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What Opportunities from the “One Belt, One Road” Initiative for Manufacturing? The Case of Hong Kong's Textiles and Clothing Sectors

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Abstract: The One Belt, One Road (hereafter OBOR) initiative is a development strategy launched by China in 2015. Its aim is to increase economic co-operation among countries along the China’s Silk Road Economic Belt and 21st Century Maritime Silk Road that connect Asia, Europe and Africa. As one of China’s important economic drivers, Hong Kong’s anticipated gains taking part in this initiative are substantial. This is particularly true for companies in the textiles and clothing (T&C) sectors, as the OBOR initiative offers investment opportunities in developing low-cost production bases in developing countries and promotes global trade.

The main objective of this paper is twofold. First, it investigates how Hong Kong can strengthen its “super-connector” role, facilitating sustainable trade and development in the T&C industries among some OBOR countries. Specific measures are identified so that T&C companies in Hong Kong can establish and facilitate technological upgrades and transformation to potential production facilities in some developing countries under the OBOR initiative. This would contribute to the sustainable development of the T&C sectors in Hong Kong. Second, the study extends the gravity trade model to analyze the development of T&C trade patterns between Hong Kong and OBOR countries. Especially it covered some of the key factors not considered in previous studies, such as Logistics Performance Index (LPI), demographical factors, and those related to the business environment and policies. The analysis covers the impacts of country-specific, social, economic and supply chain factors on T&C trade. Based on the results, recommendations are provided to address how Hong Kong helps to facilitate trade and development of the T&C sectors under the OBOR initiative.

Keywords: Supply chain management, trade gravity model, textiles and clothing, One Belt, One Road

1. Background

The OBOR initiative is a development strategy launched by China in 2015. Its main objective is to promote economic co-operation among countries Asia, Europe and Africa along the belt (the “Silk Road Economic Belt” stretching from China to Central Asia, Russia and Europe), and the road (the “21st Century Maritime Silk Road” from China to Europe through the South China Sea and Indian Ocean, and from China through the South China Sea to the South Pacific). Start from 2013, over 30 OBOR proposals for cooperation and implementation agreements have been developed, together with core areas of cooperation, well-defined details for the key framework, and cooperation mechanisms. In general, the initiative contains six international economic cooperation corridors, covering the key transport routes and important cities (Lau et al., 2018). Due to its strategic location with convenient access to South East Asia and Pacific countries, and the strength in financial services and technology advantage, Hong Kong is expected to benefit substantially from the initiative. For example, its banks could provide financing services for OBOR infrastructure projects and trading companies could expand their markets and have better access to countries in the OBOR region. Hong

Kong manufacturing companies can also benefit from technology transfer and investment in countries with relatively lower labour cost.

Demand for new low-cost offshore production is highly relevant for labor-intensive industries in Hong Kong, and that is particularly the case for the T&C sectors. Since the 1980s, T&C companies in Hong Kong have been relocating and expanding their production facilities to mainland China and other countries such as Bangladesh, Cambodia, Vietnam and Sri Lanka. This strategy helps to expand production at lower costs and reap the benefits from trade preferential access agreements for the EU and US markets. The strategy of relocating the production of lower-end and mass garments to places with a cheaper labor supply seems to underpin the historical development of some of these T&C companies that position themselves as original equipment manufacturing (OEM) package contractors for foreign brand owners and retailers.

On the other hand, partner countries will present themselves as attractive destinations through the OBOR initiative for foreign investments in trade-led manufacturing. This is because a country's infrastructure quality and quantity affect its attractiveness as an offshore production location, and thus its opportunity of integration with global and regional production chains. In their meta-analysis of 36 empirical trade studies, Celbis et al. (2013, p.1) reported that there is a significantly positive impact between export performance and infrastructure. With the use of gravity trade model, Hoekman and Nicita (2011) found that domestic trading costs are a crucial import and export bottleneck for low income countries. Using a standard gravity trade model, Shepherd and Wilson (2009, p.367) reported that "trade flows in Southeast Asia are particularly sensitive to transport infrastructure and information and communications technology", and suggested that "the region could make significant economic gains from trade facilitation reform". Pomfret (2013) observed that Cambodia, Laos and Myanmar, as the new members of the Association of Southeast Asian Nations (ASEAN), are not meeting the challenge of matching the performance of earlier ASEAN members in the integrated East Asian economy. That is partly due to their high trade costs which create barriers that impede their active participation in regional value chains (Pomfret 2013).

