



HONG KONG'S TRADE PATTERNS AND TRADE ELASTICITIES

Key points:

- *A salient feature of Hong Kong's external trade is its intermediation role. As the entrepôt for Mainland China, Hong Kong helps channel raw materials and semi-manufacturing products from the rest of the world to the Mainland for further processing and then helps re-export the processed goods and final products to the rest of the world.*
- *Economic theory suggests that the effect of a real exchange rate depreciation on trade balance can be ambiguous. However, if the Marshall-Lerner condition is satisfied, a depreciation of the real exchange rate would lead to an improvement in the trade balance under normal circumstances. Partly because of the complicated nature of re-exports, there has not been adequate study on whether the Marshall-Lerner condition holds for an entrepôt economy such as Hong Kong.*
- *This paper applies an error-correction model to examine Hong Kong's long-run price and income elasticities as well as its short-run dynamics. Our empirical estimates indicate that the sum of the absolute values of the estimated price elasticities of Hong Kong's direct imports and exports is greater than one, thus implying that the Marshall-Lerner condition holds for Hong Kong. Moreover, changes in re-exports and the re-export earnings are found to be sensitive to changes in the real effective exchange rate of the renminbi and income growth of the Mainland's trading partners.*
- *The movement in the real exchange rate between the Hong Kong dollar and the renminbi is found to have a significant influence on merchandise trade flows between Hong Kong and the Mainland, thus indicating the processing trade activities are quite sensitive to changes in the real exchange rate.*

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I. INTRODUCTION

A salient feature of Hong Kong's external trade is its intermediation role. As the entrepôt for Mainland China, Hong Kong helps channel raw materials and semi-manufacturing products from the rest of the world to the Mainland for further processing and then helps re-export the processed goods and final products to the rest of the world. Reflecting this, total trade in goods and services represented over 3.8 times GDP in 2005. Moreover, about one-fifth of Mainland's merchandise trade transited through Hong Kong in 2005.

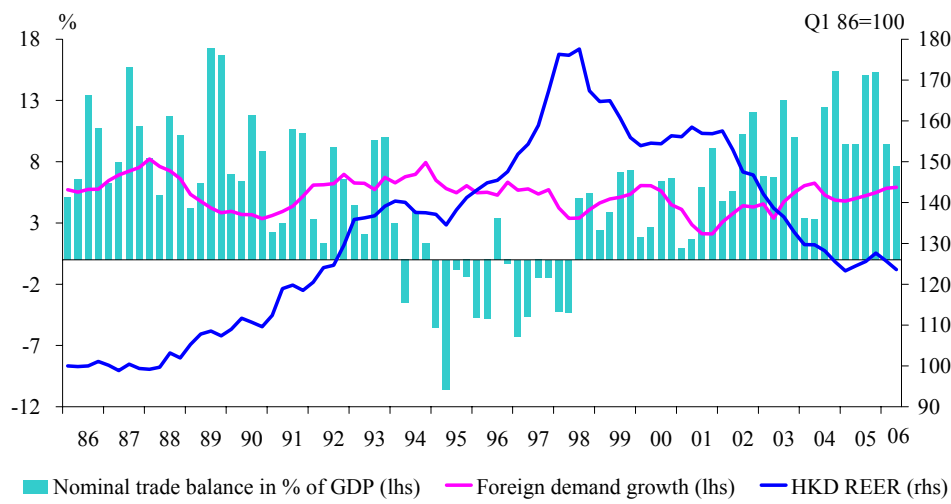
Economic theory suggests that the effect of a real exchange rate depreciation on an economy's trade balance can be ambiguous. This is because the real exchange rate depreciation often has two direct and, to a certain extent, offsetting effects on the trade balance, namely the volume and the value effect. On the one hand, a real depreciation improves the competitiveness of the economy's exports and discourages imports in volume terms, thus contributing to an improvement in the trade balance. On the other hand, imports in value measured in domestic currency would become more expensive, thus leading to a worsening of the trade balance. The net effect depends on whether the volume or the value effect would dominate. If the volume effect dominates, a real depreciation would in general lead to an improvement of the trade balance. This criterion, also known as the Marshall-Lerner condition, requires the sum of the price elasticities of demand in absolute term for imports and exports to exceed one.¹ Thus, whether this condition holds or not and the stability of these trade elasticities could be used to predict the potential effect of a change in the real exchange rate of an economy on its trade balance.

The Linked Exchange Rate System (LERS) implies that Hong Kong cannot use exchange rate policy to influence its external trade because the value of the Hong Kong dollar (HKD) against other major currencies is exogenously determined by the movements of the US dollar. However, this does not mean that movements in Hong Kong's real exchange rate do not matter. Although casual observation suggests that movements in Hong Kong's real effective exchange rate (REER) are negatively correlated with its trade balance (Chart 1), Hong Kong's trade pattern, particularly the role of re-exports, may have complicated the estimation of Hong Kong's trade elasticities. Indeed, over 70% of Hong Kong's total trade in goods and services is related to re-exports, which not only respond to the exchange rate of the HKD but also to that of other currencies involved and foreign income. Partly because of the complicated nature of re-exports, there has not been any adequate study on whether the Marshall-Lerner condition holds for an entrepôt economy such as Hong Kong.

¹ The Marshall-Lerner condition was derived based on the assumptions that supply elasticities for exports and imports are perfectly elastic, so that changes in demand volumes have no effect on prices.

This paper intends to fill this void by providing a careful treatment of this complication when estimating Hong Kong's trade elasticities. The objectives of this paper are twofold: first, we provide a careful analysis of the trade pattern of Hong Kong with a special emphasis on Hong Kong's re-export trade with Mainland China; second, we apply a well-established methodology to estimate both the long-run trade elasticities and their short-run dynamics for both Hong Kong's direct trade and its re-export trade with the Mainland.

Chart 1. Hong Kong's trade balance



Sources: Census & Statistics Department and staff estimates.

The rest of the paper proceeds as follows. The next section discusses the stylised facts about Hong Kong's external trade pattern, in terms of trading partners and product composition, with a particular focus on re-export trade with the Mainland. Section III applies an error correction model to test whether the Marshall-Lerner conditions hold for Hong Kong's trade and presents the empirical results. Section IV concludes.

II. FEATURES OF HONG KONG'S EXTERNAL TRADE

This section discusses the stylised facts about Hong Kong's external trade pattern, in terms of trading partners and product composition, with a particular focus on the re-export trade with the Mainland.

a. Trade flows by major trading partners and products

Table 1 summarises Hong Kong's external trade flows with its largest four trading partners, namely, the Mainland, the US, the euro area, and Japan, in 2005.

Table 2 provides information on the major products of merchandise trade. Additional charts and more detailed statistics of trade in goods and services by main trading partner and product category are presented in Appendix A. Several key observations emerge as follows:

First, as a service economy, Hong Kong's domestic exports of goods accounted for only 5% of total exports of goods and services, or equivalent to about 10% of GDP.² The Mainland and the US are the two largest markets, with each accounting for about 30% of the total domestic exports. Among those exports to the Mainland, more than half were raw materials or semi-finished manufacturing products for further processing with a contractual arrangement for subsequent re-importation of the processed goods into Hong Kong (the so-called outward processing trade). Of the total domestic exports, over 40% were articles of apparel and clothing accessories. The second largest category was electrical machinery, apparatus and appliances, and electrical parts, which accounted for 14% of total domestic exports.

Secondly, re-exports of goods were the largest category, accounting for 77% of total exports of goods and services, equivalent to 1.5 times of GDP.³ In particular, more than 60% of re-exports originated in the Mainland and most of the remaining 40% were imports from other economies for re-export to the Mainland. Within those re-exports to the Mainland, almost 40% were for further processing and most of those processed goods were ultimately re-exported to other places through Hong Kong. Of the total re-exports, over half were electrical and electronic products. Electrical machinery, apparatus and appliances, and electrical parts accounted for 21% of the total, telecommunications and sound recording and reproducing apparatus and equipment accounted for 15%, and office machines and automatic data processing machines accounted for another 13%.

