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Impacts of Global Manufacturing Trends on Port Development: The Case of Hong Kong*

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Abstract

Global manufacturing trends may have profound implications for regional port development. This paper studies Hong Kong port (HKP), which has been one of the world's busiest container ports since the 1990s. In recent years, global manufacturers have started to move away from its primary cargo base, the Chinese Pearl River Delta. This study investigates impacts of the emerging global manufacturing trends on HKP development. It is found that relocation of manufacturing to Western Guangdong benefits HKP, while other relocation destinations make HKP less attractive or even irrelevant. Based on the findings, government policies are discussed that may be formulated to support the growth of the port and wider port-related economy.

Key Words : Port Development, Global Manufacturing, Pearl River Delta, Hong Kong

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I. Introduction

Classical port development theory states that "port growth is a function of the production outcomes of firms in the port's adjacent space — or of that space to which it is linked, either in landward space or in areas linked across water or ocean" (Robinson, 1998). This statement is clearly borne out by the rapid expansion of ports serving the Chinese Pearl River Delta (PRD). In the past three decades, the PRD has grown into the "world's factory" for a large variety of labor-intensive products. The latest available data shows that the export of the PRD region in 2012 stood at US$547.7 billion (Invest Hong Kong, 2014). Only six countries (the United States, Germany, Japan, Netherlands, France and South Korea) were able to surpass this volume in that year. To China's total export of US$2,048.7 billion, the PRD region contributed 26.73%, even though it encompasses only 0.57% of China's total landmass. Massive cargoes flowing in and out of the region have boosted regional port development. In 2013, leading ports serving the territory, namely Hong Kong port (HKP), Shenzhen port and Guangzhou port, each took places among the world's top eight container ports in terms of throughput as seen in Table 1. This standing showcases the importance for port growth of the global manufacturing activities of the hinterland and their supply chain systems (Robinson, 2002).

<Table 1> Throughput of the world's top eight container ports in 2013[1)2)]

(million TEUs)

Rank	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Port	Shanghai	Singapore	Shenzhen	Hong Kong	Busan	Ningbo-Zhoushan	Qingdao	Guangzhou
Throughput	33.6	32.6	23.3	22.4	17.7	17.4	15.5	15.3

This paper identifies the critical link between global manufacturing activities and regional port development. Specifically, it studies impacts of the emerging trends in relocation of global manufacturing away from the PRD on HKP development. Since the early 2000s, industrial policies and market conditions have changed dramatically for labor-intensive global

1) MARINE DEPARTMENT 2014b. Ranking of container ports of the world. *In:* DEPARTMENT, M. (ed.). Hong Kong.
2) TEU: Twenty-foot Equivalent Unit

manufacturing in the PRD. The Chinese central government and Guangdong provincial government have reduced tax rebates for it and introduced various restrictions on it (GPRD Business Council, 2006). Production costs have also climbed rapidly. Consequently, thousands of factories have ceased their operations there since the late 2000s (Fang and Canaves, 2008). Due to political agendas and economic forces, it is likely that emerging trends of relocating labor-intensive global manufacturing will continue to affect the area. In 2012, about 73.3% of the port cargo movements between Hong Kong and Mainland China originated from or were destined for the PRD (Census and Statistics Department, 2013). The shift of global manufacturers away from the PRD will result in HKP losing its attractiveness to these manufacturers as it loses its proximity. It is in this way that the relocation of the PRD's major manufacturers will likely have a negative impact on HKP. Taking into consideration fiercer competition from neighbouring Shenzhen and Guangzhou ports, HKP faces a very challenging future.

The relocation of hinterland economic activities is highly relevant to port development. Since port investments are usually long-term and capital-intensive projects, the welfare of the port community, stakeholders and the state's economy are at risk should government policies and port development plans fail to take into consideration the influence of cargo shifting in the hinterland. The trends of relocation of global manufacturing away from the PRD have just emerged, and their implications on HKP development have not been investigated thoroughly by researchers. A recent study (Fu et al., 2010) pointed out the trend of relocation of global manufacturing to the less-developed Western PRD and Guangdong. However, it focused primarily on port resource rationalisation for barge services other than on port development. Also, it did not consider other relocation trends. This paper aims to narrow the research gap through in-depth analysis of the impacts of all major relocation trends, so that proactive government policies may be formulated to support port growth and the wider port-related economy.

