

Exchange Rate Effect on HK Trade

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1. Introduction

- 1.1. The appreciation of the US Dollar against major currencies from mid 2014 has raised concern about Hong Kong's trade outlook. Conventional wisdom suggests that a stronger HK Dollar (due to the USD-HKD peg) would hurt exports and possibly boost imports. This paper reviews evidence we found on this conjecture.

2. Basic Theory

- 2.1. There is a huge literature on exchange rate determination where different factors, such as relative prices, monetary and fiscal policies, saving and investment adjustments, are put into perspective. Regarding the exchange rate – trade balance nexus, the most well known prediction is the Marshall-Lerner condition and the J-curve.
- 2.2. The Marshall-Lerner condition suggests that if export elasticity and import elasticity are sufficiently elastic, a depreciation of the home currency will prompt less import by local residents and encourage foreigners to buy more of the exports. The trade balance will improve as a result.
- 2.3. This notwithstanding, the short term or immediate impact of a home currency depreciation could be a slight initial deterioration of the trade balance because in local currency terms, imports will become more expensive and exports much cheaper instantaneously. The phenomenon of an initial deterioration (impact effect) in and a subsequent improvement (the Marshall-Lerner condition) of the current account is regarded as the J-curve.

3. The Case of Hong Kong

- 3.1. Following the convention in the literature, the exchange rate variable for the analysis should be the **real exchange rate** (RER) defined as:

$$RER = \text{Nominal Exchange Rate} \times \frac{P_{foreign}}{P_{HK}}$$

where the nominal exchange rate is the HKD per unit foreign currency, and $P_{foreign}$ and P_{HK} are the price levels of the foreign country and of HK respectively. The RER is unit free (i.e. not in HKD or other currency denomination) and reflects the price ratio of foreign goods to HK goods. **An increase in RER means that foreign goods become more expensive or equivalently the HKD has declined in value.**

- 3.2. In HK, a convenient choice for the Nominal Exchange Rate is the Effective Exchange Rate Index (EERI, trade weighted) compiled by the C&SD which measures the relative appreciation of the HKD against currencies of our trading partners. To obtain the RER, we need to plug in relative prices of HK and other economies in a certain way.
- 3.3. For now, we focus on the aggregate trade picture and the EERI suffices. Charts 1 to 6 summarize the situation of HK from 1995:Q1 to 2014:Q3. To be consistent with the interpretation above, we use the *inverse* of the official EERI in the diagrams so that **a rising inverted EERI implies a depreciation of the HKD against foreign currencies.** The trade figures are seasonally adjusted official data.
- 3.4. The major observations are:
- i. In Chart 1, there was a trade deficit from 1995-1998 when the HKD was strengthening. During the decade of HKD depreciation from 2001-2011, the trade balance for goods and service together was in surplus while the balance of merchandise trade was in deficit. In fact, the latter was deteriorating all along from 2001 due mainly to the dwindling domestic exports. So, the relationship between merchandise trade balance and the exchange rate seemingly defies the theory described in the previous section.

Chart 1. HKD Depreciation (Rising Inverted EERI) more or less Improves Overall Trade Balance but Not Merchandise Trade Balance

