# 3. Domestic economy

The Hong Kong economy maintained its steady growth momentum in the second half of 2017 amid strong domestic demand and improving export performance. Economic growth for 2018 is expected to remain solid. This outlook is subject to various uncertainties and risks, including those relating to central banks' monetary policy normalisation and global financial market stability, as well as heightened protectionism sentiments and geopolitical tensions. Local inflationary pressures will likely stay moderate in the near future, though some upside risks remain.

3.1   Real activities

The Hong Kong economy sustained its growth momentum during the second half of 2017. On a seasonally adjusted quarter-on-quarter basis, real Gross Domestic Product (GDP) increased by 0.8% in both the third and fourth quarters, similar to the average growth rate of 0.9% over the preceding two quarters (Chart 3.1). Compared with the first half of the year, growth in private consumption remained robust and continued to be one of the major drivers of GDP growth. The solid consumption growth reflected favourable job and income conditions, the still-confident consumer sentiment, and booming asset prices which provided impetus through positive wealth effect. After being roughly stable for three quarters of the year, overall investment spending rebounded visibly in the final quarter due to stronger business capital expenditure despite softer building and construction activities. On the external front, Hong Kong's export performance improved further on the back of better global trade growth and a gradual recovery in inbound tourism (Chart 3.2). That said, net exports of goods still detracted from GDP growth as imports expanded even faster than exports, while net exports of services contributed positively to GDP growth.

Chart 3.1
Real GDP growth and contribution by major expenditure components
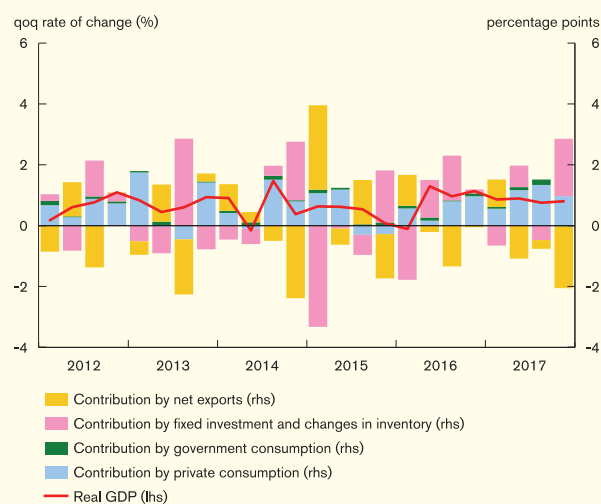
Sources: C&SD and HKMA staff estimates.

Chart 3.2
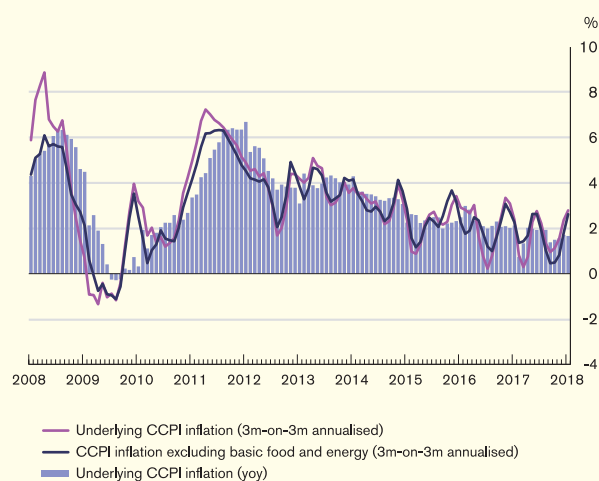**Exports and imports in real terms**
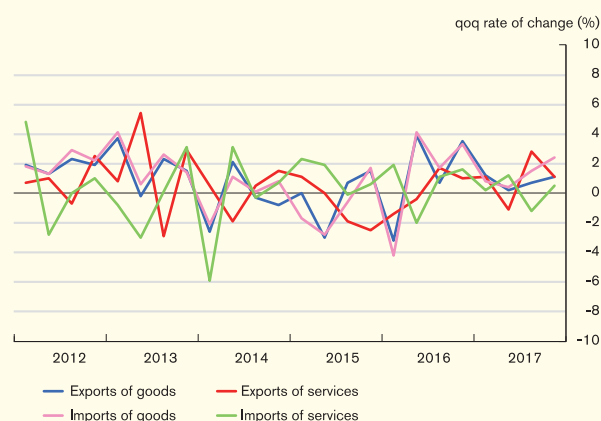
Source: C&SD.

