

## **Impact of exchange rate movements of the Hong Kong dollar on consumer price inflation in Hong Kong**

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### **Abstract**

As Hong Kong relies predominantly on imports from outside sources for its supply of foodstuffs and consumer goods, local consumer price inflation is often influenced by external factors such as global economic and inflation conditions, as well as exchange rate movements. As such, there are concerns that the recent depreciation of the Hong Kong dollar alongside the US dollar against other major currencies may push up import prices, and hence, fuel price pressures in Hong Kong. This note analyses the extent to which Hong Kong's inflation is influenced by exchange rate movements (as measured by the import-weighted Effective Exchange Rate Index (EERI)). It is crudely estimated that a 1% year-on-year decrease in the import-weighted EERI would lead to a cumulative increase of around 0.1 percentage point in underlying inflation over one year.

### **港元匯率變動對香港消費物價通脹的影響**

#### **摘要**

香港的食品和消費品供應主要是從其他地方進口，因此，本地消費物價通脹通常會受外圍因素影響，包括環球經濟和通脹狀況以及匯率變動等。因此，最近港元跟隨美元兌其他主要貨幣貶值，有意見指進口價格或會被推高，從而增加香港的通脹壓力。本文分析香港的通脹有多大程度上受匯率變動(以進口貨值加權港匯指數量度)影響。粗略估計，進口貨值加權港匯指數按年下跌 1%，將導致基本通脹率在一年內累計上升約 0.1 個百分點。

The views and analysis expressed in this article are those of the authors and do not necessarily represent the views of the Office of the Government Economist.

## I. INTRODUCTION

1. As Hong Kong is a small and open economy with few natural resources, a large share of foodstuffs and consumer goods consumed locally are imported. Hence, Hong Kong's consumer price inflation is not only affected by domestic cost pressures but also swayed by such external factors as global economic and inflation conditions, as well as exchange rate movements. As the Hong Kong dollar has recently depreciated alongside the US dollar against other major currencies, there are concerns about added consumer price pressures in Hong Kong via the import channel. This note aims to analyse the extent to which Hong Kong's inflation is affected by exchange rate fluctuations. In this study, the exchange rate of the Hong Kong dollar is proxied by the import-weighted Effective Exchange Rate Index (EERI) compiled by the Census and Statistics Department (C&SD). Consumer price inflation is the year-on-year rate of change in the underlying Composite Consumer Price Index which nets out the effects of the Government's one-off measures.

2. The structure of this note is as follows. **Part II** describes past movements of the exchange rate and consumer price inflation in Hong Kong. **Part III** examines the import content of local consumption in Hong Kong. **Part IV** analyses the impact of exchange rate fluctuations on consumer price inflation with an econometric model. **Part V** discusses other possible channels through which the exchange rate movements may affect inflation. **Part VI** concludes.

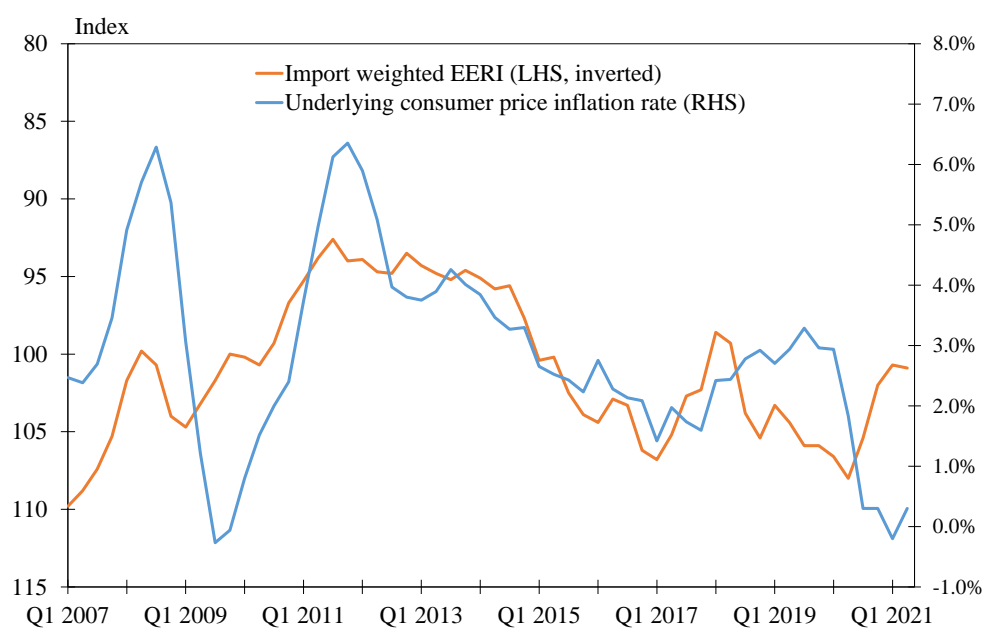
## II. PAST MOVEMENTS OF THE EXCHANGE RATE AND CONSUMER PRICE INFLATION IN HONG KONG