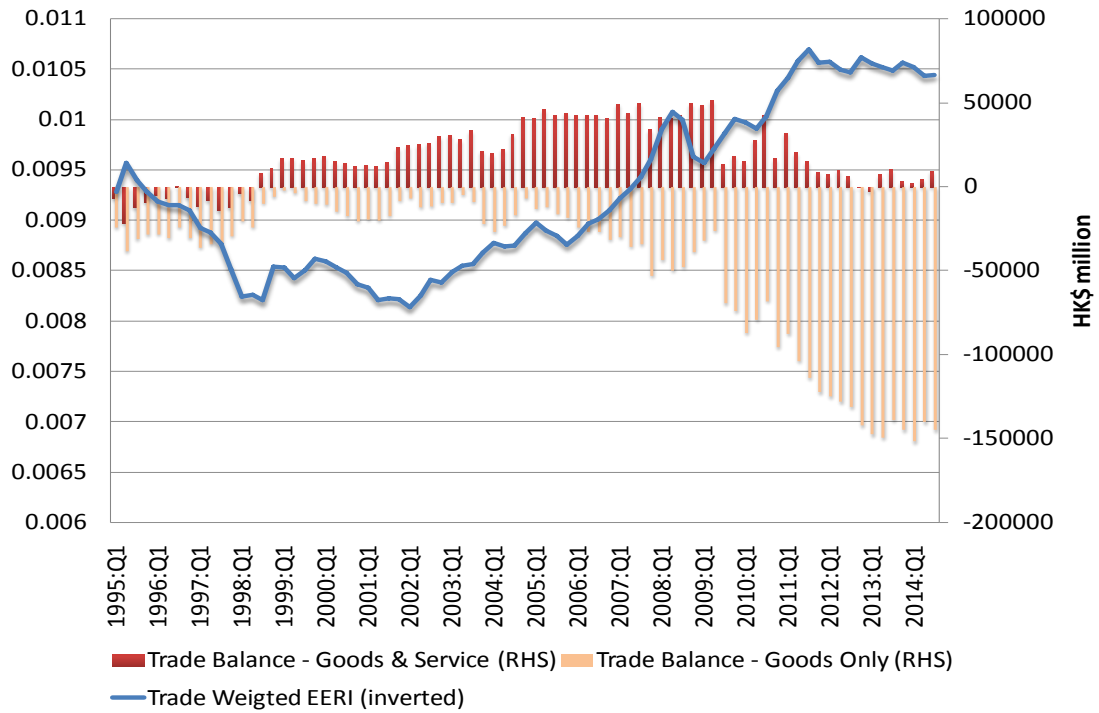


Chart 2. Weakening HKD (Rising Inverted EERI) Boosts Total Exports AND Total Imports