The case of HKP being affected by evolving global manufacturing trends is not an isolated one. During the 1980s and 90s, leading Japanese ports did not respond effectively to the relocation of global manufacturing

activities away from newly-industrialized economies to China and other developing countries. Consequently, their role has fallen as local feeder ports in East Asia. In a similar context, the reorientation of South Korea's trade has resulted in changes and differential port growth in the Korean port system (Lee and Rodrigue, 2006). Busan port was quick to manage the change and retained its role as a regional transhipment hub (Hoshino, 2010). The focus of this paper is not how global manufacturing trends evolve; rather, it is to analyze their impacts on regional port development using the case of HKP. Such a study offers insights for the planning of the development of other ports, the hinterlands of which are experiencing major relocation trends in manufacturing activities.

The remainder of this paper is organized as follows. First, a review of HKP development and global manufacturing trends will be provided in the next section. The third section analyses how each global manufacturing trend confers comparative advantages or disadvantages on HKP. The fourth section discusses potential policy measures. Finally, the fifth section concludes the research and identifies areas for further work.

II. HKP Development and Global Manufacturing Trends

1. HKP Development and Past Global Manufacturing Trends

The growth of HKP has been closely associated with regional and global manufacturing trends. During the 1960s and 70s, there was a trend of relocating labor-intensive manufacturing from developed countries to less-developed Asian economies in search of cheap labor. Hong Kong's export-oriented, labor-intensive manufacturing grew. Its economy took off and it rose as one of the Asian Tigers (Tan and Wee, 1995). As a result, HKP expanded to support domestic manufacturing activities. Its first specialized berth for container ships was put in use in 1972 (Wang, 2009).

By the late 1970s, it was no longer cost-competitive for Hong Kong to host labor-intensive factories after two decades of strong economic growth. As Mainland China introduced its open-door policy, global manufacturers in Hong Kong started to relocate northward to the PRD. By the late 1990s, most labor-intensive factories in Hong Kong had moved out. Over the

same period, the PRD had grown into the world's leading manufacturing base of many labor-intensive products, including textiles and garments, footwear, toys, plastic products and lighting products (GPRD Business Council, 2005). These light-industry products often require containerization in global trade. As the only modern deep-water container port in the territory, HKP handled most container cargoes for the PRD. During the 1990s, it had an average annual growth rate (AAGR) of 14.0% in terms of throughput and was the dominant container port in the region, as seen in Table 2. HKP first became the world's busiest container port in 1987 and maintained the position most years in the 1990s (Yap et al., 2006).

<Table 2> Throughput of major ports in PRD in the 1990s (million TEUs)[3)]

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	AAGR
Hong Kong	5.1	6.2	8.0	9.2	11.1	12.6	13.5	14.6	14.6	16.2	14.0%
Shenzhen			0.1	0.1	0.2	0.3	0.5	1.0	2.1	2.6	
Guangzhou						0.5	0.6	0.7	0.8	1.1	

At the turn of the millennium, HKP started to face rising competition from the newly-constructed Shenzhen and Guangzhou ports. Hong Kong's domestic export continued to shrink in terms of absolute value (Census and Statistics Department, 2009a). Nevertheless, HKP continued to grow, albeit at a slower pace, throughout the 2000s, as seen in Table 3. The key driver of this growth was, as before, the rapid expansion of global manufacturing activities in the PRD, which outweighed the influence of cargo diversion to neighbouring low-cost rival ports.

<Table 3> Throughput of major ports in PRD, 2001 – 2013 (million TEUs)[4)]

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Hong Kong	17.8	19.1	20.4	22.0	22.6	23.5	24.0	24.5	21.0	23.7	24.4	23.1	22.4
Shenzhen	5.0	7.6	10.7	13.7	16.2	18.5	21.1	21.4	18.3	22.5	22.6	22.9	23.3
Guangzhou	1.7	2.2	2.8	3.3	4.7	6.7	9.3	11.0	11.2	12.5	14.3	14.5	15.3

3) Marine Department (2010), Cullinane *et al* (2004).
4) Marine Department (2014), Marine Department (2010, 2012), Cullinane et al. (2004)

The role of HKP as a regional shipping hub can be seen in its transhipment cargo volume. As shown in Table 4, the share of cargo handled by HKP which is transhipment has increased steadily since 1998 and currently contributes the majority of the throughput. According to Hong Kong Port Development Council (HKPDC), about 70% of container traffic handled in Hong Kong is related to the PRD and its adjacent areas (Hong Kong Port Development Council, 2009). Global manufacturing industries in the PRD have been vital for HKP and have boosted Hong Kong's role as a regional shipping hub.

