Is Hong Kong still an entrepôt under the Sino-U.S. trade war?

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Is Hong Kong Still an Entrepôt under the Sino-U.S. Trade War?

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Abstract: This paper studies the Hong Kong economy from a trade intermediary's perspective. Using a structural vector autoregression (SVAR) framework, we discover that trade-related external shocks mainly affect the economy through re-exports channel over the offshore trade channel. We observe that re-exports shock does not transmit to the real economy through employment channel. A puzzling phenomenon is that trade-related employment has been in decline since 2008. Moreover, we notice that although the Sino-U.S. trade war exerted much downward pressure on economic growth between 2018 and 2019, the trade intermediary sector swiftly recovered in 2020, reflecting the versatility of the external trade sector in Hong Kong.

JEL Classifications: F13, F14, F16.

Keywords: Hong Kong; Entrepôt; Re-Export; Sino-U.S. Trade War.

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1 Introduction

The two major sectors of Hong Kong, financial services and trade & logistics, contribute around 23% and 20% respectively to the Hong Kong economy in 2020. Over the period of 2018 to 2022, Hong Kong has suffered from the Sino-US trade war, the social movement and the COVID-19 pandemic. However, no study has explored the impact of Sino-US trade war on the trade intermediary status of Hong Kong. After half a year of mounting tensions between China and the U.S., the Sino-U.S. trade war commenced in the second half of 2018. In July, the U.S. government imposed 25% tariff on selected Chinese imports and the Chinese government quickly retaliated with tariffs of similar magnitude. Since then, multiple rounds of additional tariffs had been imposed between the two nations, several trade talks had been held, the phase one trade agreement was ratified, and various tariff exemption lists had been announced. This series of events has created much uncertainty and an unfavorable impact on the global economy. Hong Kong, as a small open economy, was also not isolated from that impact. As illustrated in Figures 1(a) and (b), the YOY growth rate of re-exports value plummeted soon after July 2018, and the YOY growth rate of real GDP also decelerated simultaneously. It appears that the trade war has compromised Hong Kong's entrepôt role and struck a heavy blow to the economy.
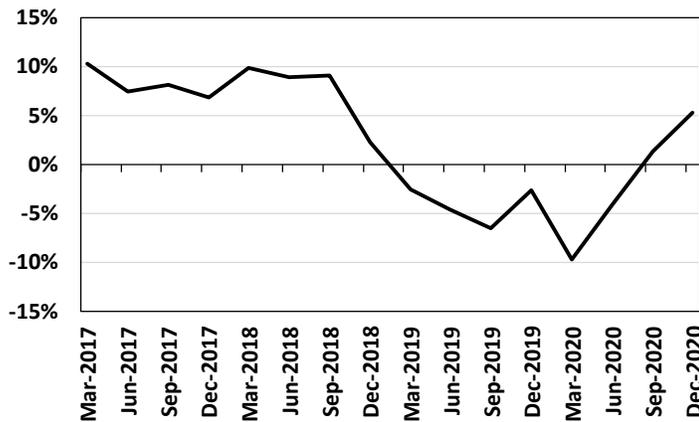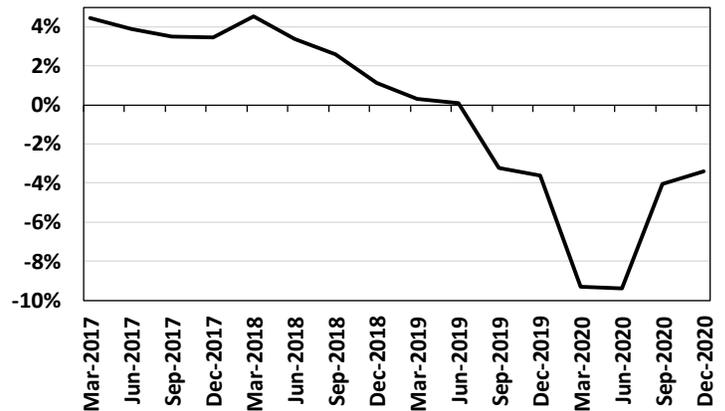
(a) YOY Growth Rate of Re-exports Value	(b) YOY Growth Rate of Real GDP

Figure 1: Growth Rates of Re-exports and Real GDP – 2017 to 2020

The trade sector is an integral part of the Hong Kong economy. As a trade intermediary between mainland China and the rest of the world, Hong Kong operates both onshore re-exports and offshore trade. In 2019, the value of re-exports and offshore trade amounted to 3,946 billion HKD (1.39 times of GDP) and 4,709 billion HKD (1.66 times of GDP), respectively. The sector also contributes significantly to employment. Statistics published by the Census and Statistics Department in 2019 show that the Trading and Logistics industry supported the most employment among the Four Pillar industries.[2] A further breakdown reveals that the Import and Export Trade sector hired 387,200 people, which is equivalent to around 10% of the labor force.

Despite its significance, only a rare stream of literature has studied an economy from an entrepôt's perspective. Against this backdrop, this paper attempts to fill the gap in the literature by studying the role of Hong Kong as a trade intermediary. In particular, we seek to explore and shed light on the following two topics:

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[2] The Four Pillar Industries are the Trading and Logistics industry, Financial Services industry, Tourism industry, and Professional Services and Other Producer Services industry.

1. The dynamics between external shocks on the trade sector and the economy of Hong Kong, and

2. The impact of the Sino-U.S. trade war on the economy of Hong Kong.

The rest of the paper is organized as follows: Section 2 reviews the literature regarding trade and small open economy, Hong Kong's entrepôt status, and external shocks and Hong Kong's economy. Section 3 provides an in-depth overview of the recent development in the trade sector. Section 4 analyzes the dynamics between trade-related shock and the real economy. Section 5 summarizes and concludes.

2 Literature Review

2.1 International Trade and Small Open Economy

A large strand of literature has examined how international trade can impact a small open economy via the transmission of terms of trade shocks.[3] Jääskelä and Smith (2013) that studied the economy of Australia is one example. The authors argued that different underlying terms of trade shocks could have different macroeconomic implications. With a sign-restricted structural vector autoregression (SVAR) model, three underlying terms of trade shocks (world demand shock, commodity-market specific shock and globalization shock) were identified. They discovered that a positive terms of trade shock tended to be expansionary, but whether it was inflationary relied on the underlying source of shock.

This framework, however, cannot be applied to study Hong Kong. The reason is that Hong Kong's unique external trade structure is dissimilar to other small open economies, including

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[3] Terms of trade refers to the ratio of export prices to import prices.

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Australia. Contrary to counterpart economies where domestic exports constitute a large share of total exports, Hong Kong's domestic merchandise exports only accounted for 1.2% of the total merchandise exports in 2019. Instead of exports trade, Hong Kong thrives as an entrepôt that earns from providing trade intermediary services. Therefore, terms of trade is of limited relevance for Hong Kong (Figure 2).[4]

Hong Kong thereby is a special small open trading economy. Current methodologies that study trade and small open economies cannot be meaningfully applied to Hong Kong. This justifies the significance and necessity of developing a framework dedicated to studying entrepôt economies.
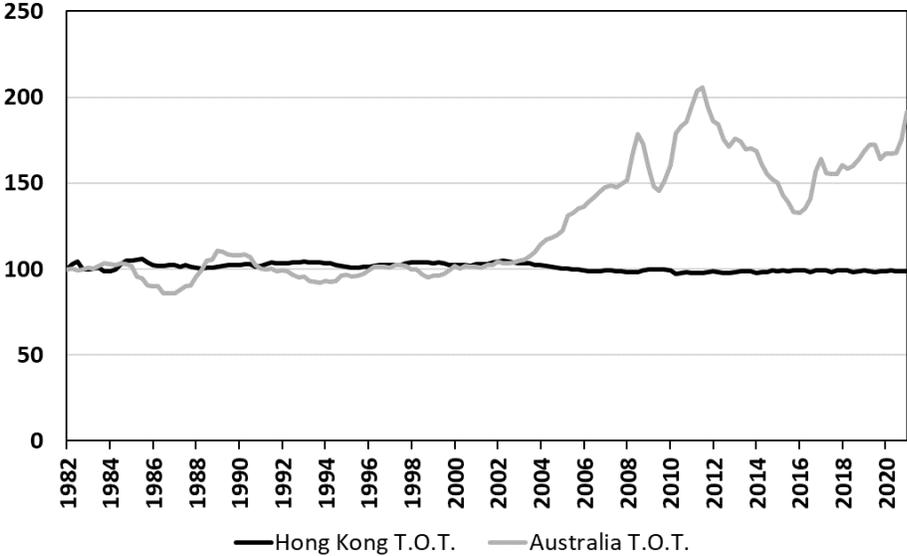

Figure 2: Terms of Trade (T.O.T.) - Hong Kong and Australia (1982Q1 = 100)

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[4] Unlike Australia which experienced a booming terms of trade since 2000, Hong Kong's terms of trade has remained stable for the past 40 years. This is another piece of evidence to differentiate Hong Kong as a special case of small open economy.

2.2 Hong Kong as an Entrepôt

Hanson and Feenstra (2001) examined Hong Kong's entrepôt role between China and the rest of the world. They focused on (1) the reasons why Hong Kong had become an entrepôt, and (2) the markups Hong Kong charged during the re-exports of Chinese goods. Their results suggested that Hong Kong traders had informational advantages over foreign buyers and sellers, such that re-exports were needed for quality sorting. Moreover, some traders capitalized on the low tax rate in Hong Kong to shift profits through transfer pricing. As for re-exports markups, a higher markup was usually charged on (1) differentiated products, (2) products with varied export prices, (3) products sent to China for outward processing, and (4) products sent to countries with less trade with China. Other studies that are helpful for enhancing the understanding of entrepôt economies include Smith (1910), Feenstra et al. (1999) and Ganapati, Wong, and Ziv (2021).

Ha, Fan, and Shu (2003)[5] which explored the implications of the structural change in Hong Kong's trade sector by the early 2000s[6] resembled more closely to this paper. Their results showed that, conditional on total exports earnings, the composition change in exports had little to no impact on real output via the multiplier effect but had material impact on employment. In particular, the employment multiplier was the largest for domestic exports, smaller for re-exports, and the smallest for offshore trade. Therefore, although the structural change was not expected to greatly influence real output, fewer employment opportunities would be generated under the surge of offshore trade as compared to re-exports and domestic exports.

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[5] Note that Ha et al. (2003) used data on "export of trade-related services" as a proxy for offshore trade earnings as offshore trade statistics were not well available by that time.

[6] Owing to the continuous integration between Mainland China and the global economy by the early 2000s, Hong Kong's trade sector experienced a fundamental change. Specifically, Hong Kong domestic exports had shrunk while the growth in offshore trade had outstripped that of re-exports.

Twenty years later, in 2021, the abovementioned structural change has long since concluded. Specifically, domestic exports have further diminished to constitute only 1% of total merchandise exports in the past decade and the growth rate of re-exports and offshore trade has equalized, maintaining a stable ratio of around 1:1.2 in value terms in the past decade.

2.3 External Shocks and Hong Kong's Economy

In essence, the Sino-U.S. trade war is an external shock to Hong Kong. A strand of the literature has explored how external shocks could impact the small open economy of Hong Kong. In this paper, we identify external shocks that affect trade intermediation by adopting a SVAR framework to evaluate how and to what extent such shocks would influence the real economy of Hong Kong.

