



***REVISITING THE DEMAND FOR HONG KONG DOLLAR CURRENCY:
NEW DEVELOPMENTS AFTER THE GLOBAL FINANCIAL CRISIS***

Key points:

- *After the global financial crisis, Hong Kong dollar currency held by the public recorded double-digit annual growth rates during 2009–2013, before slowing to mid-single-digit rate in 2014 and 2015. This broadly led to a brisk rise in the currency-to-GDP ratio of Hong Kong. In light of the increased domestic use of non-cash payment means, developments in Hong Kong dollar currency remained unlikely to be explained by domestic factors alone, and external factor should continue to play an important role.*
- *Fresh data collected from major wholesale banknote dealers confirmed that this was the case. The data reveal that there were continued net cash outflows from Hong Kong in 2009–2015, pointing to persistent external demand for Hong Kong dollar currency. The size of these cross-border cash movements also indicates that external demand increased alongside the up-cycle in inbound tourism from Mainland China and thriving gaming industry in Macao during 2010–2013, but began to lose momentum thereafter as the cycle turned and gaming activities in Macao began to slow.*

- *Broadly consistent with the currency shipment data, simulation results from the cash demand model indicate that the change in Hong Kong dollar currency over the past few years was mainly driven by ups and downs in the external demand associated with the spending by inbound Mainland tourists. The importance of local transaction demand ranks second, and the impact from low interest rates and the change in the renminbi exchange rate were relatively mild. Correspondingly, the share of external demand is estimated to have risen further after the global financial crisis, before declining slightly to 68% in 2015.*

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The views and analysis expressed in this paper are those of the authors, and do not necessarily represent the views of the Hong Kong Monetary Authority.

* The authors would like to thank Lillian Cheung and Frank Leung for their valuable comments. Emily Chan provided excellent research assistance.

I. INTRODUCTION

A study¹ by the HKMA in 2010 found that Hong Kong dollar currency held by the public grew notably faster than nominal GDP after 1997. Given the increasing use of non-cash payment means in Hong Kong, domestic factors alone could not account for the enormous expansion in the currency and external demand was assessed to be the major driving force. Different econometric estimates based on macro-level data suggested that about 50–70% of the outstanding Hong Kong dollar currency at the end of 2009 can be attributable to external demand. Simulation results from a cash demand model also confirmed that the trend growth in Hong Kong dollar currency was mainly driven by the external circulation associated with the thriving cross-border tourist spending between Mainland China and Hong Kong. These findings were consistent with increased net shipments of banknotes from Hong Kong to Mainland China and Macao by major wholesale banknote dealers.

Six years on, some new developments affecting Hong Kong dollar currency demand have emerged. For example, cross-border spending by Mainland tourists in Hong Kong continued to grow at a robust pace during 2009–2014, before moderating in 2015 along with the decline in inbound arrivals. After several years of sharp growth, the gaming industry in Macao has also faced stiff headwinds since the second half of 2014 partly due to Mainland China government’s anti-graft and austerity campaign. Meanwhile, anecdotal evidence suggests that Hong Kong tourists no longer use Hong Kong dollar cash when they travel to Mainland China. On the domestic front, there are incidents suggesting that some retail shops and restaurants are refraining from taking large-value banknotes in view of the risks of receiving counterfeit notes. All these developments may have affected the demand for Hong Kong dollar cash in recent years.

Against this backdrop, this paper discusses the new developments in Hong Kong dollar currency subsequent to the global financial crisis, and updates our estimates of external demand. The paper is organised as follows. Section II reviews the recent developments in Hong Kong dollar currency. Section III examines the cross-border currency shipment data collected from major wholesale banknote dealers.

¹ See Leung, Frank, Philip Ng and Simon Chan (2010), “Analysing External Demand for the Hong Kong-dollar Currency”, Working Paper 07/2010, Hong Kong Monetary Authority, 14 September 2010.

Section IV reviews the potential factors driving the currency demand in recent years. Section V updates our estimates of the share of external demand for Hong Kong dollar currency. The final section draws conclusions.

II. RECENT DEVELOPMENTS IN HONG KONG DOLLAR CURRENCY

After the global financial crisis, the Hong Kong dollar currency held by the public recorded double-digit annual growth rates for five straight years during 2009 – 2013, but its increases slowed to a mid-single-digit rate in 2014 and 2015 (Table 1). Averaging 7.0% during 1997 – 2008, annual growth in the currency further accelerated to an average rate of 13.0% in 2009 – 2013 before slowing to 5.5% on average in 2014 and 2015. In terms of levels, the stock of Hong Kong dollar currency held by the public at the end of 2015 totalled around \$350 billion or \$48,000 per person in Hong Kong, roughly doubled from the figures in 2008.

Table 1: Hong Kong dollar currency

		Currency held by the public		
		Value	Per capita holding	Annual growth rate*
		(period-end)	(period-end)	(period-average)
		HK\$ bn	HK\$	%
1962-1974	(a)	3.2	718	10.8
1975-1983	(b)	12.7	2,348	16.6
1984-1996	(c)	76.5	11,832	15.1
1997-2008		170.5	24,481	7.0
2009-2013		313.9	43,463	13.0
2014		330.1	45,426	5.2
2015		349.3	47,696	5.8

Notes: * Annual growth rates are adjusted for the Year 2000 effect.

(a) Fixed exchange rate regime.

(b) Flexible exchange rate regime.

