formation has turned the PRD region into a prominent economic cluster in China. In 2015, the GDP of the PRD region (not including Hong Kong and Macao) reached 6.2 trillion RMB, accounting for 9.2% of the country's GDP, ranking 16th in the world as an economic entity (Huang, 2017).

Table 2. The Estimated Journey Time from Lo Wu to Different Places of Hong Kong

Station	Sheung Shui	Tai Po	Sha Tin	Kowloon Tong	Tsim Sha Tsui	Central	Causeway Bay
Time (mins)	7	18	30	37	49	61	65

Source: MTR Corporation

Table 3. The Number of Arrival and Departure Passengers Passing Through the Lo Wu and Lok Ma Chau Control Points from 2007 to 2016.

Year	Arrival	Departure	Total
2007	49,663,634	50,299,724	99,963,358
2008	53,594,668	54,355,939	107,950,607
2009	55,177,957	56,112,831	111,290,788
2010	59,672,135	60,547,450	120,219,585
2011	63,195,874	63,809,147	127,005,021
2012	68,266,866	68,786,852	137,053,718
2013	68,996,979	69,773,080	138,770,059
2014	70,283,046	71,539,631	141,822,677
2015	71,983,750	73,162,590	145,146,340
2016	71,748,282	72,942,399	144,690,681

Source: Transport Department, Hong Kong

The road-based land crossing between Hong Kong and Shenzhen is well developed. There are four vehicle boundary crossings located in Man Kam To, Sha Tau Kok, Lok Ma Chau, and Shenzhen Bay for both passengers and cargo (Figure 1). The Man Kam To BCP was the first vehicular control point between Hong Kong and the Chinese mainland.

Many vehicles transporting fruits and vegetables to Hong Kong use the Man Kam To BCP. Shau Tau Kok BCP, located at the northeastern part of Hong Kong, was the second control point. It is the main BCP gateway to connect to places in eastern Guangdong province. Lok Ma Chau BCP is the busiest road control point and is in operation 24 hours a day. In 2016, the daily average number of vehicles crossing this BCP was around 23,726. Located in the southwestern corner of Shenzhen, Shenzhen Bay BCP is one of four road crossings and the newest BCP (commissioned in 2007). It is the first BCP to have immigration and customs clearances for both Hong Kong and mainland in the same terminal building. On average, the daily traffic volume through the four BCPs is about 42,000 vehicle trips (Figure 2). In

addition to these four existing BCPs, a fifth, Liantang BCP, is under construction, and is expected to be commissioned in 2018 at the earliest. In 1978, there were only three control points (Lo Wu, Man Kan Kam To, and the airport). Today, the number of control points between the Chinese mainland and Hong Kong has reached 12 (Figure 3): four road-based BCPs, three rail-based BCPs, four ferry terminal CPs, and one air-based BCP.

Figure 1. Control Points between Hong Kong and Chinese mainland

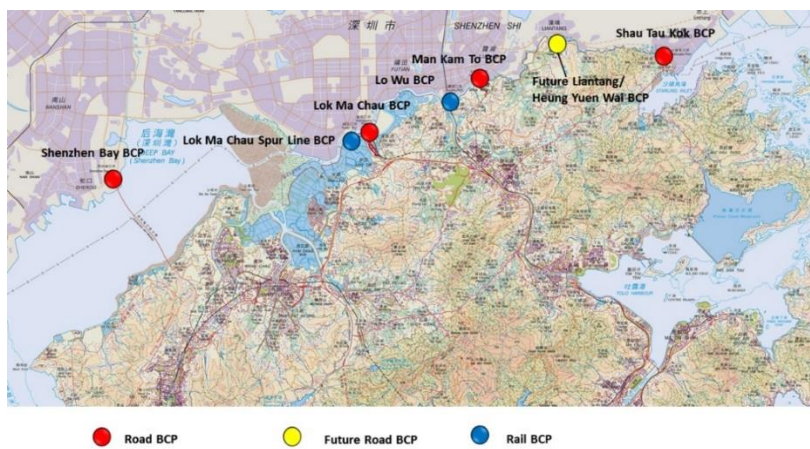
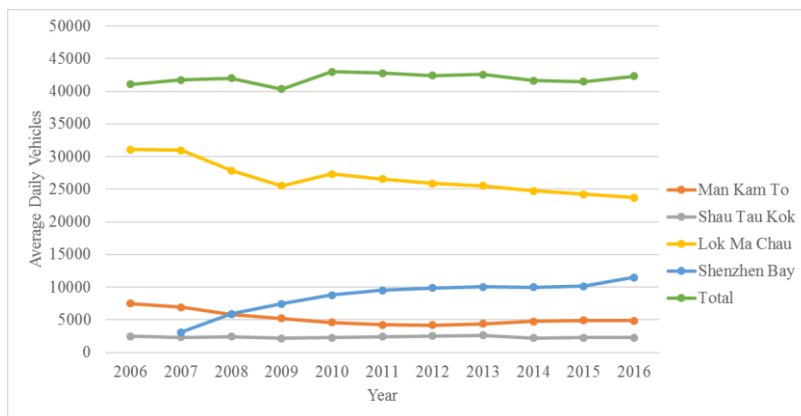
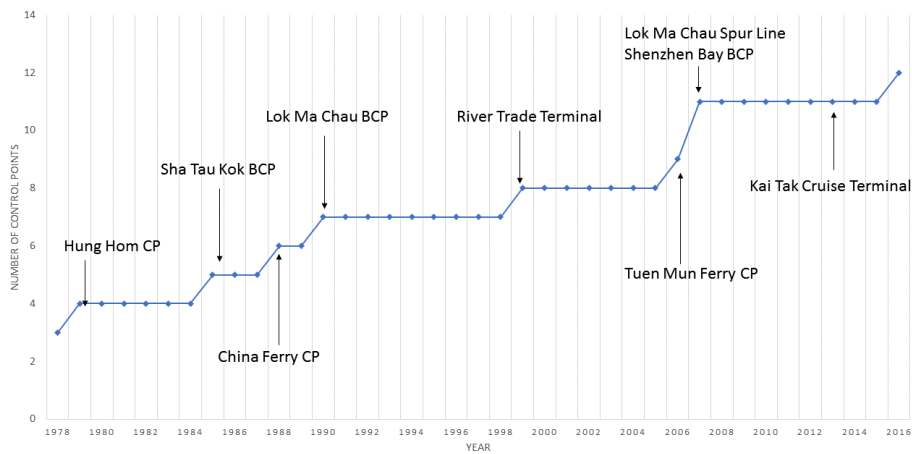


Figure 2. Average Daily Vehicles through Various Control Points



Source: Transport Department, Hong Kong

Figure 3. Control Points between Hong Kong and Chinese mainland



Hong Kong serves as a regional hub and is southeast Asia’s gateway to China. Hong Kong’s airport is connected to most urban cities in China and throughout the world. More than a hundred airlines and a thousand flights take off and land at the Hong Kong airport every day. According to the Airport Authority Hong Kong, air cargo and passengers increased by 3.2% and 2.9% to 4.52 million tons and 70.5 million passengers, respectively, in 2016. In addition, Hong Kong is linked to 45 Chinese cities and there are more than 1,600 direct flights between Hong Kong and the Chinese mainland every week (Table 4). Shanghai, Beijing, and Hong Kong are the busiest regional hubs; there are about 500 scheduled flights between Hong Kong and Shanghai every week and around 300 weekly schedule flights between Hong Kong and Beijing.

Table 4. The Weekly Direct Flights between Hong Kong and Chinese mainland

Destination	Shanghai	Beijing	Hangzhou	Xiamen	Chengdu	Nanjing	Fuzhou
Number of flights	496	280	88	84	70	68	42
Destination	Jinjiang	Chongqing	Ningbo	Haikou	Kunming	Wuhan	Tianjin
Number of flights	42	42	41	38	37	36	34
Destination	Wuxi	Xi'an	Guangzhou	Sanya	Qingdao	Wenzhou	Dalian
Number of flights	28	28	28	24	20	18	14
Destination	Guiyang	Changsha	Zhanjiang	Zhengzhou	Nanning	Nanchang	Guilin
Number of flights	14	14	14	14	8	8	6
Destination	Shenyang	Yiwu	Xuzhou	Meixian	Taiyuan	Wuyishan	Changchun
Number of flights	6	4	4	4	4	4	4
Destination	Hefei	Jinan	Beihai	Datong	Hohhot	Yantai	Lanzhou
Number of flights	0	0	0	0	0	0	0
Destination	Luoyang	Shantou	Yancheng				
Number of flights	0	0	0				

Source: Computed based on the statistics of Hong Kong International Airport in November 2017

3.2. Demographic Perspective

Hong Kong is characterized by substantial ethnic homogeneity. Over 92% of Hong Kong residents are Chinese (Table 5). In the 1960s, the total population of Hong Kong was only 3.1 million, but the figure had increased to 7.4 million by 2016. During these 50 years, a large number of immigrants have arrived from various parts of the Chinese mainland, especially from Guangdong province and Southern China. Migration has changed the demographic makeup of Hong Kong. In 1981, about 40% of the population was born on the Chinese mainland or in Taiwan and Macao (Table 6). This dropped slightly to 31% in 2016. Since July 1, 1997, about 150 eligible people from the mainland have been reunited with family in Hong Kong every day. About half of the migrants came to live with their spouses and half have been reunited with their parents; only a small number relocated to be with their children.

After the 1997 Asian financial crisis, the Hong Kong government introduced various migration schemes (e.g., Quality Migrant Admission Scheme (QMAS), Admission Scheme for Mainland Talents and Professionals (ASMTF)) to attract talented people from the Chinese mainland to Hong Kong. All of these schemes facilitate the cultural homogeneity and social interconnectedness of the Chinese mainland and Hong Kong. As many Hong Kong residents originate from the Chinese mainland, Hong Kong society shares its cultural values, language, norms, and characteristics with many southern Chinese cities. Many Hong Kong residents have relatives, family, and friends on the Chinese mainland.

Table 5. Ethnicity of Hong Kong

Ethnicity\Year	2001	2006	2011	2016
Chinese	94.9%	95.0%	93.6%	92%

Source: Hong Kong Census and Statistic Department

Table 6. Place of Birth

Place \ Census Year	1981	1986	1991	1996	2001	2006	2011	2016
Hong Kong	57.2%	59.4%	59.8%	60.3%	59.7%	60.3%	60.5%	60.7%
The mainland of China/ Macao/ Taiwan	39.6%	37.0%	35.6%	33.7%	33.7%	33.5%	32.1%	31.0%
Elsewhere	3.2%	3.6%	4.6%	6.0%	6.6%	6.2%	7.4%	8.4%

Source: Hong Kong Census and Statistic Department

As shown in Table 7, Cantonese is the most common language/dialect spoken in Hong Kong; nearly 90% of total population report it as their main language. The ability to speak Mandarin has become more common in the last three decades. The proportion of the population who can speak Mandarin, either as a first or second language, increased from

18.1% in 1981 to 25.3% in 1996 before the transfer of sovereignty from the United Kingdom to China; this had increase to 48.6% by 2016 (Table 8), nearly doubling in two decades. This trend may reflect the frequent interaction and business transactions between Hong Kong and the Chinese mainland in recent years.

Table 7. Usual Language/dialect in Hong Kong

Usual language \ Year	1991	1996	2001	2006	2011	2016
Cantonese	88.7%	88.7%	89.2%	90.8%	89.5%	88.9%
Putonghua	1.1%	1.1%	0.9%	0.9%	1.4%	1.9%
Other Chinese dialects	7%	5.8%	5.5%	4.4%	4%	3.1%
English	2.2%	3.1%	3.2%	2.8%	3.5%	4.3%
Other languages	1%	1.3%	1.2%	1.1%	1.6%	1.9%

Table 8. Ability of Speaking Selected Languages in Hong Kong

Able to speak selected language \ Year	1991	1996	2001	2006	2011	2016
Cantonese	95.8%	95.2%	96.1%	96.5%	95.8%	94.6%
Putonghua	18.1%	25.3%	34.1%	40.2%	47.8%	48.6%
English	31.6%	38.1%	43.0%	44.7%	46.1%	53.2%

Source: Hong Kong Census and Statistic Department

3.3. Economic Perspective

The economy of Hong Kong has been primarily determined by its close relationship with the Chinese mainland. The close economic partnership between Hong Kong and the Chinese mainland can be divided into four phases: Pre-1949 economic development, 1949–1978 Post-war industrialization, 1978–1997 Chinese Economic Reform, and Post-1997 transfer of sovereignty.

Pre-1949 economic development

After the treaty of Nanking between the United Kingdom and China (formerly known as the Qing dynasty), Hong Kong became a colony of the United Kingdom. It quickly became a

regional financial center in which many shipping, merchant, and banking companies (e.g., HSBC, Jardine Matheson) located their regional headquarters. During the Japanese invasion from 1941 to 1945 and the Chinese civil war between 1945 and 1949, Hong Kong suffered from a slowdown in economy activities and world trade.

1949–1978 post-war industrialization

In 1949, the new China (i.e., the People's Republic of China) was isolated by the international community, partly because of its ideology and partly because of the embargoes imposed by the United Nation and Western countries around 1950. During this period, Hong Kong played a major role in linking China to the world. Industrialization accelerated due to the influx of refugees, entrepreneurs, and capital fleeing the Cultural Revolution on the Chinese mainland. The Hong Kong economy experienced rapid growth. Many small and medium-size enterprise (SME) were established to export manufactured products (e.g., garments and textiles) to the global market. At the same time, the low taxes and the government's laissez-faire and free trade policies encouraged the inflow of capital and provided a favorable environment for international trade and foreign investment.

1978 – 1997 Chinese economic reform

In 1978, China adopted an open-door policy towards international trade and investment. The economic integration between Hong Kong and the Chinese mainland became closer and accelerated as Hong Kong regained its gateway position between the Chinese mainland and the world. Hong Kong experienced an annual double-digit rise in trade during this period. At the same time, the economic growth also increased manufacturing and labor costs in Hong Kong. Many firms moved their labor-intensive activities to the Chinese mainland, in particular to the Pearl River Delta, to take advantage of cheap labor and land. The Hong Kong economy transformed from a manufacturing economy to a commercial and service economy.

Post-1997 transfer of sovereignty

After its return to China in 1997, the Hong Kong economy was severely affected by the Asian financial crisis and the outbreak of SARS in 2003. To financially stimulate the economy, the mainland and Hong Kong signed the Closer Economic Partnership Arrangement (CEPA), a free trade agreement between the mainland and Hong Kong under the one country two systems policy. CEPA covers four aspects of the economy: free trade in goods, free trade in services, investment, and economic and technical cooperation. CEPA has strengthened trade and investment and fostered economic integration, increasing the intensity of the long-term economic integration of Hong Kong and the Chinese mainland. One of the prominent features of CEPA is the implementation of zero import tariffs for selected products between the Chinese mainland and Hong Kong. Starting in 2004, there have been zero import tariffs on 374 tariff codes, increasing to 1,087 and 1,254 zero tariff codes in 2005 and 2006, respectively. By 2016, there were 1,823 zero tariff codes under the CEPA agreement.