One can expect that the OBOR initiative has a role in helping developing countries to improve their infrastructure for trade as well as to enable some of the T&C companies in Hong Kong to pursue future production relocation. This model of development will only encourage companies to keep relocating low-value added production processes to locations with lower costs, and put pressure on developing countries to keep their domestic production and trade costs as low as possible to attract foreign investments. As Ross and Chan (2002) showed, since 2000, during the transition from the North-South to South-South competition in the production of labor-intensive commodities, Mexico lost its low-cost competitive advantage vis-à-vis China, and between 2000 and 2002, approximate 28,000 jobs in Mexico's maquiladoras were lost. Competition for international capital is fierce not only at the country level, but also among provinces within a country. Liu et al. (2010) in their study of 2,884 firms that invested in China between 1993 and 1996 reported that foreign investors are highly sensitive to provincial wage differences in finalizing their decision on location of T&C industries, among other labour intensive industries. It is no surprise that export-oriented manufacturers who pursue geographical relocation of low value adding production processes may take advantage of the OBOR initiative. This could, on one hand, further accelerate the "race to the bottom" in labor welfare in the T&C sectors of developing countries. And, on the other exacerbate the negative consequences resultant of the ending of the quota system since 2005 (Appelbaum et al. 2005).

The main objective of this paper is twofold. First, it extends the trade gravity model to analyze the development of T&C trade patterns between Hong Kong and OBOR countries. Second, it investigates how Hong Kong can take advantage of its "super-connector" role in facilitating sustainable trade and development in the textiles and clothing (T&C) industries in One Belt One Road (OBOR) countries.

2. Quest for a Sustainable Development Model in the T&C Industries

Due to its strategic location in South East Asia and technological advantage, Hong Kong has a 'super-connector' role in driving the T&C sectors in both China and the OBOR countries. This can be achieved from at least three aspects. First, due to their location and better access to international transport and logistics services, they have cost advantage and hence more competitiveness than producers in other countries. Contrary to the common view that international buyers take the lead to upgrade their supply chains, Au and Ho (2002) noted that it is actually some Hong Kong manufacturers who have played a proactive role

in pursuing supply chain excellence by applying of new technologies and practices over the years. This is plausible because most international brand-name retailers do not own or operate production facilities, and thus rely heavily on highly capable full-package suppliers

Second, due to their cumulative knowledge in product management, marketing and market access, they can serve as a distribution hub for T&C products produced from OBOR countries and exported to the rest of the world; companies in Hong Kong can play the central role in design, production and distribution of products produced from OBOR countries and distributed to the rest of the world, especially the markets in developed countries, where they would have a better understanding of consumer tastes and access to the distribution networks. According to Ho (2016), some T&C companies in Hong Kong have established in-house training and development programs that aim to enhance technical skills for critical production roles, with pilot programs conducted in factories in China and Malaysia and later expanded to all factories in the Asian region. With advanced knowledge and skills, the trainees are empowered and enabled to implement different projects that boost production efficiency and quality. These practices help to reduce the pressure induced by rising labor costs due to the relocation of production facilities, and offer opportunities to pursue higher-value activities. Social upgrades in developing countries are also made possible through the transfer of successful training and development programs to new production facilities, with the aim to improve labor skills and welfare in a shorter amount of time (Ho 2016).

