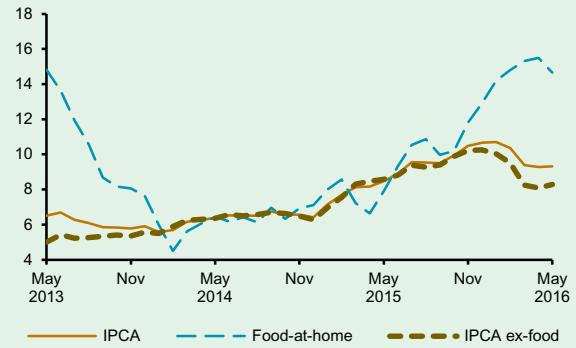
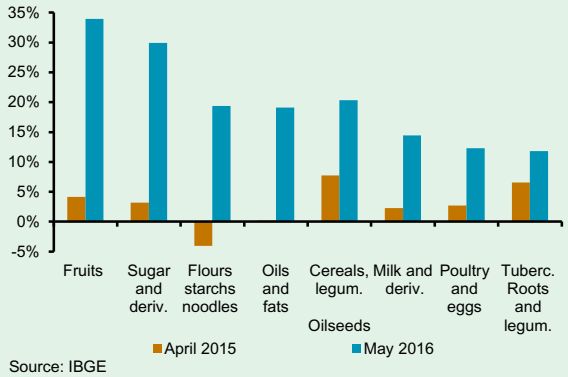
Recent trajectory of food inflation

Figure 1 – IPCA and food-at-home
% in 12 months



Source: IBGE and BCB

Figure 2 – Components of food inflation
% in 12 months



Source: IBGE

The trajectory of prices of the food-at-home subgroup sharply accelerated in recent periods, with relevant impact on the Extended National Consumer Price Index (IPCA). Among the factors that determined this movement, it is noteworthy the exchange rate depreciation and the *El Niño*[1] climate event, which impacted, directly or indirectly in 2015 and in the first months of 2016, the supply of most food products consumed by families. In this context, considering the importance of the food-at-home subgroup for the IPCA[2] reference basket, this table analyzes the main determinants for the recent trajectory of food prices and the implications of this adverse context on the domestic inflationary dynamics.

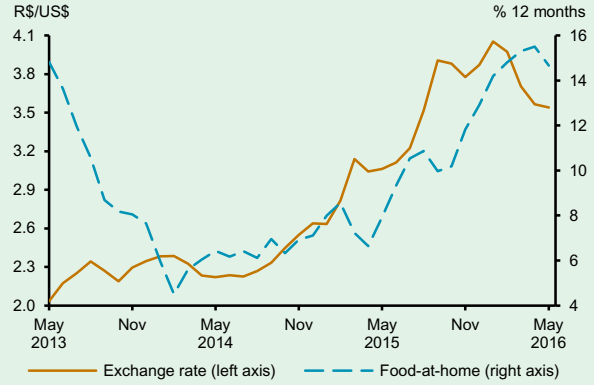
The current cycle of acceleration in food prices began in the second quarter of 2015, when the 12-month rate rose from 6.64%, in April, to 9.33%, in June, peaked in April 2016 (15.50%), and showed signs of slowdown in May (14.66%), according to Figure 1. This movement was significantly influenced by price variations of the items: fruits; sugars and derivatives; flours, starches, and noddles; oils and fats; cereals, legumes, and oilseeds; milks and derivatives; and poultry and eggs (Figure 2).

The influence of the acceleration of food prices on inflation is illustrated by the comparison between the IPCA and a core measure – the IPCA except food-at-home (Figure 1). In this sense, an important detachment occurs between these two indicators from December 2015 to May 2016, period over which the 12-month variation of the IPCA ex-food decreases by 1.9 p.p. and the 12-month variation of the headline IPCA decreases by 1.2 p.p., reflecting a 2.8 p.p. acceleration of food inflation in the period.

1/ In addition to these factors, increases of taxes relative to some products and reduction in the area of some crops have also contributed to the rise of food prices, although with less intensity.

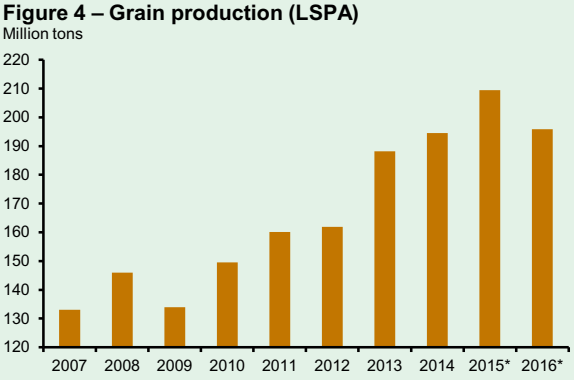
2/ In May 2016, the weight of the food-at-home subgroup was 17.08%.

Figure 3 – Exchange rate vs. food



Source: IBGE and BCB

Figure 4 – Grain production (LSPA)



*Estimate.