Thirdly, because Hong Kong is a small economy with limited natural resources and small agriculture and manufacturing sectors, most of the necessities are imported from other economies. Thus, retained imports of goods represented 41% of GDP in 2005.⁴ Unlike other trade flows which concentrate on a small number of countries, retained imports are more widely split among different source economies.

² Domestic exports are the natural produce of Hong Kong or the products of a manufacturing process in Hong Kong which has changed permanently the shape, nature, form or utility of the basis materials used in manufacture.

³ Re-exports are products which have previously been imported into Hong Kong and which are re-exported without having undergone in Hong Kong a manufacturing process which has changed permanently the shape, nature, form or utility of the product.

⁴ Retained imports refer to those imported goods which are retained for use in Hong Kong. The value of retained imports is derived by subtracting the estimated import value of re-exports from the value of imports. The former is obtained by removing an estimated re-export margin from the value of re-exports. The Census and Statistics Department regularly conducts a survey of re-export trade, based on which the rates of re-export margin for different categories of goods are estimated for deriving the retained import statistics.

In particular, retained imports from the Mainland only accounted for 4% of total retained imports, while those from Japan and the Euro area accounted for 16% and 11%, respectively. This suggests that the direct impact of the appreciation of the renminbi on Hong Kong's overall domestic price level would be quite limited. Statistics of retained imports by end-use category show that about 40% were raw materials and semi-manufacturing products, while shares of both capital and consumer goods in total were about 20%, and those of both foods and fuels were roughly 10%.

Fourthly, reflecting Hong Kong's role as an entrepôt, most of its imports are for re-export to other economies, accounting for almost 70% of total imports of goods and services, equivalent to 1.3 times of GDP, in 2005. As a large proportion of re-exports of goods originated on the Mainland, imports of goods for re-export from the Mainland accounted for almost 60% of the total. Moreover, the product composition of imports for re-exports was very similar to that of re-exports of goods.

Table 1. External trade pattern, 2005

Exports	In % of GDP	In % of total	In % of sub-total	Imports	In % of GDP	In % of total	In % of sub-total
Total exports	197.9	100.0	100.0	Total imports	185.4	100.0	100.0
Of which:				Of which:			
Mainland China	82.9	41.9	41.9	Mainland China	78.9	42.6	42.6
US	33.3	16.8	16.8	US	10.3	5.5	5.5
Euro area	19.3	9.8	9.8	Euro area	10.6	5.7	5.7
Japan	11.1	5.6	5.6	Japan	20.7	11.2	11.2
Exports of goods	162.9	82.3	100.0	Imports of goods	167.2	90.2	100.0
Of which:				Of which:			
Mainland China	73.3	37.0	45.0	Mainland China	73.9	39.9	44.2
US	26.1	13.2	16.0	US	7.6	4.1	4.5
Euro area	16.4	8.3	10.1	Euro area	9.7	5.2	5.8
Japan	8.6	4.3	5.3	Japan	19.1	10.3	11.4
Domestic exports	9.9	5.0	100.0	Retained imports	40.9	22.1	100.0
Of which:				Of which:			
Mainland China	3.2	1.6	32.8	Mainland China	1.8	0.9	4.3
US	2.7	1.4	27.8	US	3.2	1.7	7.9
Euro area	1.0	0.5	10.2	Euro area	4.6	2.5	11.2
Japan	0.3	0.2	3.2	Japan	6.6	3.6	16.2
Re-exports	153.1	77.3	100.0	Imports for re-exports	126.3	68.1	100.0
Of which:				Of which:			
Mainland China	70.1	35.4	45.8	Mainland China	72.2	38.9	57.1
US	23.4	11.8	15.3	US	4.3	2.3	3.4
Euro area	15.4	7.8	10.1	Euro area	5.1	2.7	4.0
Japan	8.3	4.2	5.4	Japan	12.5	6.7	9.9
Exports of services*	35.0	17.7	100.0	Imports of services*	18.2	9.8	100.0
Of which:				Of which:			
Mainland China	9.6	4.8	27.4	Mainland China	5.0	2.7	27.4
US	7.2	3.6	20.6	US	2.7	1.4	14.7
Euro area	2.9	1.5	8.3	Euro area	1.0	0.5	5.4
Japan	2.5	1.3	7.2	Japan	1.6	0.9	8.7

Note: * Data on breakdown of service trade by trading partner for 2005 are not yet available. Ratios are based on those in 2004.

Sources: Census & Statistics Department and staff estimates.

Table 2. Product composition of merchandise trade, 2005

	In % of sub-total
Domestic exports of goods	100.0
Articles of apparel and clothing accessories (84)	41.3
Electrical machinery, apparatus and appliances, and electrical parts (77)	13.8
Miscellaneous manufactured articles (89)	11.1
Office machines and automatic data processing machines (75)	10.1
<i>Total of the above</i>	<i>76.3</i>
Imports of goods	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	22.8
Telecommunications and sound recording and reproducing apparatus and equipment (76)	12.7
Office machines and automatic data processing machines (75)	10.7
Articles of apparel and clothing accessories (84)	6.2
<i>Total of the above</i>	<i>52.4</i>
Re-exports of goods	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	20.9
Telecommunications and sound recording and reproducing apparatus and equipment (76)	15.4
Office machines and automatic data processing machines (75)	13.0
Miscellaneous manufactured articles (89)	8.6
<i>Total of the above</i>	<i>57.8</i>

Note: Numbers in brackets are the Standard International Trade Classification (SITC) codes.

Sources: Census & Statistics Department and staff estimates.

Fifthly, exports of services, which have been growing rather fast in recent years, accounted for 18% of total exports of goods and services, or 35% of GDP. Similar to exports of goods, the Mainland and the US were the two largest trading partners, accounting for 27% and 21% of total exports of services, respectively. Out of the major export service categories, exports of merchanting and other trade-related services was the largest group, accounting for 34% of the total.⁵ It was followed by transport, travel, and financial services, which accounted for 31%, 17%, and 9%, respectively. For merchanting and other trade-related services, the Mainland and the US were the two most important destinations, with each accounting for nearly 30% of the total exports of services. For travel services, the Mainland was the largest contributor, accounting for more than half of the total. For financial services, the most important counterparts were the US and the UK, together contributing half of the total.

Finally, imports of services accounted for 10% of total imports of goods and services, equivalent to 18% of GDP. Imports of services from the Mainland and the US accounted for 27% and 15% of the total respectively. Travel was the largest major service group, accounting for over 41% of the total. It was followed by transportation

⁵ Merchanting and other trade-related services comprise mainly offshore trade, for which the goods involved do not enter and leave Hong Kong.

and merchanting and other trade-related services, accounting for 29% and 7% of the total respectively. For travel services, the Mainland was the most important source, which accounted for 30% of the total.

In sum, the Mainland is Hong Kong's largest trading partner in both trade in goods and services. The US is the second largest destination for exports of goods and services, while Japan is the second largest source of imports of goods and services. Owing to the close trade link between Hong Kong and the Mainland, more detailed discussions on the trade flows between them are provided in the following section.

b. Merchandise flows between Hong Kong, the Mainland, and the rest of the world

Hong Kong, as an entrepôt for the Mainland, helps channel raw materials and semi-manufacturing products from the rest of the world to the Mainland for further processing, and then re-exports the processed goods to other economies. Moreover, as discussed above, Hong Kong's trade in goods with the Mainland is to a large extent related to outward processing activities. More than 80% of Hong Kong manufacturers have established production facilities on the Mainland, which have boosted outward processing activities and thus re-exports.

