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Euro changeover and inflation in Croatia

Croatia joined the euro area on 1 January 2023. It is the 20th EU Member State using the single European currency, the euro.

This note assesses the euro changeover impact on inflation in Croatia from January to March 2023, as estimated by Eurostat based on the Harmonised Indices of Consumer Prices (HICP).

Eurostat estimates that the month-on-month rate of change of the Croatian all-items HICP would have likely been between 0.04 and 0.18 percentage points (pp) lower in January 2023 had the euro changeover not taken place (see Table 1). Thus, rather than 0.25%, the monthly rate in January would have likely been between 0.08% and 0.22% without the changeover. This estimated effect on the monthly inflation rate for January 2023 appears to be the total (one-off) euro changeover impact during and immediately after the introduction of the euro, as in February and March the impacts were statistically not significant.

For the annual rate of change of the Croatian all-items HICP, the euro changeover impact is estimated to range between 0.04 and 0.20 percentage points in January, February, and March 2023, respectively. Consequently, if the euro changeover had not taken place, the annual rate of change would have likely been lower than the observed one in the three months.

As in the cases of the euro changeover of other countries ⁽¹⁾, Eurostat considers that the euro changeover effects in Croatia have been perceivable for some products in some months but were not of a magnitude that could drive headline inflation.

Table 1: Euro changeover impact on monthly all-items inflation rates

Month	Observed monthly rate, %	Expected monthly rate range (*), %	Euro changeover impact (*), pp	Significance
Jan-23	0.25	[0.08 , 0.22]	[0.04 , 0.18]	Significant
Feb-23	0.28	[0.28 , 0.28]	[0.00 , 0.00]	Non-significant
Mar-23	0.86	[0.86 , 0.86]	[0.00 , 0.00]	Non-significant

(*) See overleaf how the expected monthly rate and the impact were calculated.

⁽¹⁾ First-wave changeover in 2002, of Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009, Estonia in 2011, Latvia in 2014, and Lithuania in 2015. The reports can be found at [Information on data - Harmonised Indices of Consumer Prices \(HICP\) - Eurostat \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1).

ESTIMATING THE IMPACT OF THE EURO CHANGEOVER

It is not possible to precisely estimate the inflation level if the euro changeover in Croatia had not taken place, since isolating the effect from the realised inflation is not a straightforward exercise. Several causes for price changes are interacting and some can overlap with genuine euro changeover effects; some changeover effect factors may amplify each other or cancel each other out. However, it is possible to determine if there is empirical evidence for a price level change that could not be plausibly attributed to any other factor than the euro changeover.

Eurostat estimated the euro changeover impact by producing, for each of the first three months after the introduction of the euro, a forecast using past HICP data and other relevant auxiliary information of the Croatian HICP sub-indices. In comparison to prior euro changeover analyses, the present one benefited from more detailed sub-indices down to the 5-digit COICOP level. However, the forecast analysis was also complicated by strong impacts on consumer prices in recent years due to the COVID-19 pandemic and the overall strong price increases.

The forecasting model produced an 'expected price development' for each HICP sub-index as a range, which was compared to the results from the observed indices. If the observed monthly rate of change fell inside the prediction interval, then the price change was considered to have been as expected. Sub-indices whose price changes fell outside the range were listed for further investigation to find out what could have caused higher than predicted price changes.

The list of sub-indices with unusual price changes was presented and analysed in a meeting between Eurostat and the Croatian Bureau of Statistics (CBS) in September 2023. Experts from CBS provided information on the identified sub-indices and provided possible reasons for the price changes.

For some sub-indices on that list, a plausible explanation – other than euro changeover – for the higher-than-expected price changes could be identified. The remaining sub-indices were attributed to a likely euro changeover impact. The final list of concerned sub-indices included 12 ECOICOPs at the 4- and 5-digit level, all services, in particular 'COICOP11111 – Restaurant, cafés and dancing establishments', 'COICOP12112 – Hairdressing for women', 'COICOP09412 – Recreational and sporting services - Participation', 'COICOP1112 – Canteens', and 'COICOP09421 – Cinemas, theatres, concerts'. For each of these sub-indices, experts from CBS derived the share of price changes that were likely impacted by the euro changeover.

The total euro changeover impact on the all-items HICP of Croatia was calculated as the difference between the observed rate and the minimum and maximum expected monthly rates, which are the boundaries of the range (see column 4 of Table 1). The expected monthly rate range for the all-items HICP was derived using observed values for all sub-indices except for those that were identified having a likely euro impact; in the case of the

latter a weighted average of the forecast and published index was used instead, where the weights were defined by the shares of price changes that were likely impacted by the euro changeover. As these shares were found to be relatively low in February and March 2023, the expected monthly change rates nearly coincide in these months with the published ones.

When the range of the differences between the observed rate and the expected rates did not contain zero the impact is considered statistically significant; as Table 1 shows this is the case only for January.

Eurostat's assessment is that in Croatia the total (one-off) impact of the changeover on monthly consumer price inflation is likely to be between 0.04 and 0.18 percentage points in January 2023. Non-significant differences between the actual and the expected monthly rates were observed in the two following months. The expected index, monthly change rates and annual change rates, respectively, are shown in Graph 1.

Graph 1: Observed versus expected all-items HICP for Croatia