The sustained growth momentum continued to support job creation in the second half of 2017. Total employment grew by around 0.7% during the period, to over 3,850,000, led by increases in the construction sector, the financial and business services sector, and the public administration, social and personal services sector. With real output growth outpacing employment growth, labour productivity showed signs of further improvement.

Economic growth for 2018 is expected to remain solid. Externally, Hong Kong's export performance will continue to benefit from the improving global growth outlook and the gradual recovery in inbound tourism. On the domestic front, private consumption is expected to hold up mainly because of favourable labour market conditions. In view of the eventual rises in Hong Kong dollar interest rates, Box 3 examines the effect of a higher mortgage debt service burden on private consumption. As for fixed capital formation, building and construction activities should progress steadily on the back of rising housing supply and continuing infrastructure projects. While improved economic conditions will support business capital spending, headwinds may come from potential rises in interest rates. For 2018 as a whole, the Government forecasts real GDP growth in the range of 3–4%, while the growth forecasts by international organisations and private-sector analysts range between 2.0% and 4.0%. However, this growth outlook is subject to various uncertainties and risks arising from the external environment as discussed in the previous chapter, as well as those relating to Mainland's economic performance amid financial tightening, and developments in the local asset markets.

3.2 Inflation and unemployment

Local inflationary pressures remained well contained in the second half of 2017, although the sequential momentum showed signs of a mild pick up in recent months. On a year-on-year comparison, the underlying composite consumer price index (CCPI) increased by 1.7% in the third quarter and 1.6% in the fourth quarter, comparable with the average rate of around 1.7% during the first half of the year. However, inflation momentum, as measured by the annualised three-month-on-three-month underlying inflation rate, picked up moderately to 2.8% in January 2018 (Chart 3.3). The mild increase in inflation momentum was fairly broad-based, driven by price increases in both tradables and services. In particular, the renewed upward trend in fresh-letting private residential rentals since mid-2016 may have somewhat pushed up the sequential inflation momentum (Chart 3.4). Meanwhile, labour cost pressures continued to be modest in recent quarters (Chart 3.5).

Chart 3.3
**Different measures of consumer price inflation**

Underlying CCPI inflation (3m-on-3m annualised)
CCPI inflation excluding basic food and energy (3m-on-3m annualised)
Underlying CCPI inflation (yoy)

Sources: C&SD and HKMA staff estimates.

Chart 3.4
CCPI rental component and market rental

% 3m-on-3m

Underlying CCPI rental component
Residential rental (18-month moving average)
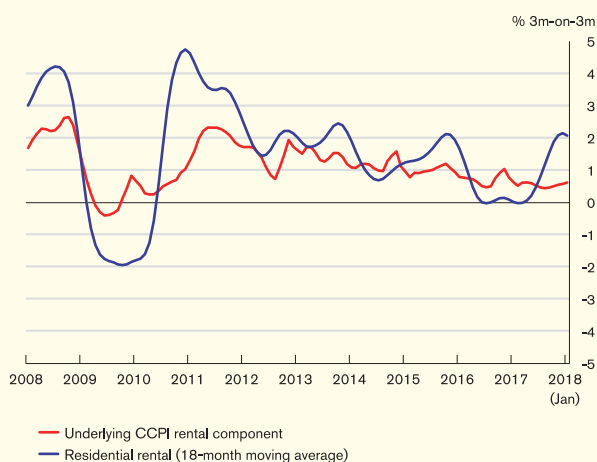
Sources: C&SD and R&VD.