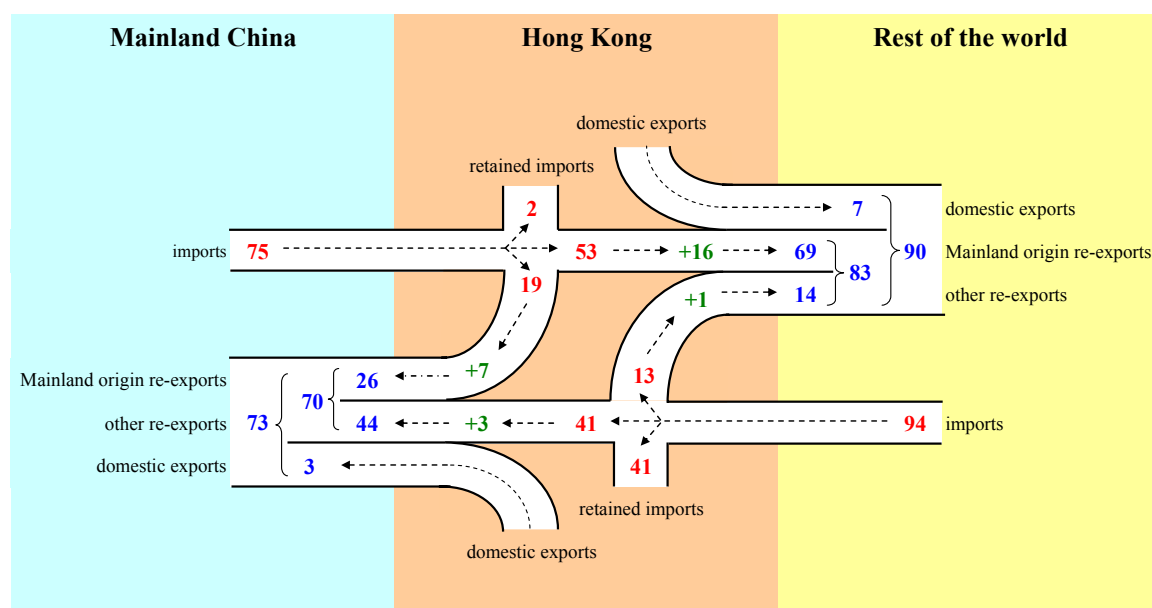
Chart 2 illustrates the goods flows between Hong Kong, the Mainland, and the rest of the world. All figures in the chart are values of goods in 2005, expressed in percentage of GDP. Of the total imports of goods from China, 70% (53 out of 75) were for re-export to the rest of world and 25% (19 out of 75) were for re-export back to the Mainland. Among those re-exported back to the Mainland, over half were electrical and electronic products.⁶ For those re-exported to the rest of the world, about half were electrical and electronic products. Clothing and textiles accounted for less than 10%. Less than 3% (2 out of 74) of the imports from the Mainland are for Hong Kong's domestic use.

Of the total imports of goods from places other than the Mainland, 44% (41 out of 94) were imports for re-exports to the Mainland and 14% (13 out of 94) were for re-exporting to the rest of the world. A large part of goods re-exported to the Mainland were raw materials and semi-manufacturing for further processing on the Mainland. About 44% (41 out of 94) of goods were retained in Hong Kong. Taking all imports of goods together, over 75% were for re-export. In other words, only 25% of imports were for domestic use.

⁶ One possible reason for these round tripping trade flows is to make use of the logistics facilities in Hong Kong. For example, shipments of raw materials and semi-manufacturing from factories in some northern Mainland cities to Hong Kong by sea and then transport the goods to factories located in southern cities by truck for further processing may be cheaper than the direct shipments of the goods from the northern to southern parts.

Of the total re-exports to places other than the Mainland, 83% (69 out of 83) originated from the Mainland. For those re-exporting to the Mainland, 63% (44 out of 70) originated from the rest of the world. Taking all re-exports together, around 90% either originated from the Mainland or were re-exported to the Mainland from other places. These Mainland-related re-exports depend mainly upon demand conditions on the Mainland and its trading partners as well as the RMB exchange rates against currencies of these partners. Hong Kong's margins earned from re-exports were estimated to amount to 26% of GDP in 2005, of which over 80% arose from re-exports of Mainland origin.

Chart 2. Traffic of goods between Hong Kong, Mainland China, and the rest of the world, 2005



Note: Figures in red are imports and those in blue and green are exports and re-export margins respectively. All the figures are value of goods expressed in percentage of GDP. Figures may not add up to total due to rounding.

Sources: Census & Statistics Department and staff estimates.

Table 3 shows that 46.5% and 31.5% of the re-exports originating from the Mainland were consumer goods and capital goods, respectively, and only 21.8% were raw materials and semi-manufacturing products. By contrast, for re-exports originating from other places (of which around 75% were exported to the Mainland), about 55% were raw materials and semi-manufactured products. These statistics indicate that most of the Mainland origin re-exports are final products, while a large part of re-exports to the Mainland are raw materials and semi-manufactured products for further processing. In particular, among the total re-exports of consumer and capital goods, over 80% and 60%, respectively, originated from the Mainland. This suggests that Hong Kong plays an important role in channelling raw materials and semi-manufacturing from the rest of the world to the Mainland for further processing, and then re-exporting the processed goods to other economies.

Table 3. Re-exports of goods by end-use category and main origin, 2005

Re-exports by end-use and origin	In % of total re-exports			In % of total end-use		
	All economies	Mainland China	Others	All economies	Mainland China	Others
Raw materials and semi-manufacturing	34.1	21.8	54.4	100.0	39.6	60.4
Consumer goods	34.7	46.5	15.4	100.0	83.2	16.8
Capital goods	30.4	31.5	28.5	100.0	64.4	35.6
Foodstuffs	0.6	0.2	1.2	100.0	19.9	80.1
Fuels	0.2	0.0	0.4	100.0	10.8	89.2
Total	100.0	100.0	100.0	100.0	62.1	37.9

Sources: Census & Statistics Department and staff estimates.

III. EMPIRICAL ESTIMATION

This section estimates the price and income elasticities of Hong Kong's demand for foreign imports and the foreign demand for Hong Kong's exports. To get a quick gauge on the long-run elasticities, we conduct the empirical analysis using the more aggregate trade data. Following a well-established approach by Hooper, Johnson, and Marquez (2000) to estimate price and income elasticities for the G-7 industrial economies and more recently a paper by Chinn (2005) to estimate the US trade elasticities, we specify both an import and an export equation based on trade theory of imperfect substitution. By assuming log-linear function forms, these two equations can be written as follows:

$$IM_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 RER_t^{IM} + \mu_{t,IM} \quad (1)$$

$$EX_t = \beta_0 + \beta_1 FY_t + \beta_2 RER_t^{EX} + \mu_{t,EX} \quad (2)$$

where IM_t , Y_t , and RER_t^{IM} in equation (1) are Hong Kong's real imports, real GDP, and the import-weighted real effective exchange rate, respectively. EX_t , FY_t , and RER_t^{EX} in equation (2) are Hong Kong's real exports, foreign real GDP, and the export-weighted real effective exchange rate, respectively. It is expected that both α_1 and β_1 are greater than zero. Because both RER_t^{IM} and RER_t^{EX} are measured relative to the Hong Kong dollar, we thus expect $\alpha_2 > 0$ and $\beta_2 < 0$. In addition, this specification implies that the real effective exchange rate (RER) can be considered as a composite indicator that combines both the exchange rate pass-through effect and the price effect. Thus, this approach allows one to have a direct interpretation of the response of imports to changes in the real effect exchange rate (Chinn, 2005).