3. The past movements of the import-weighted EERI (on an inverted scale) and consumer price inflation are depicted in *Chart 1*.<sup>1</sup> From 2007 to 2011, the import-weighted EERI was on a general downtrend and fell by about 13% during the period, despite a short rebound at the peak of the 2008-09 Global Financial Crisis amid the safe-haven demand for the US dollar. Over the same period, consumer price inflation rose from 2.5% in the first quarter of 2007 to 6.3% in the third quarter of 2008 amid buoyant economic conditions, before easing sharply through end-2009 due to the global economic recession. Inflation resumed an uptrend afterwards and rose to 6.4% in the fourth quarter of 2011, along with the global and local economic recovery and the concurrent rebound in world commodity and energy prices. In essence, global and domestic economic conditions appeared to be the dominant forces in shaping local inflation during this period.

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<sup>1</sup> The year-on-year rate of change in the underlying Composite Consumer Price Index is only available starting from 2007.

**Chart 1: Import-weighted EERI and consumer price inflation in Hong Kong**



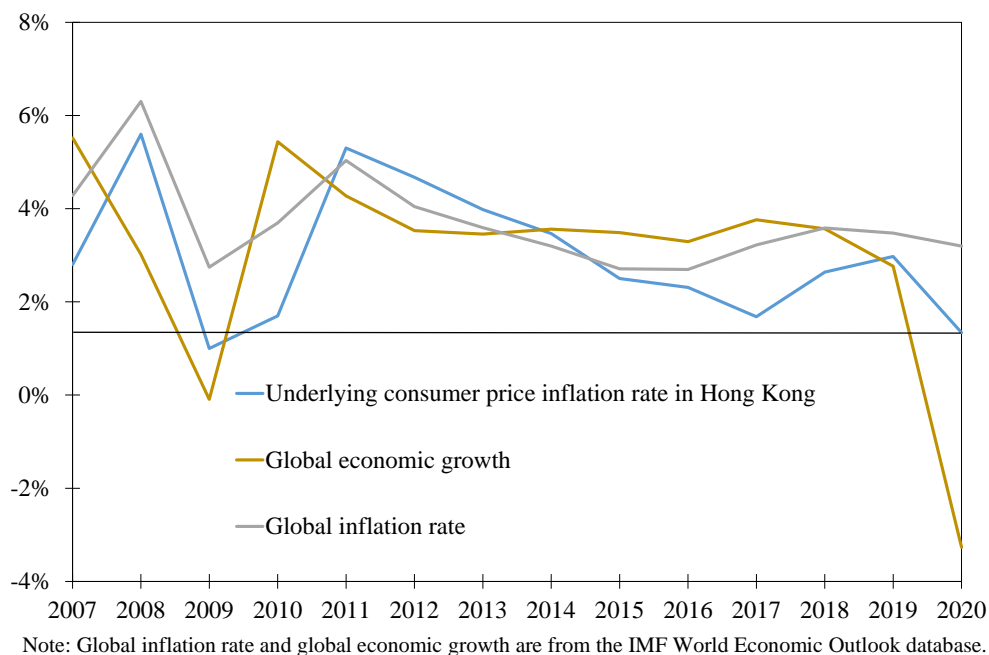
4. Between 2012 and 2016, the import-weighted EERI reverted to a general uptrend and rose by around 11%. Meanwhile, consumer price inflation moderated successively from 6.4% in the fourth quarter of 2011 to 2.1% in the fourth quarter of 2016. While the appreciation of the Hong Kong dollar against major currencies may be a contributing factor to the easing of price pressures over the period, the decline in inflation rates in many of Hong Kong’s major import sources and the moderation in local cost pressures should also be relevant.