Chart 3.5
Unit labour cost and payroll per person

% seasonally adjusted qoq

Real unit labour cost
Real payroll per person
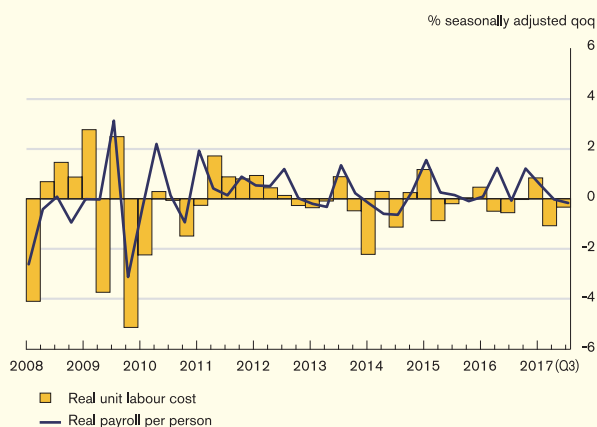
Sources: C&SD and HKMA staff estimates.

With still-moderate global inflation and steady rises in local costs, inflationary pressures in Hong Kong are expected to remain moderate in 2018, but the underlying inflation rate is likely to pick up gradually from the eight-year low of 1.7% in 2017. For example, the rental component of inflation may gather momentum in the latter part of 2018 because of the feed-through from the increases in fresh-letting private residential rentals. Market consensus predicts the headline inflation rate at a still-moderate level of 2.2% for the year, and the Government projects the underlying inflation rate to be 2.5%.

Nevertheless, this benign inflation outlook is subject to upside risks. Externally, faster-than-expected increases in global inflation or commodity prices could bolster local inflation momentum. Domestically, the labour market tightened recently, with the seasonally adjusted unemployment rate declining from 3.4% in 2016 to 2.9% in December 2017, below 3% for the first time in nearly 20 years (Chart 3.6). Should the labour market strengthen much further, this may exert additional upward pressures on inflation, given that the current output gap is estimated to be near zero.

Chart 3.6
Unemployment rate

%

Unemployment rate
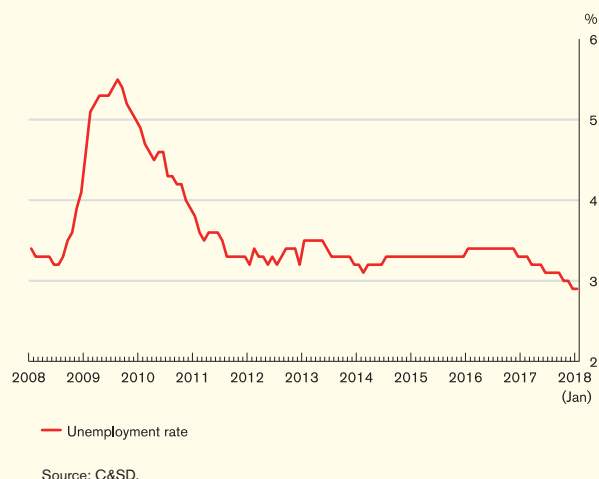
Source: C&SD.

Box 3
Measuring the effect of mortgage debt service burden on private consumption

Introduction

Hong Kong households' mortgage debt has expanded amid the post crisis low-interest rate environment. As Hong Kong dollar interest rates will eventually increase along with the US interest rate normalisation process, it is expected the mortgage debt service burden on households will pick up, posing headwinds to household consumption. As such, this Box examines the effect of a higher mortgage debt service burden on Hong Kong's private consumption.[34]

Measuring the mortgage debt service burden

The mortgage debt service burden refers to the mortgage debt service payment (i.e. interest payment plus amortisation of loan principal) as a share of income. Chart B3.1 shows the transmission of an interest rate shock to private consumption, highlighting the role of the mortgage debt service burden in the transmission process. Apart from the well-known substitution/income effect and wealth/collateral effects (through influencing asset prices), interest rate shocks in the presence of a mortgage debt service burden could also affect private consumption through changing mortgage interest payments and, therefore, households' expendable income. Such impact is expected to increase with the size of the outstanding mortgage loans. The amortisation of loan principal also changes along with the size of the outstanding mortgage loans, which can affect private consumption through households' expendable income.