Recognising the simultaneity among income, real effective exchange rate, and trade, we next test for co-integration and identify co-integration vectors using the methods proposed by Johansen (1988) and Johansen and Juselius (1990). In addition, because movements in international trade may respond differently in the short and long run to those in key determinants of trade, we use the error correction method to capture the short-run dynamics. Thus, a vector error correction model (VECM) for the import equation can be written as follows:

$$\Delta IM_{it} = \gamma_{10} + \varphi_1(IM_{t-1} - \alpha_0 - \alpha_1 Y_{t-1} - \alpha_2 RER_{t-1}^{IM}) + \gamma_{11} \Delta IM_{t-1} + \gamma_{12} \Delta RER_{t-1}^{IM} + \gamma_{13} \Delta Y_{t-1} + \xi_{1t} \quad (3)$$

$$\Delta RER_t^{IM} = \gamma_{20} + \varphi_2(IM_{t-1} - \alpha_0 - \alpha_1 Y_{t-1} - \alpha_2 RER_{t-1}^{IM}) + \gamma_{21} \Delta IM_{t-1} + \gamma_{22} \Delta RER_{t-1}^{IM} + \gamma_{23} \Delta Y_{t-1} + \xi_{2t} \quad (4)$$

$$\Delta Y_t = \gamma_{30} + \varphi_3(IM_{t-1} - \alpha_0 - \alpha_1 Y_{t-1} - \alpha_2 RER_{t-1}^{IM}) + \gamma_{31} \Delta IM_{t-1} + \gamma_{32} \Delta RER_{t-1}^{IM} + \gamma_{33} \Delta Y_{t-1} + \xi_{3t} \quad (5)$$

Similarly, a VECM for the export system can be written as:

$$\Delta EX_t = \gamma_{40} + \varphi_4(EX_{t-1} - \beta_0 - \beta_1 FY_{t-1} - \beta_2 RER_{t-1}^{EX}) + \gamma_{41} \Delta EX_{t-1} + \gamma_{42} \Delta RER_{t-1}^{EX} + \gamma_{43} \Delta FY_{t-1} + \xi_{4t} \quad (6)$$

$$\Delta RER_t^{EX} = \gamma_{50} + \varphi_5(EX_{t-1} - \beta_0 - \beta_1 FY_{t-1} - \beta_2 RER_{t-1}^{EX}) + \gamma_{51} \Delta EX_{t-1} + \gamma_{52} \Delta RER_{t-1}^{EX} + \gamma_{53} \Delta FY_{t-1} + \xi_{5t} \quad (7)$$

$$\Delta FY_t = \gamma_{60} + \varphi_6(EX_{t-1} - \beta_0 - \beta_1 FY_{t-1} - \beta_2 RER_{t-1}^{EX}) + \gamma_{61} \Delta EX_{t-1} + \gamma_{62} \Delta RER_{t-1}^{EX} + \gamma_{63} \Delta FY_{t-1} + \xi_{6t} \quad (8)$$

where Δ stands for the difference of a variable between time t and $t-1$. φ_i 's are coefficients of error correction terms, which account for the difference between actual imports (exports) and their long-run values as predicted by the co-integration relationship among the import (export) system. It is expected that φ_1 and φ_4 are negative and statistically significant in trade equations as trade flows react to long-run disequilibria by closing the gap in the cointegration relationship. Although it can be directly tested, the error correction coefficients in those non-trade equations also indicate whether there exist weakly exogenous relationships for the exchange rate and income.

The two VECM systems are estimated using quarterly data from 1994 Q1 to 2006 Q1.⁷ All variables are in logarithm and detailed descriptions of the data are

⁷ Before 1994, Mainland China had a dual exchange rate system for the renminbi (RMB). The official rate was set by the government at 5.8 RMB/USD and the "swap" rate was set by the market according to the supply and demand. The foreign exchange swap market was first established in early 1980's in which those who held retained foreign exchanges could sell to those who needed them. It appears that most of the trade related transactions are determined using the swap rate. Partly reflecting this, these two exchange rates were merged on 1 January 1994. The official rate was *de facto* devalued from 5.8 RMB/USD to 8.7 RMB/USD. Since the movement of the RMB/HKD exchange rate has a significant influence on the HKD REER given that the RMB has the largest currency weight, we use data starting from 1994 to avoid any distortions due to the unification of the official and the swap rates. In addition, Chart A6 in Appendix A shows that there appears to be a structural shift in Hong Kong's trade pattern from conventional re-exports to offshore trade since the middle of 1990's. To avoid these complications, a sample starting from 1994 may be preferable.

provided in Appendix B. Different from Hong Kong's direct trade, trade flows related to re-export activity depend primarily on economic conditions outside Hong Kong. In particular, about 90% of re-exports either originate from the Mainland to the rest of the world or are re-exported to the Mainland from the rest of the world. These Mainland-related re-exports depend mainly on demand conditions on the Mainland and of its trading partners, and the real exchange rates of the renminbi against currencies of these trading partners. In estimating the price and income elasticities of Hong Kong's re-exports, we use both Hong Kong's re-export flows and re-export margins (re-exports minus imports for re-exports) in logarithms to regress on the logarithms of the renminbi REER and the Mainland's foreign demand.⁸ For this purpose, a measure of the renminbi REER is computed based on the methodology presented in Peng and Fan (2005) and Peng and Leung (2005), for which the currency weights are determined by the trade pattern of the Mainland, adjusting for its trade via Hong Kong with the rest of the world. The Mainland's foreign demand is defined as the trade-weighted real GDP of its major trading partners.⁹

Before estimating the two VECM systems, we need to select lag length. The Johansen (1988) procedure was used to estimate the co-integrating vectors using lag lengths up to nine quarters. The optimal lag length is chosen based on the minimum of the Akaike and Schwarz information criteria, in addition to the judgement on whether the signs of the coefficients are consistent with economic theory. As such, the lag lengths for the co-integrating vectors tend to vary across trade aggregates. The estimation results are presented in Table 4. For retained imports and services and domestic exports and services, the optimal lag selected is 5. For re-exports and re-export margins, the lag chosen is 9. In addition, two test statistics (the trace and the maximum eigenvalue) for testing the alternative of cointegration against the null of no cointegration are also calculated as shown in Table 4. These tests indicate that for retained imports and imports of services, domestic exports and exports of services, and re-report volume, there is only one co-integration vector. However, for re-export margins, we cannot reject the null hypothesis of two co-integration vectors. Thus, some judgement has to be exercised in order to determine as to which price and income elasticities from the two co-integration vectors are more plausible ones according to both economic theory and intuitions.¹⁰

⁸ Because most of the re-exports from the rest of world passing through Hong Kong to the Mainland are for processing on the Mainland, this implies that ultimate demand is still foreign. Thus in the re-export equation, only foreign demand is considered. That said, it may be worthwhile to estimate these re-exports of the opposite directions separately.

⁹ The reason on foreign income is used in estimating trade elasticities of re-export is that a large portion of the re-exports originated from the rest of the world to the Mainland is for further processing. Thus, the ultimate demand remains foreign.

¹⁰ Detailed statistics are presented in Appendix C.

Table 4: Cointegration test for Aggregate data

Variable	$\hat{\lambda}_{\max}$	$\hat{\lambda}_{\text{trace}}$	H_0	H_1	lags
Retained imports & import of services	23.82*	30.43*	$r = 0$	$r = 1$	5
	6.42	6.62	$r \leq 1$	$r = 2$	
Domestic exports & exports of services	22.53*	32.21*	$r = 0$	$r = 1$	5
	9.58	9.68	$r \leq 1$	$r = 2$	
Re-export volume	32.09*	43.16*	$r = 0$	$r = 1$	9
	9.32	11.07	$r \leq 1$	$r = 2$	
Re-export margins	83.84*	55.17*	$r = 0$	$r = 1$	9
	28.67*	28.48*	$r \leq 1$	$r = 2$	
	0.19	0.19	$r \leq 2$	$r = 3$	

Note: *Denote significant at the 95% level. $r = 0$ represents no cointegrating, vector, lags defines the length of lag in the Vector Autoregression.