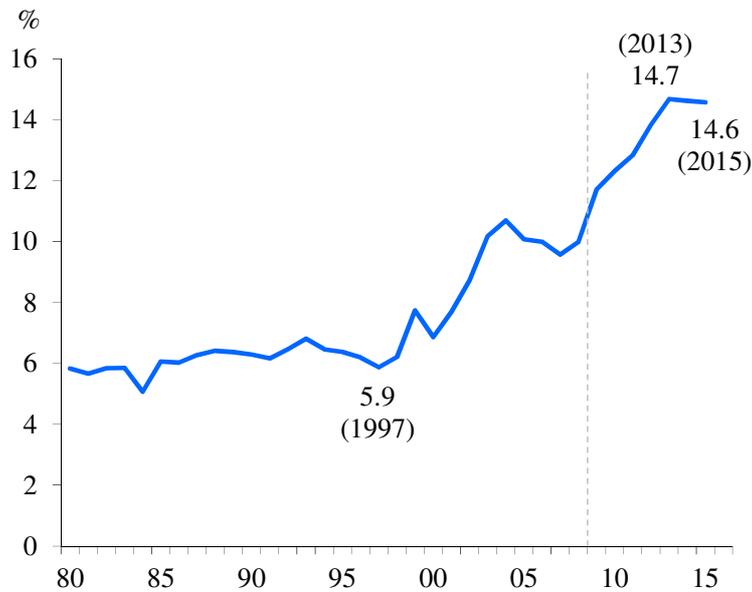
(c) Since October 1983, the Linked Exchange Rate system.

Sources: C&SD and HKMA.

Consistent with the growth pattern of the cash, **the currency-to-GDP ratio also increased further during 2009 – 2013 but has stabilised recently alongside slower currency growth (Chart 1).** Except for the moderation in 2005 – 2007 and the recent stabilisation in 2014 and 2015, the ratio has generally been on the

upward trend since 1997, when the time paths of the currency and GDP diverged noticeably. Since 2009, the ratio increased by another 5 percentage points to a peak of 14.7% in 2013 before plateauing out in 2014 and 2015.

Chart 1: Currency-to-GDP ratio



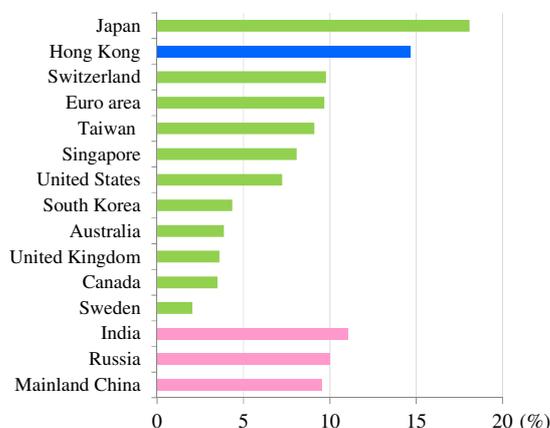
Sources: C&SD and HKMA.

To put the above figures in perspective, **international comparison shows that Hong Kong ranks very high in terms of the currency-to-GDP ratio and the per capita holding of cash among selected advanced economies and some major emerging market economies** (Charts 2a and 2b). In terms of the currency-to-GDP ratio in 2014, Hong Kong (14.6%) was only second to Japan (18.1%) in our sample, followed by Switzerland (9.8%). In terms of per capita holding of cash, Hong Kong's level (almost US\$5,900 per person) was also comparable with that in Japan and only lagged behind Switzerland (US\$7,700 per person).² Compared with the US, the UK and the euro area, which have sizable external circulation of cash, Hong Kong also stands out in terms of these measures of currency. Meanwhile, the tech-forward Sweden is at the other end of the spectrum, being one of the few places which are moving towards a cashless society.³

² Anecdotal evidence suggests that both Japanese and Swiss continue to prefer cash in their daily transactions despite the increased availability of alternative payment methods. In particular, Japanese reportedly have large cash savings at home because of persistently low interest rates and crime rates.

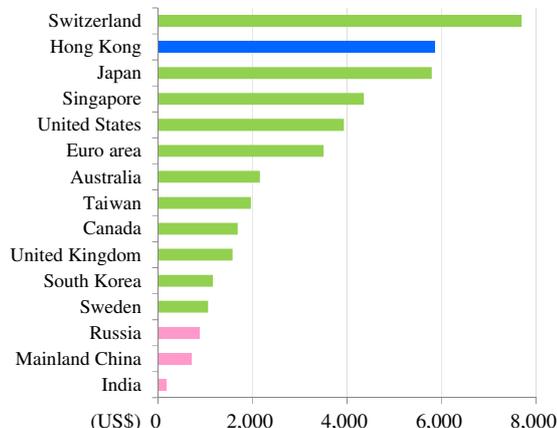
³ See The New York Times report entitled "In Sweden, a Cash-Free Future Nears" by Liz Alderman on 26 December 2015.

Chart 2a: Selected economies' currency-to-GDP ratios in 2014



Sources: BIS Red Book and CEIC.