<Table 4> Hong Kong Port cargo throughput by shipment type[5)]

Year	Direct shipment cargo (%)	Transhipment cargo (%)	Total ('000 Tonnes)
1998	76	24	167, 170
1999	70	30	168, 838
2000	65	35	174, 642
2001	62	38	178, 210
2002	59	41	192, 510
2003	56	44	207, 612
2004	53	47	220, 879
2005	53	47	230, 139
2006	51	49	238, 238
2007	46	54	245, 433
2008	46	54	259, 402
2009	47.3	52.7	242, 967
2010	44.3	55.7	267, 815
2011	42.7	57.3	277, 444
2012	41.3	58.7	269, 282
2013	43.2	56.8	276, 055

2. Emerging Global Manufacturing Trends in the Chinese Pearl River Delta

Since the late 2000s, labor-intensive global manufacturers started to move away from the PRD (Fang and Canaves, 2008), which may affect HKP development. From past global manufacturing trends, it is clear that

5) Compiled based on data from Marine Department of Hong Kong SAR Government

labor-intensive global manufacturing has been in constant search of cheap labor. The PRD has been in the process of industrialization for three decades since the 1980s. Production costs have now climbed rapidly with the appreciation of the Chinese currency Renminbi (RMB), rising labor costs, the reduction of value-added tax (VAT) rebates, etc. (Zhang et al., 2012). Although Chinese workers are more productive than their counterparts in many other low-cost countries (HKTDC, 2010b), there is a limit to how well global manufacturers can accommodate accumulating cost pressure. More and more labor-intensive global manufacturers are likely to relocate to inland China (HKTDC, 2007) or to other Asian countries where labor costs are more favourable (Table 5).

<Table 5> Comparison of minimum wages[6)]

	China	**India**	**Indonesia**	**Malaysia**	**Philippines**	**Thailand**	**Vietnam**
Annual minimum wage (US$)	2,472	689	1,087	3,107	1,515	3,012	1,296
Hourly minimum wage (US$)	1.19	0.28	0.52	1.24	0.73	1.21	0.64
Annual Total cost of labour (minimum wage plus welfare, US$)	3,337	740	1,187	3,534	1,648	3,167	1,581

Most global manufacturers in the PRD are funded by investments from Hong Kong. In fact, Hong Kong accounts for about 70% of the foreign direct investment in export-oriented manufacturing in Guangdong province (GPRD Business Council, 2007). Global manufacturing industries have the highest concentration of any type of industry in the Eastern/Central PRD due to convenient road connections with Hong Kong. Thus, future developments in the emerging relocation trends can be fairly confidently predicted based on understanding of how Hong Kong-invested manufacturers in the PRD respond to changes in the business environment. A survey conducted by the Federation of Hong Kong Industries in 2012 indicates that 70% of the responding manufacturers intended to stay within the PRD, while the rest have plans to scale down their production or move part or all of it out of the PRD, as shown in Table 6.

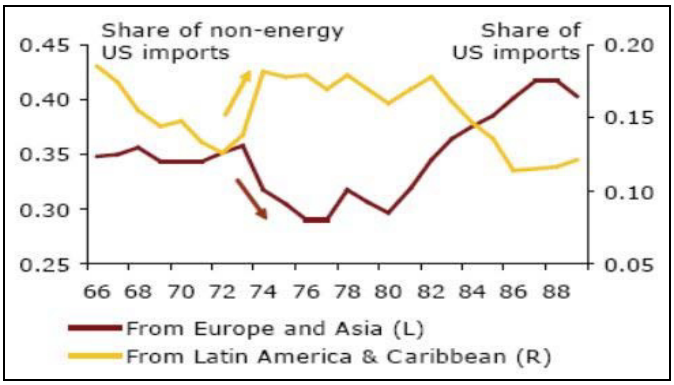
6) China Briefing (2014)

<Table 6> Relocation possibilities of Hong Kong-invested manufacturers[7)]

	% of responded manufacturers
Will not move out of PRD	70%
Retain existing scale in PRD, will also open new lines in other regions	16%
Scale down production, may move parts out of PRD	12%
Move all out of PRD	1%

Relocating global manufacturing to locations near the major markets of North America and Europe is another trend, which may develop with the recent hike in oil prices. Fuel expenditure is a major cost component in ocean shipping. The hike in oil prices directly pushes up shipping costs, which is especially harmful to global manufacturers in the PRD because of its long transport distance from major markets. Before 2003, oil prices had stayed at around US$30 per barrel for about two decades. However, they have risen quickly in recent years and been highly volatile. In early 2008, oil prices rose above US$100 per barrel and American importers were advised to source freight-intensive goods from Mexico rather than China (Rubin and Tal, 2008). Although oil prices fell with the unfolding of the global financial crisis in late 2008, they rebounded sharply with the recovery of global economy. Thus, the possibility that global manufacturing will be relocated to places nearer major markets is not remote. In fact, a dramatic trend in this direction was observed in US imports during the OPEC oil shocks in the late 1970s, as seen in Figure 1.

