

Technical Considerations Underlying the Key Macroeconomic Assumptions under the Base Case

1. The macroeconomic assumptions for real GDP, GDP deflator, and underlying CCPI 2014 – 2018 follow those in the 2014-15 Budget. For 2014 in particular, the mid-points of the range forecasts for real GDP and nominal GDP growth are used.

GDP growth assumptions beyond 2018

Labour force assumptions

2. The labour force assumptions are sourced from the latest projections released by Census and Statistics Department (C&SD) in September 2013. For the purpose of projecting overall economic growth, the labour force projections in *Charts 2.5* and *2.6* have been adjusted to include the projected number of foreign domestic helpers¹.

Labour productivity growth assumptions

3. With the labour force stagnating after 2018, the key driver of Hong Kong's economic growth in the future would necessarily come from a sustained increase in output from each worker, i.e. the labour productivity growth.
4. Adopting the growth accounting framework², labour productivity growth can be attributed to two factors: (a) capital intensity, i.e.

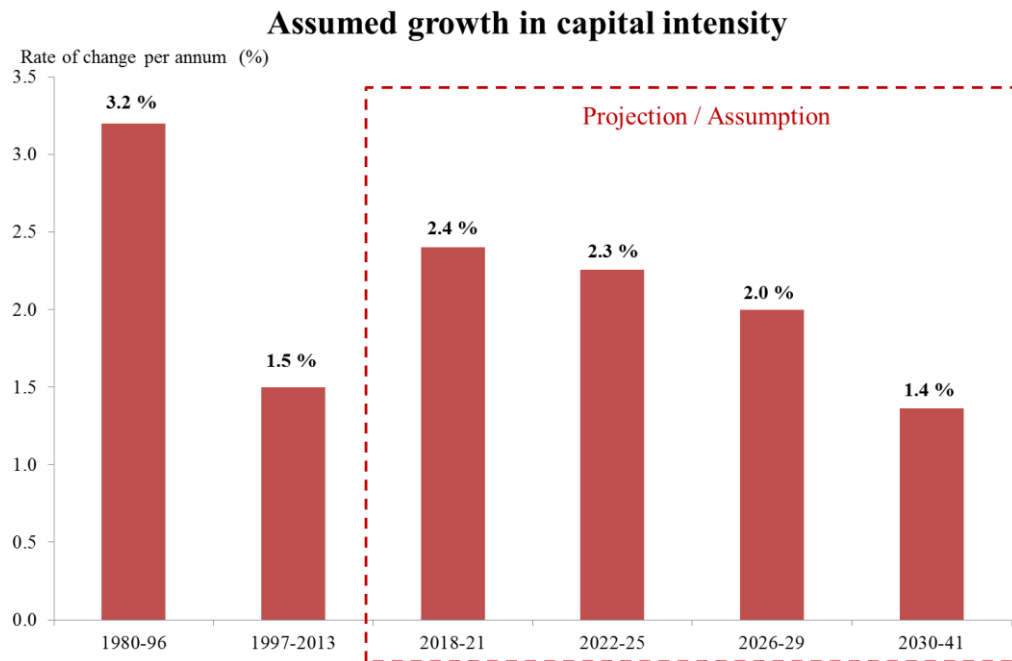
¹ From the Hong Kong Population Projections, published by the Census and Statistics Department.

² The growth accounting framework is originated from the Solow growth model. A notable example of applying this framework on the East Asian economies is in Alwyn Young, *The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience*, *Quarterly Journal of Economics* 110:641-80 (1995).

the size of capital stock relative to the labour force in the overall economy; and (b) total factor productivity (TFP).

5. Capital intensity, while showing a slower growth in 1997 – 2013 as compared with 1980 – 1996, would possibly pick up in the late 2010s (*Chart B.1*), mainly on account of the expected hectic investment under the on-going major infrastructure programme. The current relatively tight labour market conditions would also induce more labour-saving investments. Following a relatively faster intensification in the late 2010s and early 2020s, there would be a gradual deceleration to an average that is broadly in line with that seen in 1997 – 2013.