Chart 2b: Selected economies' per capita holdings of cash in 2014



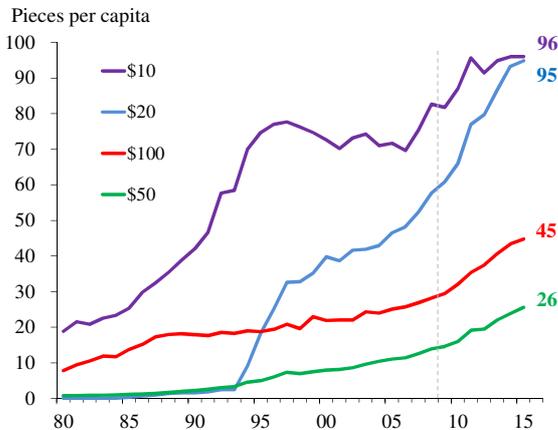
Sources: BIS Red Book and CEIC.

A breakdown by denominations of Hong Kong dollar banknotes⁴ reveals that the number of small-value notes (\$100, \$50, \$20 and \$10) continued to climb in recent years, while the number of \$500 notes increased markedly following the reduced use of \$1,000 notes after 2013 (Charts 3a and 3b). After increasing at a brisk pace during 2009–2013, the number of \$1,000 notes decreased from a high of 26 pieces per capita in 2013 to 23 pieces per capita in 2014 and 2015. By contrast, the number of \$500 notes increased considerably from 24 pieces per capita in 2013 to 32 and 36 pieces per capita in 2014 and 2015 respectively. The decreased use of \$1,000 banknotes reflected the public concerns about counterfeit banknotes,⁵ which led to the refusal to take \$1,000 bills by some retailers and restaurants. Having said that, the total demand for large-value notes (\$1,000 and \$500 combined) remained on the rise, with its volume share increasing from 14% to 18% during 2009–2015 and its value share from 80% to 83% in the same period.

⁴ In this paper, currency data by denominations include notes held by banks. Note that these currency holdings by banks are not a component of Hong Kong dollar money supply which includes currency held by the public only.

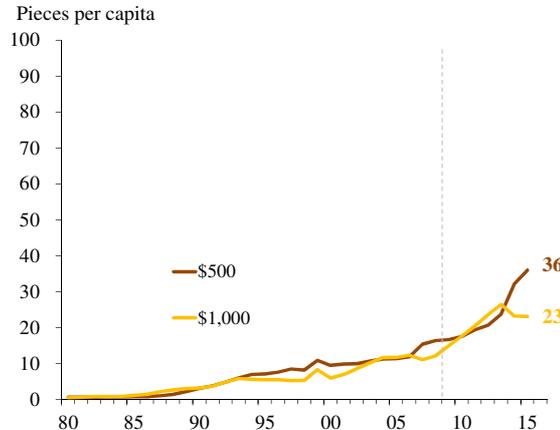
⁵ The public concern was mainly related to the 2003 series HK\$1,000 counterfeit notes. In response, the HKMA introduced a new series of banknotes in 2010 with more advanced and easy-to-recognise security features, which would assist the public in identifying counterfeit banknotes more readily. These 2010 series banknotes are gradually replacing the 2003 series banknotes in circulation.

Chart 3a: Volume of small-value banknotes by denominations



Sources: C&SD and HKMA.

Chart 3b: Volume of large-value banknotes by denominations



Sources: C&SD and HKMA.

With increased use of non-cash means of payment since 2009, the enormous growth in banknotes in circulation during the period remained unlikely to be due to domestic use by local residents alone, and external demand should continue to play an important role. While the number of credit card accounts opened under the authorized institutions (AIs) and their subsidiaries grew at a slower rate after the global financial crisis, the total number of accounts had more than tripled since 1997, to 17.1 million at the end of 2015. As a percentage of private consumption expenditure (PCE), the total value of credit card transactions⁶ relating to retail sales also increased to 35.1% at the end of 2015 from 29.9% at the end of 2009 (Table 2). On the other hand, the rising popularity of Octopus Cards may also have continued to reduce the domestic use of small-value notes and coins in recent years. As a share of PCE, the total transaction value of Octopus Cards rose from 1.2% in 1999 to about 3.9% in 2012 (the latest estimate), although its average transaction value was still small. As a result, the more prevalent use of non-cash means of payment in Hong Kong should theoretically have reduced the domestic demand for cash for transactional purposes.

⁶ The payment card statistics are compiled from data on credit and debit cards issued in Hong Kong by both authorized institutions (AIs) and non-authorized institutions (non-AIs) under the credit and/or debit card schemes of the eight payment card scheme operators.

Table 2: Usage of non-cash means of payment

	<u>Credit card: total transaction value</u>	
	HK\$ bn	% share of PCE
2009	302.0	29.8
2012	449.3	34.2
2015	557.7	35.1

Notes: The total transaction value of credit cards refers to retail payments (Hong Kong and overseas) only.

PCE stands for private consumption expenditure.

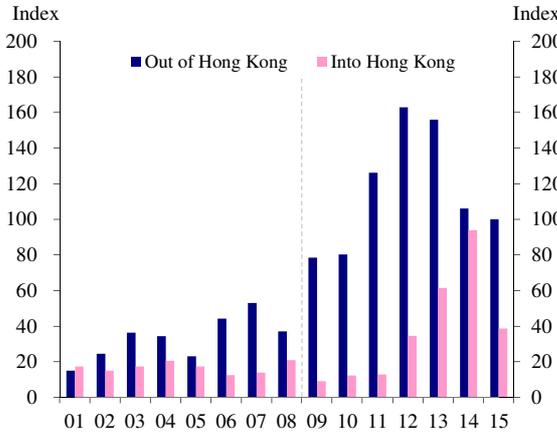
Sources: C&SD and HKMA.