<Figure 1> Trade diversion during the OPEC oil shocks[8)]



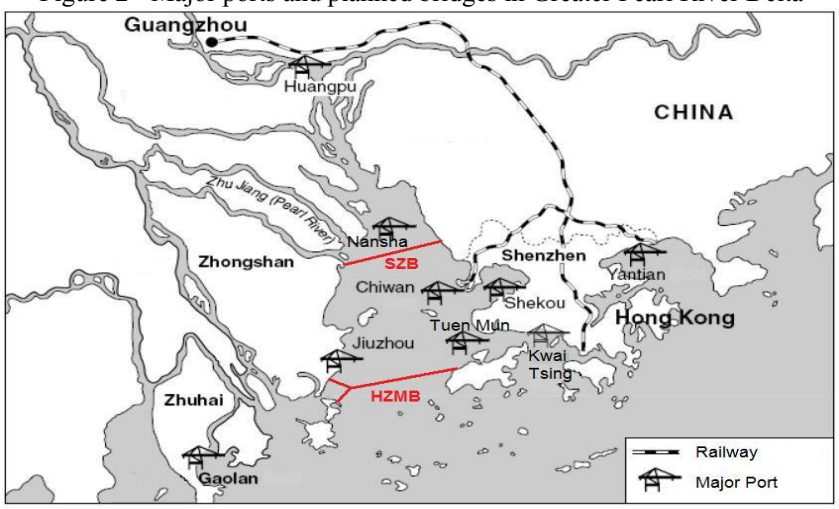
7) Federation of Hong Kong Industries (2014)
8) Rubin and Tal (2008)

III. Impacts of Emerging Global Manufacturing Trends on HKP Development

1. Impacts of Relocation of Global Manufacturing within Mainland China

Port choices are influenced by availability of transportation connections to ports, shipping costs, port charges, port service levels, regional port competition and quality of services (Wong et al., 2001, Chang et al., 2008, Tongzon, 2009, Veldman et al., 2011). In general, better transportation connections and shorter transport distance mean lower cost for the drayage service between a container terminal and the origin (or destination) of a shipment (Cheung et al., 2008). Barging incurs substantially lower costs than land transportation modes if waterways are available. Railway transportation is more economical over long distances than trucking. Trucking is most flexible and best overall for short-distance transportation. As a large share of HKP's cargo movement comes from the PRD, the choice of mode of transport inland plays a part in determining whether HKP is chosen. In the PRD, the main determinants for port choice are (a) total through cost, which consists of inland transport cost, port charges and ocean freight; (b) lead time, which includes port dwell time and inland transport time; and (c) intangible factors, such as shippers' experience with a port's handling of cargo, documentation, administration, security level and customs policy (Zhang et al., 2014).

<Figure 2> Major ports and planned bridges in Greater Pearl River Delta[9)]



9) Adapted from Song (2003), Highways Department (2011)

Figure 2 shows the locations of major ports and planned bridges in the Greater PRD region. As mentioned previously, lower-cost regions in Guangdong are a popular relocation destination for global manufacturers in the PRD. Specifically, they can relocate to less-developed Western, Northern or Eastern Guangdong. Most of these areas are within a three-hour travelling distance of the PRD seaports. HKP gains a geographical advantage if global manufacturers relocate to the Western PRD and Guangdong and ship their cargoes via barging (Lin, 2008, Fu et al., 2010). The future completion of the Hong Kong-Zhuhai-Macau Bridge (HZMB) and the Shenzhen-Zhongshan Bridge (SZB) will cause competition between the transportation modes of trucking and barging. However, most cargoes will probably still be transported by barge due to lower costs, the wide availability of waterways as seen in Figure 2 and the high concentration of small feeder ports in Western Guangdong (Fu et al., 2010). In addition, issues with Mainland Chinese customs also make HKP more favourable for cargoes from the Western PRD and Guangdong (Wang and Slack, 2000).