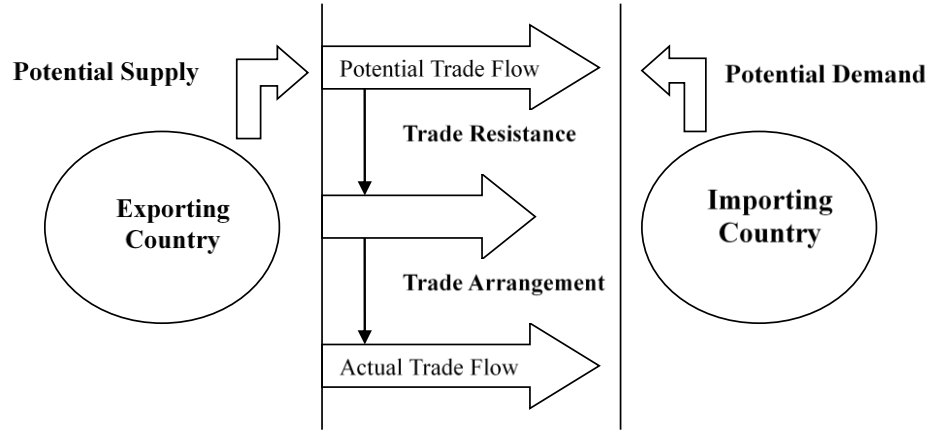
Third, they can play a key role in foreign investment and technology transfer for the development of the T&C sector in the OBOR countries. T&C companies in Hong Kong may also invest in developing new technologies and practices in the more mature and advanced production facilities, so as to offset higher labor costs through productivity gain and better product quality. This strategy offers opportunities for technology transfer and knowledge sharing with the new production base, thus contributing as industry upgrades in the host countries. At the same time, these new technologies and practices are highly eco-efficient, for example, the denim program of H & M aims to improve water-efficiency and thus impose fewer negative environmental impacts (Ho 2014).

Fourth, the past few years have seen increasing awareness of corporate social responsibility (CSR) and sustainable development that are related to the issue of safety management, environmental impacts, and community engagement. As a result, large fashion companies have been managing their operations in a more socially and environmentally responsible way (Ho 2014). Large Hong Kong T&C manufacturers are in joint collaborations jointly with their international buyers and non-government bodies to implement various training and development programs for workers, with the aim to expand their network relations as well as occupational health and safety in their new factories in the Southeast Asian region (Ho 2016). It is therefore expected that T&C suppliers in the developing countries will follow the same trend.

3. Extended Gravity Model of T&C Trade between Hong Kong and OBOR Countries

This section analyses T&C trade between Hong Kong and the Asian countries that are now members countries of the OBOR initiative. The well-known gravity model of international trade is extended and applied to investigate T&C trade among the OBOR countries. It attributes trade between two countries to the size of their economies and distance between them, hence the ‘gravity’ model (Chan et al. 2008; 2016). Moreover, the model performs well in empirical research (Havrylyshin and Pritchett, 1991; Bayoumi and Eichengreen, 1997). Apart from its use in empirical studies, the gravity trade model has been used as a means to test different trade theories such as Anderson (1979), Bergstrand (1985) and Eli Heckscher and Bertil Ohlin in Deardorff (1998) because it can be extended to account for the effect of various factors on international trade.

In this study, the extension to the model covers other factors that have not been considered in previous studies on the same sectors, such as production costs, export supply chain costs, technologies, demographical factors, and the characteristics of business environment and policies. The analysis makes use of panel data and allows for the fixed effects over time for each scenario, thus exploring the changes and increasing the manipulation of the data quality and quantity which would otherwise not be possible with the use of cross sectional or time series estimation alone. The analysis will cover the impact of the transport and logistics represented by Logistics Performance Index (LPI), country-specific and social determinants as well as economic indicators influential to T&C trade.