Chart B.1 – Capital intensity – past and projected trends

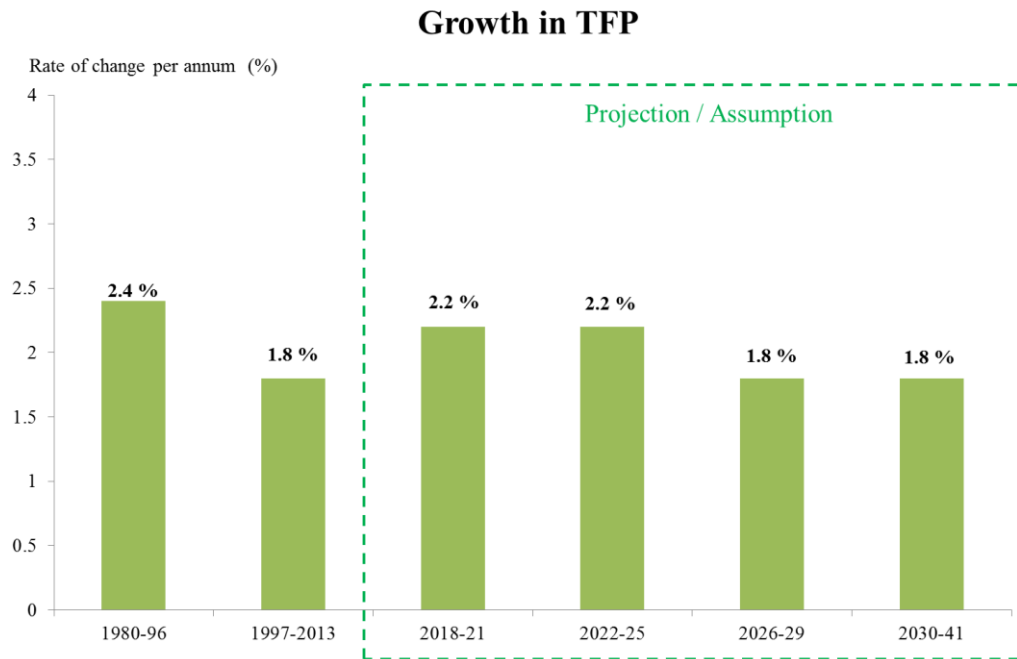


Note : Historical figures on capital intensity are based on Government’s in-house estimates.

6. TFP growth is expected to sustain in the years to come, at a pace broadly in line with those seen in the past three decades (*Chart B.2*). First, education upgrading and experience accumulation of our workforce are two instrumental factors conducive to continued productivity upgrading for some years to come. Secondly, the economy will continue its structural shift towards higher value-added, more knowledge-based activities. Lastly, the China

factor would also mean considerable development opportunities for our economy, as Hong Kong continues to re-position itself to gear in with Mainland’s development needs at different stages of its reform. All these factors should render some boost to labour productivity growth in the years to come.

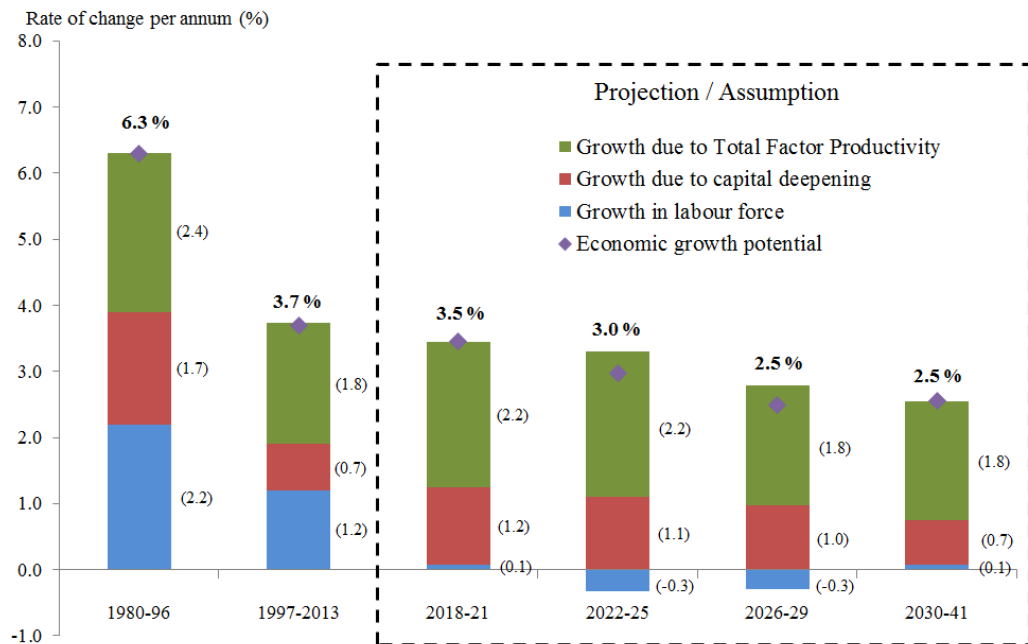
Chart B.2 – TFP growth expected to sustain at a high level in the years to come