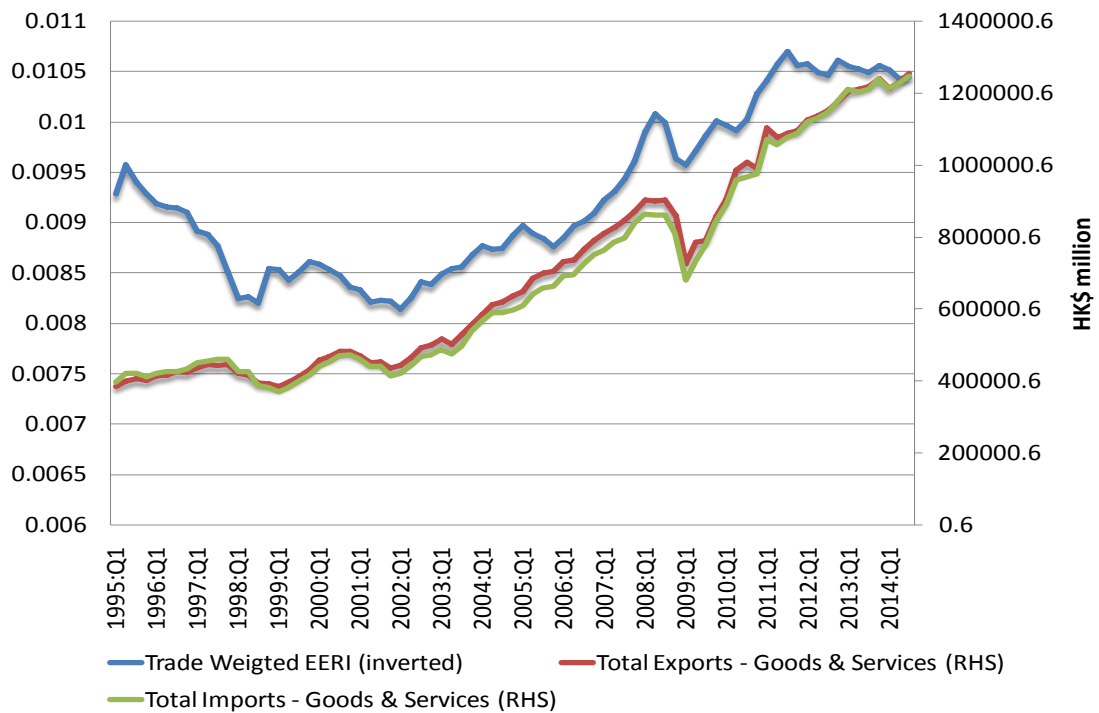


Chart 3. Service Trade Balance and Re-export Trade Balance Provide Major Support

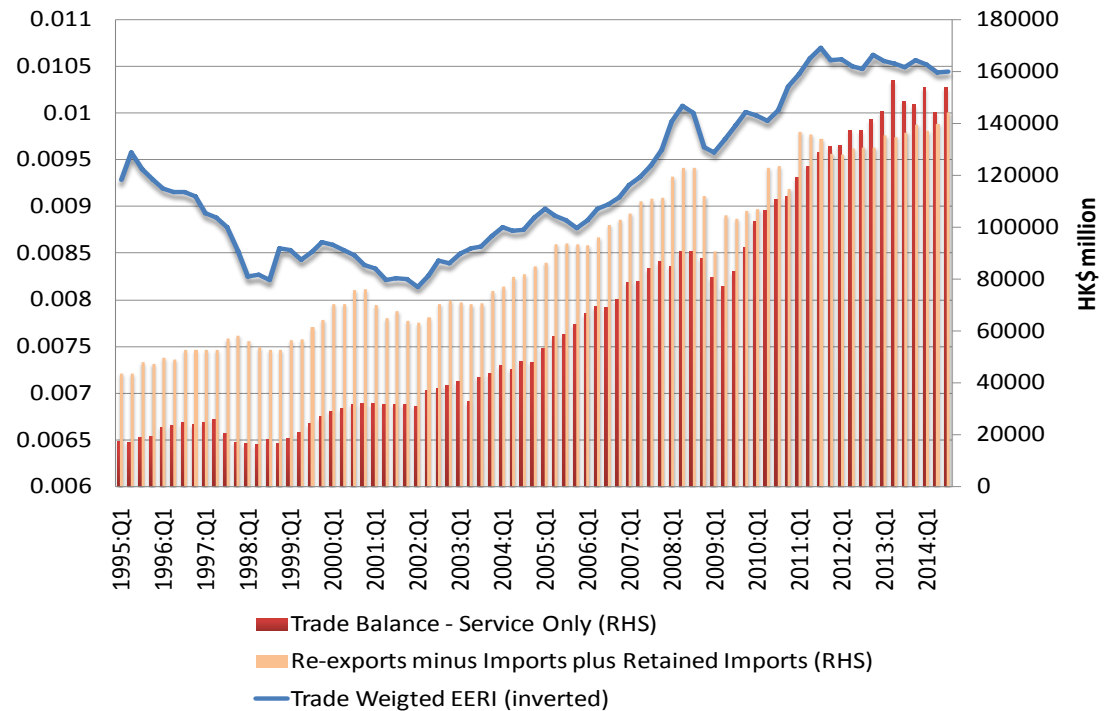


Chart 4. Contributions by Service Types in Improving Service Trade Balance 1995-2013

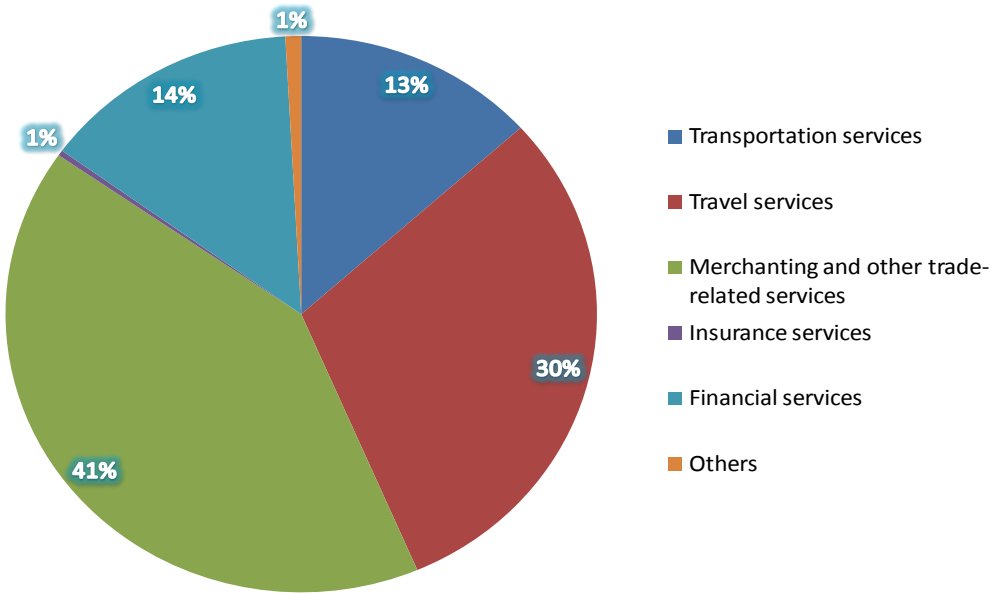


Chart 5. Contributions by Product Types in Improving Re-export Trade Balance 1995-2013