3.4. Trade between the Chinese mainland and Hong Kong

3.4.1. Domestic exports to the mainland

Hong Kong and the Chinese mainland have maintained a close trade partnership for many years. Over the past decades, the mainland has been the largest destination for exports and the largest supplier of imports to Hong Kong. In the early 1960s, many immigrants from different regions of China immigrated to Hong Kong. They brought substantial capital, advanced technology, and modern management, prompting the growth of the manufacturing industry in Hong Kong. After the Chinese Economic Reform in 1978, many Hong Kong domestic products were exported to the Chinese mainland. According to Hong Kong Census and Statistic Department, domestic exports to the mainland have registered an overall upward trend, with the value increased substantially from \$81 million in 1978 to \$63 billion in 1993

(Figure 4). In 1993, the Chinese mainland replaced the USA as the largest destination for Hong Kong's domestic exports (Figure 5).

Figure 4. Changes in Hong Kong's Domestic Exports to Chinese Mainland

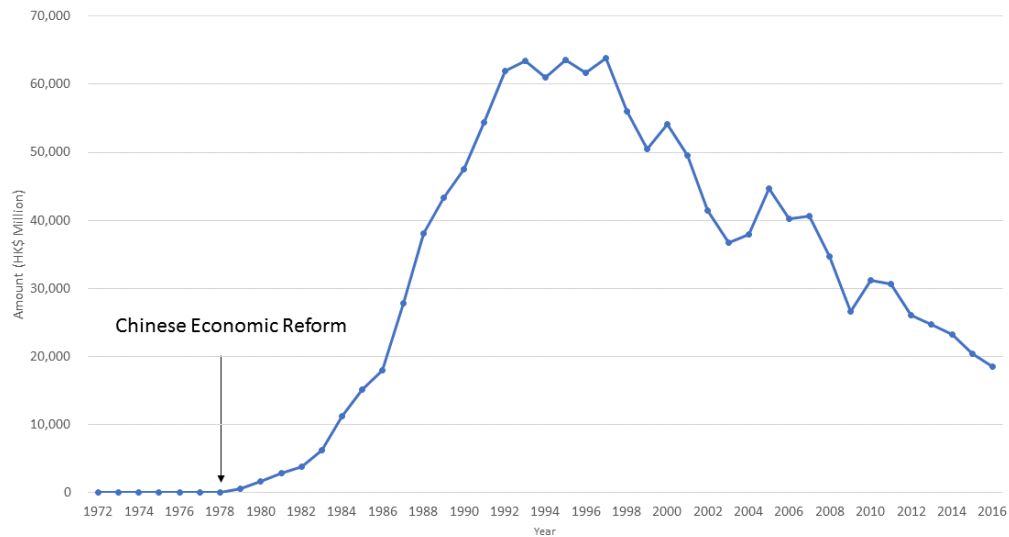
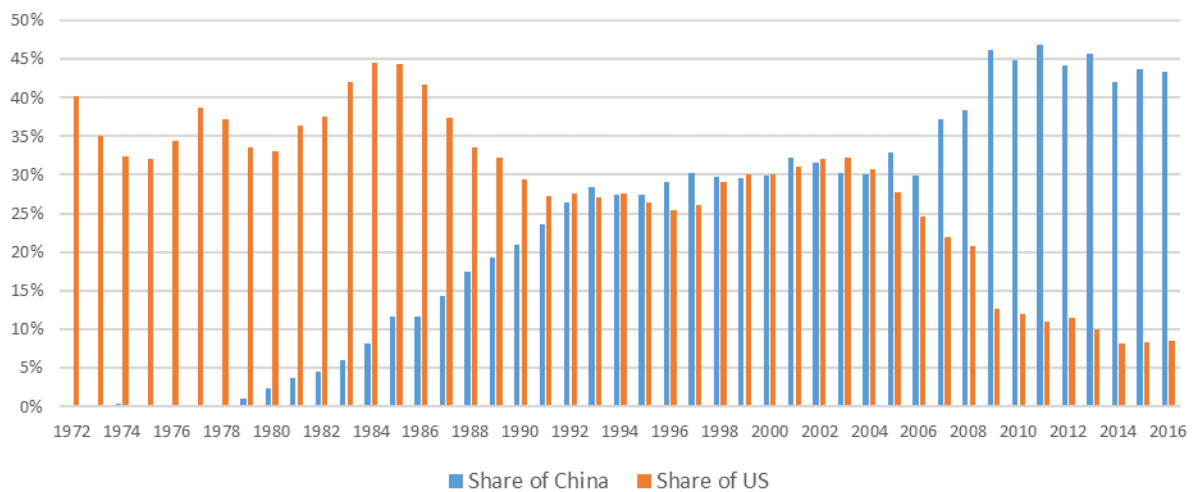


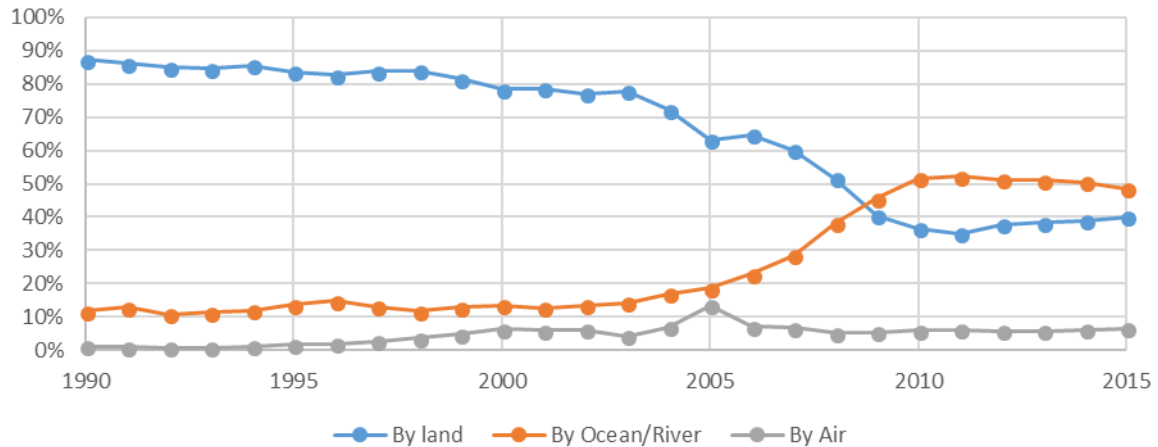
Figure 5. Share of Hong Kong's Domestic Exports



At the same time, Hong Kong manufacturing firms were challenged by high land costs, a shortage of labor, and fierce competition from nearby countries. Manufacturers started to move to the Pearl River Delta to take advantage of lower land and labor costs. Thereafter, Hong Kong transformed from a manufacturing economy to a service economy. The volume of domestic exports to the Chinese mainland decreased year by year. In the earlier periods,

domestic exports to China were transported by land, but this was replaced by ocean or river transport in late 2000s (Figure 6).

Figure 6. Domestic Exports by Mode of Transportation



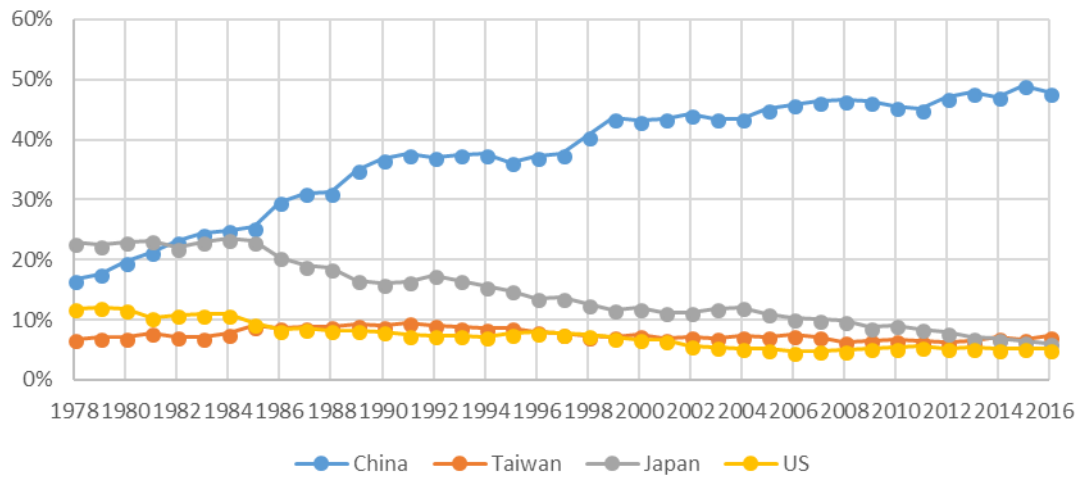
Source: Hong Kong Census and Statistic Department

3.4.2. Imports from the mainland

The mainland is the major importer to Hong Kong. The value of Hong Kong’s imports from the Chinese mainland increased substantially from \$10.6 billion to \$1,916.8 billion from 1978 to 2016. Year-on-year changes in the value of Hong Kong’s imports from mainland China have been mainly positive over the last three decades, representing an average annual growth of 15.9%. The Chinese mainland was the second largest importer prior to China’s open door policy in 1978. It surpassed Japan in 1984, when it became the largest supplier of imports to Hong Kong (Figure 7). The Chinese mainland accounted for an average of 45% of Hong Kong’s imports in the post-1997 period. Most of the imports from the mainland are re-exported to other places, and only 10% are retained for domestic use. Most of the retained products are necessary goods such as foodstuffs, water, and consumer goods. At present, over

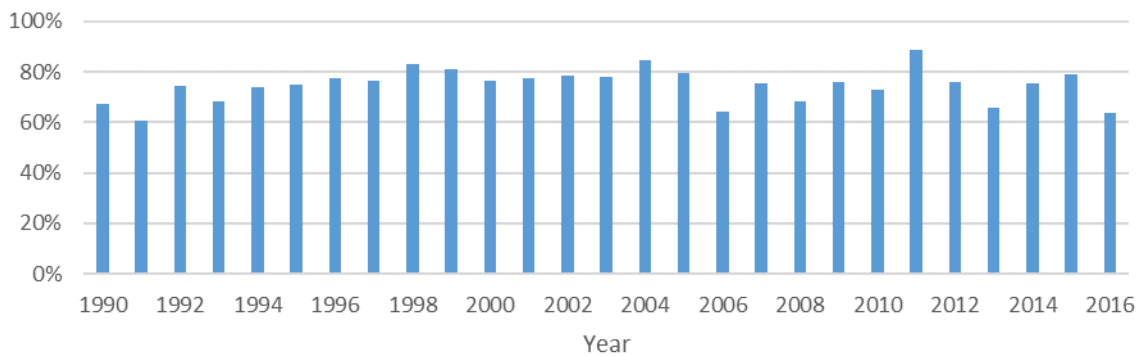
80% of Hong Kong’s fresh meat (e.g., pork and beef) comes from the Chinese mainland, and over 60% of the water is imported from Guangdong province (Figure 8).

Figure 7. Major Suppliers of Hong Kong’s Import from 1978 to 2016



Source: Hong Kong Census and Statistic Department

Figure 8. Water Supply from Guangdong Province



Source: Water Supplies Department

3.4.3. Hong Kong’s re-exporting from/to the Chinese mainland

Hong Kong has long been an entrepot for trade with the Chinese mainland and this remains the most important pillar of Hong Kong’s economy. During the 1978 to 2016 period, the value of Hong Kong’s re-exports increased substantially from 13 billion in 1978 to 3,545

billion in 2016, representing an average annual growth rate of 17.44%. At the same time, the share of re-exports from the mainland rose from 27.7% to 58.8%, with an annual growth rate of 20.35 (Table 9). Under China's open door policy, Hong Kong played a significant role in re-exporting China's manufactured goods to the world. This cross-border strategy is known as "store in front, factory in back." Surprisingly, in the early 1990s, about 7% of Hong Kong's re-exports from the mainland were re-exported back to mainland. This interesting phenomenon can be explained by the city's outward processing activities. Many capitalists moved their production plants to Guangdong province to enjoy cheap labor and land. However, they retained essential manufacturing processes in Hong Kong. Therefore, they exported the semi-manufactured items to Hong Kong for processing and merchandizing. After the products were processed and assembled, they were imported back to the Chinese mainland for sale or post-processing. In the 1978 to 1997 period, the average annual growth rate of Hong Kong's re-exports from Chinese mainland was 33.90%. This figure decreased substantially to 6.09% during the 1998 to 2016 period, partly because of the maturation of the manufacturing process in China's production plants, and partly because of the improvement of ports and shipping processes in China.

Table 9. The Value and Share of Hong Kong's Re-export of the Chinese mainland

Year	Re-export from Chinese mainland (in \$ Million)	Re-export to Chinese mainland (in \$ Million)	Total re-export (in \$ Million)	Share of re-export of the Mainland Origin	Share of re-export of the Mainland Destination
1978	3,659	214	13,197	27.73%	1.62%
1979	5,663	1,315	20,022	28.28%	6.57%
1980	8,394	4,642	30,072	27.91%	15.44%
1981	12,834	8,044	41,739	30.75%	19.27%
1982	14,694	7,992	44,353	33.13%	18.02%
1983	19,680	12,183	56,294	34.96%	21.64%
1984	28,107	28,064	83,504	33.66%	33.61%
1985	34,628	46,023	105,270	32.89%	43.72%
1986	51,597	40,894	122,546	42.10%	33.37%
1987	84,266	60,170	182,780	46.10%	32.92%
1988	131,525	94,895	275,405	47.76%	34.46%
1989	188,271	103,492	346,405	54.35%	29.88%
1990	240,410	110,908	413,999	58.07%	26.79%
1991	315,689	153,318	534,841	59.02%	28.67%
1992	403,782	212,105	690,829	58.45%	30.70%
1993	474,007	274,561	823,224	57.58%	33.35%
1994	545,831	322,835	947,921	57.58%	34.06%
1995	636,392	384,043	1,112,470	57.21%	34.52%
1996	683,514	417,752	1,185,758	57.64%	35.23%
1997	723,416	443,878	1,244,539	58.13%	35.67%
1998	691,219	407,366	1,159,195	59.63%	35.14%
1999	720,126	399,188	1,178,400	61.11%	33.88%
2000	849,517	488,823	1,391,722	61.04%	35.12%
2001	808,370	496,574	1,327,467	60.90%	37.41%
2002	863,967	571,870	1,429,590	60.43%	40.00%
2003	967,104	705,787	1,620,749	59.67%	43.55%
2004	1,135,469	850,645	1,893,132	59.98%	44.93%
2005	1,313,211	967,923	2,114,143	62.12%	45.78%
2006	1,461,292	1,115,941	2,326,500	62.81%	47.97%
2007	1,597,770	1,267,722	2,578,392	61.97%	49.17%
2008	1,707,696	1,335,687	2,733,394	62.48%	48.87%
2009	1,503,319	1,236,577	2,411,347	62.34%	51.28%
2010	1,820,964	1,566,999	2,961,507	61.49%	52.91%
2011	2,015,046	1,716,656	3,271,592	61.59%	52.47%
2012	2,104,417	1,831,732	3,375,516	62.34%	54.27%
2013	2,159,878	1,924,463	3,505,322	61.62%	54.90%
2014	2,168,329	1,955,821	3,617,468	59.94%	54.07%
2015	2,163,034	1,916,082	3,558,418	60.79%	53.85%
2016	2,085,504	1,924,906	3,545,372	58.82%	54.29%

Source: Hong Kong Census and Statistic Department

3.4.4. Outward processing activities

Since the late 1980s, many Hong Kong firms have relocated their manufacturing plants to the mainland. As a result, outward processing activities have become prominent. Nowadays, outward processing activities play a significant role in Hong Kong's trade with the Chinese mainland. A common outward processing procedure is to export raw materials or semi-manufactured items to China for processing, with a contractual arrangement for subsequent re-importation of the processed goods to Hong Kong. Table 10 presents the value and proportion of outward processing trade in the 1990–2016 period. The value of the outward proportion of Hong Kong's total exports to the mainland dropped gradually from 58.8% in 1990 to 27.6% in 2016, and that of re-exports of mainland origin to other places increased gradually from 74.1% in 1991 to 88.4% in 1997. Thereafter, it decreased gradually to 70.7% in 2016. According to the Hong Kong Statistics Department, over 95% of outward processing activities happen in the Guangdong province. In particular, Dongguan and Shenzhen are the major locations for outward processing work. Even after the recent upgrading of the manufacturing base in the Pearl River Delta, the amount of outward proportion activities involving trade is still high.