Figure 1: Trade Gravity Model

Source: Polder (2000)

The following Lau, Chan, and Nguyen (2017), we propose the following extension of the gravity model:

$$\ln(\text{EXP}_{ij})_t = \alpha + \beta_1 \ln(\text{GDP}_i)_t + \beta_2 \ln(\text{PCGDP}_i)_t + \beta_3 \ln(\text{GDP}_j)_t + \beta_4 \ln(\text{PCGDP}_j)_t + \beta_5 \ln(\text{D}_{ij}) + \beta_6 \ln(\text{POP}_{jt}) + \beta_7 \text{REXRATE}_{ijt} + \beta_8 \ln(\text{VALADDED}_i)_t + \beta_9 \ln(\text{WAGE}_i)_t + \beta_{10} \ln(\text{FEMALE}_i)_t + \beta_{11} (\text{LPI})_t + U_{ijt}$$

where:

$\ln(\text{EXP}_{ij})_t$ log of T&C export value in US\$ mil from OBOR countries to Hong Kong, with i denoting the exporting country, j Hong Kong, t the annual period from 2005 to 2015;

α fixed effect of representing unobserved time-constant factors on EXP_{ij} ;

β coefficient;

$\ln(\text{GDP}_i)_t$ log of GDP of the exporting country in US\$ mil dollars;

$\ln(\text{GDP}_j)_t$ log of GDP of the importing country in US\$ mil dollars;

$\ln(\text{D}_{ij})$ log of geographical distance (in km) between the individual capitals of the importing and exporting country;

U_{ijt} error term; and

the extension independent variables:

$\ln(\text{PCGDP}_i)_t$ log of GDP per-capita of the exporting country in US\$ mil dollars;

$\ln(\text{PCGDP}_j)_t$ log of GDP per-capita of the importing country in US\$ mil dollars;

$\ln(\text{POP}_{jt})$ log of the importing country's population;

REXRATE_{ijt} real exchange rate in terms of value of foreign currency per US dollar;

$\ln(\text{VALADDED}_i)_t$ log of the value-added amount in the apparel industry of the exporting country;

$\ln(\text{WAGE}_j)_t$	log of wage of the exporting country in millions of US dollars;
$\ln(\text{FEMALE}_i)$	log of the number of women in the work force of the exporting country; and
LPI_{it}	Logistics Performance Index of the exporting country.

The dependent variable is log of T&C trade value between Hong Kong as the importing country and OBOR exporting countries including Bangladesh, Cambodia, India, Indonesia, Malaysia, Pakistan, the Philippines, South Korea, Sri Lanka, Taiwan, Thailand and Vietnam. The independent variables include the log of total exports from country i to country j , log of GDPs of the two countries, log per capita GDPs of the two countries, distance between them, log of population size of importers, real exchange rate, log of value added factors, the number of women in the workforce, and labor costs of the exporters.

Since the economic size of the exporting and importing countries is usually measured by the GDP, the GDPs of the importing country and their apparel exporters are considered to represent the economic masses which impact the apparel exports of the country's economy. As GDP also indicates the supply capabilities of the apparel exporting countries, β_1 and β_3 are expected to be positive.

Based on the gravity principle, per-capita GDP of the exporting country is used as a proxy of capital intensity. As the apparel industry is a labor-oriented industry, per-capita GDP is utilized to indicate the impact of the monetary conditions for the workforce in countries with apparel exports. Additionally, the income level or purchasing power of importing countries is represented by per capita GDP. Controlling for GDP, richer countries (in terms of per capita GDP) are likely to demand more choices of differentiated products which may be imported from countries that are specialized in the production of those products. Therefore β_2 and β_4 are expected to be positive.

The distance variable has proved to be one of the most significant variable (Frankel and Rose, 2002). In general, longer distance involves higher transport costs, and therefore would have an adverse impact on trade. Therefore β_5 should be negative. The population size of the importing country is included as a determinant of demand for T&C products. Therefore β_6 is expected to be positive. The real exchange rate is a key factor affecting trade flows; the depreciation (appreciation) of a country's currency against other currencies stimulates (reduces) the country's exports. Thus, β_7 is expected to be negative.

A number of factors influential to T&C production are considered such as land, labor and capital goods. A higher value of materials and supplies added in apparel production should contribute more to the exports. Therefore, β_8 is expected to be positive.

