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INFLATION GAP BETWEEN POOR AND RICH CONTINUES

Seyfettin Gürsel[*], Furkan Kavuncu[**]

Executive Summary

TurkStat's inflation consumption index (CPI) reflects in fact the changes in the value of the representative household's consumption basket based on market prices. However, inflation faced by households which belong to different income and expenditure groups may differ since the composition of their consumption basket differs widely comparing to the basket of the representative household. In this research brief, different price indices are calculated for each income quintile from the poorest to richest by using consumption data from the Household Budget Surveys (HBS) released by TurkStat for the period December 2003 – May 2017. In our previous brief we had claimed that poorer households faced higher inflation rates than richer ones between 2008 and 2016. When we look at the period of May 2017, we observed a slight increase in the inflation difference between rich and poor; however, with a slower pace compared to our previous research brief. The difference, which was 21.4 percentage points in April 2016, showed a fluctuating trend during the year and finally increased by 0.1 percentage points to 21.5 percent in May 2017. Even though we expected a strong increase in inflation difference to the detriment of the poor due to the strong increase in housing and food prices as of January 2017, the widening of the inflation gap has been limited to 0.1 percentage points because of the increase in transportation prices which has much larger share in the consumption basket of rich.

Different inflation for different expenditure groups

Divergence in inflation rates across different expenditure groups may be driven by both different consumption patterns and different changes in relative prices. Consumption patterns are clearly related to income levels. However, out of necessity, Turkish Statistical Institute (TurkStat) calculates the inflation faced by a representative household for the Consumer Price Index according shares of goods and services in the consumption basket of this representative household. Consequently, CPI captures the inflation of the representative household. On the other hand, price increases in each good and service differ considerably over time depending on their relative demands and production costs. Hence, inflation varies across households according to their income levels that by far the main determinant of the consumption basket composition.

Starting from mid-2007, energy and food price shocks have changed the relative price structures.[1]. Inevitably, there have been reflections of these shocks on the relative price structure in Turkey. By the period of 2014, food inflation, which showed a high increase, also exceeded housing inflation.

[*]Prof. Dr. Seyfettin Gürsel, **Betam**, Director, seyfettin.gursel@eas.bau.edu.tr
[**] Furkan Kavuncu, **Betam**, Intern, furkankavuncu123@gmail.com
[1]Box 2 presents detailed information regarding the effects of good and energy price shock on basic consumption products in Turkey.

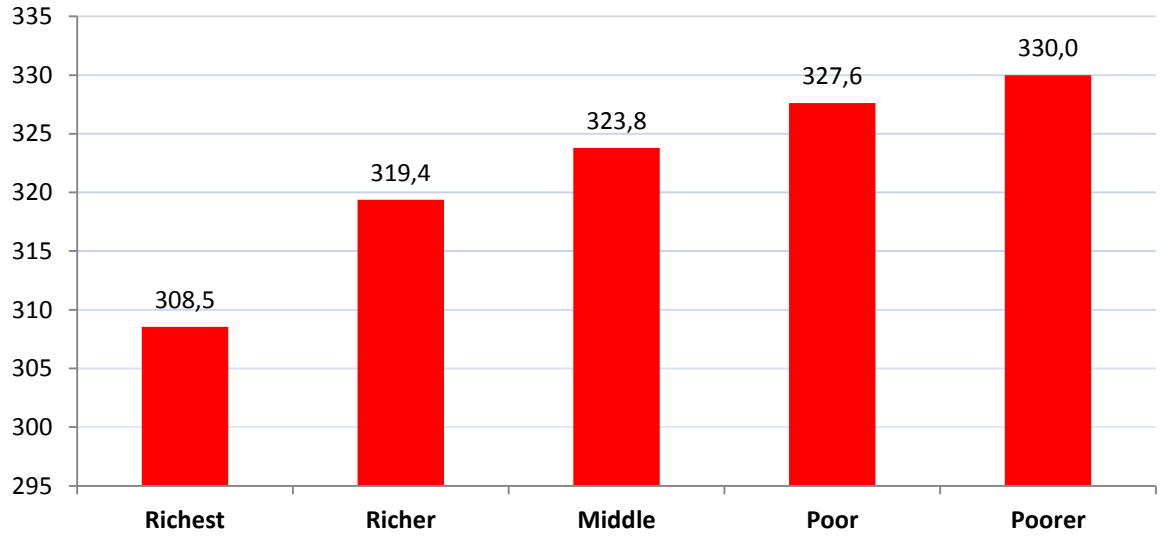
This situation did not increase the inflation gap between poor and rich as expected because of the changes in the inflation rate of the other components.

Betam is following inflation rates for different income groups periodically. We published the latest research brief on this issue on the 4th of May 2016. In this research brief, we calculate inflation rates by different quintiles for the period December 2003 to May 2017[2].