5. From 2017 to early 2020, consumer price inflation was on a general uptrend, reflecting the build-up of price pressures amid solid local economic conditions in 2017 and 2018, and afterwards surging pork prices caused by supply disruptions since May 2019. Meanwhile, the import-weighted EERI fell visibly in 2017 but bounced back subsequently until early 2020. Hence, while the depreciation of the Hong Kong dollar might have added to local consumer price pressures in 2017, exchange rate movements did not appear to have a strong bearing on local inflation between 2018 and early 2020.

6. More recently, the outbreak of the COVID-19 pandemic since early 2020 dealt a severe blow to the global and the Hong Kong economy. With the US Federal Reserve conducting large-scale monetary easing to counter the economic impact, the US dollar witnessed a sharp depreciation against major currencies since early 2020, leading to a 7% fall in the import-weighted EERI of the Hong Kong dollar between the second quarter of 2020 and the second quarter of 2021. This notwithstanding, consumer price inflation in Hong Kong receded visibly over the same period, reflecting the softening external and local price pressures amid austere economic conditions.

7. In sum, the diverse movements of the exchange rate of the Hong Kong dollar and consumer price inflation on many occasions in the past decade or so suggest that inflation in Hong Kong is influenced by a multitude of external factors (such as global economic and inflation conditions, as shown in *Chart 2*) and domestic factors, and exchange rate fluctuation is only one of these drivers. For instance, inflationary pressures in Hong Kong remained largely contained in early 2021 amid the threat of the COVID-19 pandemic, despite the depreciation of the Hong Kong dollar against major currencies in recent quarters.

**Chart 2: Hong Kong's inflation is influenced by various external factors**



### III. IMPORT CONTENT OF LOCAL CONSUMPTION IN HONG KONG

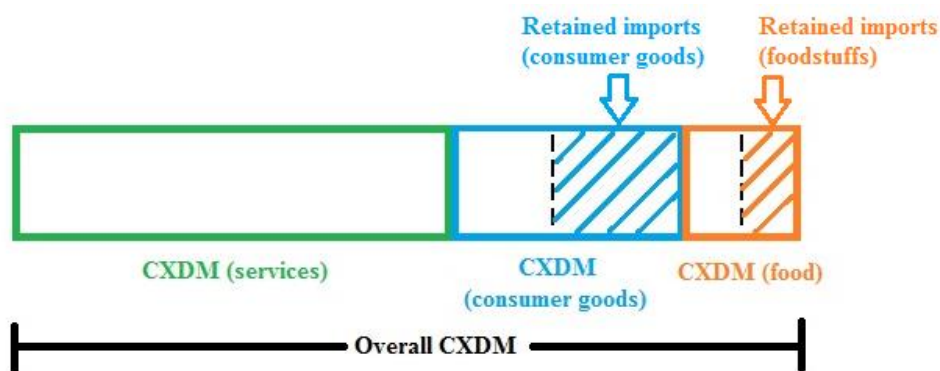
8. To gauge the extent to which consumer price inflation is directly influenced by exchange rate movements via the import channel, it is essential to analyse the share of imports retained for domestic use in the overall consumption basket. According to C&SD's trade statistics, retained imports of goods can be classified into five categories by end-use, namely foodstuffs, consumer goods, raw materials and semi-manufactures, fuels and capital goods. We will focus on the first two categories (i.e. foodstuffs<sup>2</sup> and consumer goods<sup>3</sup>) as they are more directly related to final consumption demand in Hong Kong.

