

Box 6.1**Seasonal adjustment of the unemployment rate**

The unemployment rate compiled on a moving three-month basis and released every month by the Census and Statistics Department (C&SD) is seasonally adjusted. The main purpose of seasonal adjustment is to facilitate meaningful comparison of unemployment rate figures for different periods in a year and to enhance understanding and interpretation of the underlying trend.

At present, C&SD adopts the X11-ARIMA method, which is a widely-used seasonal adjustment method, to remove the effect of seasonal variations for the unemployment rate and related series. Under the X11-ARIMA model, the original series (O) is assumed to be the product of seasonal component (S), trend-cycle component (T) and irregular component (I) (i.e. $O_t = S_t \times T_t \times I_t$ at time t). The moving average approach is used to decompose these components and derive the seasonal factors. The seasonally adjusted series is then obtained by dividing the original series by the seasonal factors.

An indirect approach is adopted to compile the seasonally adjusted unemployment rate. First, seasonally adjusted numbers of employed persons and unemployed persons are separately derived by the X-11 ARIMA method. The seasonally adjusted unemployment rate is then measured as the proportion of seasonally adjusted unemployed persons in the seasonally adjusted labour force, the latter being the sum of the seasonally adjusted employed persons and the seasonally adjusted unemployed persons. The main reason for adopting the indirect approach is to ensure that all such seasonally adjusted figures are arithmetically consistent.

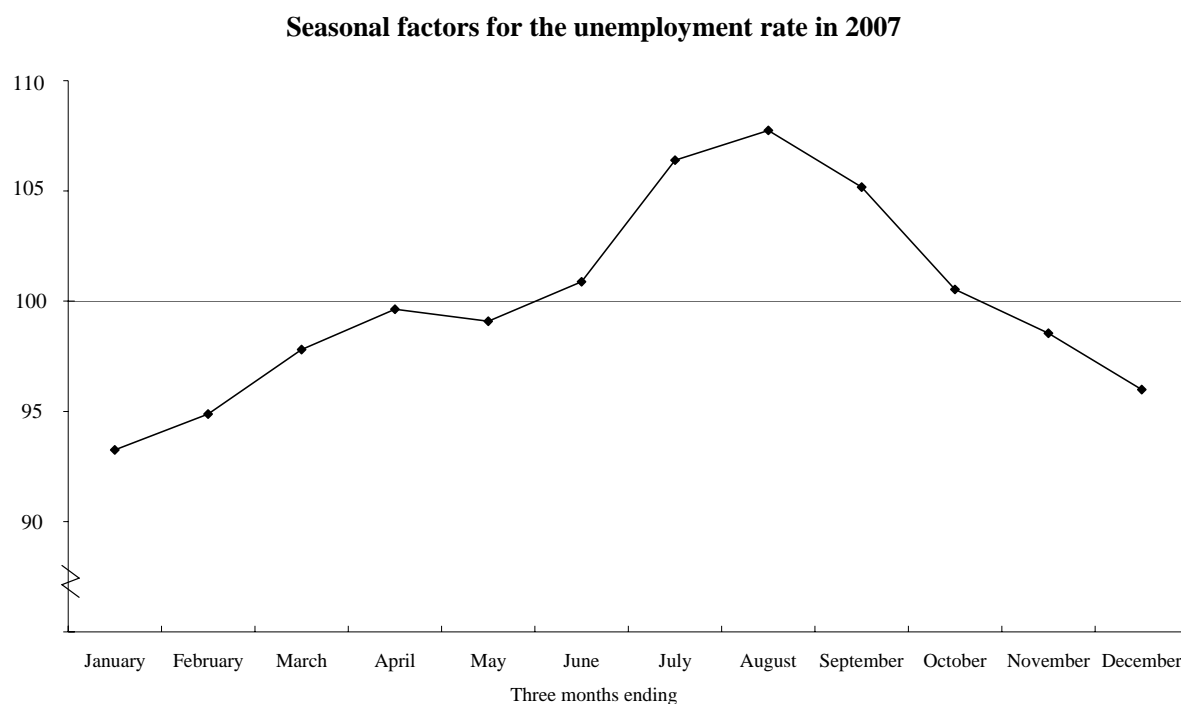
In practice, seasonal factors for a given year are first projected on the basis of past data. The length of the past data used for projections is not fixed and is determined by comparing the results using data of different lengths according to a set of statistical assessment criteria. This is to ensure that seasonal patterns of the early years that have become obsolete are no longer taken into account in the projection. For example, the seasonal factors for 2007 were projected in February 2007 based on the data for 2000-2006. These projected factors were used to calculate the seasonally adjusted numbers of employed persons and unemployed persons for different periods in 2007. The Table and Chart below show the seasonal factors so derived for 2007.

Seasonal factors⁽¹⁾ for the number of employed persons and unemployed persons and the unemployment rate in 2007

Three-month ending	Seasonal factors for the number of employed persons	Seasonal factors for the number of unemployed persons	Seasonal factors ⁽²⁾ for the unemployment rate
January	100.43	93.36	93.25
February	100.06	94.75	94.88
March	100.06	97.75	97.80
April	99.68	99.28	99.64
May	99.73	98.81	99.09
June	99.65	100.57	100.88
July	99.69	106.39	106.40
August	99.93	108.03	107.75
September	99.97	105.38	105.17
October	100.14	100.71	100.53
November	100.23	98.74	98.55
December	100.43	96.23	95.99

Notes: (1) The average seasonal factor for a year is 100. A seasonal factor above 100 means the number of employed/unemployed persons for that month is more than the average, whereas a seasonal factor below 100 means the number for that month is less than the average.

(2) Implicitly derived based on the ratio of the original unemployment rate (i.e. not seasonally adjusted) over the seasonally adjusted unemployment rate

Box 6.1 (Cont'd)

A number of salient observations follow from the seasonal factors in the above table/chart:

1. While the seasonal factors for the employment series are statistically significant, they range very narrowly between 99.6 and 100.5. The employment level is seasonally high around the Christmas and Lunar New Year holidays (with the highest seasonal factor in a year recorded in October-December or November-January) and seasonally low before the summer time (with the lowest seasonal factor in a year recorded in April-June).
2. The seasonal factors for the unemployment series have larger variations across different three-month periods, ranging from 93.4 to 108.0. Contrary to the employment series, the unemployment level is seasonally low around the Christmas and Lunar New Year holidays (with the lowest seasonal factor in a year recorded in November-January). This is mainly attributable to the strong labour demand at these festive times and the relatively low turnover of employees before the receipt of year-end double pay and bonuses. On the other hand, the unemployment level is seasonally high during the summer times (with the highest seasonal factor in a year recorded in June-August) when there are a large number of school leavers and graduates entering the labour market. Given the small variations of the seasonal factors for the employment series, the seasonal factors for the unemployment rate are very close to those for the unemployment level.