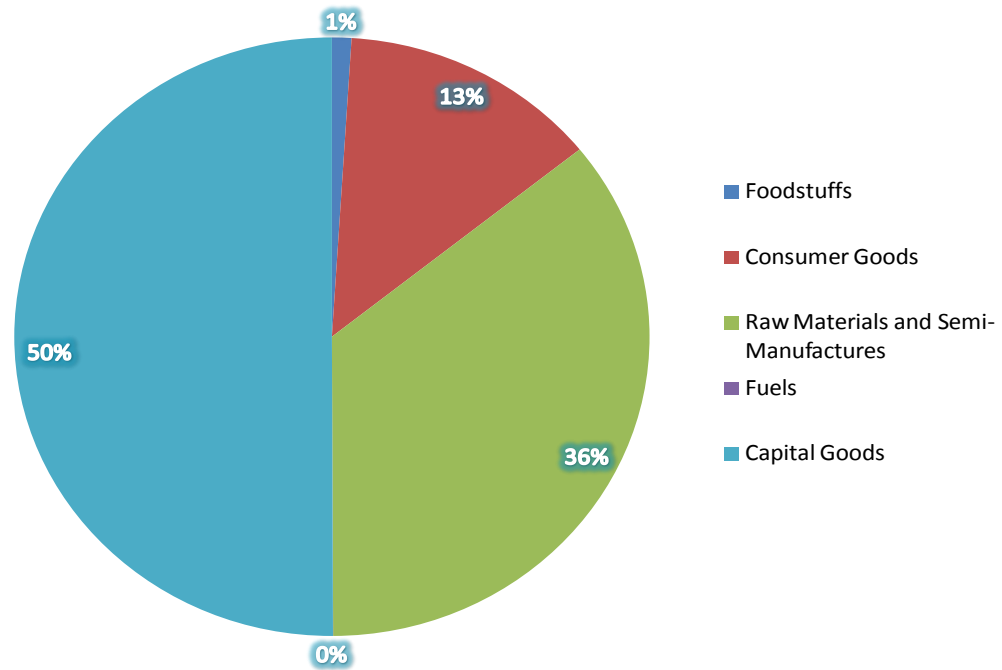
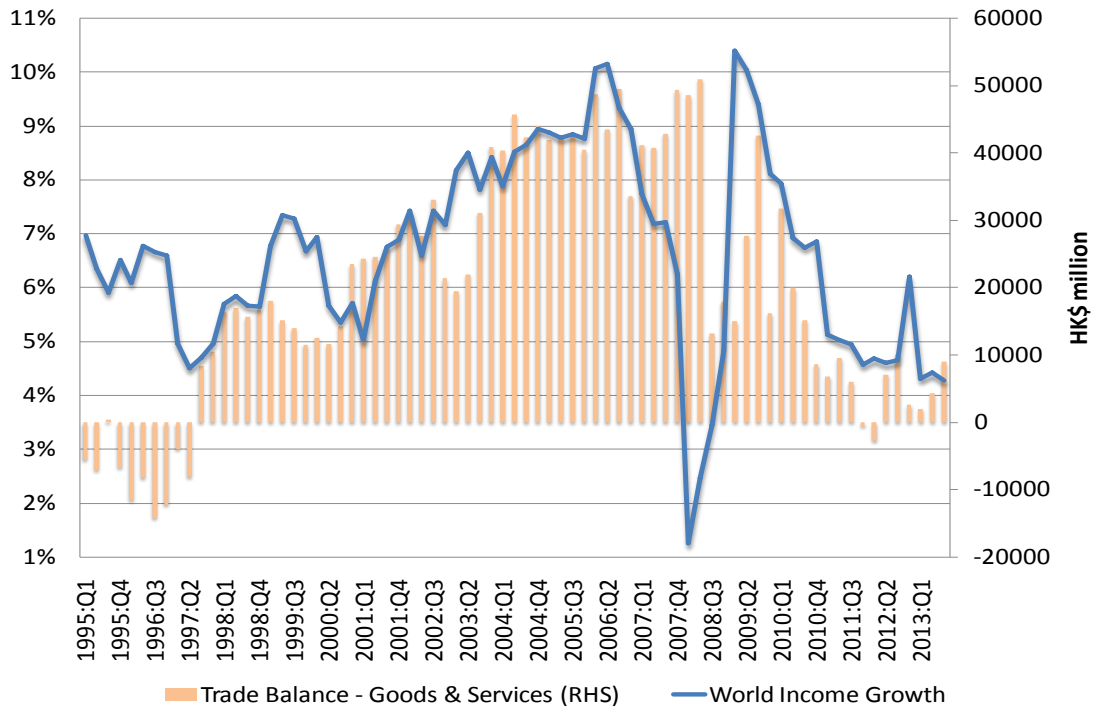