Note: TFP figures for 1980-2013 are Government’s in-house estimates derived under the standard growth accounting framework.

- Yet even with capital intensification and sustained TFP growth, Hong Kong’s economic growth potential still looks set to slow as the labour force starts to stagnate after 2018. *Chart B.3* shows the historical composition of economic growth in the past three decades, as well as the interactions of the three factors (i.e. labour force growth, capital intensification, TFP growth) in driving Hong Kong’s GDP growth potential in the longer term.

Chart B.3 – Economic growth potential looks set to decelerate over the long term as labour force starts to stagnate



Notes : () Contribution to the economic growth in percentage point.

Economic growth figures here refer to the production capacity of the economy (i.e. from the supply side perspective), when labour force is fully employed and other factors of production are deployed at their normal intensity of usage. As such, they are slightly different from the actual GDP growth rates which are affected also by the demand side factors. The historical figures are in-house estimates by the Government.

Inflation as measured by CCPI and GDP deflator³

Historical trends of CCPI and GDP deflator

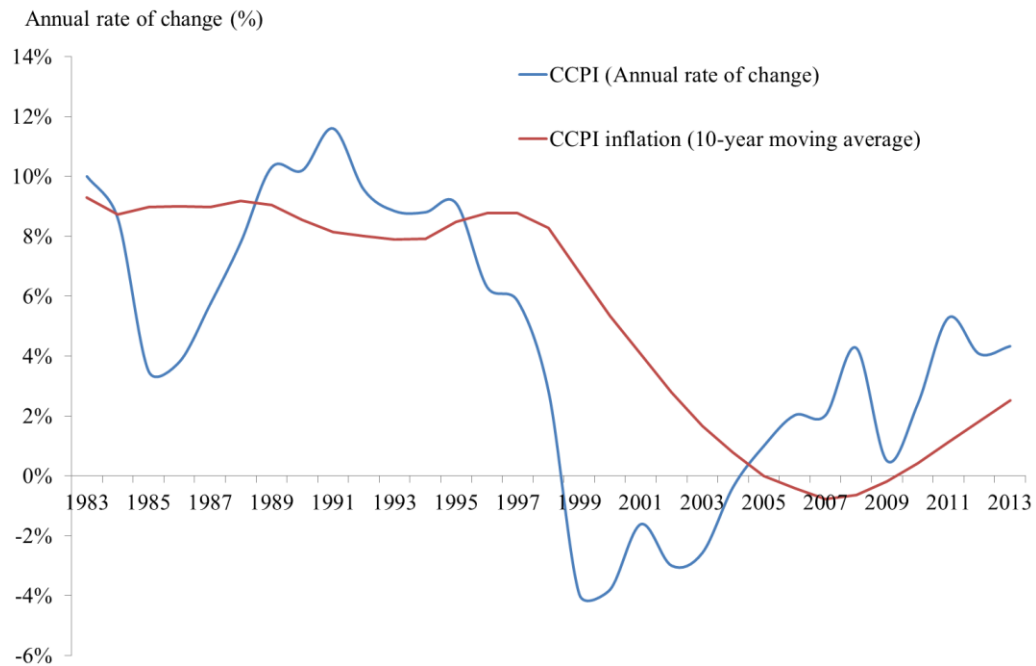
8. The trend rates of inflation in the past 5 years (2009 – 2013), past 10 years (2004 – 2013), past 20 years (1994 – 2013) and past 30 years (1984 – 2013) are set out in *Table B.1*. There had been a sustained period of high inflation during most of the 1980s and the early 1990s (See *Chart B.4*), followed by an exceptional and prolonged period of deflation from late 1998 to mid-2004. Yet in general, inflation has also trended down over the past three decades - thanks to the forces of globalization and increasing integration with the Mainland economy.