Chart B3.1
Determinants of private consumption
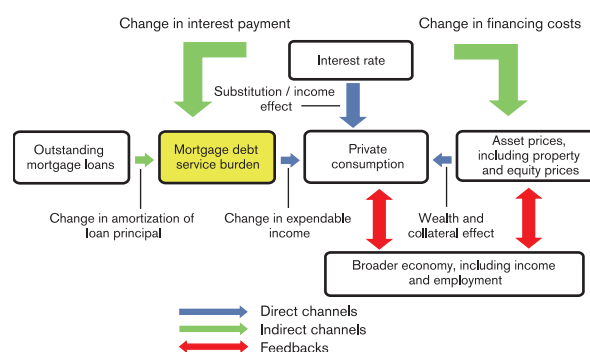
Source: HKMA staff illustration.

To measure the effect of the mortgage debt service burden on private consumption, we construct a mortgage debt service ratio based on outstanding mortgage debt – namely the outstanding mortgage debt service ratio (OMDSR). The OMDSR covers the total outstanding stock of mortgage debt of all households which is more relevant to aggregate private consumption, whereas the existing timely indicators refer only to new mortgage debt. Largely following the approach adopted by the Bank for International Settlements (BIS),[35] we measure the OMDSR using the standard formula of fixed instalment loans:

$$OMDSR_t = \frac{r_t}{(1 - (1 + r_t)^{-s_t})} \times \frac{D_t}{Y_t}$$

Where D_t denotes the outstanding amount of residential mortgage loans in the banking sector, Y_t denotes the total income of owner-occupier households (proxied by multiplying the median income of owner-occupier households with the

---

[34] A longer version of the analysis can be found in the paper by Chan et al. (2017), "Measuring the effect of mortgage debt service burden on private consumption", *HKMA Research Memorandum 16/2017*.
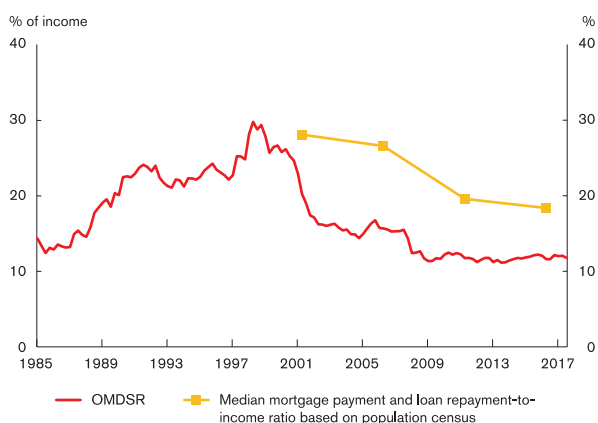
[35] See, for example, BIS (2016), "BIS database for debt service ratios for the private non-financial sector", *BIS data documentation* (http://www.bis.org/statistics/dsr/dsr_doc.pdf).

number of owner-occupier households), and r_t and s_t denote respectively the average interest rate and the maturity of the outstanding mortgage loans.

To assess whether the OMDSR can be a reliable measure of the mortgage debt service burden for the aggregate household sector, it is useful to compare the OMDSR with two commonly-used indicators of debt service burden.

Chart B3.2 shows the estimated OMDSR from 1985 – mid-2017, together with the actual median mortgage payment and loan repayment-to-income ratio estimated by the Census and Statistics Department (C&SD)'s quinquennial population census. Both ratios trended down during the early 2000s, consistent with the decline in aggregate household mortgage borrowings following the bursting of the housing bubble in 1997 and the noticeable drop in mortgage interest rates during that period. Despite the sharp rise in property prices in the post-global financial crisis (GFC) period, both ratios remained steady, as the aggregate household leverage on mortgages was constrained by the HKMA's macro-prudential measures on banks' mortgage loans, while the lengthened tenors of new mortgage loans brought down the actual amount of mortgage debt service.