Since trade liberalization has progressed after the completion of the ATC in 2005, price competition among apparel suppliers have become more intense. The level of exporters' worker wages is one of the crucial deciding factors in the entire apparel trade flow. Nearly three quarters of workers working in the global apparel production industry are women. The participation rate of female labor force in developing countries is even higher. As more female workers provide higher production capacity for apparel exports, β_{10} is expected.

In addition to the above macroeconomic factors, the LPI is added as a key independent variable. Exporting countries sharing similar factor endowments may differ in their logistics performance in terms of customs clearance efficiency, transport and IT infrastructure quality, ease of arranging international shipments, the ability to track and trace shipments, domestic logistics cost, timeliness in reaching destination, and competence of the domestic logistics industry. It is anticipated that exporting countries' logistics performance contributes to their apparel exports. Thus, β_{11} is expected to be positive.

4. Data Analysis, Results and Implications

A pool cross sectional (PCS) or cross sectional (CS) ordinary-least-square (OLS) is often utilized in the gravity trade model. Unfortunately, Cheng and Wall (2005) showed that these estimation approaches create biased results. Since there is no heterogeneity allowed in the error term for standard CS regression equations,

the gravity trade model yields overestimate results. In order to solve the problem of using OLS, the panel data estimation method will be employed to determine the variables that affect the bilateral trade flows between OBOR countries over time. As Baltagi (2013) noted, this method increases the volume of informative data in variability but with less collinearity among the variables. Moreover, the method has more degrees of freedom and efficiency. Finally, the regression results of the OLS will be compared with those of the panel data estimation with the fixed effects model in order to examine how well the models fit the data. The data will be analyzed by using the panel data estimation approach with an econometric and statistical software - EViews, which is designed for econometric analysis.

Historical trade data at the 2-digit SITC level from 2005-2015 are obtained from the United Nations Comtrade Database and Hong Kong Trade Development Council, while data for per-capita GDP, real GDP, population, real exchange rate, etc. are collected from the International Financial Statistics of the International Monetary Fund, Eurostat and other relevant sources. The number of female workers and wages are collected from the UNIDO Industrial Statistical Database (INDSTAT), and Logistics Performance Index (LPI) data are collected from the World Bank.

As shown in the Table 1, the extended gravity model has strong fit for both textile and clothing sectors, with the R squares of 0.67 and 0.76 respectively, and coefficients significant at 0.01 and 0.05. The regression results show that T&C exports increase with GDP, GDP per capita of the importing and exporting countries, population of the importing countries, the number of female workers, value added factor and the LPI of exporting countries. Distance, real exchange rate and labor wage have a negative impact on T&C exports as expected.

Table 1: The Gravity Model

Dependent Variable: $\ln(\text{EXP}_{ij})$	Textile	Clothing
Independent Variables	Coefficient	Coefficient
Constant	-31.12***	-25.45***
$\ln(\text{GDP}_i)$	+1.07***	+1.18***
$\ln(\text{PCGDP}_i)$	+1.59***	+1.76***
$\ln(\text{GDP}_j)$	+2.19***	+2.23***
$\ln(\text{PCGDP}_j)$	+4.67**	+4.56**
$\ln(\text{D}_{ij})$	-1.90***	-1.85***
$\ln(\text{POP}_j)$	+1.97**	+1.89**
REXRATE_{ij}	-1.63**	-1.78**
$\ln(\text{VALADDED}_i)$	+1.19***	+1.23***
$\ln(\text{WAGE}_i)$	-0.76**	-0.79**
$\ln(\text{FEMALE}_i)$	+0.83**	+0.86**
LPI _i	+ 4.24***	+4.53***
Adjusted R²	0.67	0.76

The above results imply T&C trade is expected to grow strongly as a result of a combination of growth in the population, GDP, GDP per capita, value adding service, and transport-logistics cost between the training partner countries in the coming years. This should be more than offsetting the negative impact of wage,

whose effect (as indicated by its coefficient) is relatively small while distances are unchanged and exchange rates are expected to be more stable in the long term.