Source: IBGE

The recent trajectory of food prices was influenced by the exchange rate depreciation, with a monthly average of R$4.05/US$ in January 2016 over R$2.63/US$ in January 2015 (Figure 3). Exchange rate depreciation tends to impact food prices in the IPCA both directly, as in the case of tradable items, and indirectly, through the rise in the cost of inputs, such as agricultural raw materials, fertilizers, and pesticides.

Additionally, the recent trajectory of food prices was affected by the climatic phenomenon *El Nino*, which altered the rainfall in major agricultural regions, impacting the sector's supply[3]. The estimated reduction of 6.5% for the Brazilian harvest of grains in 2016[4], whose sowing began in the third quarter of 2015, illustrates the magnitude of the effects of adverse weather conditions on the crop output (Figure 4).

To assess the effects from the exchange rate depreciation and the *El Niño* on food inflation, the following equation was estimated:

$$\pi_t^{AD} = \sum_{i=0}^{1} \emptyset_i \, \Delta\epsilon_{t-i} + \sum_{i=0}^{1} \beta_i \, \Delta IC_{t-i}^{agro} + \delta \, nino_{t-1} + \gamma h_t + \sum_{i=1}^{4} \alpha_i T_i + \varepsilon_t$$

in which:

π_t^{AD} is the inflation of the IPCA food-at-home subgroup;

$\Delta\epsilon_t$ is the variation of the nominal exchange rate;

ΔIC_t^{agro} is the variation of the agricultural commodities segment of the Commodities Index – Brazil (IC-Br) (measured in dollars);

$nino_t$ is a dummy variable for the occurrence of *El Niño*[5];

h_t is the output gap;

3/ For further details concerning the inflationary impacts caused by the El Niño, see the box "El Niño, Rains, and Major Inflationary Impacts" in the December 2015 Inflation Report.

4/ According to the Systematic Survey of Agricultural Production (LSPA) of May.

5/ A dummy variable for occurrence of the phenomenon La Niña was included as a test, whose coefficient was not statistically significant for the specification. The effects from La Niña on food inflation in Brazil showed statistically significance only when the agricultural segment of the IC-Br was removed from the equation, which suggests that the impacts from the climatic event on the Brazilian inflation are predominantly indirect, via increase of international prices of agricultural commodities.

T_i are seasonal dummies; and

ε_t is an error term.

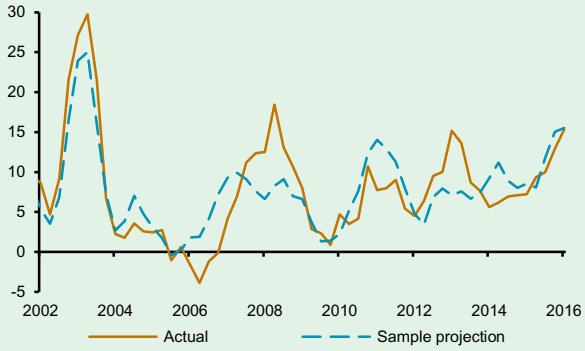
The equation was estimated with quarterly data, covering the period from the first quarter of 2000 to the first quarter of 2016, through the method of Ordinary Least Squares (OLS)[6].

Figure 5 shows that the equation presents a satisfactory adherence, since the projection inside the sample captures most of the inflationary cycles of the food-at-home subgroup in the period of estimation. In particular, the estimated coefficients were capable of projecting an acceleration of food inflation quite similar to the food inflation observed in 2015/2016.

Additionally, the result of the estimate allows for testing, by means of a counterfactual exercise, if the recent acceleration of food inflation reflects, in fact, the effects from the exchange rate depreciation and from the *El Niño* phenomenon. Figure 6 shows the comparison between the original projection of the model with estimates obtained through alternative hypotheses for exchange rate, *El Niño*, and Gross Domestic Product (GDP) gap.

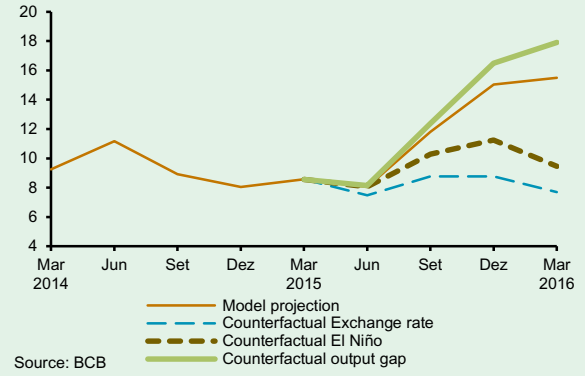
According to the results obtained, food inflation for the first quarter of 2016 would be lower if the exchange rate had remained at the average level of the first quarter of 2015 and/or if the *El Niño* event had not occurred. On the other hand, if the output gap, rather than negative, were null from the second quarter of 2015, food inflation would have been higher.

Figure 5 – IPCA – Food-at-home
% in 4 quarters



Source: IBGE and BCB

Figure 6 – Counterfactual exercise
% in 4 quarters



Source: BCB

6/ The estimated coefficients were statistically significant at the 10% level and residual analysis indicate no presence of serial autocorrelation.