Table 5 presents the estimated long-run price and income elasticities and error correction coefficients. The price elasticities in absolute terms of Hong Kong's demand for imports and the foreign demand for Hong Kong's exports are found to be 0.65 and 0.52, respectively. This suggests that 1% depreciation in Hong Kong's real effective exchange rate will lead to an increase of Hong Kong's retained imports of goods and service by 0.65% and a decrease of Hong Kong's direct exports of goods and services by 0.52%. Adding up, the sum of these point estimates is 1.17, implying that the Marshall-Lerner condition for Hong Kong's direct trade is satisfied. This also implies that a depreciation of the HK dollar REER would help improve the balance of direct trade in goods and services holding other things constant. With respect to the income elasticity, we find that the Hong Kong's elasticity for imports of goods and services is larger than foreign income elasticity for Hong Kong's exports of goods and services. For the re-export volume, the estimated price and income elasticities are -2.02 and 4.27 respectively.¹¹ Similar results are also obtained for re-export margins. As both price and income elasticities are much greater than one, this suggests that Hong Kong's re-exports are quite sensitive to changes in the exchange rate and in foreign demand.

The error correction coefficients for equations (3) and (6) of the VECM system are negative and significant statistically, suggesting both imports and exports respond to disequilibria in the long-run relationship, but with exports adjusting to disequilibria faster than imports. Similarly, for equations (4) and (5) of the import VECM system, the error coefficients are both statistically significant, suggesting that

¹¹ An appreciation of the RMB would hurt re-exports originating from the Mainland to the rest of the world, but would help Hong Kong's re-exports to the Mainland. The estimated coefficient of the RMB REER suggests that the negative effect on re-exports originating from the Mainland outweighs the positive effect on re-exports to the Mainland. This is not surprising because the size of re-exports from the Mainland has been much larger than that of re-exports in the opposite direction. Moreover, a large part of re-exports to the Mainland is related to outward processing activities, most of them are ultimately re-exported to the rest of the world through Hong Kong.

movements in Hong Kong's real effective exchange rate and income also affect its imports of goods and services from overseas. However, for equations (7) and (8) in the export VECM system, the error correction coefficients are no longer statistically significant. This implies that foreign income and prices may be weakly exogenous to Hong Kong's exports, consistent to the view that Hong Kong is a small open economy where its exports are mostly determined by both foreign income and prices.¹²

Table 5: Johansen MLE estimates for Aggregate trade data

	RER Elasticity	Income Elasticity	Error Correction Coefficients		
			Export or Import	RER	Income
<i>Import</i>					
Retained import and import of services	0.65** (2.2)	1.57*** (5.9)	-0.065*** (-3.4)	0.09** (2.30)	0.08* (1.7)
Lags: 5, Intercept and trend included					
<i>Export</i>					
Domestic export and export of services	-0.52*** (-5.9)	0.78*** (11.6)	-0.93*** (-2.9)	0.18 (1.7)	-0.01 (-0.2)
Lags: 5, Intercept and trend included					
Re-export volume	-2.04*** (4.2)	4.27*** (11.2)	-0.25*** (1.99)	-0.05 (0.63)	-0.01 (-0.27)
Lags: 9, Intercept included					
Re-export margin	-1.98*** (-4.4)	4.17*** (11.9)	-0.25* (-2.0)	-0.05 (-0.6)	-0.01 (-0.3)
Lags: 9, Intercept and trend included					

t- statistics are in parentheses.

***, **, * denotes significance at the 1%, 5%, 10% level.

Although Hong Kong's trade does satisfy the Marshall-Lerner condition, it remains to be confirmed whether these estimated price elasticities are stable over the sample period between 1994 and 2005. We next use a one-step-ahead Chow test to examine the stability of price elasticities. This procedure is implemented by first estimating the price elasticity for the sub-period of 1994 Q1 to 2000 Q4 and obtaining the sum square of errors (SSE). The sub-sample is then extended by one quarter forward to obtain a new price elasticity estimates and a re-computed SSE. This procedure is carried out forward quarter-by- quarter until all observations are exhausted. The test results for the error correction equation indicate that the price elasticities are mostly stable for the sample period investigated (Table 6). However, for domestic exports and exports of services, the price elasticities are found to be instable over the sample period between 2001 Q1 and 2003 Q2. With hindsight, this may not be surprising given this period of time is filled with large external shocks such as the US recession during 2000-01, the terrorist attack on the US on 11 September 2001, and the eruption of a pandemic, SARS, on the Mainland and in the East Asian region in early 2003.

¹² Not reported here, using a weak exogeneity test developed by Bruggemann (2002), we can not reject there exists weak exogeneity for export equations.

Table 6: Chow Forecast test

	Dates of instability
Retained import and import of services	stable
Domestic export and export of services	instable for (2001Q1 - 2003Q2)
Re-export volume	stable
Re-export margin	stable

The remainder of this section presents the estimated price and income elasticities of bilateral trade between Hong Kong and its four largest trading partners, the Mainland, the US, the EU, and Japan. Since the statistics on bilateral service trade are only available for the period of 1999-2004, the estimations are based on merchandise trade data only. The empirical results in Table 7 suggest that the Marshall-Lerner condition is satisfied for bilateral trade of Hong Kong with the Mainland, the US, and Japan, but it is inconclusive for trade with the EU as the price elasticity for imports has an incorrect sign. For merchandise trade between Hong Kong and the Mainland, the price elasticities for both imports and exports and the income elasticity for imports are much larger than one; but the income elasticity of the Mainland for Hong Kong's exports is lower than one. This suggests that the real bilateral exchange rate and Hong Kong's GDP growth have significant influence on real trade flows and imports respectively, while exports to the Mainland are relatively less responsive to the Mainland's GDP growth. The latter could be explained by the fact that about 40% of exports to the Mainland are for outward processing, which are not for meeting Mainland's own domestic demand. Thus, it is unlikely to be responsive to its growth. Moreover, exports involving outward processing are sensitive to the production costs on the Mainland, which are affected by the real bilateral exchange rate between the HK dollar and the renminbi. Similar to the results for aggregate trade data, the income elasticity is, in general, larger than the price elasticity, except for exports to the Mainland.

Table 7: Johansen MLE estimates for bilateral trade data

	RER Elasticity	Income Elasticity		RER Elasticity	Income Elasticity
<i>HK Imports of goods</i>			<i>HK Exports of goods</i>		
From Mainland China	3.26*** (6.0)	4.33*** (10.9)	To Mainland China	-2.29*** (3.3)	0.89*** (5.0)
From US	1.40*** (22.6)	1.80*** (30.1)	To US	-0.04 (0.6)	0.89*** (8.3)
From EU	-0.82*** ^ (4.9)	0.6* (1.3)	To EU	-0.75*** (12.9)	2.25*** (30.6)
From Japan	0.74*** (3.9)	1.69*** (18.0)	To Japan	-2.82** (2.3)	9.98*** (6.2)

t- statistics are in parentheses.

***, **, * denotes significance at the 1%, 5%, 10% level.

^ The sign of the coefficient is opposite to that expected.

IV. CONCLUDING REMARKS

This paper starts by discussing the stylised facts about Hong Kong's external trade pattern in terms of trading partners and product composition, with a special focus on the re-export trade with the Mainland. As an entrepôt for the Mainland, Hong Kong helps channel raw materials and semi-manufactures from the rest of the world to the Mainland for further processing and then re-export the processed goods to the rest of the world.

Because of the importance of the external trade sector, it is natural to ask whether the Marshall-Lerner condition holds for Hong Kong. Our empirical analysis suggests that the Marshall-Lerner condition appears to hold for Hong Kong's direct trade, implying that a real depreciation of the HK dollar would likely lead to an improvement in the balance of trade in direct exports and imports, holding other things constant. Given that a large part of Hong Kong's export earnings comes from its role as an entrepôt for the Mainland, movements in the renminbi real effective exchange rate plays an important role in influencing Hong Kong's overall trade balance. In particular, the price elasticity of re-export margins is much greater than that of direct exports. In addition, we find that these price elasticities estimated are mostly stable over the sample period, suggesting they are quite useful tools in helping predict the effect of changes in real exchange rate on Hong Kong's trade balances.