Despite of the predicted growth implied by the model, the actual growth in T&C exports should depend on production and investments. The actual trade value also depends on the world's demand for textile and clothing. The needs for production capacity expansion and for managing demand uncertainty are the challenges facing T&C companies in Hong Kong. Investment to extend production capacity takes time and are subject to risks. Countries with low labour cost could be potential recipients of foreign direct investment and technological transfer by companies from Hong Kong. While the level of IT infrastructure and computer literacy in some countries are disadvantage for their companies' competitiveness, this is an business and investment opportunity for Hong Kong companies, which could have more value adding service to T&C supply chains (Chan and Au 2007, Au and Ho 2002).

The gravity trade model shows that logistics plays an important role in T&C exports (Au and Chan 2009, Ho et al. 2009). This implies that the OBOR initiative with infrastructure investment projects could play an important role in improving logistics efficiency of T&C export supply chains and extending their capacity to accommodate high export volume. The initiative is expected to generate social and economic benefit to the society and economy through its positive indirect impacts on other non-infrastructure factors such as logistics performance, customs practice, cultural difference and market information. As the nodes in international logistics and supply chains, seaports in OBOR countries are expected to play an important part of the initiative. Table 2 shows the capacity of containers ports in these countries.

Table 2: OBOR Port Information

Country	Location	Water Draught (m)	Number of Container Terminals	Capability (mil TEUs/year)
Bangladesh	Chittagong	8.9	11	2.34
Cambodia	Sihanoukville	8.5	4	0.39
Hong Kong	Kwai Tsing	15.5	9	20.07
India	Jawaharlal Nehru	12.5	5	4.49
Indonesia	Tanjung Priok	14.0	3	5.20
Malaysia	Klang	13.4	4	11.89
Pakistan	Karachi	11.9	1	1.56
Philippines	Manila	13.4	2	4.23
South Korea	Busan	17.0	4	19.45
Sri Lanka	Columbo	20.0	8	5.19
Taiwan	Kaohsiung	15.0	6	10.26
Thailand	Laem Chabang	13.0	4	6.82
Vietnam	Ho Chi Minh City	11.0	2	5.31

Sources: Busan Port Authority (2017); Chittagong Port Authority (2017); Hong Kong Container Terminal Operators Association Limited (2017); Hutchison Ports KICT (2017); Laem Chabang Port Authority (2017); Manila International Container Terminal (2017); Port Klang Authority (2017); Port of Tanjung Priok (2017); Sihanoukville Autonomous Port (2017); Sri Lanka Ports Authority (2017); Taiwan Port Authority (2017); The Jawaharlal Nehru Port Trust (2017); Vietnam Seaports Association (2017); World Shipping Council (2017)

5 Conclusion

To conclude, this empirical study examines the extent to which a number of social and economic factors including transport and logistics performance affect T&C trade between the OBOR countries and Hong

Kong, which due to its strategic location can serve as the T&C distribution hub. The analysis based on the extended trade gravity model shows that GDP, income per capita, distance between countries, population, exchange rates, value added services, labour cost, and the size of the labour workforce are influential to T&C trades.

The findings also indicate that logistics performance play an important role in trade facilitation can confer a competitive advantage and thus also erect a trade barrier in its own right, either enhancing or reducing the chance of being integrated in global T&C supply chains. This is especially true for exporting countries in the same geographical region with similar factors endowment. If trade liberalization continues to solidify, large lead buyers will keep on searching on a worldwide basis for the best mix of suppliers to forge their global supply chains. Exporting countries' logistics performance may become a key determinant in differentiating the winners from losers among OBOR countries in the global T&C industries.

The findings imply potential opportunities for Hong Kong T&C companies to benefit from investment, technology transfer, and trading with OBOR countries. Hong Kong's accumulated knowledge over time would allow it to play a "super-connector" role as the hub or gateway to the world's T&C market. As a hub, it coordinates production, export logistics and provides high value adding services such as product design, research and development. In investment, Hong Kong companies can establish joint venture with local T&C producers in OBOR parties for its investment and technology transfer, to make use of their internationally-recognized technical and management knowledge. At the same time Hong Kong T&C companies need to manage the risks associated with capacity expansion and the world's demand uncertainty.

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