III. CROSS-BORDER MOVEMENT OF CASH BY BANKS⁷

One novel feature of our previous research related to a new dataset collected from major wholesale banknote dealers concerning the shipments of Hong Kong dollar cash between Hong Kong and Mainland China as well as Hong Kong and Macao. **As prima facie evidence of external demand, aggregate currency shipment data continue to point to net currency outflows from Hong Kong during 2009–2015, which expanded significantly in the early part of the period but showed clearer signs of moderation in 2014 and 2015.** Specifically, gross outflows of banknotes from Hong Kong increased much more sharply during 2009–2013 compared with the pre-crisis period (Chart 4a). The gross outflows remained large in 2014 and 2015, though smaller than the high levels seen in 2012 and 2013. On the other hand, gross inflows of currency into Hong Kong fluctuated at around \$11 billion in 2001–2011 but saw sharp rises in the three years to 2014 before moderating in 2015. With outflows greater than inflows, there were continued net currency outflows during 2009–2015.

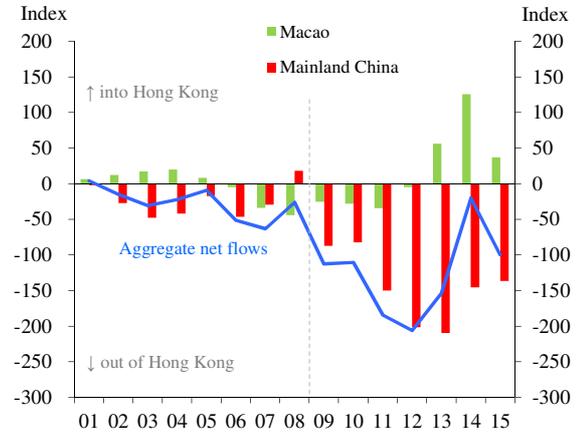
⁷ Large shipments of Hong Kong dollar currency are typically handled by a few commercial banks that act as banknote brokers specialising in wholesale bulk currency shipment. We have gathered data from some major currency wholesale dealers and these data record their total inflows and outflows of Hong Kong dollar currency vis-à-vis Mainland China (2000–2015) and Macao (2001–2015). At times, currency flows of selected denominations are also available but these data are incomplete.

Chart 4a: Gross cross-border movements in Hong Kong dollar currency through banks



Note: Outflows in 2015 are normalised to 100.
Source: Unpublished data by the HKMA.

Chart 4b: Net currency flows by locations



Note: Net flows in 2015 are normalised to 100.
Source: Unpublished data by the HKMA.

An analysis of currency shipment destination indicates that the net outflows of cash during 2009–2015 were mainly destined for Mainland China while the currency shipment relating to Macao shifted from relatively small net cash outflows from Hong Kong to sizable net currency inflows into Hong Kong (Chart 4b). There are two possible explanations behind this phenomenon. First, gaming activities in Macao has slowed visibly since the second half of 2014 and this might lead to a repatriation of banknotes back to Hong Kong as casinos would unlikely want to hold a large stock of Hong Kong dollar cash for operational needs. Secondly, concerns about the circulation of counterfeit HK\$1,000 banknotes in Macao heightened in 2013 as the Macao police seized a series of fake notes in casinos. This might have added further pressure on the repatriation.⁸

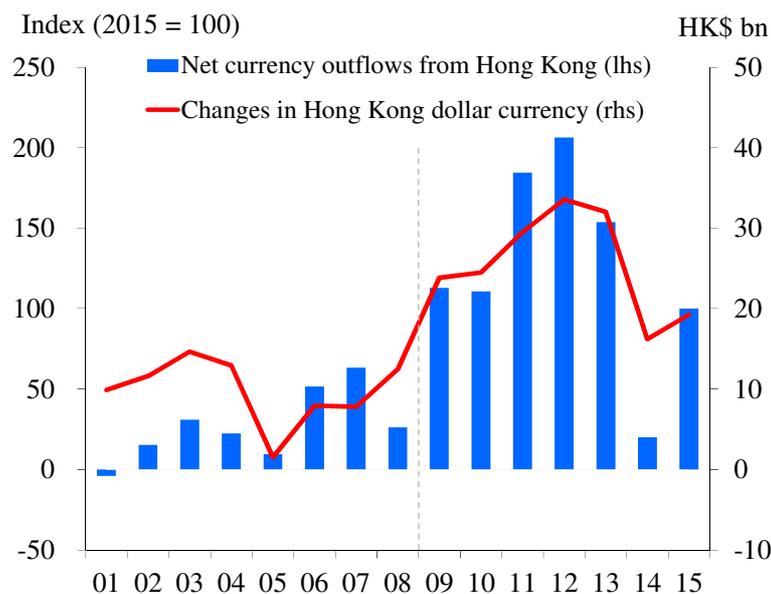
Available evidence suggests that gross currency shipment to Mainland China and Macao were largely driven by \$1,000 banknotes while gross cash inflows into Hong Kong were relatively more diverse in denominations. To Mainlanders, the larger denominations of Hong Kong dollar banknotes are probably considered to be more convenient means of payment, given that the largest denomination of renminbi notes is only RMB100. Moreover, \$1,000 bills are widely used in Macao casinos. Meanwhile, the relatively more diverse denominations found in gross inflows to Hong Kong may reflect normal recycling of currency back to Hong

⁸ Available data did point to sizable shipments of \$1,000 notes from Macao to Hong Kong.