Table B.1 – Summary of the historical trend movement of CCPI and GDP deflator (Annual rate of change)

Period	CCPI	GDP deflator
2009 – 2013 (5 years)	3.3% p.a.	1.7% p.a.
2004 – 2013 (10 years)	2.5% p.a.	0.9% p.a.
1994 – 2013 (20 years)	2.1% p.a.	0.6% p.a.
1984 – 2013 (30 years)	4.0% p.a.	3.1% p.a.

³ The GDP deflator measures overall price change in the economy, whereas the CCPI measures inflation in the consumer domain.

Chart B.4 – CCPI inflation trends have shown big swings over time



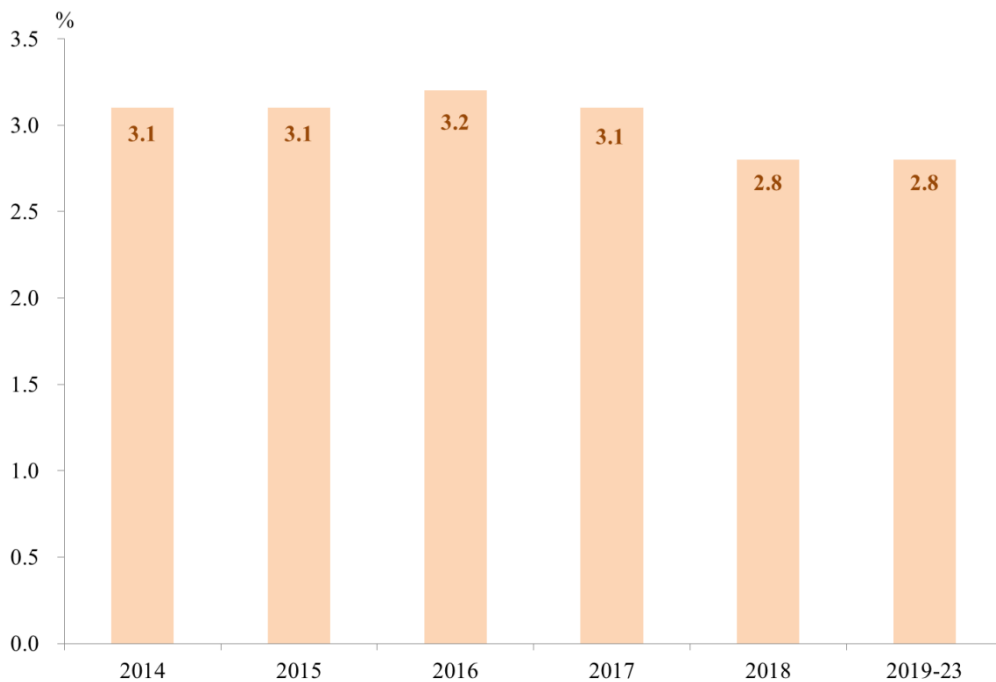
Mainland factor under the force of globalization

9. The trend of globalization, which has tended to equalize factor prices across countries that have participated in the process, is commonly considered as an important force contributing to the fall in inflation rates in the developed economies since the 1980s. The Mainland's development as the global manufacturing powerhouse has helped to contain the price increases in manufactured products over the past two decades or so, thereby contributing to lower global inflation.

10. Given the proximity of the Mainland, the implications of Mainland's rise as a global manufacturing centre have been particularly prominent on Hong Kong. The generally low increase in import prices from the Mainland during the past 30 years, at a trend rate of around 1.5% per annum, supports the idea that the integration of the Mainland into the global economy has been a contributory force in dampening Hong Kong's inflation.