3 Recent Developments of the Trade Intermediary Role

This section provides a more in-depth description of Hong Kong's trade intermediary role. Trade intermediation in Hong Kong is comprised of two types of trading of different natures, namely re-exports and offshore trade.

3.1 Re-exports

3.1.1 An Overview

Hong Kong's first involvement in re-exports can be dated back to the 1840s, and the entrepôt status was often considered to be externally endowed by Mainland China. For example, the burning down of the "Thirteen Factories" in Guangzhou in 1856 relocated the necessary labor and capital of Chinese trading firms to Hong Kong, the embargo imposed on China during the 1950s almost halted all re-exports and compelled Hong Kong to evolve into a manufacturing-based

economy, and both the Chinese "reform and opening up" policy in 1978 and the China's accession to the World Trade Organization (WTO) in 2001 saw increasing integration between China and the rest of the world, such that Hong Kong's role as a middleman in trade could thrive. All these events point to the conclusion that re-exports processed by Hong Kong largely depend on factors that are beyond the territories' own control.

Figures 3 exhibits the YOY growth rate of re-exports from 2000 to 2020. The growth rate, except occasional tumbles, is generally within the positive region in the past two decades. The two most severe declines in re-exports occurred during the 2008 global financial crisis and the 2020 COVID-19 pandemic, both of which were systematic shocks that exerted significant downward pressure on global economic activity.
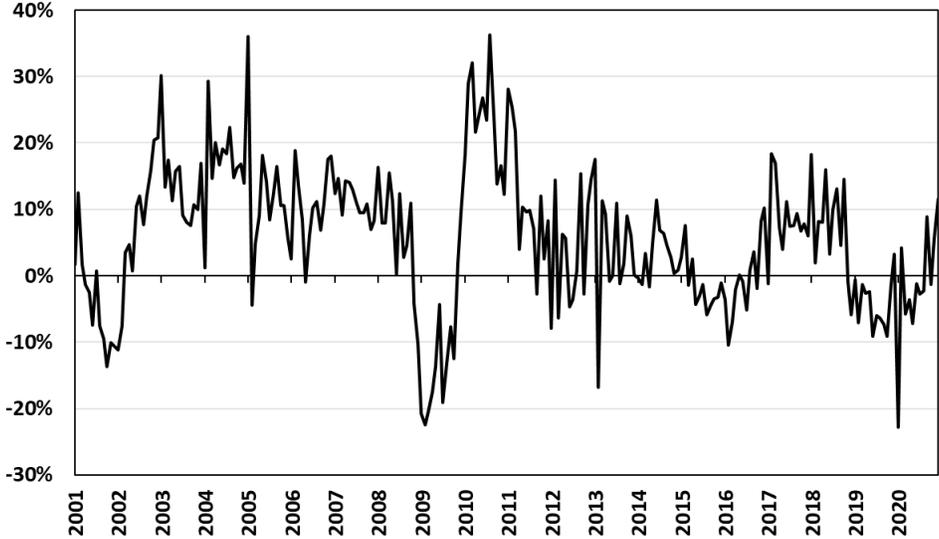

Figure 3: YOY Growth Rate of Re-exports Value – 2001 to 2020

3.1.2 Re-exports Gross Profit

It is generally believed that higher re-exports volume is conducive to economic growth. We argue that this is not necessarily true, as higher volume or value does not always translate into higher profit. A situation with low re-export volume and a high profit margin rate could be more

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robust than one with high volume and a low margin rate. In what follows, the discussion will focus on re-exports gross profit.

The Census and Statistics Department published an annual estimate for the "rate of re-export margin"[7] until 2011. Fortunately, the estimates after 2011 could still be gauged following Leung and Chow (2007) formula:

Retained Imports = Total Imports – Re-exports · (1 – Rate of Re-export Margin)   (1)

Collecting the estimates by the Census and Statistics Department and those following Leung and Chow (2007), the rate of re-export margin from 1990 to 2020 is presented in Figure 4.[8] After reaching a peak in 2000 following a gradual increase since the 1990s, the profit margin rate has remained in a declining trend. It also appears that the rate of decline has aggravated after 2018.
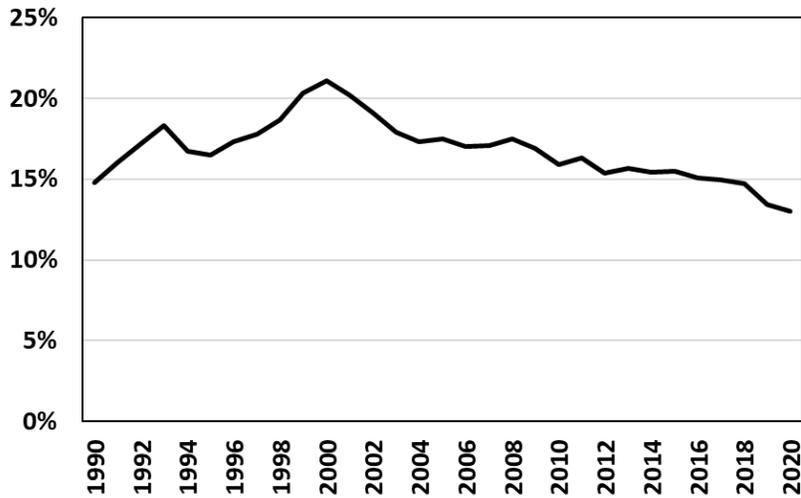

Figure 4: Rate of Re-exports Gross Margin – 1990 to 2020

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[7] Based on the government's "Survey of Re-export Trade" results, the rate of re-export margin measures the gross profit derived from re-exports.

[8] The rate of gross margin estimated following Leung and Chow (2007) before 2011 is also close to the figures published by the Census and Statistics Department.

The re-exports gross profit can be deduced by multiplying the re-exports value with the gross margin rate.[9] Figures 5(a) and 5(b) show the YOY growth rate of real re-exports gross profit and its ratio to GDP. The growth rate appears to have slowed down after 2012, whereas the earnings-to-GDP ratio also registered a declining trend after peaking at around 2012. Furthermore, by comparing Figures 3 and 5(a), it is clear that the COVID-19 shock was less damaging in terms of earnings over value. This may support our argument that gross profit, rather than value or volume, better reflects a shock's impact to the real economy.

(a) YOY Growth Rate of Re-exports Earnings   (b) Re-export Earnings to GDP Ratio
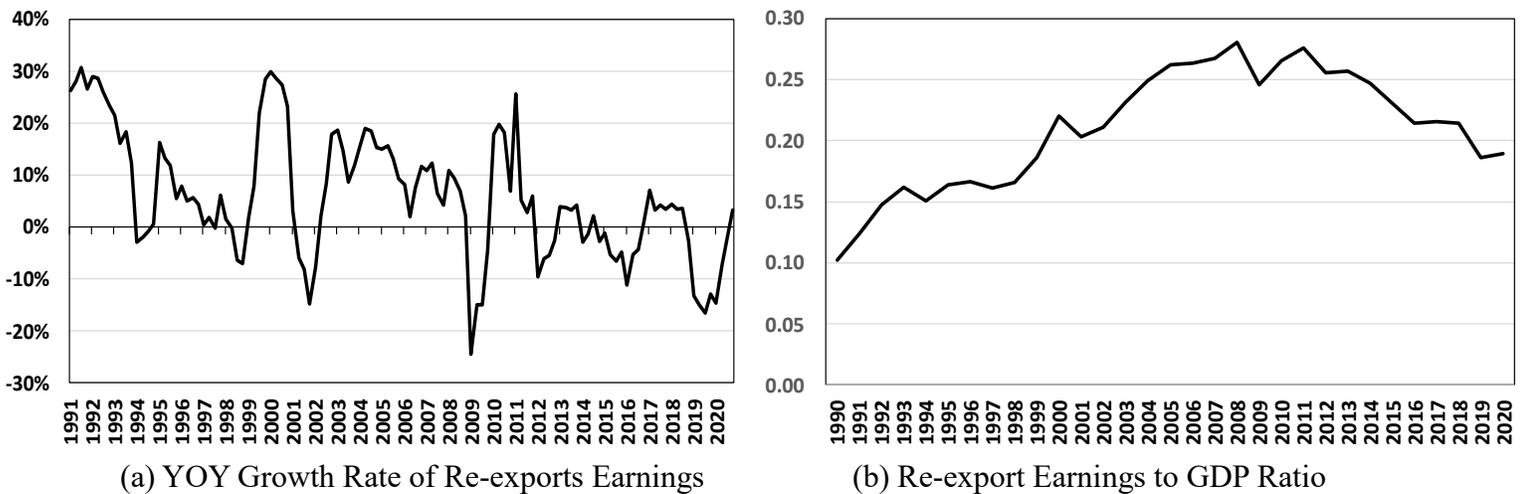
Figure 5: Gross Profit of Re-exports – 1990 to 2020

3.1.3 Origins and Destinations of Re-exports

Table 1 presents the data for the main origins and destinations of re-exports in 2019. As expected, Mainland China ranked first in both the origin and the destination of Hong Kong's re-exports. However, one caveat is that a significant portion of Chinese imports were re-exported to

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[9] As discussed, this implies that two factors can impact the re-exports gross profit, namely (1) value effect and (2) gross margin rate effect.

the Mainland rather than to other countries. In 2019, around 40% of Chinese imports for re-export purposes were re-exported back to the Mainland.

Origins	Percentage (%)	Destinations	Percentage (%)
China	54.7%	China	55.6%
Taiwan	10.5%	U.S.	7.6%
Korea	6.4%	Japan	3.0%
Japan	5.0%	India	3.0%
U.S.	3.5%	Taiwan	2.2%
Malaysia	2.9%	Vietnam	2.0%
Thailand	2.1%	Germany	1.8%
India	1.5%	Singapore	1.6%
Others	13.3%	Others	23.1%

Table 1: Re-exports by Main Origins and Destinations – 2019

It should also be noted that a considerable part of the trade between Hong Kong and the Mainland is taken in the form of outward processing.[10] In 2019, outward processing trade accounted for around 70% of re-exports (via Hong Kong) with Chinese origins to the rest of the world.

Hong Kong's role as the Mainland's trade middleman has also evolved over time. A few observations can be drawn from Figure 6, which depicts the re-exports value index (via Hong Kong) between China and major trading partners.[11] First, a large part of Chinese-originating re-exports is re-exported back to the Mainland as discussed (the black line). Second, reflecting a

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[10] A usual outward processing trade agreement involves the exports of raw materials or semi-manufactures from or through Hong Kong to China for further processing and the subsequent re-imports to Hong Kong for further distribution, according to the Census and Statistics Department.