Kong after travellers used the currency in Mainland China and Macao.

In a nutshell, the cross-border movement of currency suggests that external demand for Hong Kong dollar currency increased considerably in 2009 – 2013 but appeared to have softened in 2014 and 2015. Moreover, Mainland China and Macao factors remained a key driver of Hong Kong dollar currency over the past few years. This can be seen from the remarkable resemblance between the aggregate net currency shipment outflows from Hong Kong and the changes in Hong Kong dollar cash (Chart 5). Nevertheless, cash shipment data alone cannot completely measure the stock of currency held abroad, in part because they miss much of the cash that is hand-carried to/from Hong Kong by travellers.

Chart 5: Net currency shipment flows and changes in Hong Kong dollar currency



Source: Unpublished data by the HKMA.

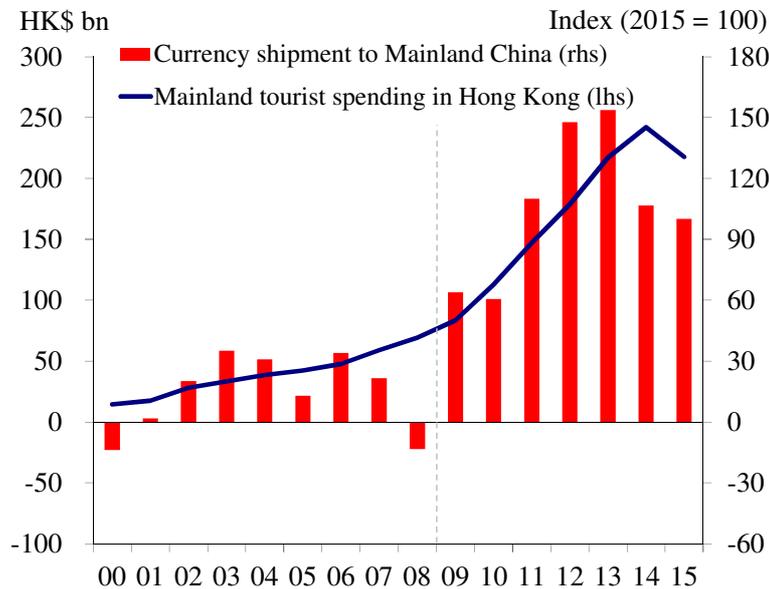
IV. WHAT FACTORS DRIVE THE DEMAND FOR CASH IN RECENT YEARS?

Based on our previous study in 2010, we review some determinants that are likely to affect Hong Kong dollar currency in recent years.

Cross-border tourist spending

The external demand for Hong Kong dollar currency was influenced by the ups and downs of the cross-border tourist spending. One major source of such demand comes from Mainland residents' spending in Hong Kong, which grew at a robust pace during 2009–2013, and growth in consumption of “big ticket” items by Mainland visitors may have partly contributed to the rapid increase in net currency shipment to Mainland China (Chart 6). However, Mainland visitor arrivals and their per capita spending softened respectively in 2014 and 2015, dragging total spending in 2015.

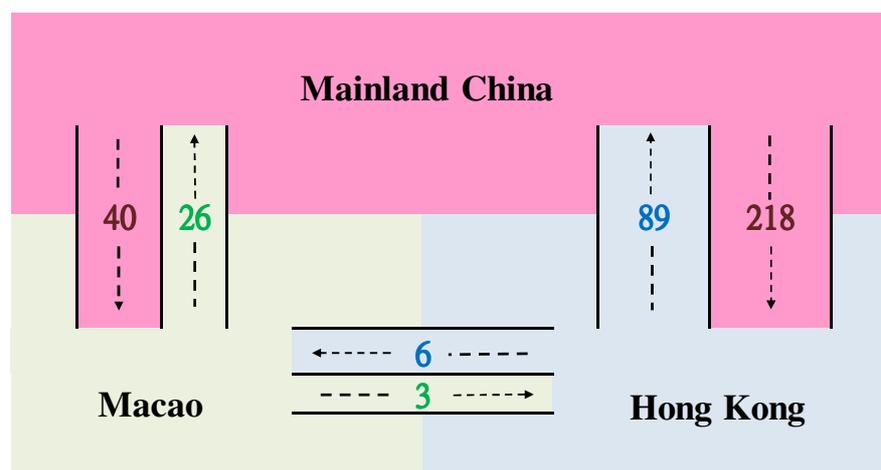
Chart 6: Spending by Mainland travellers in Hong Kong and net currency shipment to Mainland China



Sources: Tourism Board and unpublished data by the HKMA.

In the past, there was another major source of external demand arising from Hong Kong residents spending Hong Kong dollars in Shenzhen and Guangdong.⁹ In recent years, however, this channel has been less prevalent, as Hong Kong visitors now are likely to use the renminbi instead of the Hong Kong dollar when they travel to Mainland China. Cross-border shopping by Hong Kong people in the southern part of Mainland China also waned because of rising price levels in Mainland China. On the other hand, while the use of the Hong Kong dollar currency by the Hong Kong residents in Macao or that by the Macao residents in Hong Kong represent other sources of external demand, such spending was somewhat dwarfed by the cross-border tourist spending between Mainland China and Hong Kong (Chart 7).