11. Going forward, the disinflationary effect of the Mainland on global inflation is likely to sustain in the future, though its incremental impact might wane somewhat over time under a scenario of gradually appreciating RMB, as well as rising wages and land costs in the Mainland. As *Chart B.5* indicates, analysts in the private sector and international organisations generally believe inflation in the Mainland to remain tame in the longer term. If so, it should help keep Hong Kong’s inflation at a moderate level, as the Hong Kong economy increasingly moves in sync with the Mainland economy.

Chart B.5 – Analysts generally expect the Mainland’s consumer price inflation to remain tame in the longer term



Source: Asia Pacific Consensus Forecasts (October 2013).

12. Moreover, with more and more underdeveloped economies integrating into the global economy under the trend of globalization, it is possible that the rise of other emerging markets would also have a continuing dampening effect on global inflation, and hence Hong Kong’s inflation.

Monetary policies of major central banks

13. The abundance of global liquidity at present, due to the quantitative easing pursued by major central banks in response to the global financial crisis of 2008, has increased the uncertainty about the global inflation outlook for the medium term. Yet with their eventual exit from their unconventional monetary policies, it is conceivable that the major central banks would continue to accord great importance to the policy objective of maintaining price stability. For instance, both the US Federal Reserve and the European Central Bank have set the inflation target at around 2%. The anti-inflation practice of the major central banks, including the People's Bank of China, will likely keep global inflation in check over the longer term to the benefit of Hong Kong's inflation situation.

Inflation expectations and views of private sector analysts

14. Information on inflation expectations can also be used to examine the reasonableness of the price assumptions for this exercise. In particular, the inflation expectation information (on CPI inflation) available in the US should be a useful reference, considering that the Hong Kong dollar is pegged to the US dollar under the Linked Exchange Rate System and the US is a dominant economy in the world. *Table B.2* sets out the inflation expectations (also in the form of the expected annual rate of change in the consumer price index) in the US up to the horizon of 30 years, as worked out by the US Federal Reserve through the market data on US Treasuries, inflation swaps, etc.⁴ It shows that the inflation rate in the US is expected to climb up gradually over time from the recent relatively low levels to still-relatively moderate levels. This is consistent with the view that global inflation would continue to remain moderate over time.

⁴ *Cleveland Fed Estimates of Inflation Expectations*, the Federal Reserve Bank of Cleveland (See http://www.clevelandfed.org/research/data/inflation_expectations/)

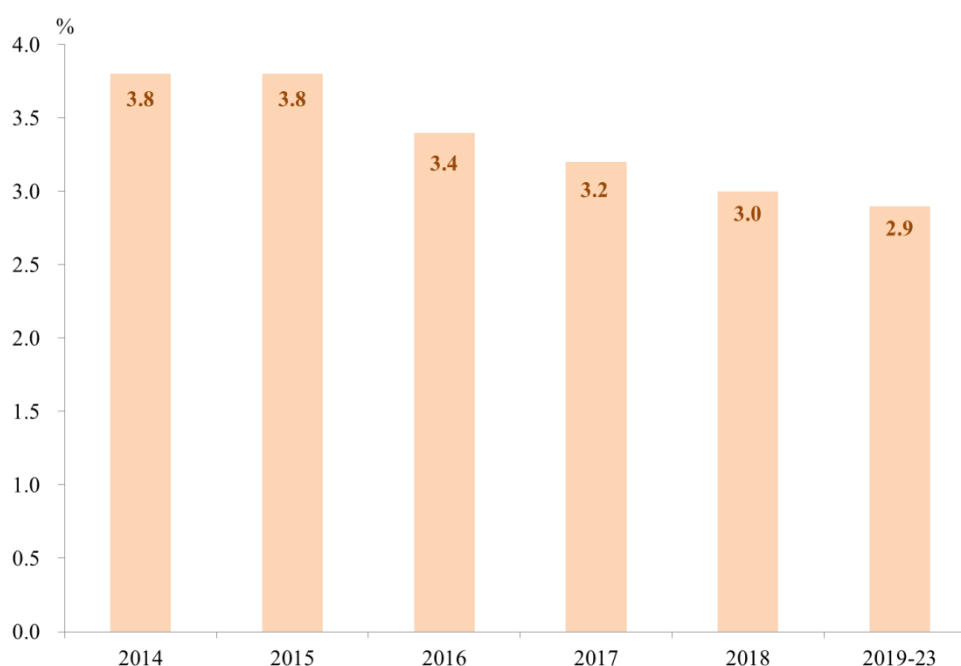
Table B.2 – Longer-term inflation expectations in the US as in November 2013