The OMDSR is also compared with the banks' debt-servicing ratio (DSR), which is the actual debt repayment-to-income ratio for banks' new mortgage applicants. As shown in Chart B3.3, the OMDSR was lower than the banks' DSR, partly reflecting the fact that the OMDSR covers mortgage repayments on "old" mortgages in addition to that on new mortgages. As "old" mortgages were made at a time when housing prices were lower, the mortgage repayment on these mortgages would accordingly be lower than that on new mortgages. As such, a debt service burden indicator on the outstanding mortgage (i.e. the OMDSR), which covers both "old" and new mortgages, would be lower than an indicator on new mortgage applicants alone (i.e. banks' DSR). In addition, the higher level of the banks' DSR also reflects the inclusion of non-mortgage loan repayment in calculating the banks' DSR in accordance with the HKMA's prudential requirements. Reflecting the prudential limits on the banks' DSR, which should also help restrain the OMDSR, both the OMDSR and the banks' DSR were steady in the post-GFC period.

Chart B3.3
The OMDSR and banks' DSR for new mortgages
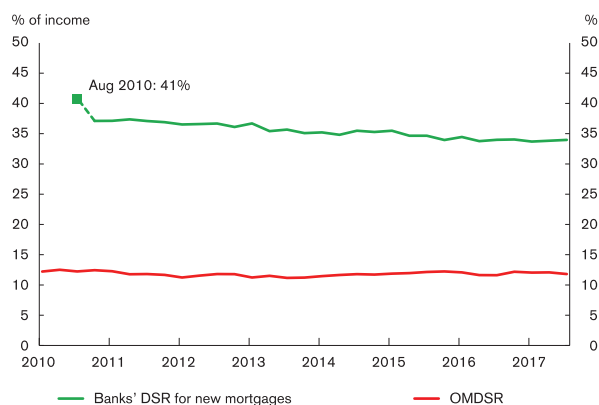
Note: The HKMA has been compiling banks' DSR since August 2010. For the purpose of comparison, the monthly time series of banks' DSR is transformed into the quarterly average data.

Source: HKMA staff estimates.

Chart B3.2
The OMDSR and the median mortgage payment and loan repayment-to-income ratio

Sources: C&SD and HKMA staff estimates.

Overall, the OMDSR is broadly in line with those commonly-used indicators of the debt service burden, but is more timely and refers to the burden on the total outstanding mortgage debt rather than new mortgage debt only. This gives us confidence in using the OMDSR to assess the influence of the mortgage debt service burden on private consumption.

Empirical analysis

To assess the impact of the mortgage debt service burden on Hong Kong's private consumption, we follow Lai and Lam (2002)[36] and Kang (2016)[37] to estimate an error correction model, where the long-run relationship between real private consumption (proxied by real private consumption per household (PCEH)) and its determinants is expressed as an error correction term in the short run equation. In accordance with theory and empirical evidence, we include real income (proxied by median household income deflated by the CCPI), real housing and financial wealth (proxied by residential property prices and Hang Seng Index respectively deflated by CCPI), and OMDSR as the long-run determinants.

Table B3.A shows the estimation results of the error-correction model based on quarterly data from the first quarter of 1985 to the fourth quarter of 2016. For the long-run equation, all coefficients have the correct signs, with real income, real housing prices and real equity prices having a positive and statistically significant impact on real private consumption, while the OMDSR has a negative and statistically significant impact. According to the estimates, a one-percentage point rise in the OMDSR would reduce household consumption by 0.76% in the long run, affirming the fact that indebtedness

could further render consumption more vulnerable to interest rate rises.[38]

Table B3.A
Estimated results of the error-correction model

Long-run co-integrating equation:
$$\log(PCEH(t)) = constant + \beta\ variables(t) + \varepsilon(t)$$

Short-run equation:
$$\Delta \log(PCEH(t)) = constant + \alpha\varepsilon(t-1) + \gamma\Delta variables(t) + \mu(t)$$

Explanatory variables	Long-run equation	Short-run equation
Constant	0.53 *	0.00 ***
Error correction term (α)		-0.14 **
Real median household income^	0.63 ***	0.14 ***
Real housing prices^	0.28 ***	0.11 ***
Hang Seng Index in real terms^	0.03 **	0.05 ***
OMDSR	-0.76 ***	-0.20 (1)

Note: ^denotes log-transformed variables.
   ***, ** and * denote the estimated coefficient is statistically significant at 1%, 5% and 10% respectively.
   (1) p-value = 0.1911
Source: HKMA staff estimates.