Price and income elasticities of bilateral merchandise trades between Hong Kong and its four largest trading partners, the Mainland, the US, the EU, and Japan, are also estimated. The empirical results suggest that the Marshall-Lerner condition is satisfied for bilateral trade of Hong Kong with the Mainland, the US, and Japan, but it is inconclusive for trade with the EU. In particular, the movements in the real bilateral

exchange rate between the HK dollar and the renminbi are found to have significantly affected trade flows between Hong Kong and the Mainland. This probably reflects that a large proportion of goods traded with the Mainland are related to outward processing activities, which are quite sensitive to the production costs on the Mainland. Furthermore, we find that the US income elasticity for Hong Kong's imports is much larger than Hong Kong income elasticity for US imports. The finding appears to be consistent with those using aggregated US data with respect to the rest of world.

This study can be extended by examining the Marshall-Lerner conditions with respect to disaggregated data. In addition, the re-exports can be further divided into those from and to the Mainland to better understand changes in income and prices in both Mainland China and the rest of the world on the behaviours of such trade flows. Finally, it would be of interest to separate goods from services as the services trade in Hong Kong is gaining increasing prominence over time.

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APPENDIX A. STATISTICS ON TRADE BY MAIN TRADING PARTNER AND PRODUCT

Chart A1. Real export growth

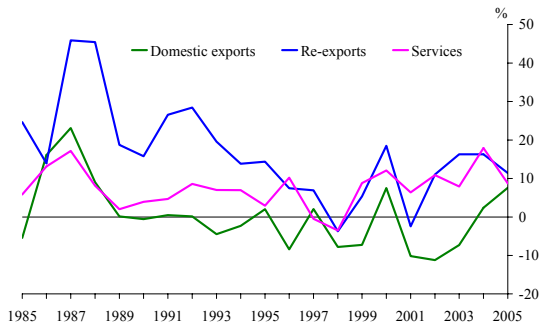


Chart A2. Real import growth

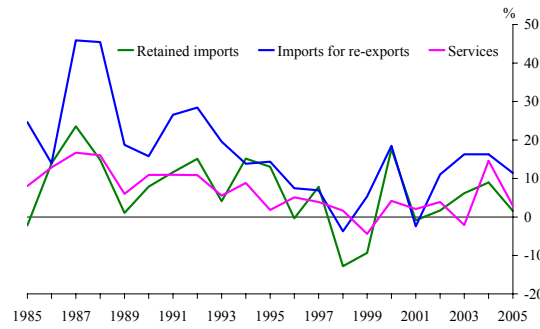


Chart A3. Exports of goods by main destination

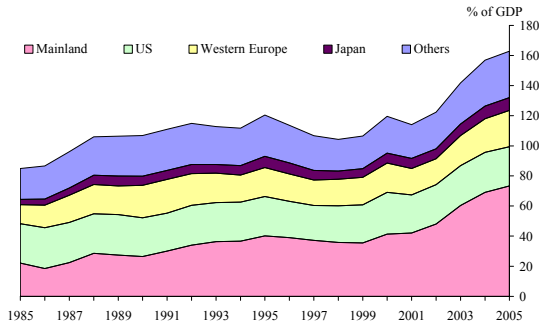


Chart A4. Imports of goods by main supplier

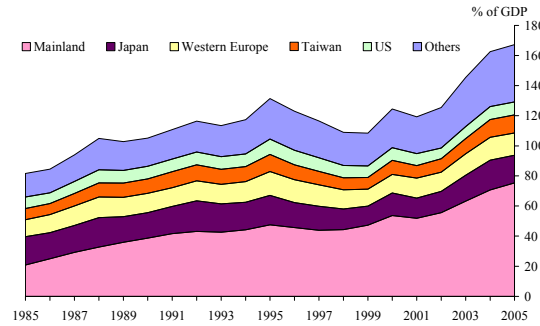


Chart A5. Re-exports related to Mainland China

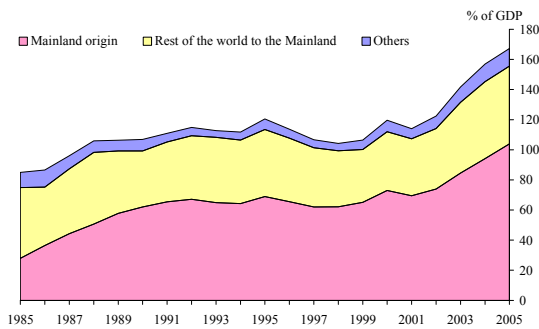


Chart A6. Real growth of re-exports and offshore trade



Chart A7. Exports of services by broad category

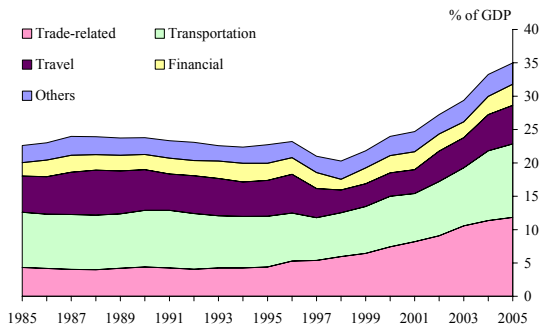
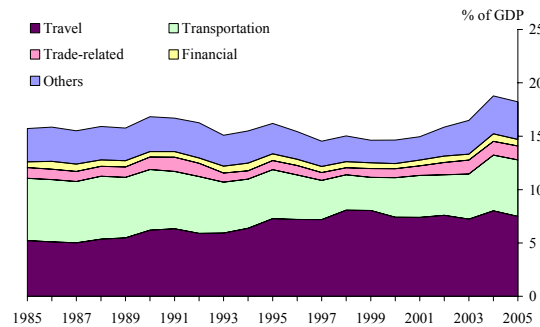


Chart A8. Imports of services by broad category



Sources: Census and Statistics Department and staff estimates.

Table A1. Domestic exports of goods by main destination and product, 2005

Domestic exports of goods by main destination and product	In % of total	In % of sub-total
To Mainland China	32.8	100.0
Articles of apparel and clothing accessories (84)	10.6	32.4
Electrical machinery, apparatus and appliances, and electrical parts (77)	5.5	16.8
Plastics in primary forms (57)	3.2	9.9
Miscellaneous manufactured articles (89)	2.0	6.0
<i>Total of the above</i>	<i>21.4</i>	<i>65.1</i>
To US	27.8	100.0
Articles of apparel and clothing accessories (84)	18.6	67.2
Miscellaneous manufactured articles (89)	3.6	12.9
Office machines and automatic data processing machines (75)	2.4	8.8
Electrical machinery, apparatus and appliances, and electrical parts (77)	1.8	6.3
<i>Total of the above</i>	<i>26.4</i>	<i>95.1</i>
To all other destinations	39.4	100.0
Articles of apparel and clothing accessories (84)	12.1	30.6
Electrical machinery, apparatus and appliances, and electrical parts (77)	6.6	16.7
Miscellaneous manufactured articles (89)	5.5	14.0
Office machines and automatic data processing machines (75)	6.8	17.3
<i>Total of the above</i>	<i>31.0</i>	<i>78.6</i>

Note: Numbers in brackets are the Standard International Trade Classification (SITC) codes.

Sources: Census & Statistics Department and staff estimates.