Period	Expected annual increase in US's CPI
1 – 5 years ahead	1.6% p.a.
6 – 10 years ahead	1.9% p.a.
11 – 20 years ahead	2.2% p.a.
21 – 30 years ahead	2.4% p.a.

Source : Federal Reserve Bank of Cleveland.

15. As another useful reference, analysts in the private sector and international organisations also generally expect Hong Kong's consumer price inflation to move lower, settling at an average of around 3% per annum beyond the medium term (*Chart B.6*).

Chart B.6 – Analysts expect HK's consumer price inflation to edge lower to around 3% per annum beyond the medium term



Source : Asia Pacific Consensus Forecasts (October 2013).

Assumptions on CCPI and GDP deflator under the Base Case

16. Having considered the above factors, the trend rate of increase in the underlying CCPI is assumed at 3% per annum beyond the medium term, after 3.7% in 2014 and 3.5% per annum in 2015 to 2018. The respective assumptions for the GDP deflator are 1% for 2014, followed by 2% per annum in 2015 to 2018, and 1.5% per annum from 2019 onwards.

Table B.3 – Summary of the assumptions on CCPI and GDP deflator

Period	CCPI (Underlying)	GDP deflator
2014 [#]	3.7%	1%
2015 – 2018 [@] (4 years)	3.5% p.a.	2% p.a.
2019 – 2021 (3 years)	3% p.a.	1.5% p.a.
2022 – 2025 (4 years)	3% p.a.	1.5% p.a.
2026 – 2041 (16 years)	3% p.a.	1.5% p.a.
2015 – 2041 (27 years)	3.1% p.a.	1.6% p.a.

Notes: [#] The figures for 2014 refer to the forecasts as announced on 26 February 2014 in the 2014-15 Budget Speech.

[@] These forecasts for the medium term follow the assumptions used in the 2014-15 Budget Speech.

The underlying SSAIP, unless otherwise specified, is assumed to be the same as that in the underlying CCPI. While SSAIP may deviate from CCPI in individual years, they co-move when viewed from a longer time horizon. For example, the 25-year average trend rates of change in the SSAIP and CCPI were 3.7% per annum and 3.6% per annum respectively.

Public sector construction output price (Public sector building and construction deflator)

17. The public sector building and construction deflator is assumed to go up by around 6% per annum in the five years from 2014 to 2018, followed by an average increase of around 5% per annum in 2019 to 2021. The average annual rates of increase in the deflator in the more distant years are assumed to converge to levels between the average increases of the deflator in the past 20 and 30 years (see *Table B.4*). The assumptions reflect that, while the average movements of the deflator in the past 10 years and 20 years have been dwarfed by a window of soft building and construction activities in 2005 – 2007 and the prolonged period of deflation across the Hong Kong economy in 1998 – 2004, the average movements of the deflator in the past 30 years were heavily affected by the surge in the deflator in the late 1980s and early 1990s amid the high inflation environment in the overall economy back then. Also, the upward pressures on construction costs are expected to recede somewhat in the more distant years in the future as the major infrastructure programme would pass its peak.

Table B.4 – Historical trend movements and assumptions on the public sector building and construction deflator (Annual rate of change)

Period	Public sector building and construction deflator
<i>Historical movements</i>	
2009 – 2013 (5 years)	4.5% p.a.
2004 – 2013 (10 years)	3.4% p.a.
1994 – 2013 (20 years)	3.2% p.a.
1984 – 2013 (30 years)	5.0% p.a.
<i>Assumptions</i>	
2014 – 2018 (5 years)	6% p.a.
2019 – 2021 (3 years)	5% p.a.
2022 – 2025 (4 years)	4.5% p.a.
2026 – 2029 (4 years)	4% p.a.
2030 – 2041 (12 years)	4% p.a.

