

Box 4.1

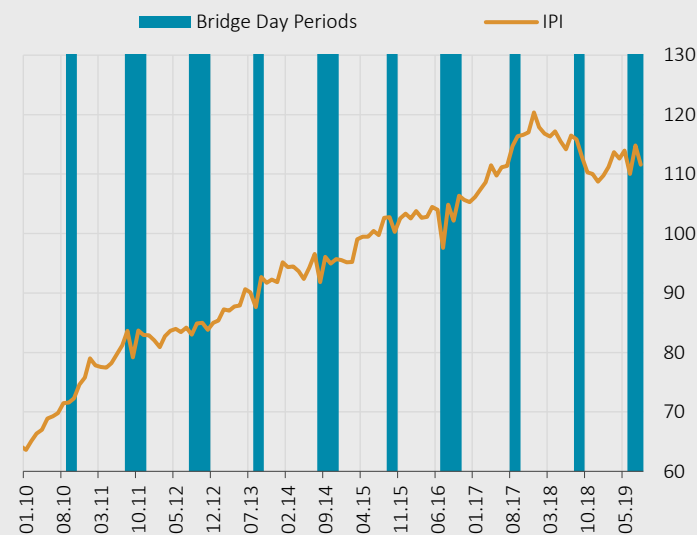
Effect of Bridge Days on Economic Activity

This box analyses the effects of additional working day losses stemming from extending official holidays that fall within a week to weekend, which is called bridge days, on the economic activity for GDP and industrial production data for the June-August 2019 period.

Yüncüler (2015) and Yüncüler (2017) found that bridge days have statistically significant effects on industrial production and GDP in Turkey, with stronger effects if the bridge days are in summer. Because bridge days are not regarded as calendar effects by standard seasonal and calendar adjustment methods, the seasonally and calendar adjusted series display a volatile course in the months (quarters) with bridge days and the following month (quarter). Therefore, when assessing the underlying trend in economic activity, technical fluctuations due to bridge day effects should also be excluded.

In June-August 2019, seasonally and calendar-adjusted industrial production followed a volatile course on a monthly basis. While production decreased by 3.5% and 2.8% in June and August, increased by 4.3% in July month-on-month. This volatility is estimated to have stemmed largely from the bridge day effect resulting from extending the holiday to the weekend in June and August. In fact, historical data show that industrial production may follow a volatile course during periods with bridge days related to religious holidays (Chart 1). In June 2019, the Ramadan Holiday was extended to 9 days with a Presidential decision, while the Sacrifice Holiday in August ended on Wednesday, August 14. In this regard, the 2.5 working days during the extended Ramadan Holiday and 3 working days after the Sacrifice Holiday can be considered as bridge days in June and August.¹

Chart 1. Industrial Production Index (Seasonally and Calendar Adjusted, 2015=100) and Bridge Day Periods



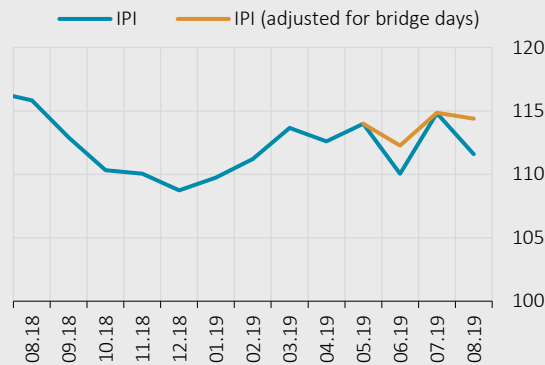
* The shaded areas show bridge day periods related to Ramadan and Sacrifice Holidays.

¹ National days, religious festivals and Sundays are not qualified as working days in Turkey. For more detailed information on the calculation of calendar variables in Turkey, see Atabek et al. (2007).

Econometric analysis² conducted to quantify the effects of working days and bridge days on industrial production reveals that one working day affects industrial production at around 2.8%. Moreover, on the bridge days during summer holiday season, it is estimated that production is approximately 30% lower than a normal working day. Thus, it is estimated that one bridge day reduces industrial production by 0.8 points. It should be noted that these coefficients are historically average values and that the actual effect may have been lower or higher than the assumed effect.

