

What impact does the date of Chinese New Year have on growth in world trade?

China's foreign trade accounts for around 10% of total world trade: this is why the inclusion of Chinese foreign trade data in a global analysis framework tracking the past and future flows of goods of services between the largest economies is so important when it comes to analysing the economic outlook.

But the data issued by the *National Bureau of Statistics of China (NBS)* are not adjusted for seasonal variation, despite the fact that the series reveal certain seasonal specificities, not least in relation to the date of Chinese New Year. Chinese New Year is a very important and symbolically-charged festival in China, and a large proportion of the country's public holidays are linked to the new year. Many employees take their holidays in this period, with an impact on activity comparable to that seen in France in August. As with Easter, the date of Chinese New Year depends on the lunar calendar and thus changes from year to year. This focus article explains the new method used in *Conjoncture in France* to correct for seasonal variations in Chinese import and export data.

The "X12" seasonal adjustment method used up until the *Conjoncture in France* issue of March 2018 was called into question because it suggested a strong surge in Chinese imports in Q1 2018, an upturn inconsistent with the export figures for the major advanced economies, and in particular China's biggest suppliers (USA and Japan), for which the quarterly accounts indicated a generalised slowdown. This observation of an increase in Chinese imports in Q1 was corroborated by the Dutch CPB (Central Planning Bureau), an institution which reprocesses and summarises customs data for world trade as a whole, but the incoherency in the data remained unresolved.

The raw figures for the month-on-month development of Chinese imports over the past five years show a high degree of seasonal variation (*Figures 1 and 2*). In 2018, non-seasonally-adjusted import figures show a sharp slowdown in February (-23.1%), the month in which Chinese New Year fell this year, followed by a rebound in March (+27.7%).

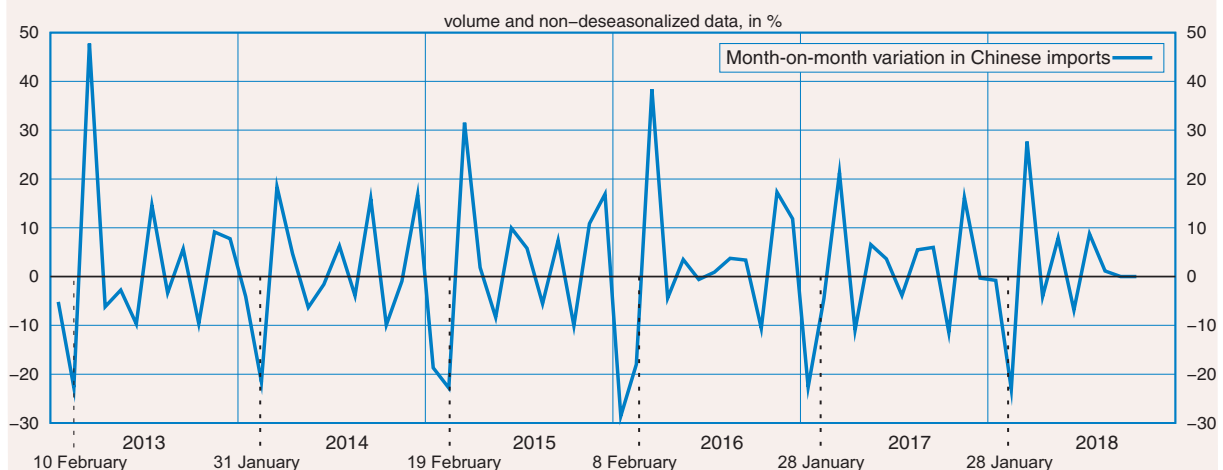
Imports have a tendency to drop off significantly in the month of Chinese New Year (January or February) then bounce back vigorously the next month. The main explanation for this phenomenon is the slowdown in investments in this period, which account for a substantial proportion of Chinese imports. But, just as the number of working days in a month or the date of Easter have economic effects which are corrected by existing methods to smooth seasonal variation, the calendar effects of Chinese New Year need to be taken into consideration when processing and analysing the data. As far as we are aware there is no standard model to correct these effects, and as such this article presents a new method for correcting seasonal variation which takes CNY into account.

Applying the standard seasonal adjustment method ("X12") to Chinese import data for early 2018 alters the estimation of these changes by transferring to January a large part of the increase observed in the raw data in March. In quarterly terms, this is reflected in a strong increase for Q1 2018 in the data seasonally adjusted using method X12 (+8.5% in the volume data).

The new seasonal adjustment method introduced here (*Method*) allows us to reconcile Chinese import data with the corresponding export data from trading partners, and also to correct for the effects of Chinese New Year. It attenuates the substantial variations observed in the raw data, which have no equivalent in the data for China's trading partners, thus bringing the series for Chinese international trade into line with the series for its trading partners (*Figures 2 and 3*). It better takes the calendar effects of Chinese New Year into account, effects with no economic origin: the consequences of monthly variations in imports and exports used to have a substantial effect on the quarterly variations, especially when the former method of seasonal adjustment erroneously transferred the downturn from the New Year month onto the preceding month.