<sup>2</sup> The Mainland was Hong Kong's largest source of retained imports of foodstuffs, contributing around 30% of the total in 2020, higher than other major sources such as the US, Japan and Thailand.

<sup>3</sup> The sources of retained imports of consumer goods were diversified. The Mainland, Japan, Korea, the US, France, Italy and Switzerland were Hong Kong's major import sources in 2020.

9. Between 2007 and 2020, retained imports of foodstuffs and consumer goods on average constituted significant shares of the corresponding categories of consumption expenditure in the domestic market (CXDM), with the former accounting for about 57% of consumption spending in food (CXDM in food) and the latter taking up around 50% of consumption spending in consumer goods (CXDM in consumer goods)<sup>4</sup>. Yet, while retained imports of foodstuffs and consumer goods are essential to satisfy domestic demand for food and consumer goods, our consumption basket also includes spending in services. Indeed, CXDM in food and CXDM in consumer goods only accounted for around 13% and 30% of CXDM respectively on average during 2007-2020, with the remaining 57% contributed by CXDM in services. This implies that retained imports of foodstuffs and consumer goods accounted for about 7% ( $= 57\% \times 13\%$ ) and 15% ( $= 50\% \times 30\%$ ) of CXDM respectively on average over this period (as represented by the shaded area in *Figure 1*).

**Figure 1: Contribution of retained imports in consumer goods and foodstuffs to overall CXDM in Hong Kong from 2007 to 2020**



10. Taken together, retained imports of foodstuffs and consumer goods accounted for about 22% of CXDM on average during 2007-2020. Hence, assuming there is a complete exchange rate pass-through to consumer prices, a 1% decline in the import-weighted EERI may imply an about 0.2% increase in consumer prices in Hong Kong through the trade channel. Yet, such a crude estimate is subject to limitations. In particular, the exchange rate pass-through, which should hinge on a host of factors such as economic conditions and price competitiveness of imports, may not be complete and could vary from time to time in reality. As such, the actual impact on inflation might be smaller than the above estimate.

<sup>4</sup> The average share of retained imports of foodstuffs in CXDM in food between 2007 and 2020 (about 57%) is computed by averaging the ratios of the annual value of retained imports of foodstuffs to that of CXDM in food for all the individual years during the period. The average share of retained imports of consumer goods in CXDM in consumer goods in the same period (about 50%) is also derived in a similar way. Retained imports aside, consumption expenditure in the domestic market also covers other components such as the mark-up of retailers and wholesalers, local transportation and storage costs, and sales of locally-produced food and consumer goods.

#### IV. ANALYSIS OF THE IMPACT OF EXCHANGE RATE MOVEMENTS ON INFLATION IN HONG KONG

11. To give a better account of the impact of exchange rate movements on Hong Kong's inflation, an econometric analysis has been conducted. Past studies in the literature such as Liu and Tsang (2008)<sup>5</sup> and Chung, Kohler and Lewis (2011)<sup>6</sup> adopted a two-stage approach to estimate the impact of exchange rate movements on domestic inflation. Accordingly, we have formulated a two-stage regression model, with the first stage focusing on the effect of exchange rate movements on import prices and the second stage on the effect of import prices movements on consumer price inflation. Quarterly data from the first quarter of 2007 to the fourth quarter of 2020 are used for this analysis.

12. In the first stage, it is assumed that import prices of foodstuffs and consumer goods are a function of the sum of contemporaneous and three lags of import-weighted EERI and export prices in Hong Kong's major import sources<sup>7</sup> as it takes time<sup>8</sup> for changes in exchange rates and export prices to feed through to import prices. The exchange rate pass-through equation is expressed as follows:

$$MUVI_t = \beta_0 + \beta_{1k} \sum_{k=0}^3 EERI_{t-k} + \beta_{2k} \sum_{k=0}^3 EXP_{t-k} + \varepsilon_t \quad (1)$$

where:

*MUVI* is the year-on-year rate of change in the import unit value index of foodstuffs and consumer goods<sup>9</sup>;

*EERI* is the year-on-year rate of change in the import-weighted EERI;

*EXP* is the year-on-year rate of change in export prices of Hong Kong's major import sources of foodstuffs and consumer goods; and

$\varepsilon$  is the error term.