**Chart 7: Tourist spending (in HK\$ billion)
among Mainland China, Hong Kong and Macao in 2015**



Notes: The unit is HK\$ billion. Flows from Hong Kong/Macao to Mainland China are 2014 figures due to data availability.
Sources: CEIC and authors' illustration.

Gambling activity in Macao

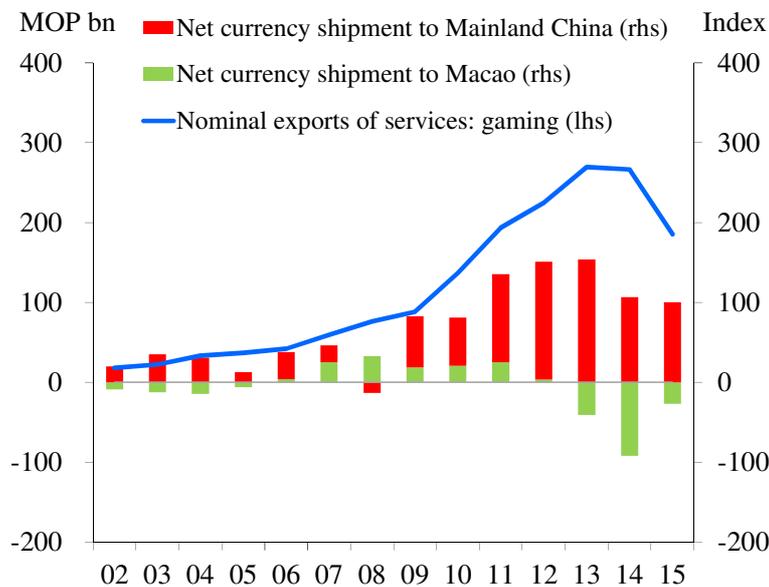
The external demand for Hong Kong dollar currency may have been further affected by the boom-bust cycles of gaming activities in Macao, where many high-rollers from Mainland China gambled. In 2015, Mainlanders accounted

⁹ Of course, there exist other channels such as bilateral trade and investment, cross-border employment and family contacts. Banknotes may also be transferred to Mainland China because of illegal activity or demands from the underground banking system, money changers or remittance agents. More recently, some people emphasise that Hong Kong dollar cash is used for property investments by Mainlanders in Hong Kong.

for around 66% of all visitor arrivals to Macao (rising by almost 16 percentage points from 2008), followed by Hong Kong people who had a share of about 21% (declining by 9 percentage points from 2008). It is common for Mainlanders to use Hong Kong dollar currency for settlement of gaming receipts, given larger denominations of Hong Kong dollar banknotes, as well as for subsequent tour in Macao.

It is clear that external cash demand is positively correlated with gambling activities in Macao (Chart 8). Large currency outflows to Mainland China were accompanied by fast increases in Macao’s gaming revenue. After several years of sharp growth, the gaming industry in Macao has faced stiff headwinds since the second half of 2014 as the Mainland China government aggressively launched an anti-graft and austerity campaign. In tandem, net currency shipment to Mainland China dwindled while net currency shipment relating to Macao reverted to inflows into Hong Kong.

Chart 8: Gambling activity in Macao and currency shipment



Note: Net currency shipment to Mainland China in 2015 is normalised to 100.
Sources: CEIC and unpublished data by the HKMA.

The renminbi exchange rate

The influence of the renminbi exchange rate against the Hong Kong dollar appeared to be two-pronged and changing over time. In the past, an appreciation of the renminbi could reduce the incentives for Mainlanders to hold the Hong Kong dollar cash, as their Hong Kong dollar holdings could suffer from valuation losses should the renminbi appreciate substantially against the Hong Kong dollar. On the other hand, an appreciation of the renminbi tends to make Hong Kong goods and services more attractive in terms of Hong Kong dollars. Some even argue that there is a psychological impact because renminbi one yuan can now be exchanged for more than one Hong Kong dollar. More recently, these two forces may have acted in reverse as the renminbi depreciated following changes in the mechanism for determining the central parity rate in 2015.

Hong Kong dollar interest rate

One salient feature in the aftermath of the global financial crisis is the record low interest rates in many economies. **Economic theory suggests that cyclical currency demand, particularly for store of value purpose, may have been boosted in recent years because the opportunity cost of holding banknotes have declined due to low deposit interest rate.**

V. ESTIMATION OF A CASH DEMAND MODEL AND THE SHARE OF EXTERNAL DEMAND

In light of the developments discussed, we update the econometric model of Hong Kong dollar cash demand used in the 2010 study.¹⁰ The variable to be explained is Hong Kong dollar currency held by the non-bank public in real terms, implicitly implying that cash holders base their demand for cash on its purchasing power. For explanatory variables, real private consumption expenditure (excluding consumer durables in the domestic market)¹¹ is used to capture domestic cash demand,

¹⁰ The selected model makes it possible to analyse both the long-term equilibrium relationship (cointegrating relationship) and the short-term dynamics. The latter are fluctuations in cash demand around the long-run equilibrium values.

¹¹ Consequently, non-residents' expenditure in the domestic market is excluded. Consumer durables are also excluded because expenditure on them is not largely settled in cash by local residents.

and the level of deposit interest rate is used to proxy the opportunity cost of holding cash. The model also includes cross-border tourist spending, gaming activity in Macao, and the renminbi exchange rate to capture the impact of external factors. The sample period runs from 1995 Q1 to 2015 Q4.