<Table 7> Transportation cost and lead time from PRD cities via major ports in PRD region[10)]

Cost in US$ (Lead time in hrs)	Via HKP		Via Shenzhen port		Via Guangzhou port	
	Truck	Barge	Truck	Barge	Truck	Barge
Shenzhen	777 (72)	614 (145)	495 (95)	N/A	806 (180)	491 (194)
Dongguan	944 (74)	768 (149)	538 (96)	727 (113)	806 (179)	709 (193)
Huizhou	905 (74)	755 (150)	538 (96)	N/A	837 (180)	N/A
Guangzhou	1,137 (74)	670 (148)	601 (97)	562 (111)	612 (179)	N/A
Foshan	1,175 (75)	678 (151)	648 (97)	557 (115)	617 (180)	551 (195)
Zhuhai	1,329 (75)	717 (153)	805 (97)	758 (118)	696 (180)	N/A
Zongshan	1,227 (74)	729 (152)	695 (97)	739 (116)	539 (179)	522 (196)
Jiangmen	1,342 (75)	807 (155)	742 (97)	N/A	821 (180)	N/A
Zhaoqing	1,368 (76)	935 (161)	836 (98)	557 (125)	821 (181)	N/A

Relocation of global manufacturing to Northern/Eastern Guangdong is unfavorable to HKP. If global manufacturers relocate to Northern Guangdong, the nearest seaport will be Guangzhou port. In terms of both

10) Wu and Peng (2013)

waterway and land transportation, Guangzhou port will be more conveniently located. If global manufacturers move to Eastern Guangdong, the nearest seaport will be the well-established Yantian, Shenzhen port. Trucking will become the primary mode of drayage services. HKP will become less attractive due the high cost of reaching it by truck. Table 7 provides a big picture of the transportation cost and lead time from PRD cities via HKP, Shenzhen port and Guangzhou port respectively (Wu and Peng, 2013, Invest Hong Kong, 2014).

Besides Guangdong, other Pan-PRD provinces are popular relocation destinations for global manufacturers. For example, Ganzhou in Jiangxi province had approved about 1,850 Hong Kong-invested enterprises by 2011 (HKTDC Research, 2011). Among the measures taken by Ganzhou to attract them were setting up a Hong Kong industrial park and allowing tax incentives and subsidies in logistics and transportation costs (HKTDC Research, 2011). Under this state of affairs, it is much less likely that the cargoes of global manufacturers there will be shipped via HKP. Besides its disadvantage in the area of trucking, HKP lacks direct railway linkage. It will lose business opportunities which railways would have provided by being more economical for long-distance land transportation. In most cases, Shenzhen and Guangzhou ports are the primary choices for cargoes related to the Pan-PRD due to better transportation connections.

<Table 8> Potential changes in port competitive positions[11)]

Global manufacturing relocation destinations in Mainland China	Hong Kong port	Shenzhen port	Guangzhou port
Western Guangdong	++	−−	−
Northern Guangdong	−	−	++
Eastern Guangdong	−	++	−
Pan-PRD provinces	−−	+	+
North side of Pan-PRD	−−	−−	−−

Table 8 summarizes potential changes in the relative competitiveness of ports as a result of relocation of global manufacturing within Mainland China. If global manufacturers move further away from the Pan-PRD, then Shanghai port, Ningbo-Shoushan port and other ports in Northern China

11) ++ / −− indicates significant improvement/decline
+ / − indicates slight improvement/decline

will become more convenient choices (Li and Oh, 2010). HKP, together with Shenzhen and Guangzhou ports, will be at a disadvantage.

2. Impacts of Relocating Global Manufacturing out of China

If global manufacturers in the PRD move overseas to lower-cost Asian countries, the nature of the cargo shipped will change more and more from direct load to transshipment for those who continue to use HKP. So far, Vietnam in Southeast Asia has gained the most from the shift in attention in labor-intensive global manufacturing (Trunick, 2008). For the regional cargo business, the port of Singapore has been HKP's primary competitor. HKP is literally better-positioned to serve transpacific routes, while Singapore is an excellent *en route* location for the ocean trade with Europe (Fleming, 1997). Evidence has suggested that the port of Singapore is more competitive than HKP due to its higher service levels and lower service charges (Yeo and Song, 2006). In addition, ports in Malaysia, Taiwan and Mainland China also compete for regional transshipment cargo business. Although their shipping line connectivity and service levels are yet to catch up with those of HKP, their service charges are better (Yap et al., 2006). HKP faces a stiff competition for transshipment cargo from Vietnam and nearby Southeast Asian countries.