This new method can be used to estimate the impact of the New Year date: the coefficient β_3 in front of the

1 - Clear seasonal effects linked to Chinese New Year Month-on-month variation in Chinese imports (in %) and dates of Chinese New Year



Source: National Bureau of Statistics of China (NBS), General Administration of Customs of the People's Republic of China

International developments

variable representing the proportion of public holidays linked to New Year in the month (CNY_t , see the methodological note) is -0.75 . In other words, if the whole month were to be declared a public holiday because of New Year, imports would fall by 75%. New Year actually brings with it an average of 5 holidays, i.e. approximately one-fifth of the total number of working days in the month: New Year thus causes imports to fall by around 15%, which in turn has a noticeable effect on world trade.

METHOD

The first step in this new method is a linear regression analysis of the series to be seasonally adjusted (import or export figures). The explanatory variables are the number of working days in the month (td , trading days) as well as the proportion of public holidays connected with the new year in this month (CNY , Chinese New Year). This variable is equal to 0 for all months from March to December, and is between 0 and 1 in either January or February. An indicator for the month of November 2008 has been added in order to take into account the special circumstances caused by the economic and financial crisis, an event whose ramifications extended far beyond China and saw international trade nosedive. The estimated equation is as follows:

$$Y_t = \beta_1 + \beta_2 td + \beta_3 CNY_t + \beta_4 1_{nov2008} + u_t$$

In the second phase, the residuals are seasonally adjusted using the ARIMA method and the principle of moving averages. This method is iterative: the trend is estimated first then separated from the series; we then estimate seasonal variation, fine-tuning the

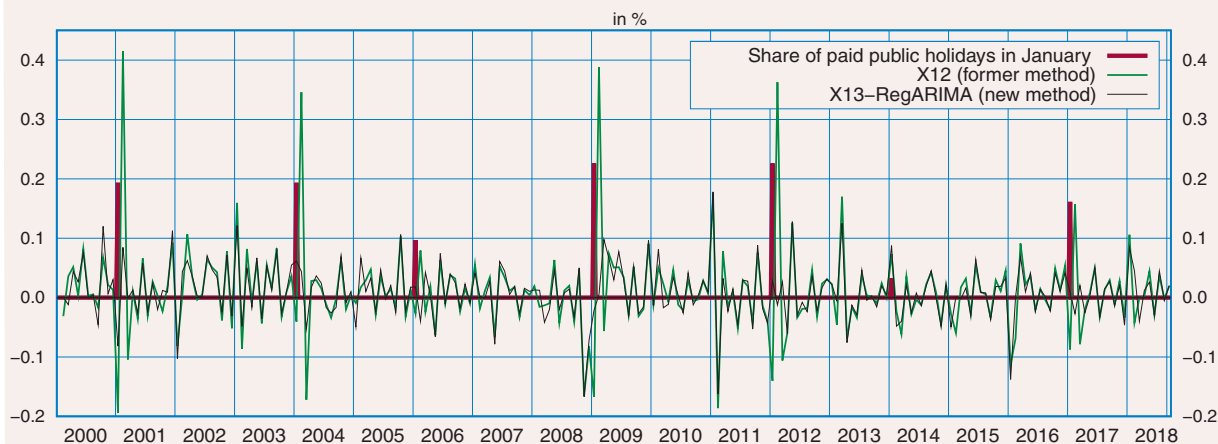
The results are consistent with the international trade figures for other countries, with the same observed economic events: for example, January 2016 saw a sharp downturn, even after seasonal adjustment, which can be explained by the worsening of the Chinese financial crisis in early January 2016 – the Shanghai stock exchange tumbled on 4 and 7 January, with significant consequences for investments, and thus imports.

Furthermore, the results are less erratic and make it easier to track trends. ■

estimated trend using the series without the estimated seasonal component, and so on. This method allows us to estimate a series independently of its seasonal component. The estimate is robust and stable: various specifications have been tested, with multiple variables in the regression stage, and with sliding windows of 10 years for the seasonal adjustment of residuals in the second stage. Seasonal adjustment and the estimation of the polynomial coefficients for sliding periods of 10 years (2000-2009, 2001-2010, etc.) yield relatively constant results which vary little when subjected to different statistical tests and criteria.

Seasonal adjustment is calculated from January 2000 and up to the most recent period for which data are available. The start date has been set as January 2000, in order to take into account the exponential acceleration of China's trading relations since the turn of the millennium, and particularly since joining the World Trade Organization (WTO) in November 2001. ■

3 - Monthly variations in Chinese imports, calculated using the old and new methods



Source : NBS , INSEE calculations

2 - Taking the dates of Chinese New Year into account improves the seasonal adjustment of Chinese import data Month-on-month variation in Chinese imports in volume terms for 2018, using different methods of seasonal adjustment améliore la désaisonnalisation des importations chinoises

| | January | February | March | April | May | June | July | August |
|--|---------|----------|-------|-------|-----|------|------|--------|
| Seasonally adjusted data | -0.8 | -23.1 | 27.7 | -4.1 | 7.9 | -6.9 | 8.7 | 1.2 |
| Seasonally adjusted data (with X12) | 25.0 | -8.2 | -0.4 | 1.4 | 4.5 | -6.0 | 6.9 | 0.0 |
| Seasonally adjusted data taking the dates of Chinese New Year into account | 8.4 | 4.5 | -4.0 | 1.2 | 2.6 | -3.0 | 4.5 | -0.5 |

Source : National Bureau of Statistics of China (NBS), General Administration of Customs of the People's Republic of China