[11] For example, the value index of re-exports between China and the U.S. presents the sum of value of re-exports from China to the U.S. and the value of re-exports from the U.S. to China.

possible shift in China's trade pattern, Hong Kong has processed more re-exports between China

and ASEAN (the grey line) and fewer re-exports between China and the U.S. (the blue line) since

2015. Mainly driven by the strengthening ties between China and ASEAN, the trade bloc of RCEP

has also outstripped the Mainland (the green line) as Hong Kong has been processing increasingly

more re-exports between the two parties. As RCEP is expected to be ratified in 2022, this may

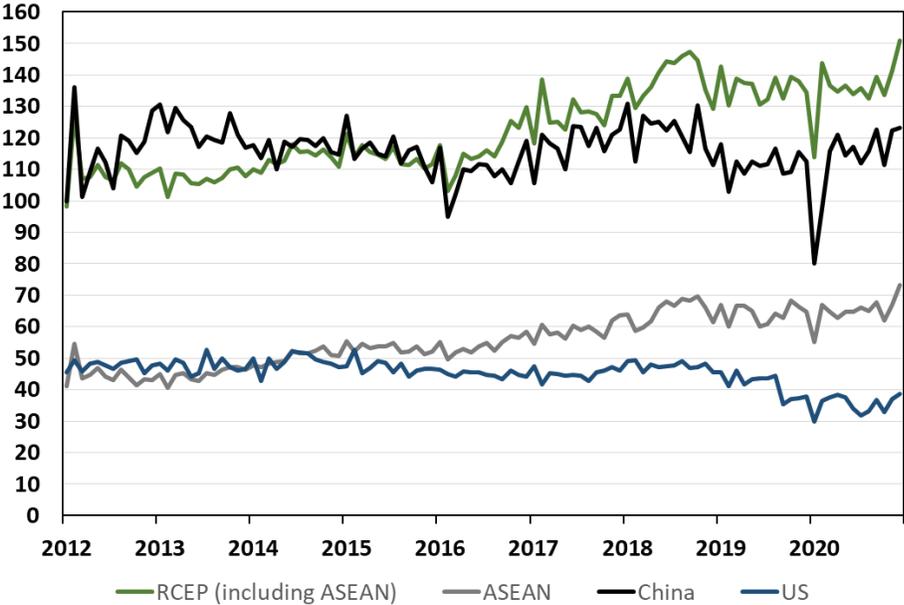represent an opportunity for Hong Kong's entrepôt businesses to further expand.

Figure 6: Re-exports Index between China and Selected Trading Partners

(China normalized to 100 at January 2012)

3.2 Offshore Trade

3.2.1 An overview

According to the Census and Statistics Department, offshore trade covers two categories

of services provided by Hong Kong companies to non-local parties: (1) merchanting[12] and (2)
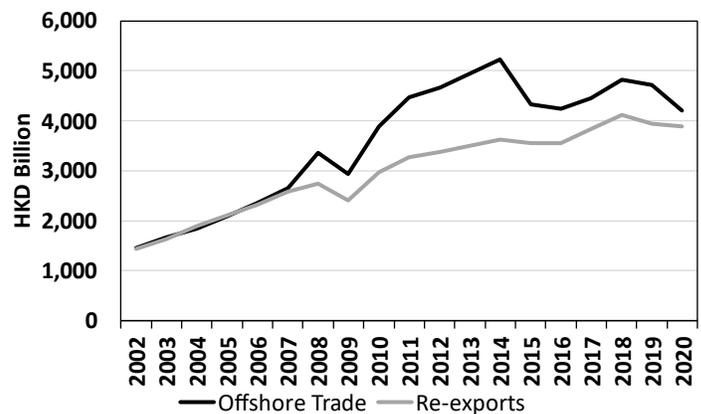
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[12] For merchanting, goods outside of Hong Kong are purchased by Hong Kong companies and then sold to non-local parties, during which the goods will not enter Hong Kong.

merchandising for offshore transactions (*referred hereafter as merchandising*).[13] [14] As the name "offshore trade" suggests, the goods traded will not enter Hong Kong but directly be shipped from one foreign country to another. The only difference between the two services lies in whether the Hong Kong companies take ownership of the goods during the trade process.

Offshore trade is mainly carried out in the form of merchanting in Hong Kong. Figure 7(a) shows that merchanting has experienced a period of rapid growth in the past two decades while merchandising has stagnated. In 2020, offshore trade was composed of 90% of merchanting and 10% of merchandising. Moreover, offshore trade has also outgrown re-exports in terms of value since 2007, as illustrated in Figure 7(b).
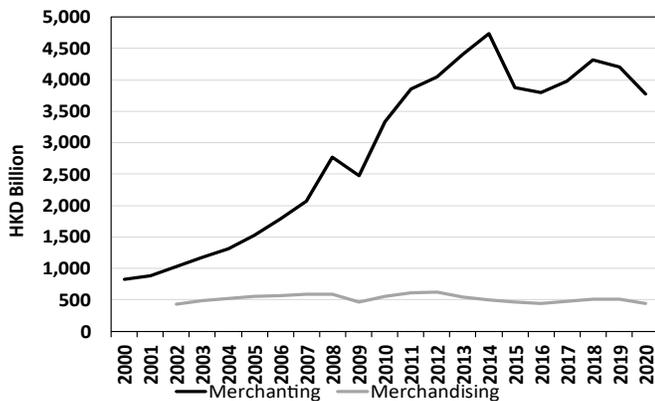
(a) Offshore Trade: Merchanting vs Merchandising   (b) Offshore Trade vs Re-exports

Figure 7: Value of Offshore Trade – 2002 to 2020

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[13] For merchandising, Hong Kong companies provide services to non-local parties by arranging the purchase and the sale of goods outside of Hong Kong to non-local parties, during which the goods will not enter Hong Kong.

[14] It should be noted that the terms "*merchanting*" and "*merchandising for offshore transactions*", defined by the Census and Statistics Department refer solely to offshore trade. They should not be confused with WTO's definition of "merchandise trade".

The Census and Statistics Department only publishes data of offshore trade on an annual basis. [15] Fortunately, the Hong Kong Trade Development Council (HKTDC) has produced a quarterly offshore trade index since 2006Q2 based on survey results. The index can be taken as reference to gauge and interpolate the annual data to quarterly data for subsequent analysis. [16] Figure 8 depicts the YOY growth rate of offshore trade value from 2008 to 2020. Analogous to re-exports, offshore trade also endured the most severe decline during the systemic shocks of the 2008 global financial crisis and the 2020 COVID-19 pandemic.
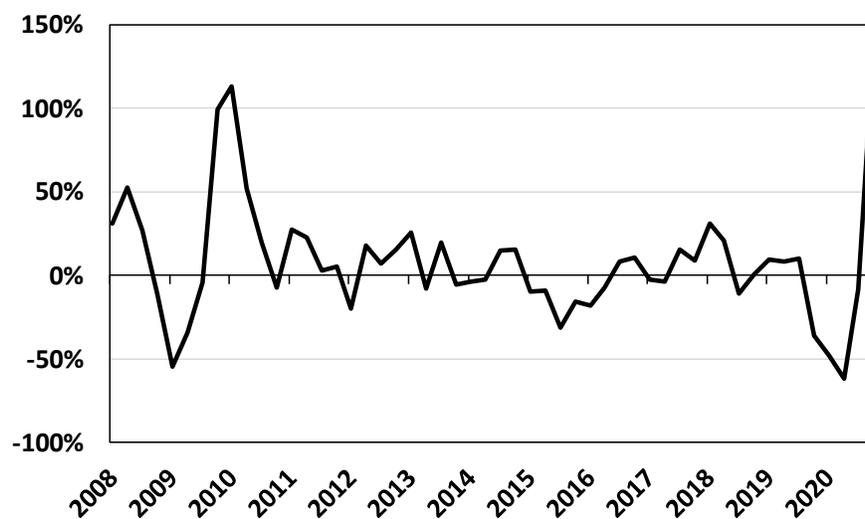

Figure 8: YOY Growth Rate of Offshore Trade Value

3.2.2 Offshore Trade Gross Profit Margin

Following the same logic as in re-exports, we argue that offshore gross profit, rather than value or volume, could better reflect a shock's impact to the real economy.

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[15] Data concerning offshore trade are less well-documented when compared with re-exports. This remains as one huge obstacle when it comes to research in this regard.

[16] The quarterly value is obtained by distributing the annual data according to the weight suggested by the HKTDC offshore trade index in the corresponding year.

The Census and Statistics Department publishes an annual estimate for the gross profit margin rate (also known as the commission rate) for both merchanting and merchandising, where the data from 2002 to 2020 are presented in Figure 9.[17] The plot reveals that the gap between gross profit margin rate of merchanting and merchandising has narrowed after 2010 (the grey and green line). The overall offshore trade gross profit margin rate has been fluctuating between 5% to 7% in the past two decades (the black line).
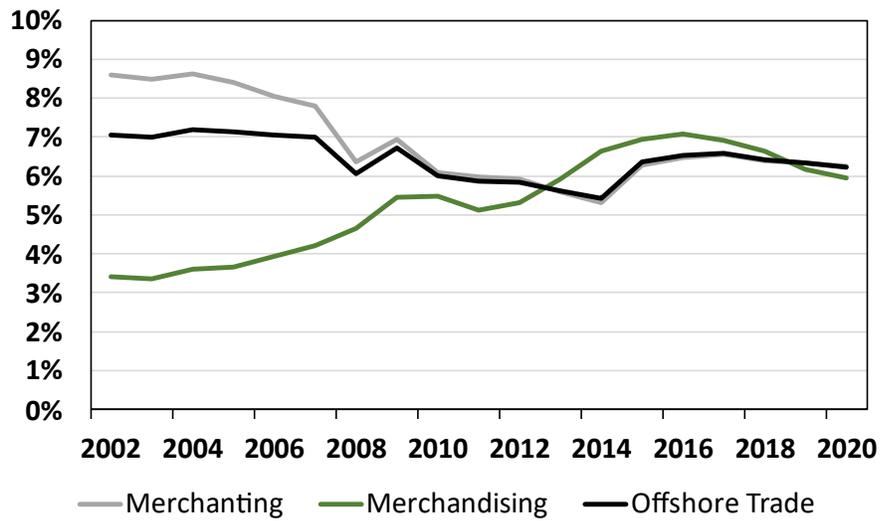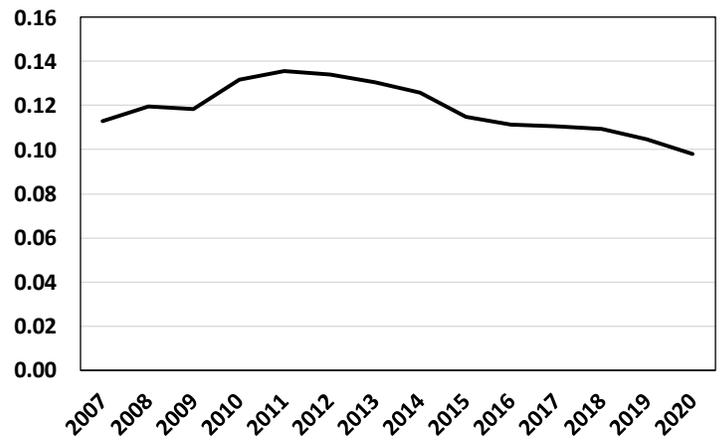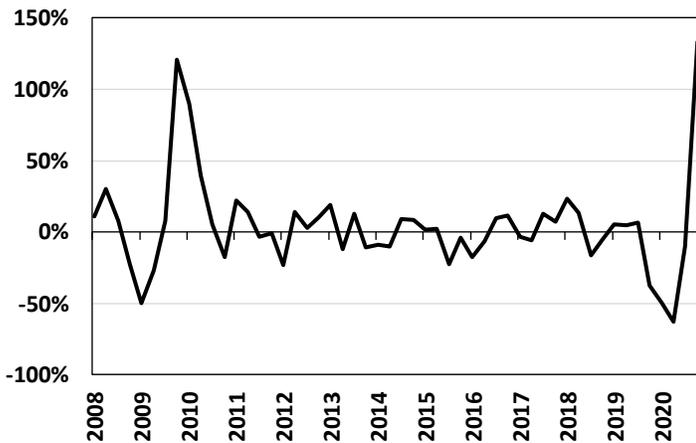

Figure 9: Offshore Trade Gross Profit Margin Rate – 2002 to 2020

[17] An offshore trade gross profit margin rate is also derived in accordance with the weight of merchanting and merchandising to represent its profitability.