Table 10. Values and Proportion of Outward Processing Trade

Year	Total exports to the mainland		Imports from the mainland		Re-exports to the mainland	
	Value	Proportion	Value	Proportion	Value	Proportion
1990	91914	58.80%	145103	61.80%	NA	NA
1991	113931	55.50%	197384	67.60%	221450	74.10%
1992	141639	52.40%	254013	72.10%	299833	78.30%
1993	160178	47.90%	295203	73.80%	364536	80.80%
1994	181179	47.70%	354912	75.90%	422544	82%
1995	217613	49%	399567	74.40%	492461	82.20%
1996	222324	46.90%	452890	79.90%	522822	86%
1997	244,886	48.60%	491,142	81.20%	595,511	88.40%
1998	221,273	48.10%	477,743	82.70%	559,726	87.60%
1999	235,586	52.60%	487,507	80.50%	570,126	86.60%
2000	282,233	52.00%	567,000	79.30%	647,338	85.10%
2001	259,553	47.50%	531,960	78.00%	578,329	82.20%
2002	277,650	45.30%	531,034	74.00%	594,708	82.50%
2003	326,147	43.90%	564,933	71.70%	603,592	79.50%
2004	386,435	43.50%	661,543	72.00%	685,147	79.30%
2005	388,482	38.40%	691,979	65.90%	756,579	79.30%
2006	409,941	35.50%	769,317	64.50%	814,793	80.70%
2007	451,533	34.50%	779,994	58.60%	841,048	78.40%
2008	470,964	34.40%	789,039	55.90%	792,221	70.10%
2009	425,243	33.70%	623,155	49.90%	641,812	68.10%
2010	519,139	32.50%	762,410	49.80%	811,996	72.90%
2011	556,100	31.80%	803,975	47.40%	884,057	72.60%
2012	586,033	31.50%	763,560	41.50%	895,635	74.20%
2013	595,623	30.60%	712,138	36.60%	866,406	71.90%
2014	580,429	29.30%	755,070	38.00%	898,420	71.50%
2015	552,166	28.50%	788,657	39.70%	907,553	71.80%
2016	536,187	27.60%	755,217	39.40%	870,540	70.70%

Source: Hong Kong Census and Statistic Department

3.4.5. Trade in services

Hong Kong underwent a remarkable transformation to a service economy over the last two decades. Travel, transport, and financial services are the three largest components of the service sector. Mainland China has been the most important service trading partner with Hong Kong in the past decade. For instance, Hong Kong exports 310.8 billion (contributing 39.8%) and imports \$221.7 billion (contributing 38.9%) worth of services with the mainland. Travel was the largest component in 2015, representing \$221.5 billion and a 71.3% share of the market (Table 11). This next largest was transport, valued at \$48 billion in 2015 (15.5%). At the same time, Hong Kong imported \$90 billion of services from the Chinese mainland, which constituted 40.6% of the total service imports in 2015. Over the past two decades, Hong Kong has recorded 16 consecutive years of deficits (1995–2011) in the trade of services. The situation has improved since 2011.

Under CEPA, the Chinese mainland and Hong Kong reached an agreement in 2014 to achieve basic liberalization of trade in services with Guangdong (Guangdong Agreement). This was followed in 2016 by the Agreement on Trade in Services, which extends the coverage of the 2014 agreement from Guangdong to all mainland cities. In 2015, the Hong Kong's trade surplus with the Chinese mainland (i.e., net exports of service) was \$89 billion. These figures might be due to the numerous restrictions on Hong Kong entry permits imposed by the Chinese government in the early years. After the introduction of the Individual Visit Scheme and the extension of the “one-year multiple-entry” and “one trip per week” individual visit endorsements for selected cities, the exports of services (especially travel) has increased gradually.

Table 11. Trade in Services between Hong Kong and Chinese Mainland

Year	Total exports and imports of services	Export to mainland (HK\$ million)	Import to mainland (HK\$ million)	Net exports of services	Share of Export services (%)	Share of Import of services (%)
1995	492,016	34,265	152,472	-118,207	16.2	54.4
1996	545,642	36,421	173,985	-137,564	15.5	56.1
1997	554,297	40,430	190,915	-150,485	17.8	58.3
1998	536,950	44,218	197,727	-153,509	21.5	59.7
1999	535,275	43,102	198,336	-155,234	20.2	61.6
2000	578,655	44,089	212,210	-168,121	18.9	61.4
2001	571,551	46,966	207,185	-160,219	20.4	60.7
2002	590,148	63,256	200,403	-137,147	25.4	58.7
2003	592,625	69,202	191,394	-122,192	27.0	56.9
2004	703,544	78,912	213,720	-134,808	25.2	54.8
2005	795,154	87,116	243,449	-156,333	24.3	55.8
2006	906,421	94,059	281,709	-187,650	22.8	57.0
2007	1,024,740	115,976	289,686	-173,710	23.7	54.2
2008	1,093,500	129,129	291,550	-162,421	24.3	51.8
2009	960,079	139,440	223,445	-84,005	28.5	47.4
2010	1,160,184	185,577	252,482	-66,905	30.1	46.4
2011	1,269,119	234,137	250,092	-15,955	33.8	43.5
2012	1,325,989	269,358	252,883	16,475	36.6	42.8
2013	1,361,845	317,151	235,908	81,243	40.6	40.7
2014	1,369,828	321,650	216,521	105,129	40.2	38.0
2015	1,351,274	310,792	221,651	89,141	39.8	38.9

Source: Hong Kong Census and Statistic Department

3.5. Direct Investment between Chinese Mainland and Hong Kong

The Chinese mainland has long been an important destination of direct investment from Hong Kong. During the 1998–2015 period, the mainland received \$41,146 billion in direct investment from Hong Kong (Table 12). In 2015, Hong Kong’s outward direct investment was \$11,869 billion. In addition to offshore financial centers, the mainland is the largest destination for Hong Kong’s outward direct investment; it accounts for 39.61% of Hong Kong’s direct investment. Guangdong province in particular is a popular location, accounting for 30% of Hong Kong’s total outward direct investment position. The total outflow to the mainland in 2015 was 306.6 billion. Some Hong Kong firms have established subsidiaries or increased their investment in China. Some of this outflow is due to the substantial operating profits of non-resident firms that was not distributed to the parent companies in Hong Kong, but reinvested in the mainland.

At the same time, enterprises based in the Chinese mainland such as the Bank of China, China Travel Service Group, and China Merchant Group have invested in and set up subsidiaries in Hong Kong for many years. During the 1998–2015 period, mainland enterprises invested \$36,897 billion in Hong Kong. The share of position of inward direct investment from the mainland increased from 12.6% in 1998 to 41% in 2007, and then dropped to 26.5% in 2015. At the end of 2015, the position of Hong Kong’s inward direct investment was \$12,335.9 billion. In addition to offshore financial centers, the Chinese mainland was the major source of inward direct investment, constituting \$3,270.3 billion, which was 26.5% of the inward direct investment. At the same time, the inflow from the mainland was \$200.8 billion. This inflow was from the operating profits of Hong Kong firms that were not distributed to direct investors but retained as reinvested earnings.

Table 12. Direct Investment between Hong Kong and Chinese Mainland

Year	Position				Flow			
	Outward to Chinese mainland (HK\$ billion)	Share (%)	Inward from Chinese mainland (HK\$ billion)	Share (%)	DI outflow to mainland	Share (%)	DI inflow from mainland	Share (%)
1998	534.3	32.02%	205.9	12.65%	51.6	44.56%	19.1	20.11%
1999	608.1	24.84%	805.6	26.62%	69.1	42.92%	30.4	16.39%
2000	991.2	33.52%	1,095.0	32.26%	335.3	79.59%	85.1	20.01%
2001	812.4	29.96%	928.0	29.67%	103.7	73.65%	74.8	33.01%
2002	812.4	33.98%	571.1	23.24%	94.7	92.21%	4.8	16.78%
2003	899.6	33.43%	747.2	26.47%	56.3	59.96%	35.3	25.43%
2004	1,161.4	36.60%	979.5	29.51%	137	40.32%	57.3	25.23%
2005	1,425.9	38.62%	1,222.0	31.92%	132.4	63.05%	79.3	29.94%
2006	2,055.7	38.87%	1,967.6	35.97%	173	50.07%	119.6	36.82%
2007	3,363.8	41.90%	3,677.3	41.06%	277.3	55.39%	113	24.80%
2008	2,552.7	42.86%	2,250.9	37.08%	200.3	53.17%	183	40.30%
2009	2,682.2	41.21%	2,603.6	37.12%	201.8	43.97%	214.8	49.90%
2010	3,014.7	41.08%	3,127.1	37.68%	289.5	43.20%	288.2	52.59%
2011	3,346.4	42.11%	3,042.8	36.32%	393.1	52.42%	318.1	42.31%
2012	3,671.1	40.74%	3,568.3	36.99%	296.6	45.84%	232.7	42.75%
2013	3,952.3	41.09%	3,341.6	31.88%	396.9	63.35%	46.6	8.09%
2014	4,560.0	40.54%	3,493.5	30.11%	637.9	66.30%	221.8	25.31%
2015	4,701.8	39.61%	3,270.3	26.51%	306.6	55.07%	200.8	14.86%

Source: Hong Kong Census and Statistic Department

3.6. Offshore RMB Business in Hong Kong

The offshore Renminbi (RMB) has undergone significant growth since the initiation of cross-border trade in RMB between Hong Kong and the Chinese mainland in 2009. According to HKMA, RMB deposits in Hong Kong increased 2.6 times within the first five years, growing from around RMB 320 billion in 2010 to 1,160 billion in 2014. The IMF figures show that Hong Kong held nearly half of the RMB offshore deposits in the world at the end of 2014. At the end of 2017, the deposits eased back to RMB 618 billion. For

offshore RMB financing, the outstanding balances of RMB loans and bonds peaked at the end of 2014, reaching 297 billion RMB in loans and 368 billion RMB in bonds (Table 13). However, the strength of the US dollar has increased the volatility of the exchange rates of the RMB. The decline in the importance of the RMB as a global payment currency also led to the drop in the amount of outstanding RMB loans and bonds in Hong Kong. Nevertheless, Hong Kong acts as a financial service gateway by connecting mainland's investment needs and to global financial services.

Table 13. Offshore RMB business in Hong Kong

Year	RMB deposits (including RMB certificates of deposit)	Outstanding RMB loans	Outstanding RMB bonds
2010	321		
2011	661	31	147
2012	720	79	237
2013	1053	116	310
2014	1168	188	381
2015	1020	297	368
2016	620	295	319
2017	618	145	212

Source: Hong Kong Monetary Authority

3.7. Flow of People

The social-economic ties between the Chinese mainland and Hong Kong have led to significant growth in cross-boundary travel. Since the Chinese mainland and Hong Kong signed a free trade agreement, CEPA, in 2003, both sides have enriched and broadened their economic partnership; they have signed ten supplements and two more agreements, liberalizing the market and strengthening trade and investment partnerships. This has led to immense changes in the social and economic landscapes of Hong Kong and Guangdong Province.

Prior to 2003, residents of mainland China could only visit Hong Kong using business visas or by joining tours. Under CEPA, Hong Kong and the Chinese government launched the Individual Visit Scheme to boost the economy of Hong Kong on July 28, 2003. The scheme allows residents from the Chinese mainland to visit Hong Kong on an individual basis. Since 2003, the Scheme has been expanded to 49 cities covering all of Guangdong province and the major cities in China (Table 14). In 2009, the “one-year multiple-entry” Individual Visit Endorsements to Hong Kong program was implemented in Shenzhen. In 2015, this was changed to the “one trip per week” Individual Visit Endorsements program.

Table 14. Chinese Cities Covered under the Individual Visit Scheme

Effective Date	Cities
28 July 2003	Donnguan, Zhongshan, Jiangmen, Foshan
20 August 2003	Guangzhou, Shenzhen, Zhuhai, Huizhou
1 September 2003	Beijing, Shanghai
1 January 2004	Shantou, Meizhou, Zhaoqing, Qingyuanb, Chaozhou and Yunfu
1 May 2004	Shaoguan, Heyuan, Shanwei, Yangjiang, Zhangjiang, Maoming, and Jieyang
1 July 2004	Hangzhou, Ningbo, Taizou, Nanjing, Suzhou, Wuxi, Fuzhou. Xiamen, and Quanzhou
1 March 2005	Tianjin and Chongqing
1 November 2005	Chengdu, Dalian, Shenyang, Jinan
1 May 2006	Nanchang, Changsha, Nanning, Haikou, Guiyang, and Kunming
1 January 2007	Shijiazhuang, Zhengzhou, Changchun, Hefei, and Wuhan
1 April 2009	Shenzhen residents could apply “one-year multiple entry”
13 Apr 2015	The “one-year multiple entry” was superseded by the “one trip per week”

These schemes have encouraged the movement of people from both sides. The number of transactions made by Hong Kong residents visiting the mainland increased from 8 million in 1984 to 74 million in 2016 (Table 15). The figures are even higher for visitors from the Chinese mainland to Hong Kong; the number of mainland visitors rose from 0.2 million in 1984 to 42.8 million in 2016, representing an annual growth rate of 18.93%. While mainland

visitors accounted for only 6.5% of total visitors to Hong Kong in 1984, they accounted for 75.5% of the visitors in 2016. More importantly, the share of total spending by visitors from the Chinese mainland increased dramatically from around 13% in 1993 to almost 80% in 2016 (Figure 9).

Today, the tourism industry in Hong Kong is more economically dependent upon mainland visitors than it was upon visitors from Western countries in the early 1980s. In addition, the movement of people has changed from a one-way trend from Hong Kong to the Chinese mainland to a bi-directional flow. Although leisure trips still constitute the largest share of the passenger trips between Hong Kong and the Chinese mainland, the number of cross-boundary workers and cross-boundary students has increased substantially over the last three decades. The number of cross-boundary workers living in Hong Kong but working in the mainland grew from 7,500 in 1999 to 47,500 in 2015 (Figure 10). The number of cross-boundary students living in the Chinese mainland but traveling across the boundary to go to school in Hong Kong has increased from 910 in 1999 to 27,790 in 2015 (Figure 11). Among these cross-boundary students, around 34% are 5 years old or below, around 52% are between 6 and 11 years old, and the remaining 14% are between 12 and 18 years old.