Based on the two-step, Engle-Granger procedure, the estimated long-run demand for Hong Kong dollar currency is shown in Equation (1).

$$rcuy = -6.40 + 0.96 pce - 0.03 i + 0.38 toursp - 0.58 e_{HKD/RMB} \quad (1)$$

where $rcuy$ is the real currency held by the public, pce is the real consumption expenditure (excluding consumer durables in the domestic market), i is the deposit interest rate, $toursp$ is the estimated sum of spending of Mainland visitors in Hong Kong and Hong Kong visitors on the Mainland, and $e_{HKD/RMB}$ is the spot Hong Kong dollar exchange rate against the renminbi. Seasonal adjustment is made where appropriate and all variables are in logarithm except for the deposit interest rate. All the coefficients in equation (1) are statistically significant.

As expected, the estimated long-run relationship indicates a positive impact of real consumption expenditure and a negative effect of interest rate on real cash demand. Cross-border tourist spending between Mainland China and Hong Kong has a long-term positive effect on real currency demand. An appreciation of the renminbi exchange rate against the Hong Kong dollar has a net negative impact empirically, but its theoretically positive effect might have been in part captured by the impact from cross-border tourist spending. Meanwhile, exports of gaming services are found to have a positive, but not statistically significant, short-term impact on real currency demand, and there is no long-run relationship between them. That said, our previous research in 2010 did find that the gaming activities had a short-run, statistically significant impact on cash demand. Table 3 summarises the quantitative effect of different variables on real currency demand.

Table 3: Quantitative effects of cash demand determinants

<u>Variables</u>	<u>Hypothetical change</u>	<u>Impact on real currency demand</u>
<i>Long-term impact on level</i>		
Real private consumption expenditure	↑ 1%	↑ 0.96%
Deposit interest rate	↑ 1 percentage point	↓ 3%
Cross-border tourism expenditure	↑ 1%	↑ 0.4%
HKD/RMB exchange rate	↑ 1% (HKD depreciates against RMB)	↓ 0.6%
<i>Short-term impact on growth rate</i>		
Macao's exports of gaming services growth	↑ 1 percentage point	↑ 0.01 percentage points*

* The coefficient of Macao's exports of gaming services is not statistically significant.

In order to estimate the share of external demand, we assume that external demand is zero when the variable *toursp* stays at its end-1984 value (denoted by *toursp_{1984Q4}*), the local demand component *rcuy_{local}* can be obtained by

$$rcuy_{local} = b_0 + b_1 pce + b_2 i + b_3 toursp_{1984Q4}$$

Plugging in the recent values of *pce* and *i*, we compute the share of external demand for Hong Kong dollar cash as¹²

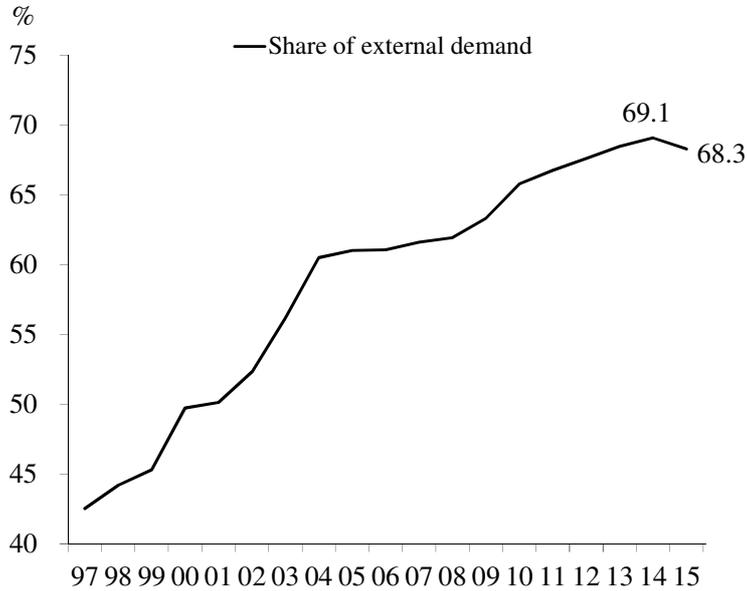
$$1 - \exp(rcuy_{local} - rcuy) = 1 - \exp[b_3 (toursp_{1984Q4} - toursp) - b_4 e_{HKD/RMB}].$$

Updated estimates suggest that the share of external demand for Hong Kong dollar currency broadly increased until 2014 but moderated in 2015 (Chart 9), accounting for around 68% of Hong Kong dollar cash (held by the public) at the end of 2015. This amounts to around \$240 billion compared with the total stock of about \$350 billion.¹³

¹² It should be noted that in theory the interest rate factor can affect both domestic and external demand for Hong Kong dollar currency.

¹³ In Annex A, we provide the updated estimates of Hong Kong dollar currency held abroad using other econometric methods. Estimates from these methods range from 59% to 72% at the end of 2015.