Chart 6. Income Growth of Major Trading Partners Also Helps



- ii. In Chart 2, total exports and total imports are highly synchronized. For the majority of the time, a weaker HKD was associated with higher exports AND imports.
- iii. Chart 3 shows the two areas that have remained strong despite the dismal merchandise trade balance. First, there was a sustained improvement in the service trade balance. Second, there was a general increase in the trade surplus of merchandise re-export as well (re-exports minus those imports that are ultimately re-exported).
- iv. Between 1995 and 2013, the annual service trade balance increased by a total of HKD 524,114 million. Chart 4 shows a breakdown of the contribution by service categories. Merchanting and trade related services accounted for 41% of the surplus increase, followed by the 30% of Travel services.
- v. The annual re-export trade balance increased by a total of HKD 365,586 million during the same period. From Chart 5, we can see that the major contributors are Capital Goods (50%) and Raw Materials & Semi-Manufactures (36%).
- vi. Finally, Chart 6 shows that strong world income growth may play a part in underpinning domestic trade surplus. [*World income is the trade weighted Real GDP of 7 of our major trading partners – China, US, EU, Japan, UK, Taiwan and Singapore. For consistency, we use the weights of the EERI and the 7 economies accounted for over 87% of the currency basket.*]

3.5. The conclusions are:

- a) There is an on-going deterioration in domestic merchandise trade deficit (domestic merchandise exports minus retained imports) which is offset partially by the surplus in re-export trade.
- b) There is a consistent improvement in the service trade surplus which, in general, more than outweighs the overall negative balance in merchandise trade. Both a) and b) look structural.

- c) The world income factor may provide support to our trade balance and mitigate the impact of an appreciating HKD should it occur.
- d) The growing surplus in merchanting and trade related services could imply HK's competitiveness (e.g. strong ties with China, operational efficiency, etc.) in world service trade which dilutes other negative factors.

4. Will a Stronger HKD Hurt Exports?

- 4.1. From the discussion above, as long as there is no sharp decline in world income growth, the service trade balance and the re-export trade balance should not be too adversely affected by the stronger USD. After all, China and US together accounted for close to 60% of HK's total trade and both currencies moved much more gently against the HKD compared to the others in the past few months. The decrease in RER (HKD appreciation) should not be large.
- 4.2. Quantitative assessment of the exchange rate impact on trade usually manipulates either of the following:

$$EX_{home} = f\left(\underbrace{RER}_{+}, \underbrace{Y_{foreign}}_{+}\right), \quad (1)$$

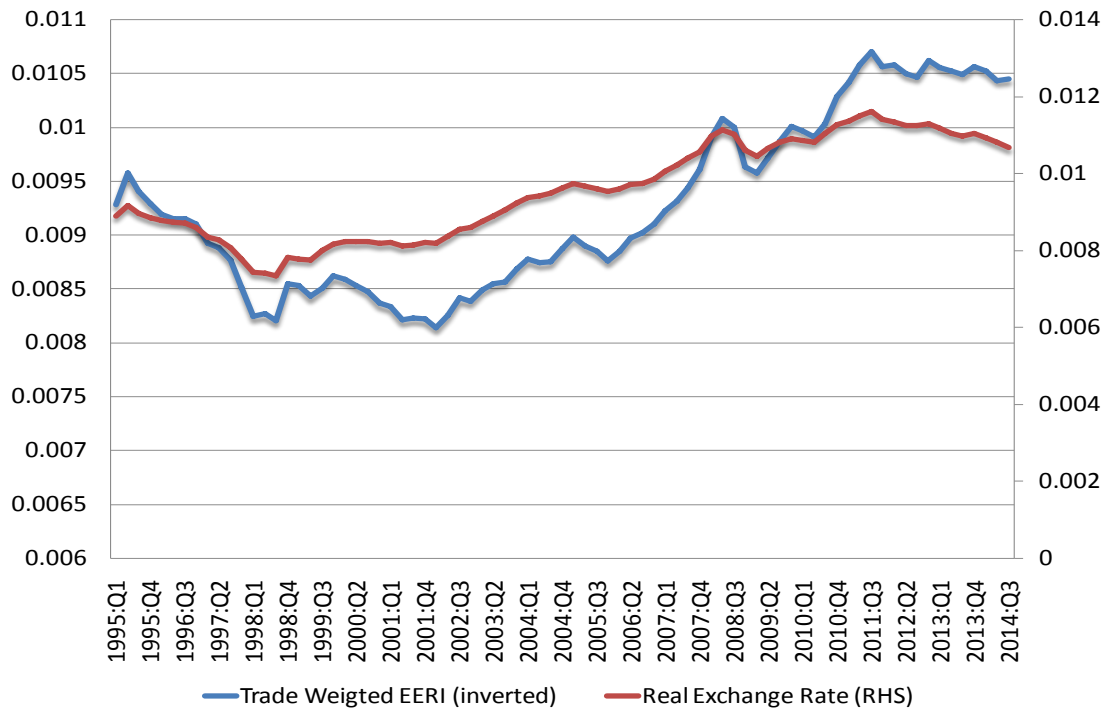
$$TB_{home} = g\left(\underbrace{RER}_{+}, \underbrace{Y_{foreign}}_{+}, \underbrace{Y_{home}}_{-}\right). \quad (2)$$