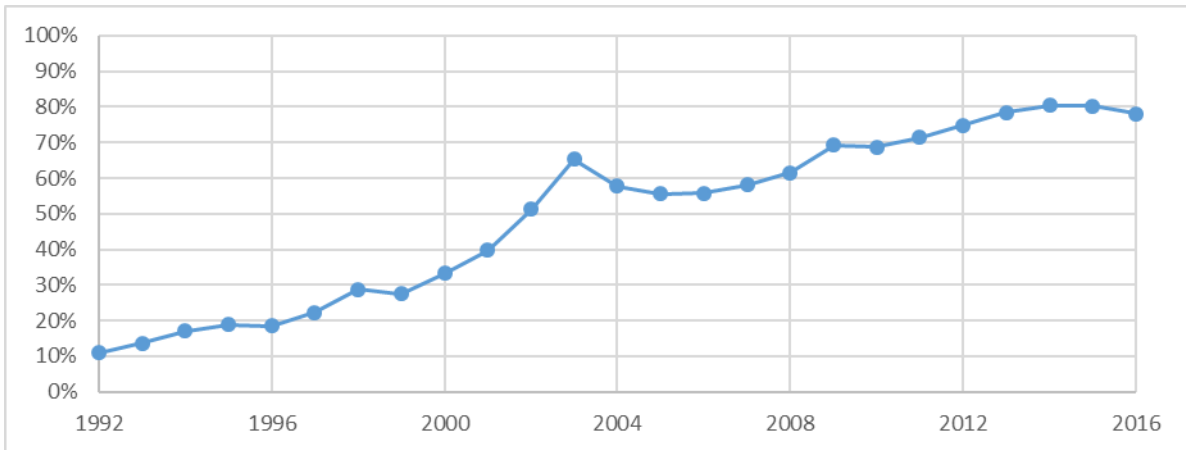
Along with increasing economic integration and interactions between the Chinese mainland and Hong Kong, the number of cross-boundary marriages has increased over the past three decades. According to a 2005 feature article by HKCSD on Hong Kong residents working in the Chinese mainland, the number of Hong Kong residents living in the mainland increased by a factor of five from 42,300 in 1988 to 228,900 in 2005, and they represented 6.8% of the labor force in 2005. The frequent interactions also boosted the number of cross-boundary marriages. The number of cross-boundary marriages increased from 16,451 in 1986 to 22,926 in 2016. Most of these cross-boundary marriages involved Hong Kong male residents marrying female residents from the mainland. There is an increasing trend of male residents from the mainland marrying Hong Kong female residents. The number of such marriages has increased by a factor of 11 from 675 in 1986 to 7,626 in 2016.

Table 15. Movement of People between Chinese Mainland and Hong Kong

Year	Visitors from Hong Kong			Visitors from Chinese mainland		
	Number (in Thousands)	Annual growth rate	Share of visitors	Number (in Thousands)	Annual growth rate	Share of visitors
1984	8,036		63.28%	215		6.50%
1985	10,961	36.39%	69.31%	309	43.81%	8.45%
1986	11,868	8.28%	70.55%	363	17.64%	8.97%
1987	14,089	18.71%	70.66%	485	33.32%	9.86%
1988	16,513	17.21%	71.45%	684	41.07%	11.08%
1989	15,207	-7.91%	69.31%	730	6.85%	12.20%
1990	16,688	9.74%	70.01%	754	3.28%	11.46%
1991	19,057	14.19%	72.41%	875	16.00%	12.88%
1992	21,461	12.62%	74.14%	1,149	31.31%	14.34%
1993	23,195	8.08%	75.65%	1,733	50.82%	19.39%
1994	24,798	6.91%	76.10%	1,944	12.16%	20.83%
1995	26,440	6.62%	76.76%	2,243	15.41%	21.99%
1996	28,792	8.90%	77.52%	2,311	3.03%	19.75%
1997	33,678	16.97%	80.95%	2,297	-0.61%	22.07%
1998	39,140	16.22%	82.24%	2,672	16.30%	26.30%
1999	45,175	15.42%	85.01%	3,206	20.02%	28.30%
2000	50,083	10.86%	85.03%	3,786	18.07%	28.99%
2001	52,003	3.83%	85.12%	4,449	17.51%	32.41%
2002	55,648	7.01%	86.22%	6,825	53.42%	41.20%
2003	52,556	-5.56%	86.25%	8,467	24.06%	54.50%
2004	59,481	13.18%	86.61%	12,246	44.63%	56.15%
2005	62,581	5.21%	86.90%	12,541	2.41%	53.69%
2006	65,338	4.41%	86.53%	13,591	8.37%	53.82%
2007	69,128	5.80%	86.09%	15,486	13.94%	54.97%
2008	69,872	1.08%	85.53%	16,862	8.89%	57.15%
2009	69,961	0.13%	85.53%	17,957	6.49%	60.68%
2010	71,588	2.33%	84.92%	22,684	26.32%	62.96%
2011	71,640	0.07%	84.80%	28,100	23.88%	67.03%
2012	71,708	0.09%	84.38%	34,911	24.24%	71.81%
2013	70,251	-2.03%	83.43%	40,745	16.71%	75.04%
2014	69,717	-0.76%	82.89%	47,248	15.96%	77.66%
2015	72,749	4.35%	82.19%	45,842	-2.98%	77.29%
2016	74,613	2.56%	82.07%	42,778	-6.68%	75.51%

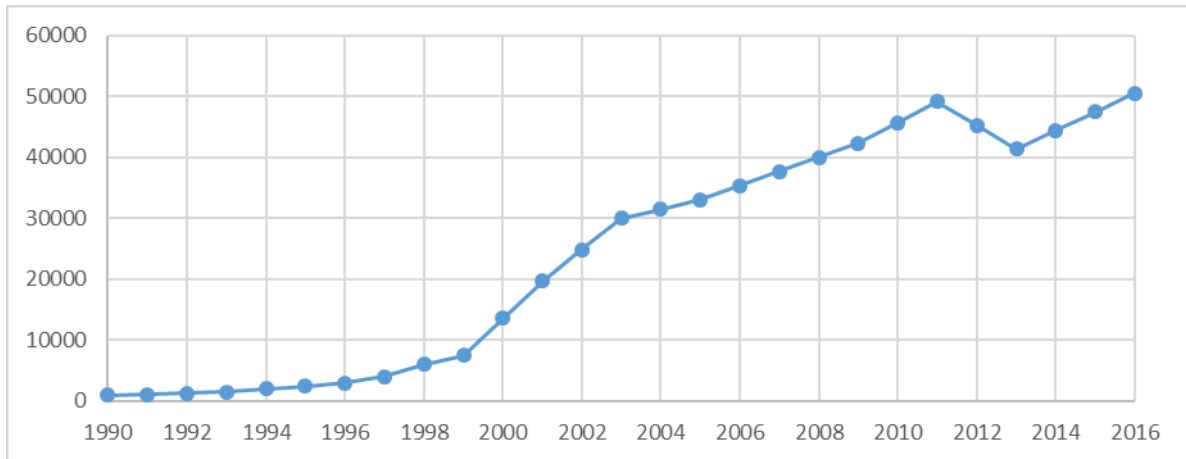
Sources: Hong Kong Tourism Board

Figure 9. Proportion of Spending by Mainland Visitors to Spending of All Visitors



Source: Hong Kong Tourism Board

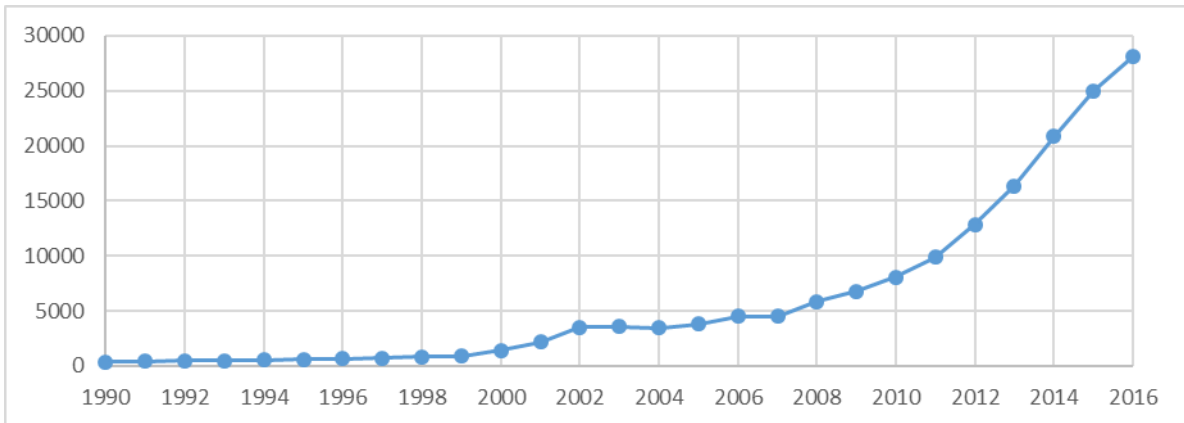
Figure 10. Cross-Boundary Workers



Remarks: Data for missing years are imputed by linear interpolation method.

Source: Planning Department, Hong Kong

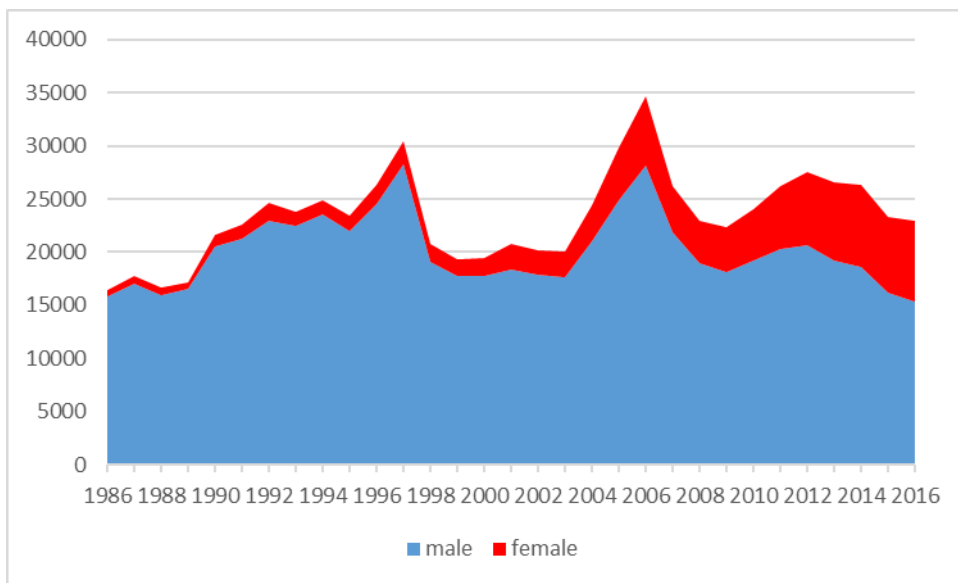
Figure 11. Cross-boundary Students



Remarks: Data for missing years are imputed by linear interpolation method.

Source: Planning Department, Hong Kong

Figure 12. Cross-boundary Marriage



Source: Hong Kong Census and Statistic Department

4. Economic Integration Index

4.1. Definition and Measurement of Economic Integration

To construct an index, we need to define the meaning of economic integration and then decide which areas and indicators are relevant to the measurement. According to economic theory, economic integration occurs when different economies establish a common market by removing restrictions on cross-border economic activities, resulting in the free movement of goods, capital, and people. Different measures of economic integration have been explored, and they can be categorized according to the driving forces, transmission channels, or consequences of integration (Krieger-Boden & Soltwedel, 2013).

The driving forces of integration include the development of institutional arrangements and the advance of technologies that reduce the transaction costs of cross-border economic activities. For example, König and Ohr (2013) used the extent of institutional participation and the level of compliance to measure the degree of integration within the EU. Other measurements in this category such as the level of tariffs and non-tariff barriers, regulation of capital flows, types of visa restrictions, costs of transportation, and international roaming have also been used in some integration indices (e.g., the Globalization Index, KOF Index of Globalization, and A T Kearney/Foreign Policy Magazine Globalization Index).

The second category uses the movement of goods, capital, and people to measure the transmission channels or processes of integration. Indicators include the volume of trade, capital flows, and commutations within the economies (Cheung et al., 2008; Dorrucchi et al., 2015; UNECA, 2016).

The third category measures the consequences of integration, which are grounded in the economic reasoning that the formation of a common market drives the equalization of various aspects of the two economies including the equalization of consumer goods prices, wages, the costs of capital, income levels, production cycles, economic structures, yields of assets, and

correlations of output shocks (Cavoli & Rajan, 2007; B. Chen & Woo, 2010; Cheng & Glascock, 2005; Gerlach-Kristen, 2009; Lei & Tam, 2010; Nieh & Yau, 2004; Tsang & Ma, 2000).

There are also concerns over the challenges integration poses to an economy and society. For example, the stagnant technological progress and declining competitiveness of Hong Kong has been blamed on economic integration (Li et al., 2011; Tsang & Cheng, 1997). Research has also suggested that the economic integration of mainland China and Hong Kong is declining as the Hong Kong-invested labor-intensive industries and producer services on the mainland face fierce competition from local suppliers.

Furthermore, there is evidence that the outflow of people and economic activities from Hong Kong to the mainland during the early years of integration are shifting direction and there is now an inflow of people and economic activity from the mainland to Hong Kong. Consequently, the new opportunities on the mainland that were to provide Hong Kong people, especially the younger generation, with promising careers have been dissipating (Lui, 2014). Recent tensions between mainlanders and the people of Hong Kong created by the inflow of people and capital from the mainland have raised additional concerns about how the public views economic integration (GPG (Global Property Guide), 2009; Yep, 2012).

4.2. Characteristics of the Mainland-Hong Kong Integration

Existing measurements of economic integration are an important resource; however, to construct an index of mainland-Hong Kong integration it is necessary to consider the particular characteristics of the “one country, two systems” context. A review of the literature on the mainland-Hong Kong setting reveals some special features that must be addressed during the construction of the index.

First, unlike the usual type of economic integration, only a small proportion of the

bilateral trade between the mainland and Hong Kong involves finished products, which signals a relatively weak integration of the goods market. The mainland-Hong Kong integration is characterized by a division of labor in a cross-border regional production system in which intermediate goods are the major component of the bilateral trade. The raw materials and end products are mostly imported from and exported to other countries. Only a very small proportion of the imports coming from the mainland are retained in Hong Kong (Ash & Kueh, 1993). Accordingly, we disaggregate the measures of trade volume into domestic exports, import from the mainland, and re-export to the mainland to ensure a more accurate measurement of the nature and type of integration between the Chinese mainland and Hong Kong.

Second, several authors have pointed out that the economic integration of the mainland and Hong Kong that began in the 1980s was not initiated through institutional arrangements between the governments of the two economies, as has been the case with most models of integration. Rather, integration was driven by the economic motives of private enterprises (Y. W. Sung, 1992; Zhang, 2005). Institutional initiatives, such as CEPA, the Individual Visiting Scheme, and the Shanghai-Hong Kong stock market connection, appeared only after the 2000s. Therefore, measurements of the driving forces defined by the institutional participants and levels of compliance (like the EU Index) largely underestimate the degree of economic integration in this case.