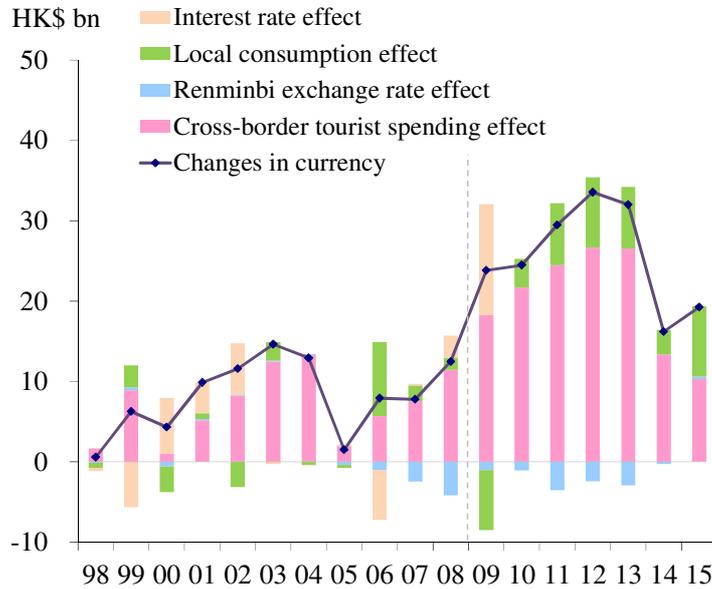
Chart 9: Share of external demand for Hong Kong dollar currency



Sources: Authors' calculation.

Simulation results reveal that the changes in Hong Kong dollar currency over the past few years were mainly contributed by external demand arising from cross-border tourist spending effect (Chart 10). In particular, growth in external demand moderated in 2014 and 2015, driven mainly by the slowdown in cross-border tourist spending. Meanwhile, the impact of the renminbi exchange rate was relatively small, with the renminbi depreciation in 2015 exerting little impact on the currency demand, as the actual fluctuation in the renminbi exchange rate was in fact moderate, despite the significant impact on global financial market sentiment. On domestic factors, the effect of local consumption has strengthened in driving the demand for Hong Kong dollar currency in recent years, but its contribution was generally much less than that of cross-border tourist spending. The impact of local interest rate on the changes in currency was relatively mild in recent years owing to its steadily low level after the global financial crisis. However, lower interest rate did have a sizable positive impact on the level of currency immediately after the crisis.

Chart 10: Simulation of factor contribution to changes in currency



Source: Authors' calculation.

VI. CONCLUDING REMARKS

This paper updates our estimates on the external demand for the Hong Kong dollar currency amid the marked increase in the Hong Kong dollar currency-to-GDP ratio since the global financial crisis. In line with the micro-level evidence obtained from major wholesale banknote dealers, our econometric results indicate that external demand increased along with the up-cycle in inbound tourism from Mainland China during 2010–2013, but began to lose momentum in 2014 as the cycle turned and Macao's gaming activities began to slow down. Domestic demand for the Hong Kong dollar also increased further but at a smaller magnitude. Reflecting these developments, the share of external demand is estimated to have risen further after the global financial crisis, before declining slightly in 2015.

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ANNEX A: UPDATING THE ESTIMATES OF HONG KONG DOLLAR CURRENCY HELD ABROAD

Different econometric methods have previously been employed by Greenwood (1990), Hawkins and Leung (1997), Peng and Shi (2002) and Ho, Shek and Shi (2005) to estimate the external demand for Hong Kong dollar currency. These methods are briefly summarised below:

- Currency-to-GDP ratio approach --- This approach estimates a trend for the currency-to-GDP ratio, assuming that the ratio will decrease initially and stabilise afterwards following the development of cashless payment methods and other financial innovations. An above-trend ratio is treated as an indication of external demand.¹⁴
- Deduction of local demand --- This method estimates local demand for Hong Kong dollar currency using the sample period 1973 – 1984, during which external circulation is virtually non-existent. The differences between the fitted value of local demand in future periods and the actual stock of Hong Kong dollar currency are calculated as external demand.
- Estimation of cash demand with external factors --- This approach estimates a demand function for Hong Kong dollar currency by explicitly taking into account the effect of external demand. For example, researchers have used a time trend, macroeconomic variables in Guangdong or tourism expenditure to measure the effect of Mainland-Hong Kong economic integration on Hong Kong dollar cash demand.

Table A1 summarises the results of these papers and provides an update of the estimates using more recent data. Updated estimates show that around 59 – 72% of Hong Kong dollar cash (held by the public) were circulated outside Hong Kong at the end of 2015. The results show that Hong Kong dollar currency circulating outside Hong Kong has increased over time.

¹⁴ For example, in the case of Hong Kong, a trend of the ratio is fitted for the period 1966 – 1984, which is then extrapolated to predict the domestic demand for Hong Kong-dollar currency in future periods. Foreign holdings are calculated as the residual. For more details, see Greenwood (1990).

Table A1: Estimates of Hong Kong dollar currency abroad

<u>Estimates of external demand for Hong Kong dollar currency</u>			
At the end of		Value (HK\$ bn)	Share of total currency (%)
<i>Currency-to-GDP ratio approach</i>			
1989	(a)	6	16
2001	(c)	25	25
2004	(d)	64	46
2009	(e)	97	50
2015		205	59
<i>Deduction of local demand</i>			
1997		16	20
2004	(d)	88	63
2009	(e)	124	64
2015		251	72
<i>Estimation of cash demand with external factors</i>			
1994	(b)	17	25
2004	(d)	82	59
2009	(e)	128	66
2015		251	72

Notes: (a) Greenwood (1990).
 (b) Hawkins and Leung (1997).
 (c) Peng and Shi (2002).
 (d) Ho, Shek and Shi (2005).
 (e) Leung, Ng and Chan (2010).
 Other estimates are updates by the authors.