Furthermore, port development in Vietnam has altered cargo routing patterns in Southeast Asia. In the past, Vietnam did not have its own deep-water port. Container cargoes from Vietnam had to be shipped by feeder vessels to a transshipment hub, typically Hong Kong or Kaohsiung, before being loaded onto large long-haul vessels (Trunick, 2008). However, this changed in May 2009 when Cai Mep International Terminal had its inauguration in Southern Vietnam. In less than two years, several major shipping lines introduced direct Vietnam-US and Vietnam-Europe services (Nguyen, 2010). The growing cargo business in Vietnam and nearby Southeast Asian countries is more and more likely to be attracted by these direct services. By the same token, it is less likely that HKP will benefit from the emerging trend of relocation of labor-intensive global manufacturing to Vietnam and nearby Southeast Asian countries.

Relocation of global manufacturing to other Asian lower-cost countries will be yet more unfavorable for HKP development. Countries such as

Indonesia, India and Bangladesh have also been hot spots for labor-intensive global manufacturing (Fernandes, 2008). Since they are all far away from Hong Kong, if global manufacturers move there, HKP will become almost irrelevant. In the best-case scenario, HKP would only have the chance of serving those of their semi-finished products which are mainly from industrialized economies in East Asia and Southeast Asia.

The future of HKP also looks bleak if global manufacturers move nearer to major markets because high oil prices discourage long-distance shipping. Intra-Asia trade has been growing rapidly (HKTDC, 2010a). However, much of it is still driven by final consumption in developed countries. The trend of relocating global manufacturing nearer to major markets, if it grew into a major trend, would greatly impair the development of HKP and other Asian ports.

IV. Policy Discussions

HKP is vital to the economy of Hong Kong. It directly contributes 1.9% of the city's Gross Domestic Product (GDP) and 113,000 jobs (Macauley, 2010). More importantly, the port is a key vehicle for trading operations in Hong Kong because ocean shipping is the major transportation mode of global trade. As one of the four pillar industries of Hong Kong, trading and logistics services accounted for 25.8% of the GDP and 24.2% of total employment in 2007 (Census and Statistics Department, 2009b). The Hong Kong government has stated that "the impact the port has on the wider economy is too great to lose" (Macauley, 2010). It is thus crucial for the government to devise proactive policies to strengthen the role of Hong Kong as an international shipping hub. This section discusses policies for the development of HKP in light of the emerging global manufacturing trends and their impacts as analysed above.

1. Influencing Global Manufacturing Trends

Trends of relocation of global manufacturing away from the PRD have only just emerged in recent years and their future development is uncertain. Opportunities still exist for the Hong Kong government to influence global manufacturing trends. The trend of moving global manufacturing near to

major markets is subject to changes in oil prices which are primarily determined by market mechanisms, but the Hong Kong government may be able to influence other relocation trends, because most global manufacturers in the PRD are funded by investments from Hong Kong (GPRD Business Council, 2007).

Analysis in the previous sections shows that HKP will gain advantage in terms of location if global manufacturers relocate to Western Guangdong, while all other relocation destinations will have negative effects. Relocation of global manufacturing to Western Guangdong is also in the interest of the Guangdong government, as industrial outputs are then retained within its jurisdiction. For Hong Kong-invested enterprises, this a relocation option minimizes potential disruption of supply chain activities due to its geographical proximity to headquarters in Hong Kong and existing production facilities in the Eastern/Central PRD. In addition, it brings only minimal challenges in terms of language and culture to Hong Kong business owners. With this win-win outcome for all parties involved, the Hong Kong government should deliberately facilitate its outward investments in Western Guangdong as long as its labor cost remains competitive. Facility relocation is a strategic decision of global manufacturers and usually requires a substantial amount of investment. Many small and medium-sized enterprises face financial difficulties with the transition (GPRD Business Council, 2007). The government could devise financial assistance schemes to aid global manufacturers. It is also possible for the Hong Kong government to work together with the business community to negotiate favorable taxes and land incentives with local governments in Western Guangdong.

Logistics infrastructure is a key factor influencing manufacturing investment. The Hong Kong government should make efforts to ensure the completion of the Hong Kong-Zhuhai-Macau Bridge on schedule in 2016, as it is hoped that this mega infrastructure will usher in an economic boom in the Western PRD and Guangdong and enhance cargo movement between the Western PRD and Hong Kong (Enright et al., 2005). On the other hand, key port players in Western Guangdong, such as Maoming and Yangjiang ports, should ensure that the increase in cargo-handling activities expected from relocating manufacturers can be accommodated

efficiently. This requires developments in cargo handling and consolidation facilities. Viable investments can come from Hong Kong's port operators, due to the close economic relations between the two regions. This will not only make Western Guangdong more attractive as a relocation destination for global manufacturers, but also secure the competitive position of HKP for cargoes from Western Guangdong via barging. The fact should not be ignored that neighbouring Mainland Chinese ports have been very active in developing feeder collaborations with the Western PRD (GHK, 2008).