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<sup>5</sup> Liu, Li-gang and Andrew Tsang (2008). "Exchange rate pass-through to domestic inflation in Hong Kong?" Hong Kong Monetary Authority Working Paper 02/2008.

<sup>6</sup> Chung, Elaine, Marion Kohler and Christine Lewis (2011). "The exchange rate and consumer prices." Reserve Bank of Australia *Bulletin*, September, 9-16.

<sup>7</sup> Hong Kong's major import sources of foodstuffs and consumer goods include the euro area, the Mainland, the US, Japan, Switzerland, Korea, Brazil, Thailand, the UK, Australia and Taiwan. Their weightings are based on their respective shares in retained imports of foodstuffs and consumer goods. For economies without export price data, their producer price data are used as proxies.

<sup>8</sup> Past studies usually used 3 or 4 lags (quarters) in the estimation of the exchange rate pass-through.

<sup>9</sup> The respective weightings of foodstuffs and consumer goods in the import unit value index of foodstuffs and consumer goods are based on the shares of retained imports of foodstuffs and consumer goods.

13. In the second stage, the impact of the change in import prices of foodstuffs and consumer goods on domestic underlying consumer price inflation (excluding the housing component)<sup>10</sup> is estimated. Using wages and retail shop rentals as a measure of domestic cost pressures, the equation of underlying inflation can be written as follows:

$$UCCPI_t = \alpha_0 + \alpha_1 MUVI_t + \alpha_2 WAGE_t + \alpha_3 Rentals_t + \epsilon_t \quad (2)$$

where:

*UCCPI* is the year-on-year rate of change in underlying consumer prices (excluding the housing component);

*MUVI* is the year-on-year rate of change in the import unit value index of foodstuffs and consumer goods from equation (1);

*WAGE* is the year-on-year rate of change in the 8-quarter moving average of the real wage index<sup>11</sup>;

*Rentals* is the year-on-year rate of change in the 8-quarter moving average of retail shop rentals<sup>12</sup>; and

$\epsilon$  is the error term.

14. The estimation results of equations (1) and (2) are summarised in **Table 1** and **Table 2**. It is found that the pass-through elasticity over one year (i.e.  $\sum_{k=0}^3 \beta_{1k}$ ) is around  $-0.46$  in equation (1). This implies that a 1% year-on-year fall in the import-weighted EERI would lead to a cumulative increase of 0.46 percentage point in import prices of foodstuffs and consumer goods over one year. From equation (2), the coefficient of import prices of foodstuff and consumer goods (i.e.  $\alpha_1$ ) is estimated at 0.29. This suggests that a 1% year-on-year increase in the import prices of foodstuffs and consumer goods would lead to an increase of 0.29 percentage point in overall underlying inflation (excluding the housing component). Taken together, it is crudely estimated that a 1% year-on-year fall in the import-weighted EERI would lead to a cumulative increase of about 0.1 percentage point ( $= 0.46 \times 0.29 \times 60\%$ <sup>13</sup>) in overall underlying inflation in Hong Kong over one year. This result is largely consistent with the discussion in paragraph 10.

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<sup>10</sup> For a more accurate estimation in the second equation, the housing component (consisting mostly of private housing rent and public housing rent) of the CPI basket is excluded as it should not be directly affected by the exchange rate movements through the import channel.

<sup>11</sup> The real wage index is for employees up to supervisory level (excluding managerial and professional employees), for all industries covered by C&SD's Labour Earnings Survey.

<sup>12</sup> Retail shop rentals are measured according to the private retail rental index compiled by the Rating and Valuation Department.

<sup>13</sup> In the 2019/20-based series, CPI components other than housing account for around 60% of the overall Composite CPI basket.