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(a) YOY Growth Rate of Offshore Trade Earnings   (b) Offshore Trade Earnings as Ratio to GDP

Figure 10: Gross Profit of Offshore Trade – 2007 to 2020

The offshore trade gross profit can be deduced by multiplying the offshore value with the gross margin rate.[18] The YOY growth rate of real offshore trade gross profit and its ratio to GDP are presented in Figures 10(a) and 10(b). It is observed that the earnings were highly volatile during crisis time, and the earning-to-GDP ratio has remained in a declining trend after reaching its peak at around 2010 to 2011.

3.2.3 Destinations of Offshore Trade

Table 2 presents the data of main destinations of merchanting in 2019.[19] Analogous to that of re-exports, mainland China ranked first as the most popular destination. Interestingly, the Census and Statistics Department also publishes a country-specific gross profit margin rate for merchanting, as shown in Table 2. In line with Hanson and Feenstra (2001) discussions on re-exports markups, it appears that the country-specific rate was positively correlated with the distance between Hong Kong and the destination country. Therefore, the largest share of gross profit was in fact generated from merchanting trade to the U.S.

Destination	Share of Merchanting (%)	Rate of Gross Profit Margin (%)	Share of Total Gross Profit (%)
China	41.5%	3.4%	22.4%
U.S.	19.5%	11.3%	34.8%
Singapore	6.5%	2.1%	2.2%
UK	5.7%	7.4%	6.7%
Japan	4.4%	6.6%	4.6%

Table 2: Share of Merchanting Value by Destination

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[18] Analogous to re-exports, this implies that two factors can impact the offshore trade gross profit, namely (1) value effect and (2) gross margin rate effect.

[19] Notice that only the data concerning merchanting and its destination are provided by the Census and Statistics Department.

3.3 The Trade Intermediary Sector as a Whole

Data of re-exports and offshore trade can be aggregated to evaluate how the trade intermediary sector has performed. The earnings-to-GDP ratio depicted in Figure 11(a) shows that the sector peaked in the early 2010s and has since been in decline. Concerning the sector's structure, Figure 11(b) shows that the composition of trade intermediation by re-exports and offshore trade has remained fairly stable in terms of both gross profit and value over the last two decades, implying that the structural change investigated by Ha et al. (2003) has long concluded. Moreover, it is noticeable that while the value of offshore trade has exceeded re-exports as discussed, a larger portion of earnings is in fact contributed by re-exports (the grey line).

One caveat to Figure 11 is that gross profit (earnings) does not necessarily reflect net profit. Since offshore trade involves fewer inputs, such as labor and logistic, than re-exports, it should be expected that offshore trade enjoys a higher net profit margin rate in comparison.
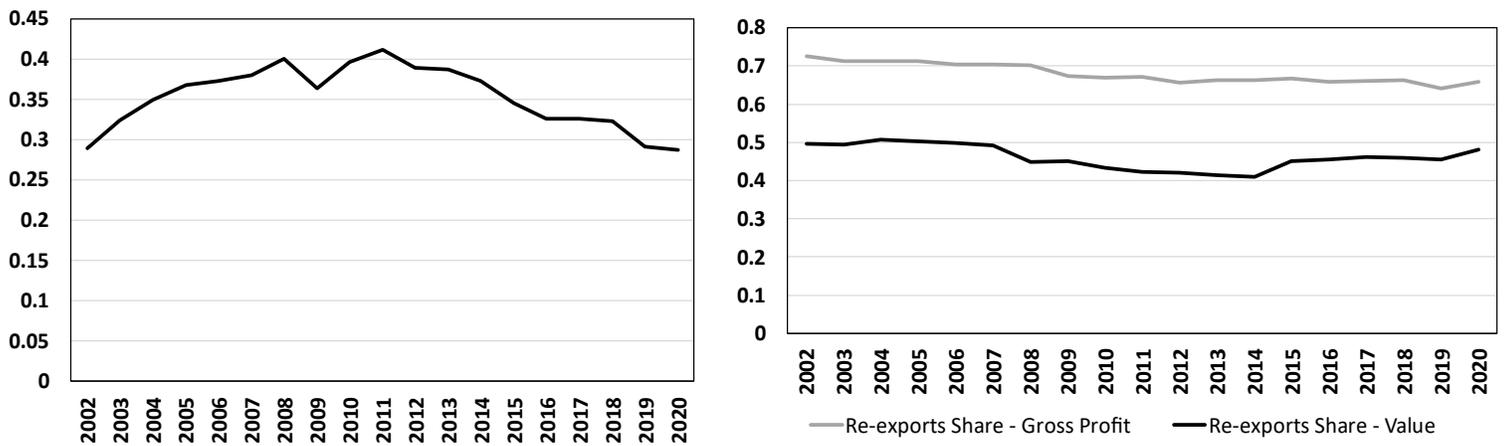
(a) Trade Intermediation Earnings to GDP Ratio   (b) Share of Re-exports in Trade Intermediation

Figure 11: Trade Intermediation – 2002 to 2020

4 Analysis on Dynamics between Trade Sector and Real Economy

4.1 Identification of External Shocks on Trade Sector

We adopt a structural vector autoregression (SVAR) framework to identify external shocks on the trade sector and evaluate their impact towards the real economy.

The identification of such external shocks is dependent on two restrictions which are demonstrated in Equations (2) and (3). In the equations, $Trade$ is the gross profit from external trade, HK is a vector of n time series of the Hong Kong Economy, u refers to the reduced-form shocks, and ε refers to the structural shocks. First, because external trade gross profit is heavily influenced by external factors, we will impose $Trade$ as an exogenous variable in the VAR system by applying zeros restrictions ($\alpha_{12}(L) = 0$).[20] Second, we identify the structural shocks by Cholesky decomposition.

$$\begin{pmatrix} Trade_t \\ HK_t \end{pmatrix} = C + \begin{pmatrix} \alpha_{11}(L) & 0 \\ \alpha_{21}(L) & \alpha_{22}(L) \end{pmatrix} \begin{pmatrix} Trade_{t-1} \\ HK_{t-1} \end{pmatrix} + \begin{pmatrix} u_t^1 \\ u_t^2 \end{pmatrix} \tag{2}$$

$$\begin{pmatrix} u_t^1 \\ u_t^2 \end{pmatrix} = \begin{pmatrix} \phi_{11} & 0 \\ \phi_{21} & \phi_{22} \end{pmatrix} \begin{pmatrix} \varepsilon_t^1 \\ \varepsilon_t^2 \end{pmatrix} \tag{3}$$

By imposing the two restrictions, ε^1 is identified as an external shock on the trade sector to which $Trade$ and HK will respond contemporaneously. On the other hand, ε^2 summarizes other shocks on the local economy to which $Trade$ will not respond.

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[20] By imposing $Trade$ as an exogenous variable, it means that $Trade$ will only affected by its own lags and shocks but not by that of other time series of Hong Kong economy.

4.2 Dynamics between Re-exports and Real Economy

4.2.1 Dynamics between Re-exports and Real Output

We first explore the impact of an external shock on re-exports towards real output by estimating Model (4). ReX is the real re-exports gross profit and Y is the real GDP. In the model, ε^1 represents an external shock towards the re-exports sector (*re-exports shock*) and ε^2 summarizes other shock towards real output (*other output shock*). We estimated the model using the year-on-year growth rate of quarterly real re-exports gross profit and quarterly real GDP from 2003Q1 to 2020Q4 with 1 lag.[21]

$$\begin{pmatrix} ReX_t \\ Y_t \end{pmatrix} = C + \begin{pmatrix} \alpha_{11} & 0 \\ \alpha_{21} & \alpha_{22} \end{pmatrix} \begin{pmatrix} ReX_{t-1} \\ Y_{t-1} \end{pmatrix} + \begin{pmatrix} \phi_{11} & 0 \\ \phi_{21} & \phi_{22} \end{pmatrix} \begin{pmatrix} \varepsilon_t^1 \\ \varepsilon_t^2 \end{pmatrix} \qquad (4)$$

The impulse responses[22] from a one-standard-deviation re-exports shock in Figures 12(a) and 12(b) illustrate that real output does respond to an external shock on re-exports. More specifically, a 6.6% jump in real re-exports gross profit leads to a 1.2% instant increase in real GDP growth rate, with that impact fading in 15 quarters' time. The implied re-exports multiplier from 2003 to 2020 was 0.76.

Also, the forecast error variance decomposition in Table 3 indicates that an external shock towards re-exports can explain up to 31% of the variability in real output at the one-quarter horizon. Even though the shock's explanatory power diminishes over time, around 25% of the uncertainty in real GDP growth is still attributable to it at the fifteen-quarter horizon. These results altogether demonstrated the externally oriented nature of the Hong Kong economy.
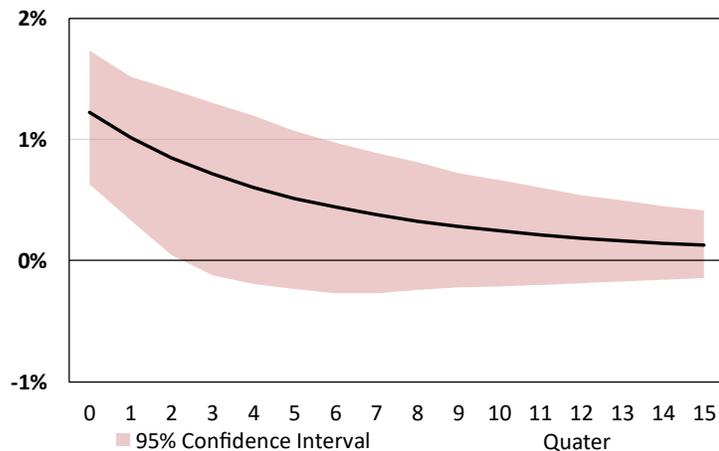
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[21] The Akaike information criterion suggested a lag order of 5 and the Schwarz information criterion suggested a lag order of 1. We followed Schwarz information criterion for parsimony.