As households become poor, the inflation increases

Figure 1 presents price indices for each quintile calculated by using the prices index of main component of consumption baskets and their weights for different expenditure quintiles from December 2003 to May 2017. Our findings point out that price index increases significantly while moving from rich households to poor households. According to the data of May 2017, inflation index of the richest attained 308.5 whilst the inflation of the poorest reached to 330. In other words, the purchasing cost of rich household's consumption basket increased by 208.5 percent whereas the poor's rose by 230 percent since 2003. The inflation difference between rich and poor, which has started to arise since 2007, is 21.5 percentage points. Since the poor and middle expenditure groups' inflation rates are closer to the poorest (Figure 1), it is obvious that lowest expenditure group suffers more from the erosion of purchasing power caused by inflation.

Figure 1: Price indices by different expenditure groups (2003=100)



Source: TurkStat, Betam

We have already mentioned that the inflation difference between rich and poor is caused by the diverse composition of their consumption baskets. While poor households are more likely to spend much higher proportion of their income on basic needs like food and housing, these items constitute a smaller proportion of household income of the rich. On the other hand, households in the richest 20% are more likely to spend more on transportation, clothing and footwear, entertainment and culture, education, furniture. According to 2015 Household Budget Survey, the proportion of food and housing are measured as 31.7 and 39.1 percent respectively in poorest quintile's budget while it

[2]Methodology for the calculation of inflation by different expenditure groups is presented in Box 3.

remains at 14 and 20.4 percent respectively in richest quintile's budget. Hence, higher inflation of expenditures on basic needs has larger effects on poor's inflation.

Housing and food inflation are against the poor while transportation inflation is against the rich

Expenditures on 12 basic goods and services items provided by TurkStat may be examined in order to understand the causes of the inflation gap between the rich and the poor. One can decompose the inflation difference by using weights of goods and services in consumption baskets and their specific price indices. Figure 2 and **Error! Reference source not found.** provide the contribution of item category to the total difference of 21.5 percentage points between rich and poor[3].

By May 2017, housing, water, electricity and natural gas component contributed 126.5 and 61.9 points to poor's inflation and rich's inflation respectively. This component constitutes 39.1 percent of poor's budget while its proportion in rich's budget is 20.4 percent. Also, this component creates 64.6 points difference against poorest households[4]. Food and non-alcoholic beverages contributed 108.3 point to poor's price index while its contribution to rich remained at 44.7 points. Once again, the difference between rich and poor in this component is against poor households by 63.6 points.

On the other hand, transportation component which has 26.5 and 5.3 percent shares in rich's and poor's budget respectively, contributes unfavorably 61.1 points to rich's inflation. This negative contribution narrowed the inflation gap between poor and rich. Since the share of alcoholic beverages and tobacco expenditure in poor's budget is relatively high compared to the rich, the inflation of this expenditure group is against the poor. This result does not imply that the poor spend more on alcohol and tobacco as incomes of poor are much lower than incomes of rich. It is worth noting that since the price increase in alcohol and tobacco mainly stemmed from the tax increases, it has a relatively more negative effect on the poor than on the rich.

[3]See Box 3 for details of decomposition

[4]Given that the rich and the poor do not consume the same food items, the food inflation will also differ by income levels. However, we think that this inflation difference is more likely to work against the poor. Global food price shock in 2007 had larger effects on basic food items. Needless to say, basic food items constitute a higher proportion in the bundle of the poor compared to the rich. On the other hand, we also expect the rich to consume organic products more and hence would be affected more by their price increases. However, we do not have price data on these products.

Figure 2: Decomposition of inflation difference* (January 2003-May 2017)