Third, integration between the Chinese mainland and Hong Kong is characterized by its asymmetry. Hong Kong is a globalized economy that is tightly integrated with the world; there are almost no restrictions on the movement of goods, capital, and labor. In contrast, the mainland is still transforming from a closed economy to an open economy with substantial restrictions on various cross-border economic activities. Due to the asymmetric movement of goods, capital, and labor across the border (Yang, 2006; 吕大乐, 2014; 郑永谦, 2001), the

process of economic integration has different implications for the two economies. Constructing an index that reveals this asymmetry is therefore advisable. For instance, rather than measuring the extent of regional integration, i.e., the total intra-regional flow of goods, capital, and labor, the direction of these flows should be taken into account to measure the extent of integration in the individual economies (B. Chen & Woo, 2010). It should be noted that any measurements of the equalization between the two economies based on the consequences of integration that fail to reveal the asymmetrical aspect of the integration process may underestimate the actual level of integration.

Fourth, the integration of the Chinese mainland and Hong Kong has so far been limited to border integration (Ho & So, 1997). Economic integration has mainly taken place between Guangdong Province and Hong Kong. This could lead to contradictory conclusions if the measures of integration are not properly adjusted. For instance, when we measure the equalization of prices and wages, the integration of prices and wage would be higher between Hong Kong and Guangdong Province than between Hong Kong and all of the Chinese mainland.

Fifth, because the Chinese mainland and Hong Kong do not exist in an isolated world, the degree of integration is likely to be influenced by their integration with the rest of the world. For instance, when we measure the consequences of integration using indicators like the equalization of interest rates, inflation, and economic cycles, the degree of integration may be biased upward by the effects of the economic situation of the United States on both the mainland and Hong Kong (Genberg, Liu, & Jin, 2008).

Finally, unlike other examples of regional integration in China, the institutional barrier of “one country, two system” is one of the main obstacles to economic integration, as it affects the free flow of goods, services, capital, and labor (Yang, 2006; 何亦文 & 劉瀾昌, 2016; 张玉阁 & 郭万达, 2013; 李罗力, 2004; 林依琳, 2009; 莫伟光 & 杨国勇, 2005).

Furthermore, the economic integration of the Chinese mainland and Hong Kong has some features that distinguish it from other regional economies like the European Union (EU) and the North America Free Trade Agreement (NAFTA). These differences create difficulties in selecting measurement indicators and collecting data.

This study takes all of these factors into consideration when choosing indicators, collecting data, and constructing the integration index.

4.3. Applications of the Index

Once the index is constructed, we use it to study the dynamic economic, social, and political trends, including economic growth, unemployment rates, property prices, income disparity, social mobility, satisfaction with the government, and ethnic identity.

Previous studies have generally assumed that economic integration is good for economic growth (Balassa, 1961) and contributes to income equality (Beckfield, 2006; Richardson, 1995). However, it is empirically unclear whether economic integration has any effect on income growth, income disparity, and social mobility in Hong Kong. For example, property prices are an important factor in the living standards of many Hong Kong people and economic integration is sometimes blamed for the recent property bubble (GPG (Global Property Guide), 2009). This study investigates this link. Satisfaction with the government and the ethnic identity of the Hong Kong people are important benchmarks for political stability and the operation of the “one country, two systems” policy. This is the first study to empirically investigate whether the development of economic integration influences these economic, social, and political trends.

5. Data and Research Methodology

5.1. Indicators of Economic Integration

First, we perform in-depth and comprehensive analyzes of the indicators that can accurately measure the different aspects of the economic integration of the Chinese mainland and Hong Kong. Consistent with existing theory and practice, the indicators for the mainland-Hong Kong Index measure the driving forces, transmission channels, and consequences of the integration. Existing integration indicators used in regional economies are important references for this study. We adjust these indicators as necessary to make them suitable for the Chinese mainland and Hong Kong context. We use publicly available data.

The data are mainly extracted from the Hong Kong Census and Statistics Department and the National Bureau of Statistics of China. We construct the economic integration index using three sets of indicators: (1) the driving forces (antecedents) of economic integration, (2) the transmission channels through which the integration forms and influences the economy, and (3) the consequences of integration.

5.1.1. Indicators of the driving forces of integration

The driving forces of integration include the development of institutional arrangements and advances in technologies that reduce the transaction costs of cross-border economic activities. For example, König and Ohr (2013) used the extent of institutional participation and the level of compliance to measure the degree of integration within the EU. For this study, we obtain the number of regional headquarters/regional offices/local offices of mainland Chinese firms in Hong Kong. Factors such as tariff rates and non-tariff barriers may impede or facilitate economic integration. Other economic incentives such as institutional initiatives (e.g., CEPA) may encourage trade and investment. We count the number of zero tariff codes signed by both parties. This information can be obtained from the Hong Kong Trade and Industry department.

Previous studies found that most joint business activities between Hong Kong and the Chinese mainland occurred in the Pearl River Delta (Zhang, 2005). Therefore, time and transportation costs are key factors in economic integration.

We use the number of control points, the number of cross-boundary trains, and the number of cross-border buses between Hong Kong and mainland as proxies for the convenience of transportation. The Immigration and Custom Departments provide information on the control points, and the Hong Kong MTR Corporation provides information on the number of trains between the Chinese mainland and Hong Kong. There are a few cross-border bus companies operating franchise services in Hong Kong (e.g., Eternal East Group, Trans-island); we count the number of busses (including coach and shuttle bus) that pass through the control points each day. The data are from the Hong Kong Transport Department. The list of indicators of driving forces is shown in Table 16.

Table 16. Indicators of Driving Forces of Economic Integration

Year	Number of zero tariff codes	Number of control points	Number of offices	Number of daily cross-border trains between Shenzhen and Hong Kong	Number of Cross-border buses (including Coach and Shuttle Bus)
1990	0	7	60	108	50,000
1991	0	7	70	108	70,000
1992	0	7	90	173	89,998
1993	0	7	109	173	112,113
1994	0	7	131	173	128,855
1995	0	7	152	213	161,630
1996	0	7	213	213	194,797
1997	0	7	243	213	224,012
1998	0	7	205	213	248,744
1999	0	8	205	213	255,298
2000	0	8	229	213	303,792
2001	0	8	402	213	370,721
2002	0	8	556	213	390,709
2003	0	8	539	220	544,452
2004	374	8	635	220	971,786
2005	1087	8	710	220	901,961
2006	1452	9	717	220	877,063
2007	1465	11	725	273	851,120
2008	1515	11	722	273	930,208
2009	1573	11	750	273	1,007,532
2010	1603	11	789	273	939,107
2011	1619	11	805	273	920,699
2012	1746	11	853	273	983,776
2013	1777	11	901	273	1,068,359
2014	1804	11	957	273	1,149,184
2015	1814	11	1091	273	1,180,662
2016	1823	12	1123	273	1,177,639

5.1.2. Indicators of the transmission channels of integration

The second type of constitutive element of economic integration is transmission channels. The efficient movement of capital, goods, and people through the transmission channels improves factor allocation. We collect data on the direct investment (both inflow and outflow) between Hong Kong and the Chinese mainland in terms of amount and percent of external primary income. This measure reflects the repatriation of profits made by foreign firms operating within the zone. The major data source is the Hong Kong Census & Statistics Department (HKCSD). We also report the net flow, which is the difference between the inflow and outflow between Hong Kong and the Chinese mainland. Another important type of transmission channel is the movement of people. We use the number of visitors (in terms of transactions) from the Chinese mainland as a proxy for the movement of people from the Chinese mainland to Hong Kong. This information is collected from the Hong Kong Tourism Board. We also count the number of Hong Kong residents visiting the mainland as reported by HKCSD to approximate the frequency with which Hong Kong residents visit the mainland.

Previous studies (e.g., Ash & Kueh, 1993; E. K. Chen & Ho, 1994) have shown that Hong Kong is an entreport: a very small portion of the imports come from the mainland and most of the exports to the mainland are retained by the mainland. Thus, in the measurements of imports and exports, it is important to separate the domestic exports, re-exports, and retained imports. We collect Hong Kong's external merchandise trade statistics from HKCSD and the Customs Department to measure the trade volume between Hong Kong and mainland by land, air, water, and post. This information is compiled from information contained in import and export declarations. Outward processing (OP) activities also play an important role in Hong Kong's trade with the mainland. They include any business activities where qualified enterprises located in the mainland consign raw materials, parts, components, or

semi-finished goods to overseas-based enterprises for manufacturing or processing, and subsequently re-import the processed goods within a prescribed period and pay the processing fee, price of materials sourced from overseas, and other related fees to the overseas enterprises, or vice versa. The usual OP arrangement between Hong Kong and the Chinese mainland is to export raw materials or semi-manufactured material from or through Hong Kong to the mainland for processing, with a contractual arrangement for subsequent re-importation of the processed goods into Hong Kong. The two major arrangements of OP trade are (1) processing and assembling (P&A) and (2) processing with imported materials (PIM).

To better evaluate the performance of trade between Hong Kong and the Chinese mainland, we collect OP statistics from HKCSD to differentiate OP trade from regular trade. To measure the social dimension, expressed as the flow of people, we obtain the number of Hong Kong residents visiting the mainland, the number of visitors coming from the Chinese mainland, and the share of spending done by mainland visitors. This cross-boundary travel reflects the socio-economic ties between the Chinese mainland and Hong Kong. We also include the daily cross-boundary trips between the Chinese mainland and Hong Kong. The list of indicators measuring the transmission channels between the Chinese mainland and Hong Kong is given in Table 17.

Table 17. Indicators of Transmission Channel of Economic Integration

Year	Flow of people				Flow of goods			Flow of capital	
	Visitors from Chinese mainland (in Thousand)	Hong Kong residents to mainland (in Thousand)	Spending from mainland visitors (in percent)	Daily cross boundary vehicle trips	Import from mainland (in HK\$ million)	Domestic export to mainland (in HK\$ million)	Re-export to mainland (HK\$ million)	Direct Investment from mainland (in HK\$ billion)	Direct investment to mainland (in HK\$ billion)
1990	754	16,688	7%	15,000	236,134	47,470	110,908	90	150
1991	875	19,057	9%	16,000	293,356	54,404	153,318	120	200
1992	1,149	21,461	11%	17,894	354,348	61,959	212,105	180	250
1993	1,733	23,195	13.73%	20,104	402,161	63,367	274,561	240	300
1994	1,944	24,798	17.01%	22,348	470,876	61,009	322,835	300	350
1995	2,243	26,440	18.85%	23,193	539,480	63,555	384,043	360	400
1996	2,311	28,792	18.44%	24,347	570,442	61,620	417,752	420	450
1997	2,297	33,678	22.27%	26,050	608,372	63,867	443,878	480	500
1998	2,672	39,140	28.81%	26,758	580,614	56,066	407,366	205.9	534.3
1999	3,206	45,175	27.55%	28,288	607,546	50,414	399,188	805.6	608.1
2000	3,786	50,083	33.23%	30,720	714,987	54,158	488,823	1,095.0	991.2
2001	4,449	52,003	39.66%	31,035	681,980	49,547	496,574	928.0	812.4
2002	6,825	55,648	51.26%	33,822	717,074	41,374	571,870	571.1	812.4
2003	8,467	52,556	65.25%	35,783	785,625	36,757	705,787	747.2	899.6
2004	12,246	59,481	57.80%	39,321	918,275	37,898	850,645	979.5	1,161.4
2005	12,541	62,581	55.65%	40,413	1,049,335	44,643	967,923	1,222.0	1,425.9
2006	13,591	65,338	55.70%	41,085	1,192,952	40,268	1,115,941	1,967.6	2,055.7
2007	15,486	69,128	58.07%	41,751	1,329,652	40,610	1,267,722	3,677.3	3,363.8

2008	16,862	69,872	61.59%	42,007	1,410,735	34,758	1,335,687	2,250.9	2,552.7
2009	17,957	69,961	69.36%	40,357	1,249,374	26,672	1,236,577	2,603.6	2,682.2
2010	22,684	71,588	68.68%	43,015	1,529,751	31,223	1,566,999	3,127.1	3,014.7
2011	28,100	71,640	71.41%	42,774	1,696,807	30,699	1,716,656	3,042.8	3,346.4
2012	34,911	71,708	74.94%	42,439	1,840,862	26,026	1,831,732	3,568.3	3,671.1
2013	40,745	70,251	78.52%	42,588	1,942,131	24,784	1,924,463	3,341.6	3,952.3
2014	47,248	69,717	80.49%	41,675	1,986,964	23,195	1,955,821	3,493.5	4,560.0
2015	45,842	72,749	80.17%	41,517	1,984,048	20,433	1,916,082	3,270.3	4,701.8
2016	42,778	74,613	78.11%	42,327	1,916,831	18,563	1,924,906	3100	4800

5.1.3. Indicators of the consequences of integration

The effects of the market homogeneity and market symmetry caused by economic integration include the equalization of consumer prices, wages, interest rates, inflation, economic structures, economic cycles, and common shocks (Cavoli & Rajan, 2007; B. Chen & Woo, 2010; Lei & Tam, 2010). The degree of economic integration is reflected in the degree of synchronization between the business cycles of two places. The economic cycle is measured using GDP, which can be obtained from the World Bank. Market homogeneity is also a consequence of integrated economic activities. Two places with integrated economies might eventually equalize the prices of goods (i.e., law of one price).

We measure price levels by the convergence of the Consumer Price Indexes (CPI) of the two economies. These data are published by the World Bank. To identify the convergence of prices and regional GDP per capita, we compute the dispersion using the coefficient of variation (i.e., sigma-convergence), which has been widely used in previous studies (e.g., Chang, 2002; J. Chen & Fleisher, 1996; Lyons, 1991). Variables with smaller coefficients of variation are less dispersed than variables with larger coefficients of variation. We also collect data on the annual interest rates and inflation rates from the World Bank. We take the absolute differences of the inflation rates and real interest rates between Chinese mainland and Hong Kong and use them as indicators of market homogeneity.

Cross-border marriage has become a significant proportion of Hong Kong marriages. The demographic trend toward cross-border marriage represents structural changes in families and is a consequence of economic integration. We collect data from HKCSD. Another consequence of economic integration is cross-border education. We obtain data on the number of Hong Kong residents studying in mainland China and the number of mainland residents studying in Hong Kong from the Immigration Department and the Hong Kong Education Bureau. The list of indicators measuring the consequences of the economic

integration of the Chinese mainland and Hong Kong is given in Table 18.