[22] The 95% confidence interval was constructed by bootstrapping with 500 runs.
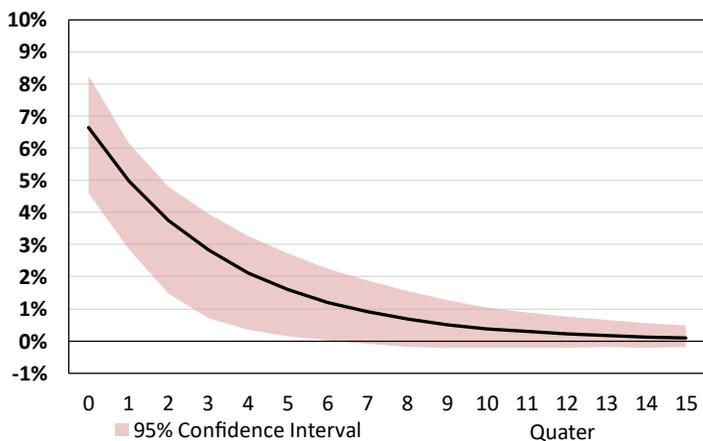
(a) Response of Real Re-exports Gross Profit

(b) Response of Real GDP

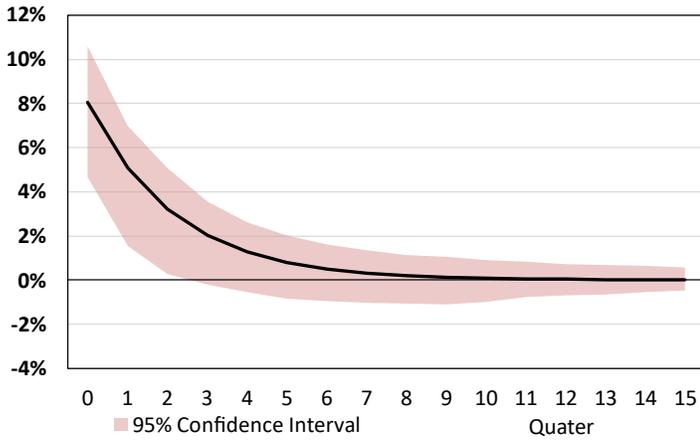Figure 12: One-Standard-Deviation Re-exports Shock

| Variance Decomposition of Real GDP		
Period	Re-exports Shock	Other Output Shock
1	31.39	68.81
5	27.68	72.32
15	25.24	74.76

Table 3: Forecast Error Variance Decomposition

4.2.2 The Strengthening of the Re-exports Multiplier

To explore how the re-exports multiplier has evolved in the past two decades, we re-estimated Model (4) for two different periods, one with data from 2003Q1 to 2011Q4 and the other from 2012Q1 to 2020Q4. Significant differences can be uncovered by comparing Figures 13 and 14, which are presented in the impulse responses from a one-standard-deviation re-exports shock in the two re-estimations. An 8.5% jump in real re-exports gross profit will lead to a 1.3% increase in real GDP growth from 2003 to 2011, whereas a 4.1% jump in real re-exports gross profit will lead to a 0.7% increase in real GDP growth from 2012 to 2020. The shock's impact of real GDP has also become more sustained during the later period, as shown in Figure 14(b). Importantly, the

19

implied re-exports multiplier has increased from 0.59 to 0.76 between the two periods. This suggests that Hong Kong has become more vulnerable to negative external re-exports shocks in the past decade.
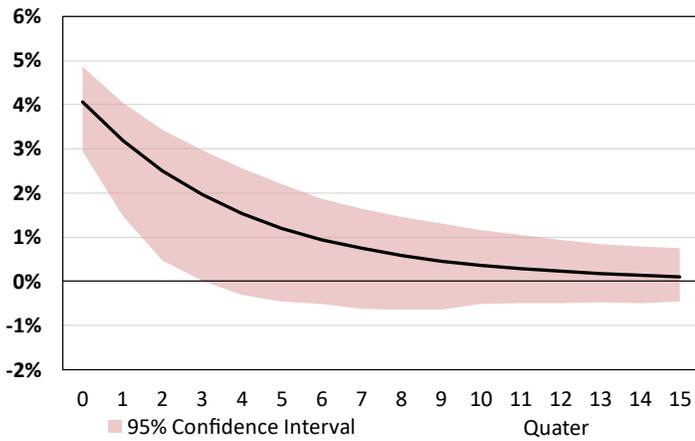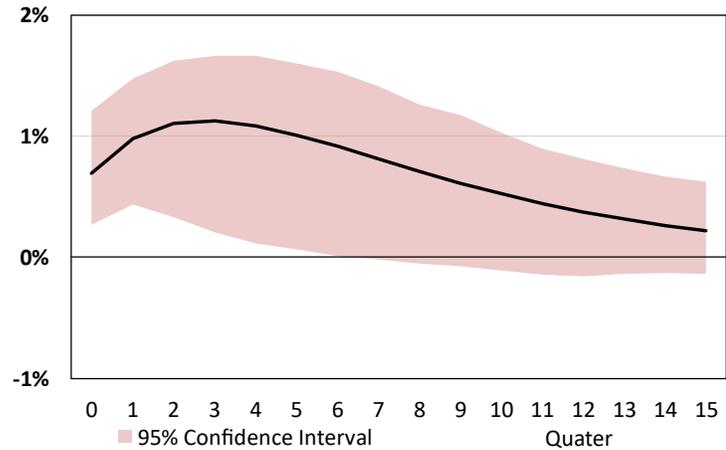

(a) Response of Real Re-exports Gross Profit
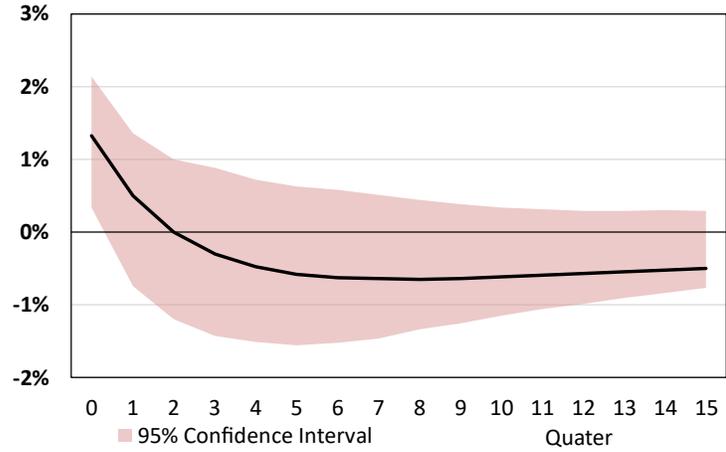
(b) Response of Real GDP

Figure 13: One-Standard-Deviation Re-exports Shock – 2003 to 2011

(a) Response of Real Re-exports Gross Profit

(b) Response of Real GDP

Figure 14: One-Standard-Deviation Re-exports Shock – 2012 to 2020

4.2.3 The Transmission Channels of Re-exports Shock

Given that a negative re-exports shock could exert sizeable downward pressure on the real economy, we next explore its possible transmission channels by estimating Model (5). In the model, ReX is the real re-exports gross profit, EMP is the total employment, INV is the real private investment,[23] and $Credit$ is the real total loans and advances provided by the authorized institutions in Hong Kong. All variables enter the model in year-on-year growth rate. The model is estimated with quarterly data from 2003Q1 to 2020Q4 in lag order of 2.[24] [25]

$$
\begin{pmatrix} ReX_t \\ EMP_t \\ INV_t \\ Credit_t \end{pmatrix} = C + \begin{pmatrix} \alpha_{1,11} & 0 & 0 & 0 \\ \alpha_{1,21} & \alpha_{1,22} & \alpha_{1,23} & \alpha_{1,24} \\ \alpha_{1,31} & \alpha_{1,32} & \alpha_{1,33} & \alpha_{1,34} \\ \alpha_{1,41} & \alpha_{1,42} & \alpha_{1,43} & \alpha_{1,44} \end{pmatrix} \begin{pmatrix} ReX_{t-1} \\ EMP_{t-1} \\ INV_{t-1} \\ Credit_{t-1} \end{pmatrix}
$$
$$
+ \begin{pmatrix} \alpha_{2,11} & 0 & 0 & 0 \\ \alpha_{2,21} & \alpha_{2,22} & \alpha_{2,23} & \alpha_{2,24} \\ \alpha_{2,31} & \alpha_{2,32} & \alpha_{2,33} & \alpha_{2,34} \\ \alpha_{2,41} & \alpha_{2,42} & \alpha_{2,43} & \alpha_{2,44} \end{pmatrix} \begin{pmatrix} ReX_{t-2} \\ EMP_{t-2} \\ INV_{t-2} \\ Credit_{t-2} \end{pmatrix} + \begin{pmatrix} \phi_{11} & 0 & 0 & 0 \\ \phi_{21} & \phi_{22} & 0 & 0 \\ \phi_{31} & \phi_{32} & \phi_{33} & 0 \\ \phi_{41} & \phi_{42} & \phi_{43} & \phi_{44} \end{pmatrix} \begin{pmatrix} \varepsilon_t^1 \\ \varepsilon_t^2 \\ \varepsilon_t^3 \\ \varepsilon_t^4 \end{pmatrix} \qquad (5)
$$

The impulse responses[26] from a one-standard-deviation re-exports shock (ε^1) are presented in Figure 15. It is shown that the re-export shock propagates to the real economy through both the investment and credit channels as both items see an expansion after a positive re-exports shock. Surprisingly, the response of the total employment is weak and economically insignificant, implying that the employment channel was not at work.

---

[23] Private investment refers to the "Gross domestic fixed capital formation" component in GDP.

[24] The Akaike information criterion suggested a lag order of 10 and the Schwarz information criterion suggested a lag order of 2. We followed Schwarz information criterion for parsimony.

[25] We also conducted robustness checking by re-arranging the ordering of variables. Details are presented in the Appendix.
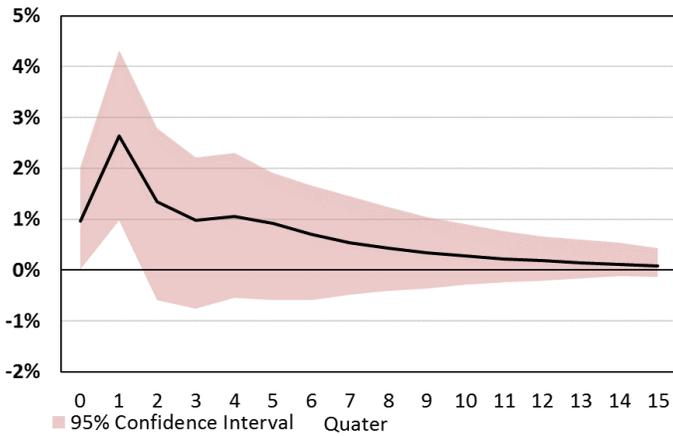
[26] The 95% confidence interval was constructed by bootstrapping with 500 runs.
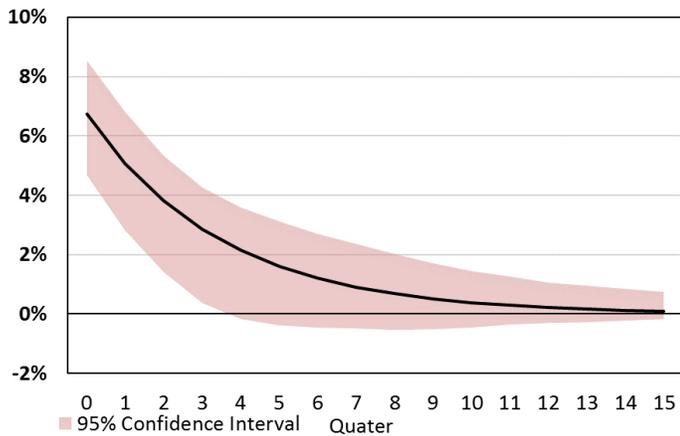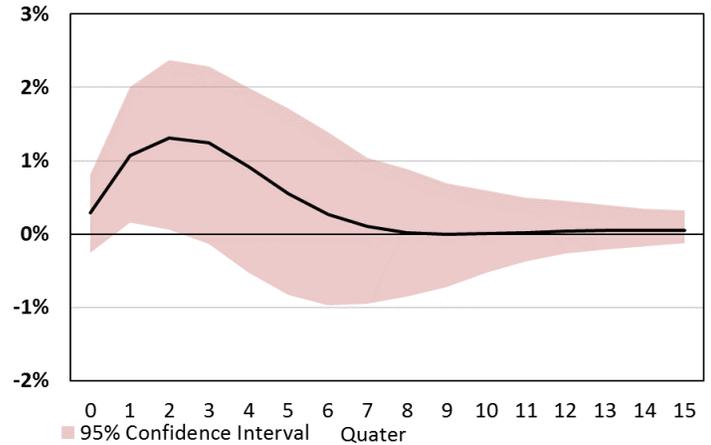
(a) Response of Real Re-exports Gross Profit
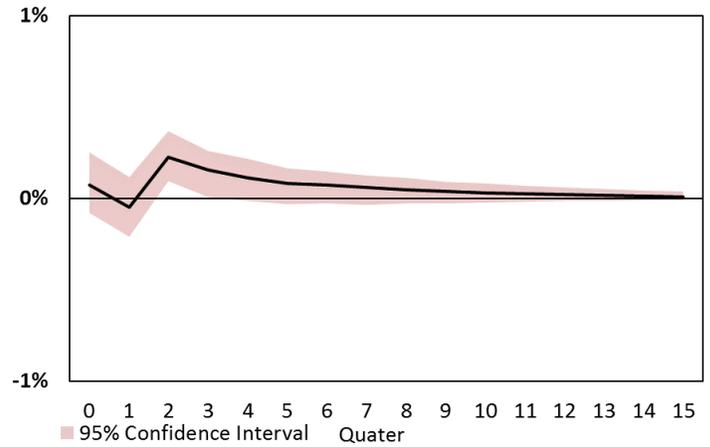
(b) Response of Total Employment