**Table 1: Estimation results of equation 1**

**Dependent variable:** Year-on-year rate of change in the import unit value index of foodstuffs and consumer goods

Constant	0.02*** (5.29)
<b>Independent variables</b>	
Exchange rate pass-through elasticity over one year ( $\sum_{k=0}^3 \beta_{1k}$ )	-0.46*** (-4.10)
Export price pass-through elasticity over one year ( $\sum_{k=0}^3 \beta_{2k}$ )	0.49*** (2.79)
Adjusted R <sup>2</sup>	0.68
Sample period	2007Q4–2020Q4

**Table 2: Estimation results of equation 2**

**Dependent variable:** Year-on-year rate of change in underlying consumer prices (excluding the housing component)

Constant	0.01*** (4.99)
<b>Independent variables</b>	
Import unit value index of foodstuffs and consumer goods ( $\alpha_1$ )	0.29*** (6.24)
8-quarter moving average of real wage index ( $\alpha_2$ )	0.20* (1.69)
8-quarter moving average of retail shop rentals ( $\alpha_3$ )	0.12*** (3.69)
Adjusted R <sup>2</sup>	0.62
Sample period	2007Q1–2020Q4

Notes: T-statistics are in parentheses.

\*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels respectively.



## V. OTHER CHANNELS

15. The quantitative analysis above offers crude estimates of the impact of exchange rate movements on consumer price inflation in Hong Kong through the import channel. Yet in reality, such effects could also be manifested via other indirect channels (Hahn and O'Brien (2018)<sup>14</sup> and Fan (2010)<sup>15</sup>). For instance, a depreciation of the Hong Kong dollar may increase the value of foreign investment by local residents in terms of the Hong Kong dollar or induce more visitors to Hong Kong (Siu (2021)<sup>16</sup>), both of which could boost the overall consumption demand in the domestic market and add to local price pressures in Hong Kong. Yet, the latter channel may be less relevant in recent quarters as inbound tourism has come to a standstill since early 2020 amid the strict travel restrictions worldwide due to the COVID-19 pandemic.

## VI. CONCLUDING REMARKS

16. On the whole, a depreciation of the Hong Kong dollar could theoretically push up consumer price inflation in Hong Kong via the trade channel. This note, based on data from first quarter of 2007 to the fourth quarter of 2020, uses a two-stage regression approach to estimate the impact of exchange rate movement on local inflation. It is crudely estimated that a 1% year-on-year fall in the import-weighted EERI would lead to a cumulative increase of around 0.1 percentage point<sup>17</sup> in underlying inflation over one year. Nonetheless, it should be noted that the actual pass-through from exchange rates to local consumer prices may also depend on the prevailing economic conditions and price competitiveness of imports. For instance, it may be more difficult for traders to pass cost increases (whether due to exchange rates or not) to consumers if economic conditions are austere or their products are in a highly competitive market.

17. While exchange rates could be a factor at play, consumer price inflation in Hong Kong would also hinge on other external factors such as global economic conditions and international commodity prices, as well as domestic factors such as labour cost and shop rentals. In the near term, despite the recent decline in the import-weighted EERI, Hong Kong's consumer price inflation should stay largely contained as global and local economic activities would take time to return to their pre-pandemic levels.

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<sup>14</sup> Hahn, Elke and Derry O'Brien (2018). "Monitoring the exchange rate pass-through to inflation." European Central Bank *Economic Bulletin*, Issue 4, 46-50.

<sup>15</sup> Fan, Kelvin. (2010). "Implications of a RMB appreciation for inflation in Hong Kong." Hong Kong Monetary Authority *Quarterly Bulletin*, June, 1-7.

<sup>16</sup> Siu, Pascal (2021). "The effects of real exchange rates and income on inbound tourism demand for Hong Kong from selected Asian economies." Office of the Government Economist Economic Letter 2021/01.

<sup>17</sup> The result is largely consistent with the findings by Liu and Tsang (2008) from the Hong Kong Monetary Authority. Using data from 1992 to 2007, they found that the exchange rate pass-through to domestic prices was 0.13 over a one-year period.