where EX is export volume, TB is trade balance and Y is income; the subscripts indicate if it is the home or foreign country; and the +/- signs show how they interact with the LHS trade variable. Note that the price element of exports is taken care of by the RER. Specification (1) is probably what we are more concerned about and it is the subject of the following quantitative analysis.

- 4.3. We need a RER to proceed. We use the inverse of the EERI as the nominal exchange rate and apply geometric weights to the relative CPIs of China, US, EU, Japan, UK, Taiwan and Singapore (with respect to

HK CPI). The weights are those used by the C&SD in compiling the EERI. Chart 7 shows the resulting RER as compared to the inverted EERI. To recap, the RER takes into account relative price differential between two economies while the EERI does not.

Chart 7. Trade Weighted RER vs. Official EERI



- 4.4. On estimating equation (1), the orthodox approach is to identify the so-called long run relationship between EX, RER and world income (i.e. how the variables are linked when all the dust settles), and **decompose the change in exports into (a) short run adjustments which may not be fundamentally driven and (b) reversion to the long run relationship**. The intuition is that if the long run relationship is ignored, the trade elasticities could be inaccurate and possibly underestimated. Studies by IMF, OECD and Bank of Canada, etc. have all done studies of the same kind.
- 4.5. The task involves quite a number of tests and estimation steps. These mundane technical works have been performed but the details are skipped for this presentation. The Appendix, however, highlights the major steps for those keen on the technicalities. All variables are log-

transformed so that the coefficients can be interpreted directly as elasticities.

- 4.6. As it turns out, the long run relationship¹ takes the following form:

$$EX_{HK} = 11.72 + 0.58 RER + 0.68 Y_{foreign}$$

The export elasticity is 0.58, so for a **1% decrease in RER (1% appreciation of the HKD)**, there will be a **0.58% decrease in total export volume in the long run**, other things held constant. Likewise, if the world economy grows faster by 1% it will trigger a 0.68% increase in our export *volume*.

- 4.7. **On top of these findings, a 1% appreciation of the HKD will induce a short run adjustment in export volumes of -0.5% after the first quarter and -0.28% after the second quarter.** Besides, any deviations away from the long run relationship will be corrected for gradually (reverting back to the long run steady state).
- 4.8. To put all these into perspective, an appreciation of the HKD will prompt short run *decreases* in export volume although there could be some fluctuations in the process. All in all, the long run *negative* impact of an appreciation is expected to prevail after the short run follow-throughs and error-corrections have completed and settled down.

¹ It is significant based on one of the test but fails marginally on another. The result will be very close to that obtained from a simple regression model of the variables.

Appendix

A1. The currency weights for compiling world income and the RER are: China (52.45%), US (8.68%), EU (7.49%), Japan (7.22%), Taiwan (4.86%), Singapore (4.67%) and UK (1.82%).

A2. The estimation of the export trade equation contains the following steps:

- Perform individual unit root tests for EX, RER and $Y_{foreign}$.
- Specify an autoregressive distributed lag model (ARDL) regressing changes in exports to lagged export changes, lagged RER changes, lagged world income changes and the lag 1 levels of these variables.
- Select model dimension based on information criterion.
- Perform a bound test based on the F-statistics on the level variables; or a unit root test of residuals from a simple long run level regression. Check if a cointegration relationship exists.
- If affirmative, re-run the ARDL and impose the error correction term to obtain the short run adjustment coefficients.

Reference

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