(c) Response of Real Investment

(d) Response of Real Credit

Figure 15: One-Standard-Deviation Re-exports Shock

Turning to the forecast error variance decomposition in Table 4, it shows that the re-exports shock accounts for a generous part (up to around a fifth) of the uncertainty in the forecast of all the three macroeconomics variables in the longer term, suggesting that re-export shock is indeed one of the underlying shocks that drive the fluctuation of the Hong Kong economy.

Variance Decomposition						
Period	Total Employment		Real Investment		Real Credit	
	Re-exports Shock	Other Shocks	Re-exports Shock	Other Shocks	Re-exports Shock	Other Shocks
1	1.4	98.6	2.7	97.3	1.2	98.8
5	17.2	82.8	18.6	81.4	13.6	86.4
15	20.1	79.9	21.0	89.0	13.8	86.2

Table 4: Forecast Error Variance Decomposition

4.3 Dynamics between Offshore Trade and Real Economy

Next, we assess the impact of an external shock on offshore trade towards real output by Model (6). OST is the real offshore trade gross profit and Y is the real GDP. In the model, ε^1 is identified as an external shock towards the offshore trade sector (*offshore trade shock*) and ε^2 summarizes other shock towards real output (*other output shock*). We estimated the model using year-on-year growth rate of quarterly real offshore trade gross profit and real GDP from 2008Q1 to 2020Q4 with 2 lags.[27]

$$\begin{pmatrix} OST_t \\ Y_t \end{pmatrix} = C + \begin{pmatrix} \alpha_{1,11} & 0 \\ \alpha_{1,21} & \alpha_{1,22} \end{pmatrix} \begin{pmatrix} OST_{t-1} \\ Y_{t-1} \end{pmatrix} + \begin{pmatrix} \alpha_{2,11} & 0 \\ \alpha_{2,21} & \alpha_{2,22} \end{pmatrix} \begin{pmatrix} OST_{t-2} \\ Y_{t-2} \end{pmatrix} + \begin{pmatrix} \phi_{11} & 0 \\ \phi_{21} & \phi_{22} \end{pmatrix} \begin{pmatrix} \varepsilon_t^1 \\ \varepsilon_t^2 \end{pmatrix} \quad (6)$$

The impulse responses[28] from a one-standard-deviation offshore trade shock are presented in Figure 16. A 28% spike in real offshore trade gross profit will lead to a 0.6% increase in real GDP growth instantly, with that impact fading in around a year's time. The implied offshore trade multiplier from 2008 to 2020 is 0.18. Also, the forecast error variance decomposition in Table 5

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[27] The Akaike information criterion suggested a lag order of 4 and the Schwarz information criterion suggested a lag order of 2. We followed Schwarz information criterion for parsimony.

[28] The 95% confidence interval was constructed by bootstrapping with 500 runs.

suggests that around 9% of the uncertainty in forecasting real GDP stems from offshore trade shock at the one-quarter horizon, and that increases to around 20% at the fifteen-quarter horizon.
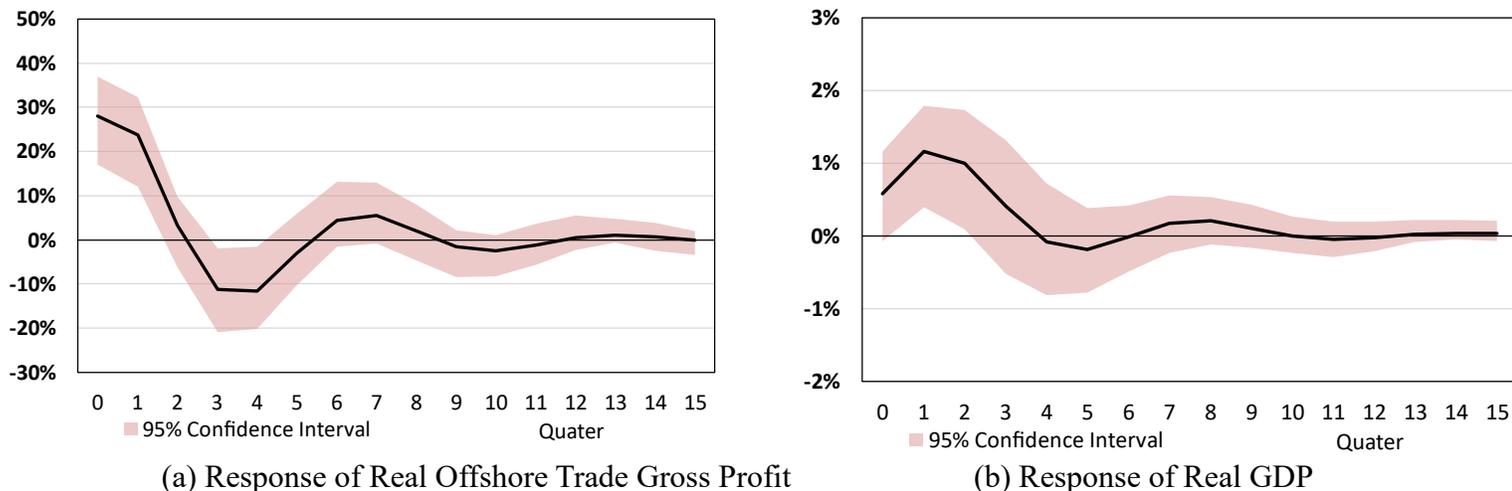

(a) Response of Real Offshore Trade Gross Profit

(b) Response of Real GDP

Figure 16: One-Standard-Deviation Offshore Trade Shock

Variance Decomposition of Real GDP		
Period	Offshore Trade Shock	Other Output Shock
1	9.2	90.8
5	20.5	79.5
15	19.4	80.6

Table 5: Forecast Error Variance Decomposition

By comparing Models (4) and (6), it shows that a one-standard-deviation re-exports shock records a greater and more persisting impact than a one-standard-deviation offshore trade shock. The re-exports multiplier is four times bigger than the offshore trade multiplier, and a larger portion of the uncertainty in future real GDP growth is ascribable to the re-exports shock than the offshore trade shock. Taken together, these results suggest that external shocks on trade sector mainly influence the local economy through the re-exports channel.[29]

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[29] This may be attributable to the fact that re-exports gross profit is greater than offshore trade gross profit, as illustrated in Figure 11(b).

**4.4 The Sino-U.S. Trade War's Impact on Hong Kong Economy**

The historical decomposition of Models (4) and (6) plotted in Figures 17 and 18 shed light on trade war's impact towards Hong Kong from 2018 to 2020 by revealing the cumulative contribution of each shock to real GDP growth.

The results suggest that the slowdown in real GDP growth from early to mid-2018 was solely driven by other output shock (Figures 17(b) and 18(b)). Reflecting the impact of the trade war, the re-export shock contributed to a 4% decline in real GDP growth from 2018Q3 to 2019Q4 (Figure 17(a)), while the offshore trade shock contributed to a 3% decline in real GDP growth between 2019Q2 and 2020Q1 (Figure 18(a)). During the same period, other output shocks also aggravated the decline in real GDP. Nevertheless, both the re-exports sector and offshore trade sector have swiftly recovered in 2020, as both shocks were contributing positively to real GDP growth. The continuous worsening of the economy in late 2019 and 2020 was driven by other output shocks, reflecting the grave impact of the social incidents and the COVID-19 pandemic.