2. Enhancing Port Service Levels

With its obvious cost disadvantage, HKP can only retain shippers by virtue of its superior service quality. Shenzhen port has made significant improvements in services in recent years (GHK, 2008). HKP must continuously improve its service levels to maintain a competitive edge. Currently, it is usually faster to ship via HKP due to high efficiency at the port and customs, and this has helped the port to win time-sensitive cargoes (HKTDC, 2010c). However, there are still serious bottlenecks slowing down cargo flows through it.

A bottleneck which has been long-standing despite improvements made in recent years is the border between Mainland China and Hong Kong (GHK, 2008). More efforts should be made to speed up the flows of people and cargoes across this border. According to government regulations, Mainland Chinese trucks cannot conduct cargo business in Hong Kong. Thus, one set of trucks and drivers must be used in Mainland China and another in Hong Kong. This not only incurs high trucking cost, but also slows down the cargo flow and makes HKP less attractive. The removal of such institutional obstacles and the simplification of border-crossing procedures would require close collaboration between the Hong Kong and Guangdong governments. In addition, a seamless border-crossing process requires the support of adequate infrastructure, continuous research and investment in enabling technologies like Radio Frequency Identification (RFID) and electronic customs clearance. Thus, the Hong Kong government needs to tackle both the "soft" and "hard" sides of border-crossing issues.

Another bottleneck is the congestion and inefficiency in the handling of river cargoes at Kwai Tsing terminals. There has been an increase of 30% in barge movements in Hong Kong over the last decade (So, 2014). Kwai Tsing terminals have been experiencing congestion as there is insufficient space and facilities to accommodate barges. It is quite common for barges to spend one to two days waiting for their containers to be loaded and uploading (Lin, 2008). Such a long time is intolerable, as the barge sailing time from the PRD is normally within 24 hours. Consequently, many river cargoes have been sent elsewhere, to neighbouring Shenzhen and Guangzhou ports (Wong et al., 2008). Ironically, the River Trade Terminal (RRT) at Tuen Mun, which was built to improve river cargo flow at HKP, is largely idle. This is because RRT is mandated to handle river cargoes only and is not legally allowed to handle ocean-going vessels, which prevents an efficient flow of river cargoes to ocean vessels. The Hong Kong government should involve various stakeholders to review the mandate and improve its port resource utilization, which will, in turn, alleviate the congestion at Kwai Tsing terminals. The government should also evaluate the option of granting additional land for dedicated barge berths next to Kwai Tsing terminals, which will reduce double-handling of river cargoes both at RRT and by midstream operations.

3. Moderating Total through Costs

Although it is not realistic to aim to totally eliminate the cost disadvantage of HKP, it is possible to moderate the total through costs. Initiatives to this effect would lead to significant throughput growth at HKP for both gateway and transshipment cargoes (Lee et al., 2006).

High trucking cost makes up about two thirds of the cost disadvantage of shipping via HKP. If Shenzhen truck drivers were allowed to transport containers directly to HKP, the cost gap would largely disappear (GHK, 2008). Of course, the immediate concern is Hong Kong truck drivers losing their jobs. However, if the deregulation is not carried out, the trend of diverting cargoes from HKP to Mainland Chinese ports will continue, and Hong Kong is likely to lose these job opportunities eventually anyway. When that happens, it will cause Hong Kong much greater harm to its wider port-related economy. The urgency of market deregulation is

paramount, because it is very difficult to win the market back once it is lost. The Hong Kong government and Legislative Council should question whether it is still viable to protect jobs in low value-added trucking when it costs Hong Kong more opportunities in higher value-added activities like freight forwarding, trading, port operations and supply chain management. To sustainably develop seaport-related industries in Hong Kong, it may be advisable to allow Hong Kong-invested logistics companies in Shenzhen to employ Mainland Chinese drivers to transport containers to HKP directly. In this way, higher value-added logistics management activities can still be retained by Hong Kong-invested enterprises, even though they may hire Mainland Chinese drivers for trucking operations.