As for the short-run equation, the error-correction term is negative and significant, indicating the tendency for consumption to adjust to the long-run equilibrium. All the short-run determinants have the expected signs and are statistically significant except for the OMDSR. Overall, our results show that the OMDSR can influence the long-run equilibrium level of real private consumption, while not appearing to have significant impact on the growth of real private consumption in the short run.

Policy implications

Our empirical findings suggest that the HKMA's macro-prudential measures, while aiming to strengthen banks' resilience, can alleviate the impact of interest rate hikes on private consumption through the debt service burden channel. Specifically, the macro-prudential measures can dampen the growth of the

---

[36] Lai, Kitty and Raphael Lam (2002), "The nexus of consumer credit, household debt service and consumption", *HKMA Quarterly Bulletin*, November 2002.

[37] Kang, Joong Shik (2016), "Private sector activity in Hong Kong SAR and the Fed: transmission effects through the currency board", *IMF Working Paper* 16/35.

[38] We also estimate a long-run equation which includes real interest rate (proxied by 3-month Hong Kong Interbank Offered Rate minus CCPI inflation) as the long-run determinant of real private consumption. The estimated coefficient of real interest rate is positive but not statistically significant, which may reflect the offsetting income and substitution effects. Including real interest rate as the long-run determinants will not affect the size of other long-run coefficients. See Chan et al. (2017) for more estimation details.

aggregate household leverage on mortgages and thereby restrain the mortgage debt service burden in the event of interest rate hikes, thus helping to alleviate the consequent impact on private consumption.[39]

To illustrate, Table B3.B shows the estimated impact of a 200-basis point increase in the mortgage rate on the OMDSR and PCEH, under different counterfactual scenarios with higher outstanding mortgage loans. Based on the current level of the outstanding mortgage loans, a mortgage rate hike of 200 basis points would increase the OMDSR by 2.9 percentage points from 12.0% to 14.9%. If the outstanding mortgage loans were 40% larger than the current level (last row of Table B3.B), the OMDSR would rise from 12.0% to 16.7% in the absence of any rate hike, and increase further by 4.1 percentage points to 20.9% in the event of a 200-basis-point rise in the mortgage rate. As such, higher outstanding mortgage loans would not only raise the OMDSR, but also make it more susceptible to the impact of mortgage rate hikes.

A rise in the OMDSR as a result of the mortgage rate hike would dampen consumption spending, and the effect would be larger if the outstanding mortgage loans were higher. Based on its estimated long-run elasticity with respect to the OMDSR (i.e. -0.76 estimated from the long-run equation), real consumption spending per household would drop by 3.1% if the outstanding mortgage loans were 40% higher, compared with a relatively smaller decline of 2.2% if the outstanding mortgage loans stayed at the current level.[40]

Concluding remarks

In summary, our empirical findings show that the mortgage debt service burden can influence private consumption. This implies that macro-prudential measures, which help restrain the burden through dampening the growth of the aggregate household leverage on mortgages, may indirectly help alleviate the potential drag on private consumption in the event of interest rate rises.

Table B3.B
Numerical illustration of counterfactual scenarios

Had the outstanding mortgage loans been higher than the current level by (%)	The OMDSR (%)		Increase in OMDSR (ppt)	Decrease in real private consumption per household (%)
	No rate hike	200-bp rate hike		
	(A)	(B)	(C) = (B) - (A)	(D) = -0.76* (C)
0 (current level)	12.0	14.9	2.9	-2.2
10	13.1	16.4	3.2	-2.5
20	14.3	17.9	3.5	-2.7
30	15.5	19.4	3.8	-2.9
40	16.7	20.9	4.1	-3.1

Source: HKMA staff estimates.

---

[39] Wong et al. (2014) showed that macro-prudential measures can restrain the level of household leverage on mortgages. Wong, Eric et al. (2014), "How does loan-to-value policy strengthen banks' resilience to property price shocks – evidence from Hong Kong", *Hong Kong Institute for Monetary Research Working Paper* No. 03/2014.

[40] For simplicity, we hold other variables constant in this illustration.