Additional insight can also be uncovered by comparing the two figures. From 2010 to 2020, re-export shocks contributed more to the fluctuation of real GDP growth than offshore trade shocks, which is consistent with our finding that external trade sector shocks primarily influence the local economy through the re-exports channel. The similar magnitude of impact struck on the real economy by re-exports shock and the offshore trade shock during 2019 to 2020 likely reflected that the trade war has dealt a heavier blow to the economy through the offshore trade industry, probably because the U.S. was the best-earning offshore trade destination.
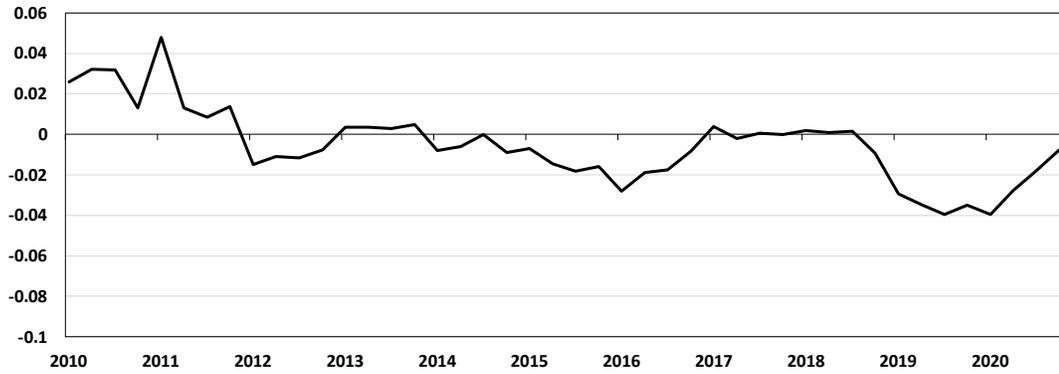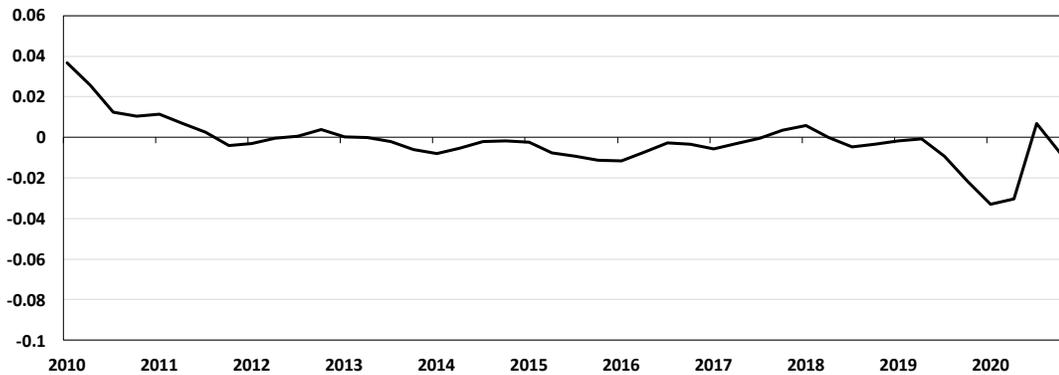
(a) Cumulative Effect of Re-exports Shock on demeaned Real GDP Growth
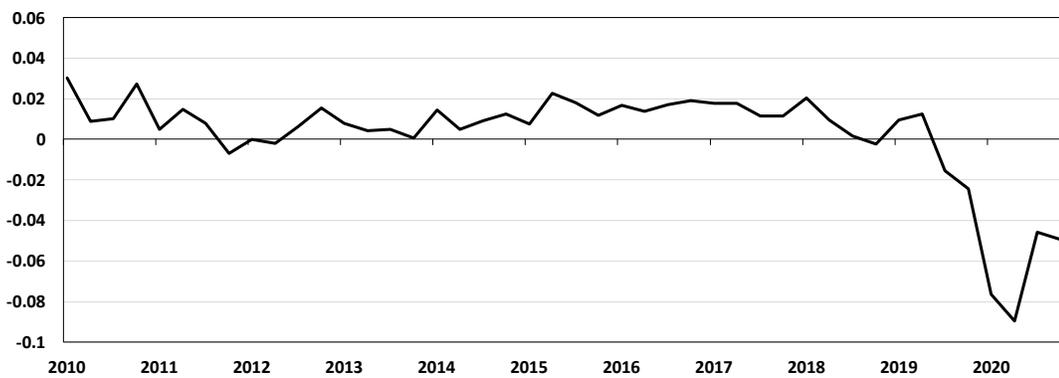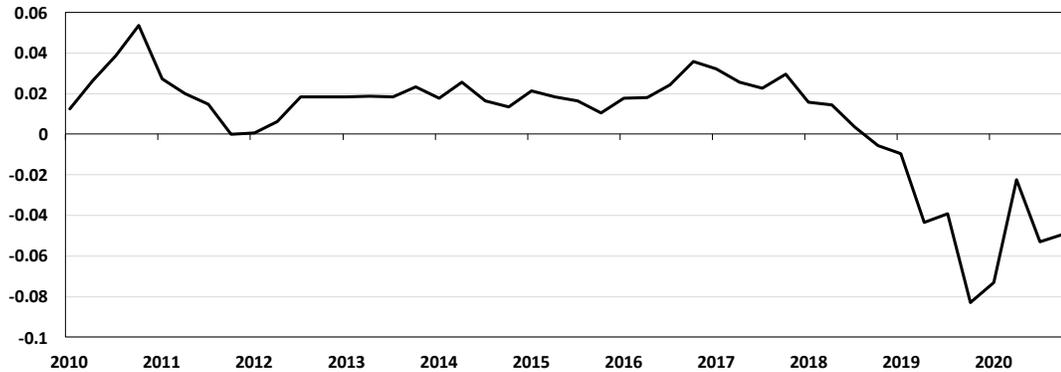

(b) Cumulative Effect of Output Shock on demeaned Real GDP Growth

Figure 17: Historical Decomposition – Model (4)

(a) Cumulative Effect of Offshore Trade Shock on demeaned Real GDP Growth

(b) Cumulative Effect of Output Shock on demeaned Real GDP Growth

Figure 18: Historical Decomposition – Model (6)

4.5 The Trade Sector and Trade-related Employment

4.5.1 An overview

In section 4.2.3, we showed that the total employment does not meaningfully respond to a re-export shock, i.e., the impact of an external shock on the trade sector does not transmit to the real economy through the employment channel. However, this contradicts Ha et al. (2003) findings that total exports earnings and trade-related employment are positively correlated. We will further explore the relationship between trade sector's performance and trade-related employment.[30]

The regression analysis with data from 1992 to 2002 extracted from Ha et al. (2003) is presented in Table 6. Other than suggesting that the elasticity between trade-related employment and total exports earnings was positive at 0.8, the results also indicated that domestic exports had the biggest employment multiplier, re-exports had a smaller one, and offshore trade had the smallest one. Therefore, the structural change from domestic exports to entrepôt trade or from re-exports to offshore trade was detrimental to employment.

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[30] The industry division of Import and Export Trade (G45) most matches trade-related employment under Hong Kong Standard Industrial Classification Version 2.0 (HSIC V2.0).

27

	Trade-related Employment (log)	
	(1)	(2)
Constant	3.99**	3.87**
	(2.05)	(2.42)
Total Exports Earnings (log)	0.82***	0.82***
	(4.81)	(5.91)
Share of Re-exports and Offshore Trade	-1.63***	-
	(-5.78)	
Share of Re-exports	-	-0.87***
		(-2.79)
Share of Offshore Trade	-	-3.60***
		(-4.22)
Adjusted R-squared	0.57	0.65

T-statistics are in parentheses. ***p < 0.01, **p < 0.05, *p < 0.1

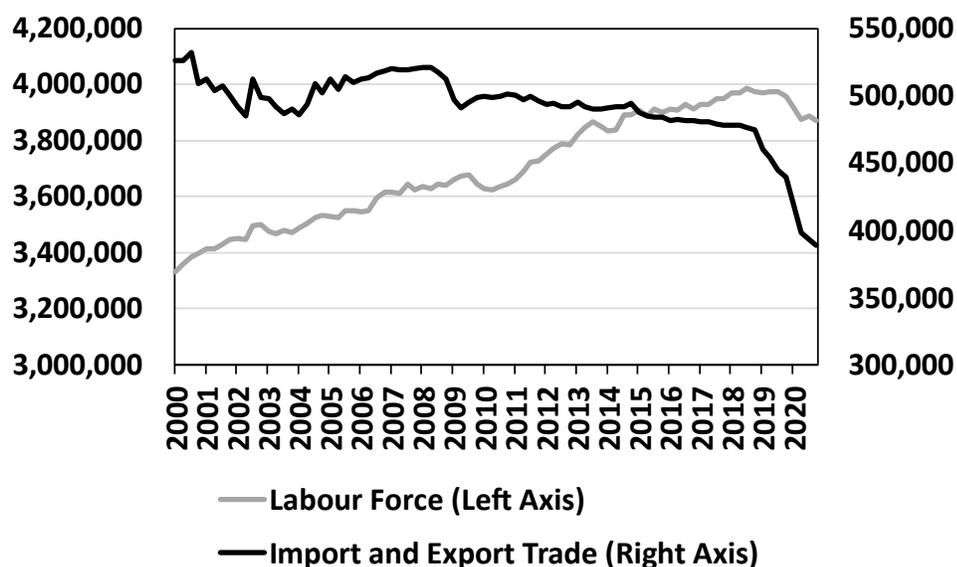Table 6: Regression Results – Extracted from Ha et al. (2003)

Figure 19: Employment – Import and Export Trade Industry

However, the employment in the Import and Export Trade sector has exhibited a baffling phenomenon over the past two decades. As shown in Figure 19, while the overall labor force has been steadily expanding, trade-related employment has registered a downward trend, and the decline has intensified after 2019.

4.5.2 Trade-related employment and trade intermediation earnings

To estimate how the relationship between trade-related employment and trade intermediation earnings[31] has changed over the last decade, we conducted regression analysis using quarterly data from 2008Q1 to 2020Q4 and the results are shown in Table 7.

Models (3), (4) and (5) all suggest that the elasticity between trade-related employment and trade intermediation earnings is still positive and statistically significant. However, the elasticity has diminished considerably from 0.8 to 0.2, reflecting the decrease in responsiveness of trade-related employment to changes in trade intermediation earnings. The regressions, on the other hand, failed to recognize a larger employment multiplier for re-exports than for offshore trade, which we believe was attributable to the end of the structural change in trade sector, as discussed and depicted in Figure 11(b). Moreover, model (4) demonstrated that the inclusion of a time trend would further weaken the elasticity, and that the trade-related employment was declining at an average rate of 0.3% every quarter. Finally, a trade war dummy from 2018Q3 to 2019Q4 was included in the regression (5) to evaluate its impact on trade-related employment. In line with the impulse responses obtained from the VAR model, no notable influence was discovered.

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[31] As domestic exports have shrunk substantially, we only focus on the trade intermediation portion (re-exports and offshore trade) of total exports.

	Trade-related Employment (log)		
	Model (3)	Model (4)	Model (5)
Constant	9.461***	11.111***	11.062***
	(7.22)	(23.45)	(30.51)
Real Trade Intermediation Earnings (log)	0.265**	0.157***	0.160***
	(2.61)	(3.38)	(3.78)
Share of Re-exports	0.536	0.181	0.194
	(1.48)	(0.45)	(0.47)
Time Trend	-	-0.003***	-0.003***
		(-5.25)	(-2.90)
Trade War Dummy	-	-	0.02
			(0.62)
Adjusted R-squared	0.19	0.68	0.69

Newey-West t-statistics are in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 7: Regression Results – Trade-related Employment

4.5.3 Explaining the Declining Trade-related Employment

The regression results suggest that some underlying forces other than trade intermediation earnings are driving the consistent decline in trade-related employment. While those underlying forces remain to be discovered, we propose some possible reasons in an attempt to explain the puzzling phenomenon.

4.5.3.1 Pessimism over the Trade Sector's Prospects

Depicting the trade-related employment by age group, Figure 20 reveals that the 15-24 and 25-39 age groups shrank by 80% and 62% respectively between 2008 and 2020. The shrinkage was a lot more drastic in comparison with that of the overall labor force.[32] This might reflect that the public, especially younger age groups, are pessimistic about the future of the trade sector such

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[32] The corresponding decline in labor force of similar age group was 34% and 1.3%, respectively.

that they are not prepared to invest their future in the industry. As a result, the trade sector is having

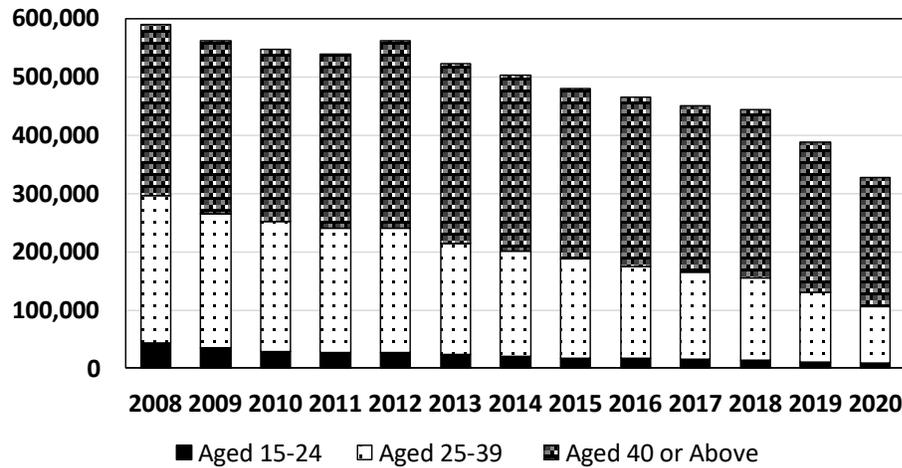a hard time replenishing the departing or retiring participants with new blood.