High terminal handling charges (THCs) account for the other third of the cost gap for the use of HKP. A major cause of this problem is the high land cost and space crunch in Hong Kong. A container terminal usually takes up about 25 hectares per berth for container storage, while HKP has only half of that space. As a result, terminal operators have to stack containers higher and require more machines to work faster, which adds costs for them (Macauley, 2010). This issue cannot be resolved in the long term unless the Hong Kong government tailors a favourable land supply policy for its port development, because the land in Hong Kong is very expensive. Another cause of high THCs, as voiced by shippers, is the lack of transparency in service charges (Hong Kong Shippers' Council, 2006). Shipping lines claim that THC collection is a cost-recovery exercise. However, they have not revised THCs downward in recent years, even though HKP terminal operators have reduced tariff charges to shipping lines substantially – by around 30%. The collection of THCs is supposedly a commercial matter and the government should not normally intervene. However, when there is strong evidence that the price fixing of THCs is not fair, the Hong Kong government should not stand still. A plausible countermeasure is to introduce a competitive law in Hong Kong, as has been adopted worldwide for many other industries (GHK, 2008, GPRD Business Council, 2007).

4. Improving Port Planning and Governance

Repetitive port construction in the PRD region has caused fierce port competition over the last decade which has directly slowed HKP development. It would benefit regional governments to more carefully coordinate port planning in line with guidelines set by the Chinese central government (NDRC, 2008). It might also be instructive to investigate whether a cross-jurisdictional port authority should be created to govern all ports in the PRD to end the unhealthy competition. Such a practice in port governance has been adopted elsewhere for ports that serve a common hinterland, for example, the Port Authority of New York and New Jersey (Heaver et al., 2001) and the Tasmanian Ports Corporation in Tasmania, Australia.

Port competition between Hong Kong and Shenzhen ports is complicated, because the same few terminal operators have built and continue to manage most terminals on both sides. To maximize their profits, terminal operators prefer to build new terminals in Mainland China rather than Hong Kong (Wang and Slack, 2000). Also, the trigger point mechanism (TPM) adopted by the Hong Kong government in port planning grants no right to build new terminals unless and until the demand for container handling services exceeds the current capacity by a certain amount. This does not benefit HKP development as they compete with Mainland Chinese ports, which are very aggressive in expanding their capacity to pre-empt the shipping market. TPM has also enforced the monopoly power of terminal operators with the effect of keeping service charges high at HKP, which indirectly makes the port less attractive (Fung, 2009). The Hong Kong government should rethink the TPM policy and its unintended consequences.

V. Conclusions and Future Work

This research studies the impacts of global manufacturing trends on port development. The planning of port infrastructure must take into account cargo shifting in the hinterland, as it may have profound implications for port throughput growth. We study the case of HKP in light of the emerging

trends of relocation of global manufacturers out of the PRD, its primary cargo base. HKP was the world's busiest container port in the 1990s and early 2000s. Labor-intensive global manufactures in the PRD have been its key cargo source and have boosted its role as a regional shipping hub. In recent years, however, many labor-intensive global manufacturers have ceased their operations in the region due to rapidly climbing production costs and industrial policy changes. If global manufacturers move far away, HKP will be marginalized over the long term. Coupled with rising competition from neighbouring Mainland Chinese ports, these challenges present HKP with a difficult future. The Hong Kong government needs to devise proactive policies to support its port growth.

This paper makes several contributions. First, it identifies the critical link between global manufacturing trends and regional port development. This topic is significant and warrants further study. Insights gained from this study can be valuable for port development planning in other regions. For example, ports in Vietnam, India and Bangladesh now have opportunities to raise their rank in global shipping networks, because there has been rapid expansion of export-oriented manufacturing activities in their hinterlands (Cho and Yang, 2011). However, their port policy makers need to act wisely and quickly enough in order to seize the opportunities.

Second, the study provides new knowledge on HKP development. It identifies emerging global manufacturing trends in the PRD and then analyses how they could impact the comparative advantages and disadvantages of HKP. Global manufacturing relocation to China's Western Guangdong province will benefit HKP development; relocation to Northern and Eastern Guangdong and to nearby Southeast Asian countries will make HKP less attractive. Relocation to inland China, faraway lower-cost Asian countries, and locations near major markets will make HKP almost irrelevant.

Last but not least, policies are discussed for supporting HKP development by influencing global manufacturing trends, enhancing port service levels, moderating total through costs and improving port planning and governance.

The research has several limitations. First, it studies only a single port, HKP, and focuses mainly on the impact on it of emerging global manufacturing trends in the PRD. Regional port competition is reviewed, but its implications for HKP development could be further explored. Second, the comparative advantages and disadvantages of ports are in constant change, especially in the PRD, where Mainland Chinese ports have been developing rapidly. The competitive position of HKP needs to be updated from time to time. Third, this research is qualitative in nature. An immediate extension would be a quantitative study on HKP development from a supply chain perspective. Mathematical models can be developed to analyse choices between HKP and competing Mainland Chinese ports. *

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