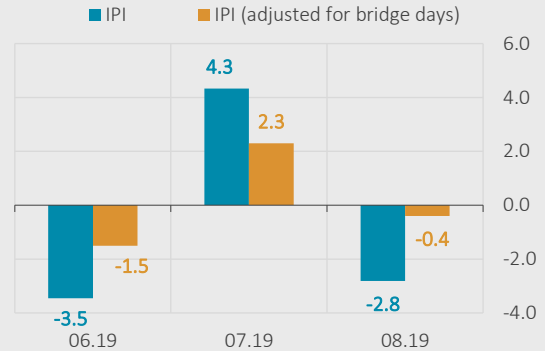
According to estimated coefficients, the decreasing effect of bridge days on the monthly changes in industrial production in June and August are estimated to have been approximately 2.0 points and 2.4 points, respectively. Therefore, the seasonally and calendar-adjusted industrial production excluding bridge day effect is less volatile and the underlying trend is more moderate than the published values (Charts 2 and 4). As a matter of fact, quarterly changes of the series excluding bridge day effect in the second quarter and in the third quarter as of August are higher than the quarterly changes of the published series (Charts 3 and 5). It should be noted that the partial volatility observed in industrial production after excluding the bridge day effect was largely due to the volatile course of the manufacture of other transport equipment

Chart 2: Industrial Production Index (Seasonally and Calendar Adjusted, 2015=100)



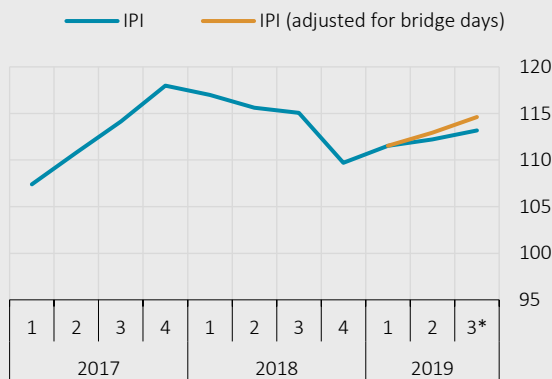
Source: CBRT, TURKSTAT.

Chart 3: Industrial Production Index (Seasonally and Calendar Adjusted, Monthly % Change)



Source: CBRT, TURKSTAT.

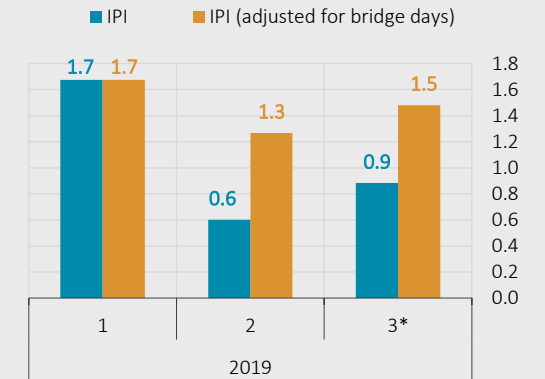
Chart 4: Industrial Production Index (Seasonally and Calendar Adjusted)



Source: CBRT, TURKSTAT.

* As of August.

Chart 5: Industrial Production Index (Seasonally and Calendar Adjusted, Quarterly % Change)



Source: CBRT, TURKSTAT.

* As of August.

² The econometric analysis is based on the methodology of Yüncüler (2015). The regressions are estimated for the period January 1997-December 2018.

Bridge days also affect the GDP. According to Yüncüler (2017), one additional working day affects GDP by 0.4 points. Assuming that the loss of value added on bridge days is similar to that of industrial production compared to a normal working day, the impact of one bridge day on GDP is calculated as approximately 0.13 points. Therefore, the bridge day effect is estimated approximately 0.3 points in the second quarter and 0.4 points in the third quarter. Accordingly, adjusted for the bridge day effect, the quarterly change of GDP is stronger than the published rate, around 1.5 %, which is almost at the same level as the first quarter.

In light of these bridge day effects, in September, industrial production may post a strong increase due to the base effect of bridge days. On the GDP side, the bridge day effect is expected to restrain economic activity in the third quarter and create a positive base effect on seasonally and calendar-adjusted GDP in the fourth quarter. Against this background, it is important to consider bridge day-adjusted values while evaluating the underlying trend in industrial production in September and GDP in the second half.

References

Atabek, A., Atuk, O., Coşar, E. E. and Sarıkaya, Ç. (2009), Working Day Variable in Seasonal Models (in Turkish), CBRT Research Notes in Economics, No: 09/03.

Yüncüler, Ç. (2015), Estimating the Bridging Day Effect on Turkish Industrial Production, CBRT Research Notes in Economics, No: 15/15.

Yüncüler, Ç. (2017), To What Extent Do Working Days Affect Growth? CBRT Blog, http://tcmbblog.org/wps/wcm/connect/blog/en/main+menu/analyses/to_what_extent_do_working_days_affect_growth