Figure 20: Employment by Age - Import and Export Trade and Wholesale Industry

4.5.3.2 Increase in Trade Sector's Productivity

The increase in the sectoral productivity might also explain the persistent decline in

employment. Figure 21 that plots the labor productivity index[33] illustrates that the trade sector has

outstripped the whole economy by recording a threefold increase in productivity over the past two

decades. That surge in productivity can be ascribed to different reasons. For example, the advent

of the Internet and ever-improving computational power may have resolved issues related to

information asymmetry or have replaced humans in completing time-consuming tasks. Other than

that, Hong Kong's participation in Free Trade Agreements (FTAs)[34] and the implementation of the

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[33] The labor productivity index is published by the Census and Statistics Department on an annual basis.

[34] Since 2003, Hong Kong has entered into eight FTAs with major trading partners, including Mainland China (June 2003), New Zealand (March 2010), European Free Trade Association (June 2011), Chile (September 2012), Macao (October 2017), ASEAN (November 2017), Georgia (June 2018), and Australia (March 2019).

WTO Trade Facilitation Agreement (TFA)[35] might also have contributed. As a result of the improving productivity, less manpower is required for the same volume of tasks compared to the past.
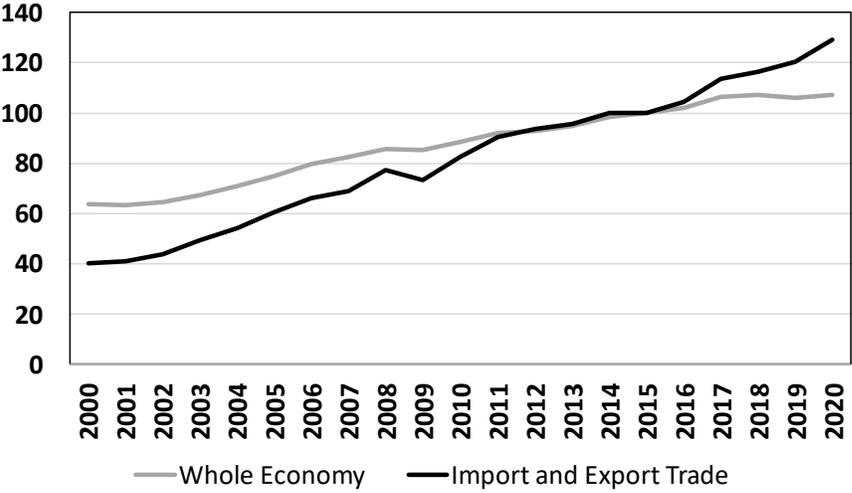

Figure 21: Labor Productivity Index (2015 = 100)

5 Conclusion

In conclusion, this paper attempts to fill the void in the literature by exploring the dynamics between Hong Kong's real economy and external shocks towards the trade sector from a trade intermediary's perspective. As suggested by the SVAR results, we discover that trade-related external shocks mainly influence Hong Kong through the re-exports channel over the offshore trade channel, as the re-exports multiplier is estimated to be four times bigger than the offshore trade multiplier and a greater portion of uncertainty concerning future real GDP growth is ascribable to the re-exports shock. There is also a sign that the re-exports multiplier has strengthened in the past decade.

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[35] Recognized by 154 WTO members as of April 2021, the TFA aims to simplify import and export processes.

While a trade-related external shock is transmitted to the real economy through various channels, we notice that the employment channel was not at work. We further show that the positive elasticity between trade-related employment and real trade intermediation earnings has diminished to around 0.2 over the past decade. Even more baffling is that trade-related employment has been persistently declining at an average quarterly rate of 0.3% from 2008 to 2020.

As a trade intermediary between mainland China and the rest of the world, Hong Kong inevitably suffered from the Sino-U.S. Trade war. Although no notable influence on trade-related employment has been identified, we estimate that the trade war has contributed to the decline in real GDP growth by around 4% from 2018Q3 to 2019Q4 and around 3% from 2019Q2 to 2020Q1 via the re-exports channel and the offshore trade channel, respectively. The sizeable impact on the real economy through the offshore trade channel suggests that the trade war has dealt a greater blow to the offshore trade sector, probably because the U.S. was the best-earning offshore trade destination. Nevertheless, both the re-exports and offshore trade sectors saw a swift recovery in 2020, reflecting the versatility of the external trade sector.

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Appendix: Robustness Check for Model (5)

We conducted robustness check for Model (5) by re-arranging the ordering of the variables. Specifically, we estimated model (7) as follows.

$$
\begin{pmatrix} ReX_t \\ Credit_t \\ INV_t \\ EMP_t \end{pmatrix} = C + \begin{pmatrix} \alpha_{1,11} & 0 & 0 & 0 \\ \alpha_{1,21} & \alpha_{1,22} & \alpha_{1,23} & \alpha_{1,24} \\ \alpha_{1,31} & \alpha_{1,32} & \alpha_{1,33} & \alpha_{1,34} \\ \alpha_{1,41} & \alpha_{1,42} & \alpha_{1,43} & \alpha_{1,44} \end{pmatrix} \begin{pmatrix} ReX_{t-1} \\ Credit_{t-1} \\ INV_{t-1} \\ EMP_{t-1} \end{pmatrix}
$$
$$
+ \begin{pmatrix} \alpha_{2,11} & 0 & 0 & 0 \\ \alpha_{2,21} & \alpha_{2,22} & \alpha_{2,23} & \alpha_{2,24} \\ \alpha_{2,31} & \alpha_{2,32} & \alpha_{2,33} & \alpha_{2,34} \\ \alpha_{2,41} & \alpha_{2,42} & \alpha_{2,43} & \alpha_{2,44} \end{pmatrix} \begin{pmatrix} ReX_{t-2} \\ Credit_{t-2} \\ INV_{t-2} \\ EMP_{t-2} \end{pmatrix} + \begin{pmatrix} \phi_{11} & 0 & 0 & 0 \\ \phi_{21} & \phi_{22} & 0 & 0 \\ \phi_{31} & \phi_{32} & \phi_{33} & 0 \\ \phi_{41} & \phi_{42} & \phi_{43} & \phi_{44} \end{pmatrix} \begin{pmatrix} \varepsilon_t^1 \\ \varepsilon_t^2 \\ \varepsilon_t^3 \\ \varepsilon_t^4 \end{pmatrix} \qquad (7)
$$

The impulse responses and variance decomposition are presented in Figure 22 and Table 8, in which the results are comparable to that of Model (5).

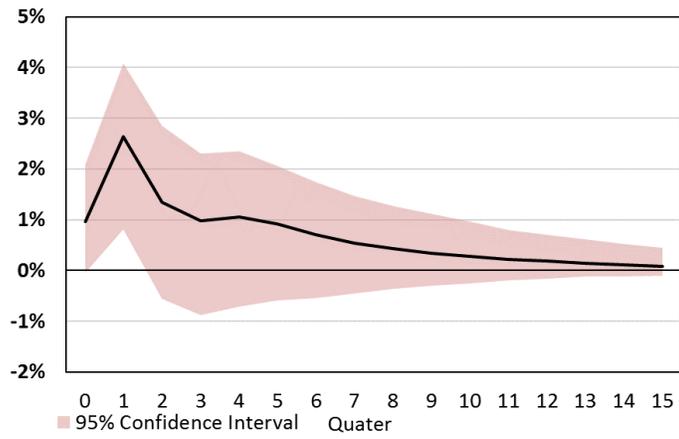|	Variance Decomposition					
Period	**Total Employment**		**Real Investment**		**Real Credit**	
	Re-exports Shock	Other Shocks	Re-exports Shock	Other Shocks	Re-exports Shock	Other Shocks
1	1.4	98.6	2.7	97.3	1.2	98.8
5	17.2	82.8	18.6	81.4	13.6	86.4
15	20.1	79.9	21.0	89.0	13.8	86.2

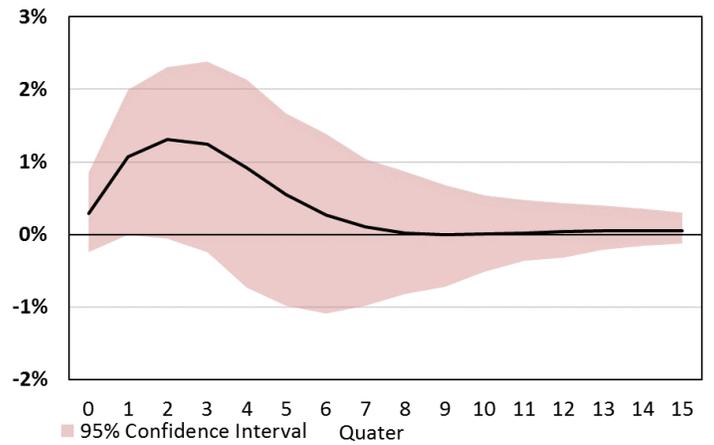Table 8: Forecast Error Variance Decomposition
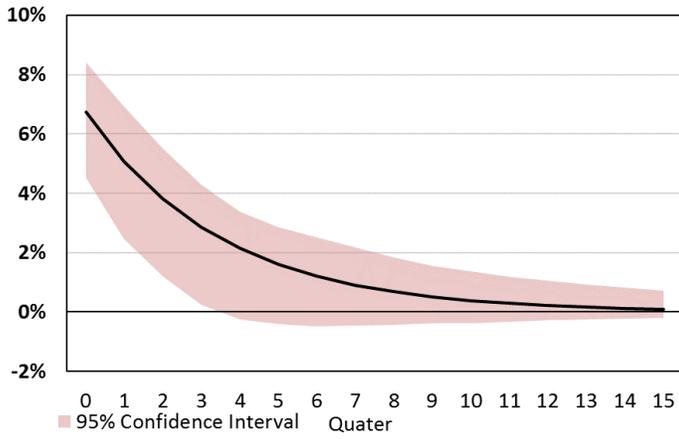
(a) Response of Real Re-exports Gross Profit
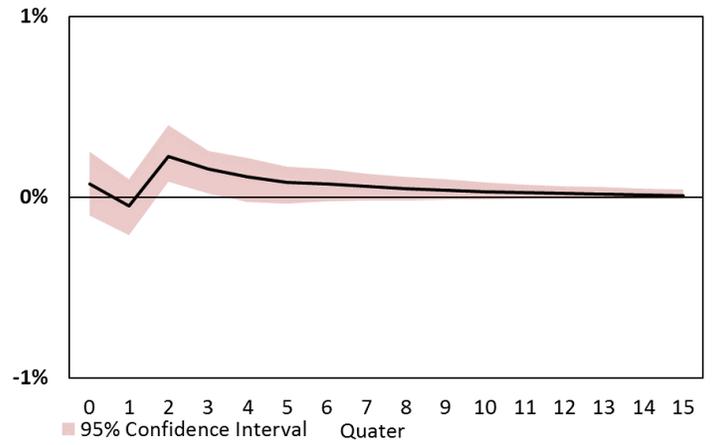
(b) Response of Total Employment

(c) Response of Real Investment

(d) Response of Real Credit

Figure 22: One-Standard-Deviation Re-exports Shock