Table 18. Indicators of Consequences of Economic Integration

Year	convergence of GDP per capita	price equalization	differences in inflation rate	differences in real interest rate	Cross boundary students	Cross boundary workers	cross-boundary marriage
1990	1.305	0.333	7.368	1.174	380	1000	21600
1991	1.302	0.380	7.615	2.421	400	1100	22610
1992	1.295	0.400	3.312	3.501	450	1250	24700
1993	1.286	0.366	5.780	1.720	500	1500	23850
1994	1.276	0.276	15.499	10.027	550	2000	24890
1995	1.264	0.230	7.820	5.844	600	2500	23420
1996	1.251	0.216	2.048	0.889	650	3000	26385
1997	1.245	0.236	2.970	3.370	700	4000	30499
1998	1.223	0.262	3.757	0.338	800	6000	20804
1999	1.214	0.243	2.602	5.924	910	7500	19293
2000	1.212	0.215	3.941	9.635	1400	13600	19408
2001	1.198	0.199	2.381	3.293	2160	19700	20739
2002	1.183	0.183	2.217	4.021	3490	24850	20222
2003	1.171	0.156	3.830	9.075	3567	30000	20093
2004	1.168	0.128	4.159	10.196	3456	31550	24360
2005	1.160	0.121	0.995	6.298	3803	33100	29788
2006	1.147	0.125	0.586	6.220	4498	35400	34628
2007	1.129	0.106	2.742	3.813	4474	37700	26203
2008	1.110	0.096	1.534	6.006	5859	40000	22951
2009	1.078	0.105	1.332	0.055	6768	42300	22339
2010	1.067	0.098	1.065	5.777	8038	45750	24027
2011	1.052	0.097	0.154	2.533	9899	49200	26179
2012	1.031	0.107	1.440	2.118	12865	45300	27538
2013	1.016	0.118	1.726	0.562	16356	41400	26610
2014	1.001	0.135	2.495	2.642	20871	44450	26330
2015	0.984	0.146	1.526	2.944	24990	47500	23290
2016	0.967	0.148	0.378	0.066	28106	50550	22926

5.2. Statistical Approach

The index is constructed using standard statistical methods. After normalizing the data using standard methods (distance to a reference), the individual indicators are aggregated. There are three popular aggregation methods: equal, subjective, and statistical weighting. Equal weighting assigns an equal weight to each indicator (e.g., Acharya et al., 2002; Dorrucci et al., 2015; UNECA, 2016). The validity of equal weighting hinges on the crucial assumption that all of the indicators are equally important for the index, an assumption that is often characterized as arbitrary and simplistic. Subjective weighting assigns weights to the indicators based on the judgment of experts. This approach is used in the G-Index, the Maastricht Globalisation Index, the Globalisation Index, and the A T Kearney/Foreign Policy Magazine Globalisation Index. The disadvantage of this weighting scheme is its sensitivity to the choices and subjectivity of the experts.

The most popular statistical weighting method is principal component analysis (PCA), which is used by the KOF Index of Globalisation, CSGR Globalisation Index, and New Globalisation Index (B. Chen & Woo, 2010; Cheung et al., 2008). PCA can be used to identify how different variables change in relation to each other and how they are associated with each other. By transforming the correlated variables into a new set of uncorrelated variables, the relative weights of the indicators can be determined, which captures the information common to the individual indicators. PCA is therefore more objective than the other two methods. We use PCA to aggregate the indicators. Different normalization methods (e.g., z-score) and aggregation methods (e.g., equal weighting) are also used in the sensitivity analysis.

To aggregate the data, the indicators measuring the same aspects of integration are first grouped together to form sub-indices, from which a composite index is constructed. We perform the PCA separately for each sub-index. The sub-indices are the driving forces,

transmission channels, and consequences of the integration indices. Using sub-indices makes it possible to study individual aspects of economic integration. The overall index is the combination of the sub-indices.

Suppose we have a vector of indicators $X=(X_1, X_2, \dots, X_p)'$ measuring the unobserved integration index with the variance-covariance matrix

$$\text{var}(X) = \Sigma.$$

Our goal is to explain most of the variance in the observed data based on a smaller number of variables, i.e., the principal components, which are uncorrelated. We first assume that there are as many principal components as indicators, i.e., $Y=(Y_1, Y_2, \dots, Y_p)'$, such that

$$Y_1 = a_{11}X_1 + a_{12}X_2 + \dots + a_{1p} X_p,$$

$$Y_2 = a_{21}X_1 + a_{22}X_2 + \dots + a_{2p} X_p,$$

$$Y_p = a_{p1}X_1 + a_{p2}X_2 + \dots + a_{pp} X_p.$$

The variance of Y_i is therefore

$$\text{var}(Y_i) = a_i' \Sigma a_i, \text{ where } a_i = (a_{i1}, a_{i2}, \dots, a_{ip})'.$$

The covariance of Y_i and Y_j is $\text{cov}(Y_i, Y_j) = a_i' \Sigma a_j$.

The first principal component is extracted by selecting the value of \mathbf{a}_1 such that $\text{var}(Y_1)$ is maximized subject to the normalization constraint that $\mathbf{a}_1' \mathbf{a}_1 = 1$. The second component is extracted by selecting the value of \mathbf{a}_2 such that $\text{var}(Y_2)$ is maximized subject to the normalization constraint that $\mathbf{a}_2' \mathbf{a}_2 = 1$ and the additional constraint that Y_1 and Y_2 are uncorrelated, i.e., $a_1' \Sigma a_2 = 0$. Subsequent principal components are extracted in a similar way.

The standard practice is to consider the principal components that have a variance larger than one (by normalization, the sum of the variance of the principal components is equal to p , i.e., the number of indicators), and/or contribute to the explanation of the overall variance by more than 10% and/or contribute cumulatively to the explanation of the overall

variance by more than 60%. After choosing the optimal number of principal components, the principal components are rotated to obtain a simpler structure, i.e., each indicator is ideally loaded exclusively onto one of the principal components. The last step is to compute the value of each principal component according to the rotated value of factor loading a_i . The individual principal components are then aggregated according to their proportion of the explained variance.

5.3. Technical Aspects of the VECM

We use multivariate time series modeling to study the dynamic relationships between the evolution of the integration index and some economic, social, and political trends. We use the vector error correction model (VECM) and perform co-integration analysis to analyze the data (Lütkepohl, 2005). Co-integration analysis is a popular econometric tool used to test the dynamic between time series data, including the macroeconomic variables, and indices (e.g., Gan, Lee, Yong, & Zhang, 2006; Masih & Masih, 1996; Nasseh & Strauss, 2000). It is considered a suitable econometric method because it avoids the issue of spurious regression that frequently occurs in time series data. We then conduct co-integration analysis to investigate whether there are long-term equilibrium relationships between economic integration and the various important economic, social, and political trends.

We define the time series of the integration index as X_t and GDP as Y_t , where $t = 1, \dots, T$ denotes the year index from year 1 to year T. Suppose both the integration index and GDP are non-stationary data, i.e., stochastic shocks of the time series will have a persistent effect: $X_t =$

$$X_{t-1} + u_{1,t} \text{ and } Y_t = Y_{t-1} + u_{2,t},$$

where $u_{1,t}$ and $u_{2,t}$ are stochastic shocks that are identically and independently distributed with different variances.

In this case, the time series of X_t and Y_t will have a stochastic time trend. Even in the case where X_t and Y_t are uncorrelated, the two time trends will make these two series look like they are correlated. The simple ordinary linear regression modelled as $X_t = bY_t + u_t$, may then produce the spurious conclusion that X_t and Y_t have a significant relationship. However, as the residual u_t is non-stationary, the assumption of an ordinary least squared regression is violated and the estimated parameters are biased. To fix this issue, stochastic trends are therefore removed from the time series data in a model. If the stationary residuals remain, the two series are said to be co-integrated, i.e., a long-term equilibrium relationship exists.

Co-integration exists if and only if an error correction model exists between the two series. In the VECM, it is assumed that the short-term and stochastic deviation from the long-term equilibrium relationship between X_t and Y_t will create a self-correction force to move the time series back to the state of equilibrium. When we consider a general model in which X_t (Y_t) are also affected by both the short-term stochastic shocks of X_t and Y_t , the dynamic of the time series can be modeled as

$$\Delta X_t = c_1 + g_1(X_{t-1} - bY_{t-1}) + a_1\Delta X_{t-1} + d_1\Delta Y_{t-1} + u_{1,t}, \text{ and}$$

$$\Delta Y_t = c_2 + g_2(X_{t-1} - bY_{t-1}) + a_2\Delta X_{t-1} + d_2\Delta Y_{t-1} + u_{2,t}.$$

In the VECM, g_1 and g_2 measure the speed of self-correction. If $g_1 > 0$, X_t is said to be error-corrected, and if $g_2 < 0$, Y_t is said to be error-corrected from the long-term equilibrium relationship $X_t = bY_t$.

Research Results/Findings

6. Economic Integration Index

Our goal is to develop an objective (vs. subjective assessment) index for measuring mainland-Hong Kong integration. The proposed index consists of 21 objective components selected to measure the economic integration between the Chinese mainland and Hong Kong in three areas: (I) driving forces of integration, (II) transmission channels of integration, and (III) consequences of integration. We compute the index for each year back to 1990. To construct the indices for the empirical analysis, each indicator is transformed to an index with a range from 0 to 100, where a higher value indicates higher economic integration. We use the following formula for variable transformation:

$$X = 100 (X_i - X_{\min}) / (X_{\max} - X_{\min})$$

where X_i indicates the actual value of a variable, and X_{\max} and X_{\min} are the maximum and minimum values of a variable, respectively.

A variable in a particular year is close to 100 if the value is near the maximum value of the variable. In contrast, a value is close to 0 if the actual value is close to the minimum value of the variable. This procedure has been applied in previous studies (Dreher et al., 2008).

For the variables measuring the economic convergence of the Chinese mainland and Hong Kong, we transform the variable in the following way:

$$X = 100 [1 - (X_i - X_{\min}) / (X_{\max} - X_{\min})]$$

We use the principal component analysis technique to determine the weights for each indicator in the construction of each sub-index. This procedure partitions the variance of a set of indicators and uses it to derive the linear combination of indicators that maximizes the variation of the newly constructed principal component. In turn, the newly constructed principal component represents the sub-index that best captures the underlying components. The same procedure is used to derive weights for the overall index.

Table 19 reports the weights of the indicators for each sub-index and the weights of each sub-index in the overall integration index. The weights for each of the three sub-indices are almost one-third, meaning that they are equally important to the overall index. Figure 13 presents the values of the three sub-indices during the 1990 to 2016 period. We see that in the early years the transmission channel, i.e., the trade and investment activities of the two sides, played an important role in the process of economic integration. In 2006, the driving forces, such as the CEPA agreement, facilitated the closer cooperation of the two economies. The transmission channel sub-index drops a little bit between 2007 and 2009 due to the global financial crisis. However, the overall economic integration in Figure 14 still moved upward due to the introduction of several governmental policies such as the Individual Visit Scheme, which further enhanced the joint cooperation and economic integration.

Table 19. Components of Mainland-Hong Kong Index

Components of mainland-Hong Kong Index	
I. Driving forces of Economic Integration	[33.37%]
a) Number of zero tariff codes	(20.20%)
b) Number of control points	(20.37%)
c) Number of regional offices	(20.76%)
d) Number of daily cross-border trains	(17.93%)
e) Number of cross-border buses (including Coach and Shuttle Bus)	(20.74%)
II. Transmission Channel of Economic Integration	[33.40%]
Flow of people	
a) Visitors from mainland	(10.7%)
b) HK residents to mainland	(10.8%)
c) Proportion of spending from mainland visitors	(11.4%)
d) Daily cross boundary vehicle trips	(10.4%)
Flow of Goods	
e) Import from mainland	(11.8%)
f) Domestic export to mainland	(10.7%)
h) Re-export to mainland	(11.8%)
Flow of capital	
i) Inward position from mainland	(11.1%)
j) Outward position to mainland	(11.4%)
III. Consequence of Economic Integration	[33.22%]
a) convergence in GDP per capita	(23.7%)
b) Price equalization	(18.2%)
c) Difference in inflation rate	(14.2%)
d) Difference in real interest rate	(1.6%)
e) Cross boundary students	(17.2%)
f) Cross boundary workers	(23.0%)
g) Cross-boundary marriage	(2.2%)

Figure 13. Three Sub-indices of Economic Integration between Chinese Mainland and Hong Kong

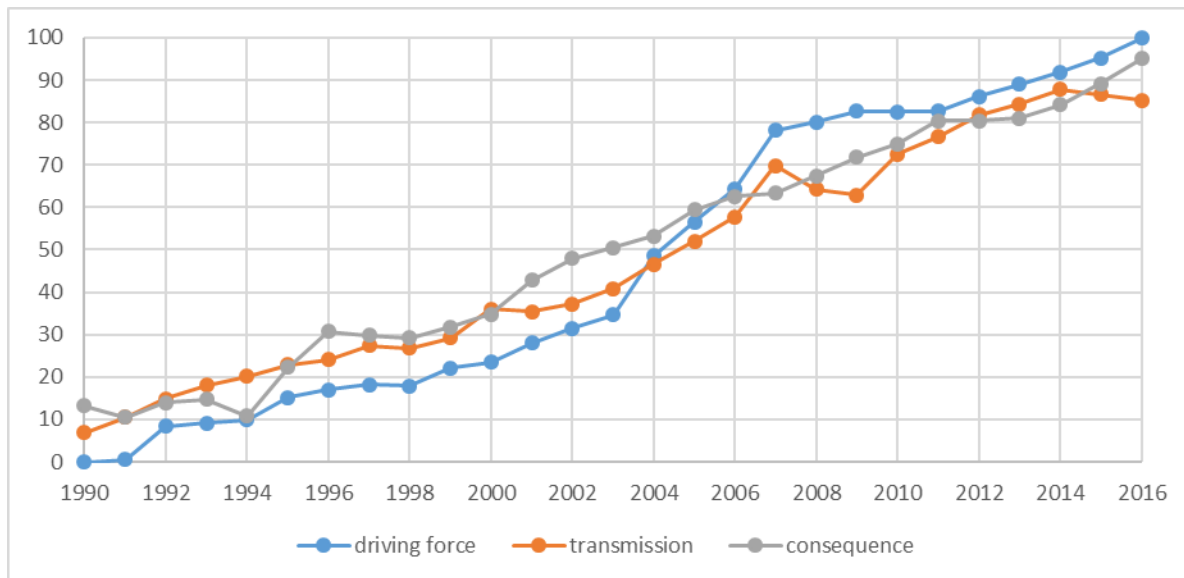
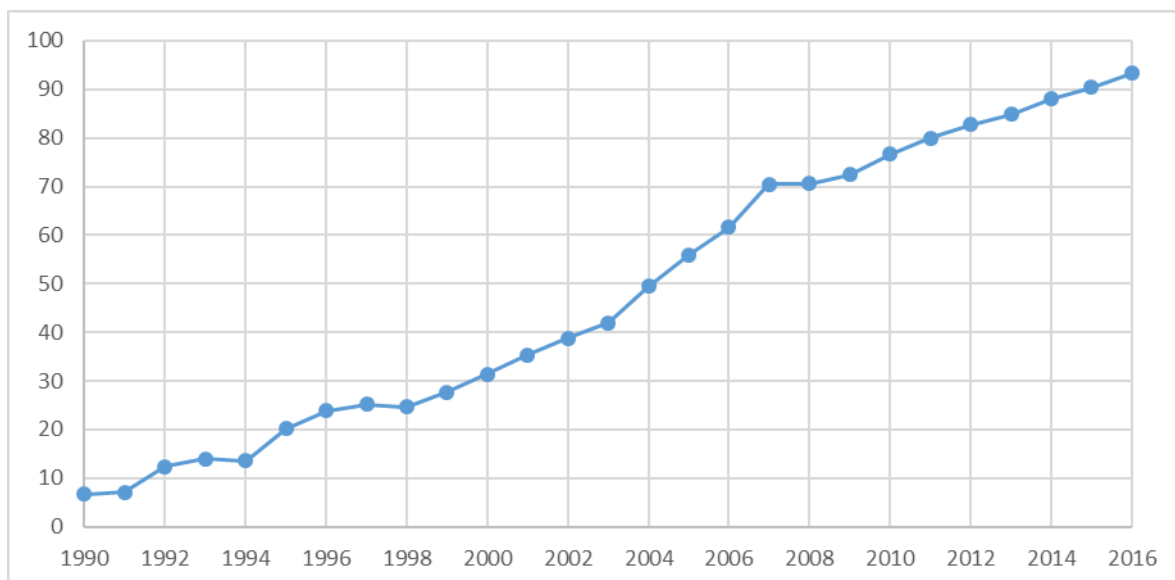


Figure 14. The Overall Mainland-Hong Kong Index from 1990 to 2016



7. Relationships between the Integration Index and Key Socio-Economic Indicators

In this section, we demonstrate how the proposed index could be used to examine the dynamic relationships between the proposed Chinese mainland-Hong Kong Economic Integration Index and several key economic indicators to demonstrate the predictive validity of the index. Several of the key economic and social indicators used in the analysis are presented in Table 20, including GDP, unemployment rate, Gini coefficient, and confidence, identity, and happiness indices. These data are retrieved from different public databases. For example, GDP and unemployment rate data are from the Hong Kong Statistics and Census Department. The data on people's ethnic identity and confidence in Hong Kong's future are extracted from the Hong Kong University Public Opinion Programme. The happiness index is derived from the Centre for Public Policy Studies of Lingnan University. The data are organized as annual time series for the 1990 to 2016 period. Table 21 shows the complete dataset. Some indicators (e.g., happiness index) were not developed until after 1990. Therefore, we collect the data as available from specific sources. Figure 15 illustrates the trends in the economic integration index and several key indicators over the study period. We can see that the trend in GDP matches the trend in economic integration.