Table A2. Imports of goods by main supplier and product, 2005

Imports of goods by main supplier and product	In % of total	In % of sub-total
From Mainland China	45.0	100.0
Telecommunications and sound recording and reproducing apparatus and equipment (76)	8.1	17.9
Electrical machinery, apparatus and appliances, and electrical parts (77)	7.5	16.6
Articles of apparel and clothing accessories (84)	5.6	12.5
Office machines and automatic data processing machines (75)	4.9	10.9
<i>Total of the above</i>	<i>26.1</i>	<i>58.0</i>
From Japan	11.0	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	3.0	27.1
Telecommunications and sound recording and reproducing apparatus and equipment (76)	1.5	13.6
Office machines and automatic data processing machines (75)	1.1	10.3
Miscellaneous manufactured articles (89)	0.7	6.4
<i>Total of the above</i>	<i>6.3</i>	<i>57.5</i>
From Taiwan	7.2	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	3.4	46.6
Office machines and automatic data processing machines (75)	0.8	11.7
Plastics in primary forms (57)	0.6	9.0
Telecommunications and sound recording and reproducing apparatus and equipment (76)	0.5	7.4
<i>Total of the above</i>	<i>5.4</i>	<i>74.7</i>
From all other suppliers	36.7	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	8.9	24.3
Office machines and automatic data processing machines (75)	3.8	10.4
Telecommunications and sound recording and reproducing apparatus and equipment (76)	2.6	7.1
<i>Total of the above</i>	<i>15.4</i>	<i>41.8</i>

Note: Numbers in brackets are the Standard International Trade Classification (SITC) codes. The ratios in this table are slightly different from those in Table 1, as import data in this table are classified by suppliers while those in Table 1 are classified by origins.

Sources: Census & Statistics Department and staff estimates.

Table A3. Re-exports of goods by main origin, destination, and product, 2005

Re-exports of goods by main origin, destination, and product	In % of total re- exports	In % of sub-total by origin	In % of sub-total by origin and destination
Country of origin: Mainland China			
To all destinations	62.1	100.0	
Telecommunications and sound recording and reproducing apparatus and equipment (76)	11.9	19.2	
Electrical machinery, apparatus and appliances, and electrical parts (77)	9.8	15.8	
Office machines and automatic data processing machines (75)	8.4	13.5	
Miscellaneous manufactured articles (89)	7.8	12.5	
<i>Total of the above</i>	37.9	61.1	
To Mainland China	17.0	27.3	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	4.0	6.5	23.8
Office machines and automatic data processing machines (75)	3.7	5.9	21.8
Telecommunications and sound recording and reproducing apparatus and equipment (76)	3.5	5.7	20.8
Textile yarn, fabrics, made-up articles, and related products (65)	1.9	3.0	11.1
<i>Total of the above</i>	13.1	21.2	77.5
To US	14.1	22.7	100.0
Miscellaneous manufactured articles (89)	3.2	5.1	22.6
Articles of apparel and clothing accessories (84)	2.4	3.9	17.0
Telecommunications and sound recording and reproducing apparatus and equipment (76)	2.1	3.4	14.8
Electrical machinery, apparatus and appliances, and electrical parts (77)	1.6	2.5	11.1
<i>Total of the above</i>	9.2	14.9	65.5
To Japan	4.8	7.7	100.0
Telecommunications and sound recording and reproducing apparatus and equipment (76)	0.9	1.5	19.5
Miscellaneous manufactured articles (89)	0.8	1.3	16.9
Electrical machinery, apparatus and appliances, and electrical parts (77)	0.8	1.3	16.3
Articles of apparel and clothing accessories (84)	0.6	1.0	13.3
<i>Total of the above</i>	3.2	5.1	65.9
To Germany	3.1	4.9	100.0
Telecommunications and sound recording and reproducing apparatus and equipment (76)	0.7	1.2	23.4
Articles of apparel and clothing accessories (84)	0.6	0.9	18.3
Miscellaneous manufactured articles (89)	0.5	0.8	16.7
Electrical machinery, apparatus and appliances, and electrical parts (77)	0.4	0.6	13.0
<i>Total of the above</i>	2.2	3.5	71.4
To all other destinations	23.2	37.3	100.0
Telecommunications and sound recording and reproducing apparatus and equipment (76)	4.7	7.5	20.1
Electrical machinery, apparatus and appliances, and electrical parts (77)	3.1	4.9	13.2
<i>Total of the above</i>	7.7	12.4	33.3
Country of origin: Japan			
To all destinations	8.8	100.0	
Electrical machinery, apparatus and appliances, and electrical parts (77)	2.2	24.6	
Telecommunications and sound recording and reproducing apparatus and equipment (76)	1.6	18.3	
Office machines and automatic data processing machines (75)	1.0	11.4	
Photographic apparatus, equipment and supplies and optical goods, watches, and clocks (88)	0.8	9.4	
<i>Total of the above</i>	5.6	63.7	
To Mainland China	7.3	83.1	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	1.9	21.6	25.9
Telecommunications and sound recording and reproducing apparatus and equipment (76)	1.4	15.6	18.8
Office machines and automatic data processing machines (75)	0.9	10.6	12.8
Machinery specialized for particular industries (72)	0.5	5.6	6.8
<i>Total of the above</i>	4.7	53.4	64.3
To all other destinations	1.5	16.9	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	0.3	3.0	18.0
Telecommunications and sound recording and reproducing apparatus and equipment (76)	0.2	2.7	15.9
Office machines and automatic data processing machines (75)	0.1	0.8	4.9
<i>Total of the above</i>	0.6	6.5	38.7

Note: Numbers in brackets are the Standard International Trade Classification (SITC) codes.

Sources: Census & Statistics Department and staff estimates.

**Table A3. Re-exports of goods by main origin, destination, and product, 2005
(continued)**

Re-exports of goods by origin, destination, and product	In % of total re- exports	In % of sub-total by origin	In % of sub-total by origin and destination
Country of origin: Taiwan			
To all destinations	7.2	100.0	
Electrical machinery, apparatus and appliances, and electrical parts (77)	3.3	46.2	
Office machines and automatic data processing machines (75)	1.1	14.6	
Telecommunications and sound recording and reproducing apparatus and equipment (76)	0.6	7.9	
Plastics in primary forms (57)	0.6	7.9	
<i>Total of the above</i>	5.5	76.6	
To Mainland China	6.3	87.2	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	2.7	37.6	43.1
Office machines and automatic data processing machines (75)	1.0	13.5	15.5
Plastics in primary forms (57)	0.6	7.8	9.0
Textile yarn, fabrics, made-up articles, and related products (65)	0.5	6.7	7.7
<i>Total of the above</i>	4.7	65.6	75.2
To all other destinations	0.9	12.8	100.0
Electrical machinery, apparatus and appliances, and electrical parts (77)	0.6	8.7	67.9
Telecommunications and sound recording and reproducing apparatus and equipment (76)	0.1	1.6	12.9
Office machines and automatic data processing machines (75)	0.1	1.0	8.1
<i>Total of the above</i>	0.8	11.3	88.8

Note: Numbers in brackets are the Standard International Trade Classification (SITC) codes.

Sources: Census & Statistics Department and staff estimates.

Table A4. Trade in services by main group and trading partner, 2005

	Exports of services		Imports of services	
	In % of total	In % of sub-total	In % of total	In % of sub-total
Total	100.0		100.0	
Merchanting and other trade-related	33.8	100.0	7.2	100.0
Mainland China*	9.7	28.6	3.3	45.3
US*	9.1	27.1	0.9	12.4
Japan*	1.8	5.4	0.7	9.0
Transportation	31.5	100.0	29.0	100.0
US*	5.7	18.1	2.7	9.4
Mainland China*	5.0	15.9	7.5	25.7
Japan*	3.5	11.3	2.3	8.0
Travel	16.5	100.0	41.1	100.0
Mainland China*	9.5	57.6	12.6	30.6
US*	1.1	6.8	4.7	11.4
Japan*	0.8	5.0	3.0	7.3
Financial	9.1	100.0	3.4	100.0
US*	2.7	29.8	0.8	25.0
UK*	1.7	18.4	0.6	17.2
Singapore*	0.7	7.8	0.5	14.7

Note: * Data on breakdown of service trade by trading partner for 2005 are not yet available. Ratios are based on those in 2004.