Wage movements

18. The Government's civil service pay policy is to offer sufficient remuneration to attract, retain and motivate staff of suitable calibre to provide the public with an effective and efficient service; and such remuneration is to be regarded as fair by both civil servants and the public they serve by maintaining broad comparability between civil service and private sector pay.
19. *Table B.5* provides a comparison between the civil service pay adjustment under each of the three salaries bands and the nominal wage index. After netting out the cyclical ups and downs by making comparison over a long period of 15 to 30 years, it is observed that civil service pay adjustments are broadly commensurate with private sector wage rises. For the purpose of the current projections, unless other stated, **civil service pay adjustment is benchmarked against private sector wage movements.**

Table B.5 – Historical growth trends of civil service pay and nominal wage (Average annual rate of change)

Period (in fiscal year)	Civil Service Pay (a)			Nominal Wage (year _{t-1}) (b)	Difference (a) – (b)		
	Upper	Middle	Lower		Upper	Middle	Lower
1999-2013 (15 years)	1.1% p.a.	1.3% p.a.	1.3% p.a.	1.5% p.a.	-0.4 ppt.	-0.2 ppt.	-0.2 ppt.
1994-2013 (20 years)	2.8% p.a.	3.0% p.a.	3.0% p.a.	3.0% p.a.	-0.2 ppt.	0.0 ppt.	0.0 ppt.
1989-2013 (25 years)	4.5% p.a.	4.8% p.a.	4.8% p.a.	4.7% p.a.	-0.2 ppt.	0.1 ppt.	0.1 ppt.
1984-2013 (30 years)	5.1% p.a.	5.4% p.a.	5.5% p.a.	5.2% p.a.	-0.1 ppt.	0.2 ppt.	0.3 ppt.

Private sector wages (Nominal wage index)

20. With the labour market expected to remain tight in the coming several years, **the nominal wage index is assumed to increase by around 5% per annum in 2014 – 2018.**
21. As for the years beyond 2018, the assumption on the nominal wage index is made by making reference to the long-run relationships between the nominal wage index and the CCPI. As shown in *Table B.6*, over a relatively long time horizon, the movements of real wages (i.e. nominal wage netting consumer price inflation) have been steady on average, at around 1% per annum. As such, under the Base Case, nominal wages are assumed to rise on average by 4% per annum for the years beyond 2018 (*See Table B.7*), implying a real wage increase of 1% per annum on top of the 3% trend CCPI inflation assumption.

Table B.6 – Historical trend rate of increase in the nominal wage index and CCPI (Annual rate of change, in fiscal year)

Period (in fiscal year)	Nominal wage	CCPI	Real wage (Nominal wage over CCPI)
1998 – 2012 (15 years)	1.5% p.a.	0.5% p.a.	1.0% p.a.
1993 – 2012 (20 years)	3.0% p.a.	2.2% p.a.	0.8% p.a.
1988 – 2012 (25 years)	4.7% p.a.	3.7% p.a.	1.0% p.a.
1983 – 2012 (30 years)	5.2% p.a.	4.1% p.a.	1.1% p.a.

Table B.7 – Comparison of the assumptions on nominal wages and the underlying CCPI under the Base Case (Annual rate of change)

Period	Nominal wage	CCPI (Underlying)	Implied real wage (Nominal wage over CCPI)
2014	5%	3.7%	1.3%
2015 – 2018 (4 years)	5% p.a.	3.5% p.a.	1.5% p.a.
2019 – 2021 (3 years)	4% p.a.	3% p.a.	1% p.a.
2022 – 2025 (4 years)	4% p.a.	3% p.a.	1% p.a.
2026 – 2029 (4 years)	4% p.a.	3% p.a.	1% p.a.
2030 – 2041 (12 years)	4% p.a.	3% p.a.	1% p.a.
2015 – 2041 (27 years)	4.1% p.a.	3.1% p.a.	1% p.a.