Table 20. Economic and Social Variables

Variables	Source	Data period
Economic indicator		
GDP	HKCSD	1990-2016
Per capita GDP	HKCSD	1990-2016
Unemployment rate	HKCSD	1990-2016
Property price (private domestic)	Rating and valuation department	1990-2016
Property price (private office)	Rating and valuation department	1990-2016
Social indicator		
Gini coefficient	HKCSD	1990-2016
Cultural indicator		
Satisfaction with the government	HKU Pop	1997-2016
Confidence in HK's future	HKU Pop	1994-2016
Ethnic identity - Hongkonger	HKU Pop	1997-2016
Ethnic identity - Chinese	HKU Pop	1997-2016
Happiness index	Lingnan	2005-2016

Table 21. Sample of Key Indicators from 1990 to 2016

Year	GDP	Per capita GDP	Unemployment rate	Property price (private domestic) Yr1999 = 100	Property price (private office) Yr1999 = 100	Gini coefficient	Satisfaction with the government	Confidence in HK's future	Ethnic identity - Hongkonger	Happiness index
1990	599,256	105,050	1.3	44.8	99.1	0.4714				
1991	691,323	120,188	1.8	61.1	100.3	0.476				
1992	807,130	139,148	2.0	85.2	137.1	0.4844				
1993	931,010	157,772	2.0	93.0	164.6	0.4928				
1994	1,049,610	173,909	1.9	114.9	230.3	0.5012		56.36%		
1995	1,119,006	181,772	3.2	107.3	194.6	0.5096		58.15%		
1996	1,235,301	191,951	2.8	116.9	188.4	0.518		62.62%		
1997	1,373,083	211,592	2.2	163.1	213.1	0.5194	3.30	73.45%	35.87%	
1998	1,308,074	199,898	4.7	117.1	134.5	0.5208	2.83	62.65%	34.10%	
1999	1,285,946	194,649	6.2	100.0	100.0	0.5222	2.86	60.23%	37.29%	
2000	1,337,501	200,675	4.9	89.6	89.9	0.5236	2.75	61.67%	36.69%	
2001	1,321,142	196,765	5.1	78.7	78.7	0.525	2.76	51.83%	31.41%	
2002	1,297,341	192,367	7.3	69.9	68.4	0.5266	2.67	46.88%	29.95%	
2003	1,256,669	186,704	7.9	61.6	62.5	0.5282	2.35	46.89%	30.01%	
2004	1,316,949	194,140	6.8	78.0	99.3	0.5298	2.57	61.24%	26.96%	
2005	1,412,125	207,263	5.6	92.0	133.0	0.5314	3.16	72.36%	24.40%	71.4
2006	1,503,351	219,240	4.8	92.7	139.3	0.533	3.36	76.47%	23.60%	70.6
2007	1,650,756	238,676	4.0	103.5	165.5	0.5338	3.38	79.50%	23.45%	67.2
2008	1,707,487	245,406	3.5	120.5	199.0	0.5346	3.13	74.46%	19.95%	69.3
2009	1,659,245	237,960	5.3	121.3	179.8	0.5354	2.91	69.48%	31.17%	70.6
2010	1,776,332	252,887	4.3	150.9	230.4	0.5362	2.85	64.93%	30.42%	70.1
2011	1,934,430	273,549	3.4	182.1	297.9	0.537	2.62	59.13%	39.77%	71.3
2012	2,037,059	284,899	3.3	206.2	334.7	0.5374	2.66	54.57%	36.32%	70.3
2013	2,138,305	297,860	3.4	242.4	409.8	0.5378	2.65	52.97%	36.53%	70.5
2014	2,260,005	312,609	3.3	256.9	423.0	0.5382	2.64	48.45%	41.24%	70.5
2015	2,398,437	328,945	3.3	296.8	448.9	0.5386	2.59	46.52%	38.26%	70
2016	2,491,001	339,531	3.4	286.1	426.9	0.539	2.50	45.57%	38.26%	67.6

To examine the long-term relationships between our proposed integration index and key indicators, we use VECM to correct the disequilibrium in the cointegration relationship. The error correction mechanisms model changes in the indicators (i.e., proposed integrated index and other social and economic factors) as a function of the level of the disequilibrium in the cointegrating relationship, as captured by the error correction term, and changes in the other independent variables to capture the short-term relations between variables. For each variable, we determine the optimal length of the underlying vector auto-regression using the traditional selection criteria methods and use the Likelihood ratio test to derive the best VECM model.

The long-term equilibrium relationships are presented in Table 22. The index is positively related to all of the indicators at significance levels of 1%, except the happiness index, which is positively related but insignificant at the 10% level. In particular, the index is positively associated with GDP growth, suggesting that economic integration is an important contributor to the region's development. Economic integration fosters international trade and interactions across borders, which in turn stimulates economic growth. In addition, economic integration promotes economic efficiency in production, resulting in many labor-intense production tasks moving from Hong Kong to the Chinese mainland to take advantage of cheaper land and labor costs. In other words, the integration weakens the bargaining power of local labor by creating a regional labor pool (Alderson & Nielsen, 2002; Brady & Wallace, 2000).

Table 22. Results of Long-run Equilibrium Relationships

Key variable	Coefficient of co-integration	t-statistics
GDP	5.46E-05***	5.81
Per capita GDP	4.71E-04***	9.04
Unemployment rate	3.42***	2.89
Property price (private domestic)	0.39***	3.09
Property price (private office)	0.43***	6.85
Gini coefficient	65737.86***	8.58
Satisfaction with the government	16.76***	4.81
Confidence in HK's future	35.18***	3.18
Ethnic identity – Hongkonger	54.33***	4.98
Happiness index	0.61	1.07

Note: level of significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

The positive relationship between integration and unemployment reflects this observed pattern. The unemployment in the manufacturing sector (data from HKCSD and the Labor Department) increases steadily as the economic integration increases. Regional integration also promotes the flow of capital resulting in a large share of China's foreign currency

flooding into the Hong Kong financial market. The association between property prices and economic index reveals this positive relationship. As more money flows from the Chinese mainland into the Hong Kong market, more venture capitalists invest in different types of investments such as stock and property. The influx of capital leads to a rise in real estate prices.

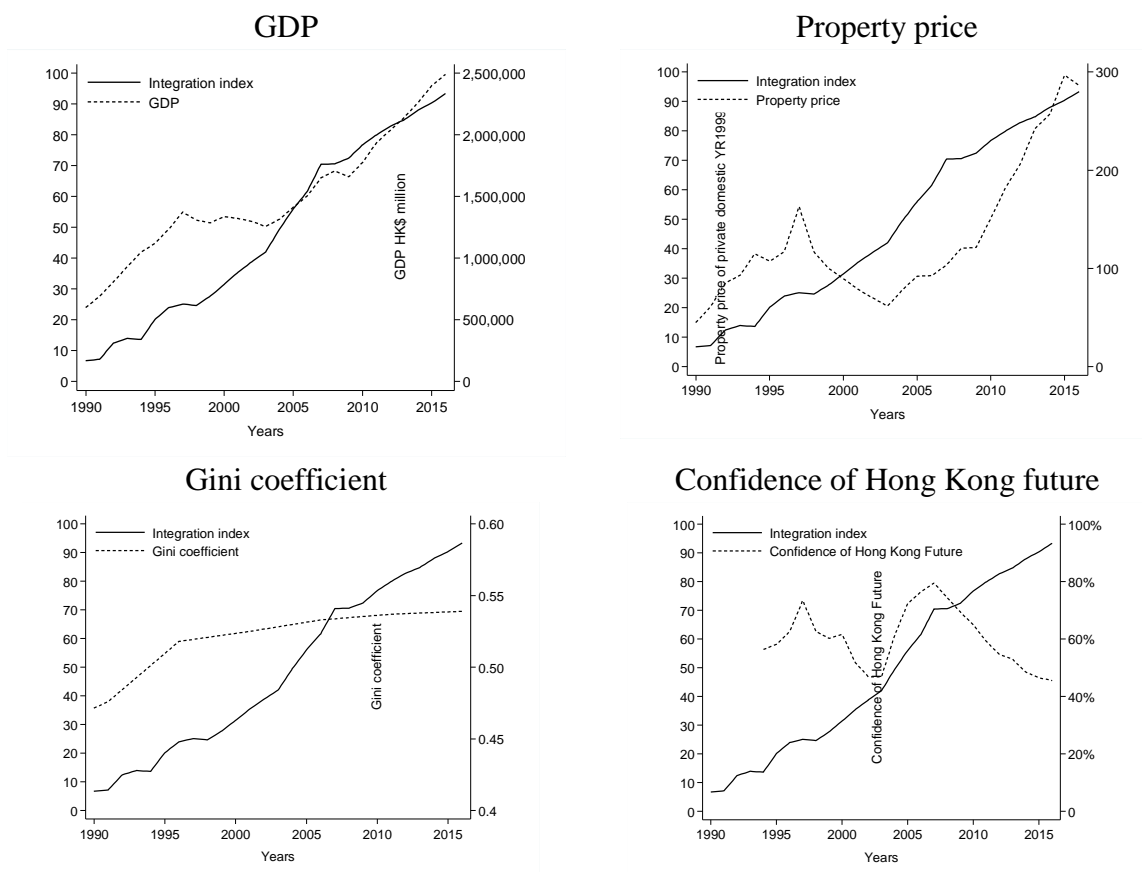
At the same time, our results show that increasing economic integration corresponds with greater income inequality and the widened gap between the rich and the poor. Economic integration fosters income inequality by undermining the position of labor through fierce employment competition and international wages (Beckfield, 2006). Culturally, integration creates a politically stable environment in which trade prospers. People are more satisfied with the government and perceive the future to be brighter and positive. Interestingly, integration also promotes a sense of the uniqueness of people in the community. As travel and communication across borders become more frequent and regular, Hong Kong citizens become more aware of their own identity. Higher integration between Hong Kong and the Chinese mainland gives Hong Kong residents a stronger sense of their uniqueness.

The Vector Error Correction Model (VECM) technique helps to distinguish between a long-run and a short-run relationship between two variables. The parameter estimates reported in Table 22 represent the long-run equilibrium relationships in which the disequilibrium error is stationary (Johansen and Juselius 1990). The coefficients indicate the average change in the variable in question (e.g., existing key index) associated with the change in the proposed economic index. In other words, the parameter estimates of VECM provide the mean rate of changes in long-run relationship after controlling for short-run influence and measurement errors.

While the overall long-term positive relations between the integration index and other indicators may be positive, these indicators may exhibit variations across these time periods.

For instance, both the “satisfaction with government” and “confidence in Hong Kong’s future” reached the peak in 2007 and have since declined, perhaps due to external shocks such as the Financial Tsunami in 2008 (Table 21). We observe similar changes in the proposed economic integration index, which increased rapidly from 1997 to 2007. After 2007, the slope of the curve is still positive, but not as steep as it was between 1997 to 2007. The non-parametric plots in Figure 15 shows the non-monotonic trends in the relationships between the selected variables during each of the observed periods. Indicators such as property price and confidence in Hong Kong’s future exhibit significant variations over time, despite their overall positive relationships with the integration index (Figure 15).

Figure 15. Relationships between the Economic Integration Index and Key Economic and Social Indicators



8. Conclusions

8.1. Discussion

Globally, economic integration between countries is considered both a driver and an outcome of regional economic development and an indicator of efficient markets at work. This study takes a systematic and integrative approach to examining the macro-level economic and social interactions between Hong Kong and the Chinese mainland over a quarter century. To construct the index, we adopt a three-pronged framework that considers the drivers, channels, and consequences of economic integration. The three dimensions are found to be generally of equal importance. Based on a multifaceted dataset, we use rigorous methodologies to construct an index of the economic integration of the two economies. The data are from various government agencies, international organizations, and reputable research institutions.

The results suggest that the level of economic integration between Hong Kong and the Chinese mainland has grown steadily from about 8% in 1996 and to a very high level of 93% in 2016. The only exceptions to this trend occurred during the Asian Financial Crisis in 1997 and the Financial Tsunami in 2008. Overall, the three time series, i.e., drivers, channels, and consequences of economic integration, closely follow one another over the study period. Further co-integration analyzes indicate that the level of economic integration is largely associated the continuous economic development of Hong Kong, as reflected in its increasing GDP and GDP per capita over time. Although the unemployment rate increased to its highest level in the early 2000s, it has been on a downward trend in recent years.

Furthermore, the level of economic integration seems to be associated with surging real estate prices for both residential and commercial properties, which have recovered from the previous shocks and reached historical highs in recent years. Continuous economic

integration and growth also coincides with increasing economic disparity (as reflected by the consistently high level of the Gini coefficient), a lack of confidence in the government and the future of Hong Kong, and a surge in ethnic identity among Hong Kong residents. Interestingly, it has little association with residents' level of happiness. These findings provide non-negligible evidence of the relations between economic integration and other aspects of social justice and public sentiment towards the government and society. These relations have been topics of heated public debate in recent years around the world and in this territory. Policy makers and researchers can certainly incorporate these findings into their deliberations when devising public policies.

8.2. Policy Implications and Recommendations

This project is relevant to public policy in Hong Kong for two reasons. First, it is the first attempt to construct an economic integration index for the Chinese mainland and Hong Kong. An economic integration index is a useful method for measuring economic integration. It offers a quantifiable basis for policy discussion, which leads to better assessments of the economic and social consequences of economic integration. Regional institutions have recently started to develop, construct, and publish integration indices. For example, in early 2010 the European Union announced an annual EU Integration Index. In 2015, the Africa Development Bank published the Africa Regional Integration Index. The Pacific Economic Cooperation Council announced an index in 2013.