Sources: Census & Statistics Department and staff estimates.

APPENDIX B. DATA DESCRIPTIONS

Trade data on a more aggregate level are obtained from the national account statistics compiled by the Census and Statistics Department. Direct exports are the sum of domestic exports of goods and exports of services at constant 2000 prices, and direct imports are the total of an estimated retained imports of goods and imports of services at constant 2000 prices. Retained imports are derived by subtracting the estimated imports for re-exports from total imports of goods. The former is obtained by removing an estimated re-export margin from the total re-exports of goods.

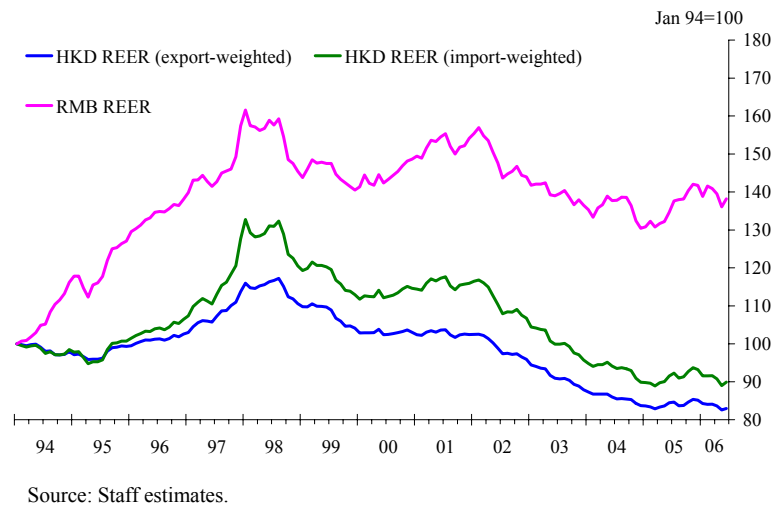
The real effective exchange rate (REER) for the Hong Kong dollar (HKD) is a CPI-based REER, using currency weights based on the direct trade in goods and services. It is different to the official REER which includes re-exports but excludes service trade in determining the currency weights.¹³ Specifically, the export-weighted REER is based on the trade pattern of domestic exports of goods and exports of services between 2000 and 2004, while the import-weighted REER is based on retained imports of goods and imports of services during the same period. The REER for the renminbi (RMB) is computed based on the methodology presented in Peng and Leung (2005), for which the currency weights are determined based on the Mainland's merchandise trade pattern, adjusting for its trade via Hong Kong with the rest of the world. The currency weights of the HKD and RMB REERs are presented in Table B1 and the REERs are shown in Chart B1.

Table B1: Currency weights of the real effective exchange rates

	HKD REER (export-weighted)	HKD REER (import-weighted)	RMB REER
Mainland China	30.6	16.7	-
US	26.8	11.7	25.9
Japan	7.2	14.9	24.9
Euro area	9.0	13.3	18.4
Taiwan	6.5	6.5	10.5
Singapore	3.0	7.7	3.5
S. Korea	2.5	8.7	10.1
UK	6.5	4.8	3.5
Malaysia	1.4	3.6	3.1
Thailand	1.1	3.3	-
Canada	1.8	1.9	-
Australia	1.5	3.1	-
Philippines	1.1	2.0	-
Switzerland	0.9	1.8	-
Total	100.0	100.0	100.0

Source: Staff estimates.

¹³ For details, see Peng and Fan (2005).

Chart B1. Real effective exchange rates of the Hong Kong dollar and the renminbi

For data on bilateral merchandise trade, real exports of goods to the Mainland, the US, and Japan are computed based on the quantum indices for domestic and re-exports to these economies published by the Census and Statistics Department, while real imports of goods from the above economies are based on the respective quantum indices for imports. Real exports to and imports from the EU are estimated by deflating the nominal values of exports and imports by the corresponding export and import unit value indices with the UK. The real bilateral exchange rates are derived from adjusting the nominal exchange rates for the relative consumer price inflation.

APPENDIX C.

Domestic export & Export of services Cointegration Results

	Number of lags Included							
	2	3	4	5*	6	7	8	9
RER elasticity	-0.75 (10.51)	-1.49 (7.70)	-0.78 (10.28)	-0.52 (5.91)	-0.03 (0.11)	-1.40 (7.66)	-16.40 (4.99)	-0.05 (0.17)
Income elasticity	0.62 (14.70)	-0.15 (1.33)	0.63 (11.14)	0.78 (11.57)	1.14 (5.75)	0.22 (1.55)	-7.24 (3.04)	0.73 (4.31)
intercept	✓	✓	✓	✓	✓	✓	✓	✓
trend	×	×	×	✓	×	✓	×	×
AIC	-2.96	-3.16	-3.49	-3.38	-3.46	-3.32	-3.22	-3.19
SBC	-2.65	-2.72	-2.92	-2.68	-2.63	-2.36	-2.12	-1.95

Retained Import & Import of services Cointegration Results

	Number of lags Included							
	2	3	4	5*	6	7	8	9
RER elasticity	-0.34 (4.59)	-0.39 (4.77)	-0.75 (5.69)	0.65 (-2.21)	4.38 (-3.32)	-16.78 (3.50)	-0.92 (14.7)	-0.76 (8.37)
Income elasticity	0.57 (-9.32)	0.54 (-8.07)	-2.33 (3.69)	1.54 (-6.01)	4.74 (-3.95)	-16.43 (3.79)	-3.05 (8.72)	0.43 (-5.38)
intercept	✓	✓	✓	✓	✓	✓	✓	✓
trend	×	×	✓	✓	×	×	×	×
AIC	-3.77	-3.73	-3.38	-3.29	-3.19	-3.27	-3.91	-5.75
SBC	-3.34	-3.21	-2.69	-2.47	-2.24	-2.18	-2.68	-4.38

Re-export volume Cointegration Results

	Number of lags Included							
	2	3	4	5	6	7	8	9*
RER elasticity	-0.64 (-2.10)	-0.94 (-3.15)	-14.63 (-4.83)	-5.16 (-3.81)	-3.50 (-2.52)	-4.05 (-2.79)	-9.53 (-5.11)	-2.04 (4.17)
Income elasticity	3.43 (13.89)	3.37 (14.02)	-5.87 (-2.31)	1.49 (1.54)	3.06 (3.07)	3.27 (3.21)	2.93 (2.28)	4.27 (11.16)
intercept	✓	✓	✓	✓	✓	✓	✓	✓
trend	×	×	×	×	×	×	×	×
AIC	-3.97	-3.97	-3.75	-4.02	-3.98	-3.86	-4.18	-4.8263
SBC	-3.57	-3.45	-3.10	-3.25	-3.08	-2.82	-3.01	-3.4613

Re-export margin Cointegration Results

	Number of lags Included							
	2	3	4	5	6	7	8	9*
RER elasticity	1.32 (1.79)	-1.61 (4.06)	8.91 (4.36)	-9.05 (3.48)	2.78 (2.17)	59.36 (2.71)	-7.24 (5.01)	-1.98 (4.39)
Income elasticity	3.91 (6.13)	3.52 (9.89)	3.91 (2.07)	0.63 (0.30)	4.88 (5.05)	15.99 (0.93)	4.91 (3.82)	4.17 (11.90)
intercept	✓	✓	✓	✓	✓	✓	✓	✓
trend	×	×	×	×	×	×	×	✓
AIC	-3.88	-3.96	-3.81	-3.94	-3.83	-3.76	-4.42	-4.82
SBC	-3.45	-3.40	-3.12	-3.12	-2.88	-2.67	-3.20	-3.45