There are several advantages to having a unified composite index as opposed to individual measurements of each aspect of economic integration. First, it provides a simple summary of the complex and elusive dimensions of economic activities. Second, it is easier for policymakers to interpret a single index than to identify the common trends across many separate indicators. Third, it facilitates communication with the public. Many fields study and

measure different aspects of mainland-Hong Kong economic integration. Simply adapting existing international indices to the mainland-Hong Kong context would be misleading. It is therefore necessary to address the specific nature and features of economic integration in the mainland-Hong Kong context.

In addition, although the literature on the nature and processes of economic integration between the mainland and Hong Kong is rich, only a few studies have discussed the consequences of integration. We fill this gap by providing empirical evidence of a long-term relationship between the degree of economic integration and economic growth, the unemployment rate, property prices, income disparity, social mobility, satisfaction with the government, and ethnic identity. These are all important and acute economic, social, and political issues that are highly relevant to the public interest. This study's conclusions should facilitate policy discussions that aim to solve outstanding issues and to develop plans for the long-term economic development of Hong Kong.

Lastly, while the economic integration index measures the overall integration between the two economies, it consists of three sub-indices (i.e., drivers, channels and consequences), which are also meaningful in their weights and interactions with one another. The dynamic interactions within the three sub-indices and with other key socio-economic indicators can be explored in further research. We expect that this economic integration index will receive wide applications in future public policy research and discussions in Hong Kong and beyond.

References

- Acharya, R. C., Rao, S., & Sawchuk, G. (2002). Building a North American Economic Integration Index An Exploratory Analysis. *Unpublished. Micro-Economic Policy Analysis Branch Industry Canada (July)*.
- Alderson, A. S., & Nielsen, F. (2002). Globalization and the great U-turn: Income inequality trends in 16 OECD countries. *American journal of sociology, 107*(5), 1244-1299.
- Ash, R. F., & Kueh, Y. (1993). Economic integration within Greater China: trade and investment flows between China, Hong Kong and Taiwan. *The China Quarterly, 136*, 711-745.
- AT Kearney. (2001). Foreign Policy Magazine, Globalisation Index. In: Washington DC at www.foreignpolicy.com.
- Balassa, B. (1961). Towards a theory of economic integration. *Kyklos, 14*(1), 1-17.
- Beckfield, J. (2006). European integration and income inequality. *American Sociological Review, 71*(6), 964-985.
- Brady, D., & Wallace, M. (2000). Spatialization, foreign direct investment, and labor outcomes in the American states, 1978–1996. *Social Forces, 79*(1), 67-105.
- Cavoli, T., & Rajan, R. S. (2007). Exploring the case for monetary integration between the Chinese mainland and Hong Kong. *China & World Economy, 15*(4), 17-34.
- Chan, K., Choi, G., Siu, A., & Wong, R. (2003). Made in PRD: The Changing Face of Hong Kong Manufacturers. In: Federation of Hong Kong Industries.
- Chang, G. H. (2002). The cause and cure of China's widening income disparity. *China Economic Review, 13*(4), 335-340.
- Chen, B., & Woo, Y. P. (2010). Measuring economic integration in the Asia-Pacific region: A principal components approach. *Asian Economic Papers, 9*(2), 121-143.
- Chen, E. K., & Ho, A. (1994). Southern China growth triangle: An overview. *Growth Triangles in Asia: A New Approach to Regional economic Cooperation, Oxford University Press, Oxford*, 29-72.
- Chen, J., & Fleisher, B. M. (1996). Regional income inequality and economic growth in China. *Journal of comparative economics, 22*(2), 141-164.
- Cheng, H., & Glascock, J. L. (2005). Dynamic linkages between the greater China economic area stock markets—Mainland China, Hong Kong, and Taiwan. *Review of Quantitative Finance and Accounting, 24*(4), 343-357.
- Cheung, Y.-W., Yiu, M. S., & Chow, K. K. (2008). Measuring economic integration: the case of Asian economies. *Press & Communications CH 4002 Basel, Switzerland*, 136.
- Dorrucchi, E., Ioannou, D., Mongelli, F. P., & Terzi, A. (2015). *The Four Unions' PIE'on the Monetary Union'CHERRY': A New Index of European Institutional Integration*.
- Dreher, A., Gaston, N., & Martens, P. (2008). *Measuring globalisation: Gauging its*

- consequences*: Springer Science & Business Media.
- Gan, C., Lee, M., Yong, H. H. A., & Zhang, J. (2006). Macroeconomic variables and stock market interactions: New Zealand evidence. *Investment Management and Financial Innovations*, 3(4), 89-101.
- Genberg, H., Liu, L.-g., & Jin, X.-r. (2006). Hong Kong's economic integration and business cycle synchronisation with mainland China and the US. In.
- Genberg, H., Liu, L.-g., & Jin, X. (2008). Hong Kong's economic integration and business cycle synchronisation with mainland China and the US. In H. Genberg & D. He (Eds.), *Macroeconomic Linkages between Hong Kong and Mainland China* (pp. 43-78). Hong Kong: City University of Hong Kong.
- Gerlach-Kristen, P. (2009). Business cycle and inflation synchronisation in Mainland China and Hong Kong. *International Review of Economics & Finance*, 18(3), 404-418.
- Ghemawat, P. (2001). Distance still matters. *Harvard business review*, 79(8), 137-147.
- GPG (Global Property Guide). (2009). *Hong Kong housing bubble! Mainland buyers blamed*. Retrieved from <http://www.globalpropertyguide.com/Asia/hong-kong/Price-History-Archive/Hong-Kong-housing-bubble-mainland-buyers-blamed-1059>
- He, D., Leung, F., & Ng, P. (2008). How do macroeconomic developments in Mainland China affect Hong Kong's short-term interest rates. *Macroeconomic Linkages between Hong Kong and Mainland China*.
- Ho, K. C., & So, A. (1997). Semi-periphery and borderland integration: Singapore and Hong Kong experiences. *Political Geography*, 16(3), 241-259.
- Holzmann, F. (1976). *International trade under communism: politics and economics*. New York: Basic Books.
- Hsiao, C., Steve Ching, H., & Ki Wan, S. (2012). A panel data approach for program evaluation: measuring the benefits of political and economic integration of Hong Kong with mainland China. *Journal of Applied Econometrics*, 27(5), 705-740.
- Huang, S. (2017). *The Challenges and Opportunities of the Guangdong-Hong Kong-Marco Big Bay Area*. Haitong.
- Johansen, S. & Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration with Applications to Demand for Money. *Oxford Bulletin of Economics and Statistics* 52, 169-210.
- Jovanovic, M. (2006). *International economic integration: limits and prospects*: Routledge.
- König, J., & Ohr, R. (2013). Different Efforts in European Economic Integration: Implications of the EU Index. *JCMS: Journal of Common Market Studies*, 51(6), 1074-1090. doi:10.1111/jcms.12058
- Kahnert, F. (1969). *Economic integration among developing countries*: Paris : Development Centre, Organisation for Economic Co-operation and Development.

- Krieger-Boden, C., & Soltwedel, R. (2013). Identifying European Economic Integration and Globalization: A Review of Concepts and Measures. *Regional Studies*, 47(9), 1425-1442. doi:10.1080/00343404.2013.834319
- Lütkepohl, H. (2005). *New introduction to multiple time series analysis*: Springer Science & Business Media.
- Lei, C. K., & Tam, P. S. (2010). A panel data approach to the income convergence among Mainland China, Hong Kong and Macao. *Journal of the Asia Pacific Economy*, 15(4), 420-435.
- Li, K.-W., Liu, T., Lam, H. K., & Wang, L. (2011). Economic Integration of Mainland China and the Hong Kong SAR: An Analysis of Growth Attributes. *The Chinese Economy*, 44(4), 92-114. doi:10.2753/CES1097-1475440405
- Lockwood, B., & Redoano, M. (2005). The CSGR globalisation index: An introductory guide. *Centre for the Study of Globalisation and Regionalisation Working Paper*, 155(04), 185-205.
- Lui, T.-I. (2014). Fading Opportunities: Hong Kong in the context of regional integration. *China Perspectives*(1), 35.
- Lyons, T. P. (1991). Interprovincial disparities in China: Output and consumption, 1952-1987. *Economic development and cultural change*, 39(3), 471-506.
- Maksimova, M. (1976). Comments on Paper: Types of Economic Integration by B. Balassa. *Economic Integration Worldwide, Regional, Sectoral Ed. F. Machlup* London: Macmillan, 6-32.
- Martens, P., & Raza, M. (2009). Globalisation in the 21st century: Measuring regional changes in multiple domains. *Integrated Assessment*, 9(1), 1-18.
- Martens, P., & Zywiets, D. (2004). Rethinking Globalisation. *A Modified Globalisation Index*.
- Masih, A. M., & Masih, R. (1996). Empirical tests to discern the dynamic causal chain in macroeconomic activity: new evidence from Thailand and Malaysia based on a multivariate cointegration/vector error-correction modeling approach. *Journal of Policy Modeling*, 18(5), 531-560.
- Mennis, B., & Sauvart, K. P. (1976). *Emerging Forms of Transnational Community: transnational business enterprises and regional integration*: Lexington Books.
- Molle, W. (2001). *The Economics of European Integration: theory, practice, policy* (4 Ed.): Aldershot : Ashgate.
- Nasseh, A., & Strauss, J. (2000). Stock prices and domestic and international macroeconomic activity: a cointegration approach. *The Quarterly Review of Economics and Finance*, 40(2), 229-245.
- Nieh, C.-C., & Yau, H.-Y. (2004). Time series analysis for the interest rates relationships among China, Hong Kong, and Taiwan money markets. *Journal of Asian Economics*,

- 15(1), 171-188.
- OECD. (2015). *Handbook on economic globalization indicators: Methodology and user guide*. Retrieved from
- Pelkmans, J. (1984). *Market Integration in the European Community* Springer.
- Pinder, J. (1969). Problems of European integration. *Economic Integration in Europe*, 143-170.
- Raab, M., Ruland, M., Schönberger, B., Blossfeld, H.-P., Hofäcker, D., Buchholz, S., & Schmelzer, P. (2008). GlobalIndex: A sociological approach to globalization measurement. *International Sociology*, 23(4), 596-631.
- RAN, J., & LI, G. (2006). 港澳在廣州和深圳直接投資的宏觀決定因素比較. In 饒美蛟 & 陳廣漢 (Eds.), *港澳與珠江三角洲的經濟合作*. 香港: 三聯書店(香港)有限公司.
- Randolph, J. (2001). G-index: Globalisation measured. *World Markets Research Centre*, 33.
- Richardson, J. D. (1995). Income Inequality and Trade: How to Think, What to Conclude. *The Journal of Economic Perspectives*, 9(3), 33-55.
- Robson, P. (1998). *The economics of international integration*: Psychology Press.
- Sung, Y. (2004). *Hong Kong's economic integration with the Pearl River Delta: Quantifying the benefits and costs final report*. Retrieved from
- Sung, Y. W. (1992). *Non-institutional economic integration via cultural affinity: the case of mainland China, Taiwan and Hong Kong*: Hong Kong Institute of Asia-Pacific Studies, the Chinese University of Hong Kong.
- Swann, D. (1996). *European Economic Integration: The Common Market, European Union and Beyond*. Cheltenham, U.K. : Brookfield, Vt. : Edward Elgar.
- Tinbergen, J. (1954). International economic integration.
- Tsang, S.-k., & Cheng, Y.-s. (1997). The economic link-up of Hong Kong and Guangdong: structural and development problems.
- Tsang, S.-K., & Ma, Y. (2000). *The integration of China and Hong Kong into the world economy: a prototype global econometric model*: Business Research Centre, School of Business, Hong Kong Baptist University.
- Tuan, C., & Ng, L. F.-Y. (1995). Hong Kong's outward investment and regional economic integration with guandong: Process and implications. *Journal of Asian Economics*, 6(3), 385-405.
- UNECA. (2016). *Africa regional integration index report 2016*. Retrieved from
- Vujakovic, P. (2009). *How to measure globalisation? A new globalisation index (NGI)*. Retrieved from
- Wang, Z., & Schuh, G. E. (2000). Economic integration among Taiwan, Hong Kong and China: A computable general equilibrium analysis. *Pacific Economic Review*, 5(2),

229-262.

- Wu, Y. (2000). Productivity, growth and economic integration in the Southern China region. *Asian Economic Journal*, 14(1), 39-54.
- Yang, C. (2006). The Pearl River Delta and Hong Kong: an evolving cross-boundary region under “one country, two systems”. *Habitat International*, 30(1), 61-86.
doi:<http://dx.doi.org/10.1016/j.habitatint.2004.06.004>
- Yep, R. (2012, October, 2012). Hong Kong-mainland tension on the brink of explosion. *Brookings East Asia commentary*.
- Zhang, K. H. (2005). Why does so much FDI from Hong Kong and Taiwan go to Mainland China? *China Economic Review*, 16(3), 293-307.
- 马经. (2009). 顺应区域经济融合趋势 推进粤港金融深度合作. *中国金融*(18), 63-65.
- 毛艳华. (2007). 香港经济转型的三大难题探析.
- 王亚平. (1999). 论深化香港与内地对外贸易的合作. *产经评论*(11), 23-26.
- 左连村, & 张小兰. (2007). “十一五” 期间粤港经济合作思考. *国际经贸探索*, 23(4), 27-31.
- 吕大乐. (2014). 一个有边界的全球化城市: 97 后转变中的香港处境. *当代港澳研究*, 42(1), 32-46.
- 何亦文, & 劉瀾昌. (2016). *十三五規劃與香港——定位, 機會與挑戰*. City University of HK Press.
- 张玉阁, & 郭万达. (2013). 香港经济未来发展面临的挑战与策略选择. *港澳研究*, 1, 006.
- 张俊森, 伍晓鹰, 姚先国, 李宏彬, & 吴延瑞. (2009). 《香港经济研究: 经济转型, 竞争力与经济增长可持续性》 研究报告.
- 张洪天. (1997). 香港与内地贸易关系的回顾与展望. *国际关系学院学报*, 3.
- 李罗力. (2004). 大珠三角区域经济整合难在哪里? *开放导报*, 6, 007.
- 林依琳. (2009). “一国两制” 框架下粤港澳合作模式研究. 兰州大学.
- 林凌, & 冯苏宝. (2003). CEPA 与华南经济圈. *开放导报*, 9(10), L6.
- 陈可焜. (2003). 香港经济与内地经济的融合——香港经济的又一种转型. *特区经济*(6), 20-22.
- 郑永谦. (2001). *粤港澳区域经济差异及其对策研究*. 暨南大学.
- 夏丽丽, & 闫小培. (2004). 新时期粤港经济合作中的区域矛盾与整合. *热带地理*, 24(4), 346-349, 360.
- 殷舒. (2003). 从区域经济一体化看 CEPA 对粤港经济的影响.
- 袁持平, & 吴肯浩. (2005). 香港对广东直接投资的演进路径与扩散效应分析. *中共珠海市委党校珠海市行政学院学报*(6), 32-37.
- 曹龙骐, & 张渝敏. (2007). 深港股市一体化: 现实要求, 制度比较和路径选择.
- 梁潔芬, & 盧兆興. (2014). *珠江三角洲發展與港澳之融合*. City University of HK Press.
- 莫伟光, & 杨国勇. (2005). 香港与珠三角区域经济融合: 生产要素市场流动初探. 学术

研究(2), 61-66.

饒美蛟, & 陳廣漢. (2002). *新經濟及兩岸四地經貿合作*. 商務印書館 (香港).