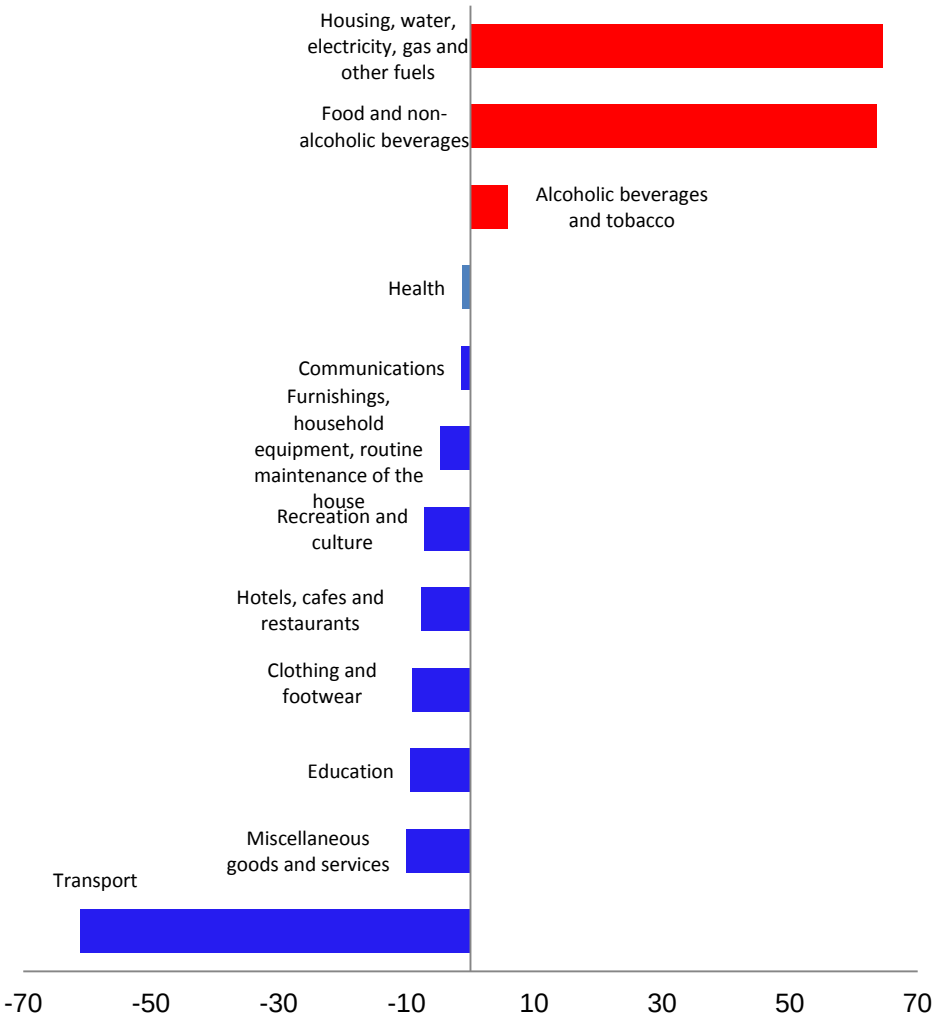
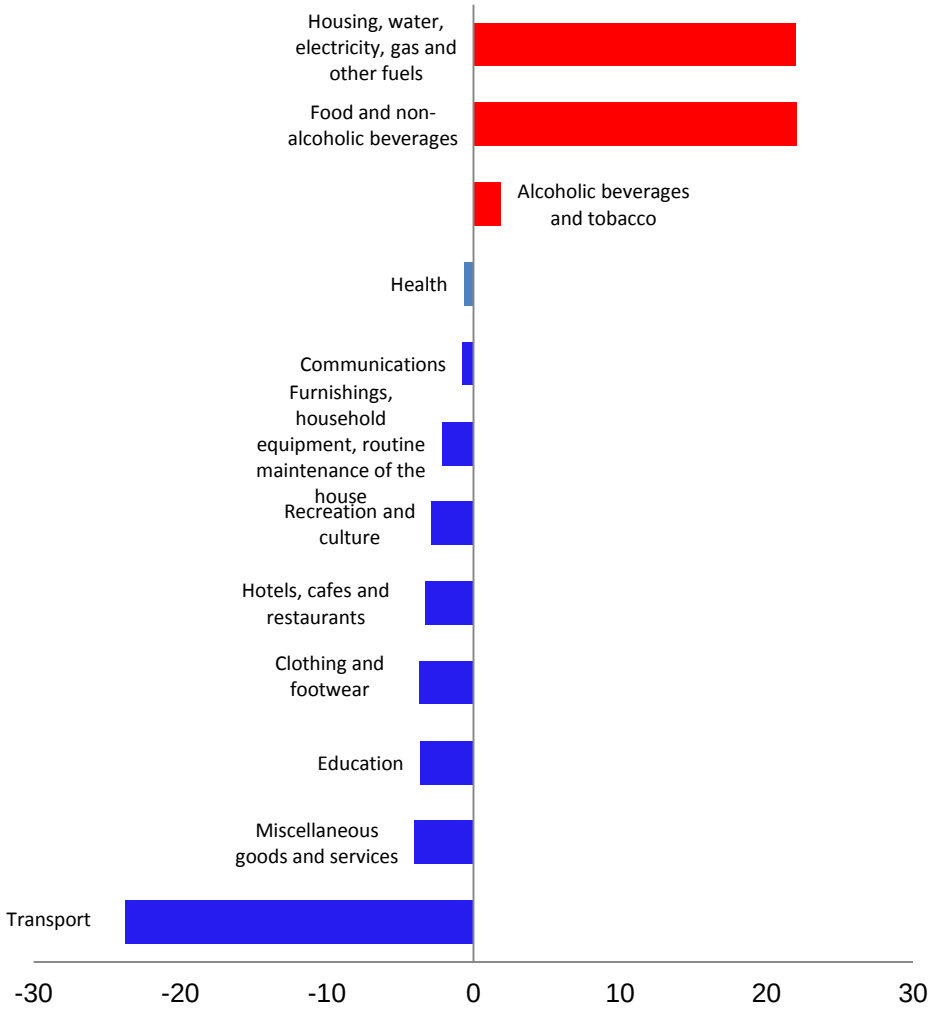


Figure 3: Decomposition of inflation difference* (April 2016-May 2017)



Source: Turkstat, Betam

* While red bars show that contributions of expenditure groups working against the poor in the total inflation difference, blue bars show those working against the rich

Despite the food inflation, which has been on a massive climb since January 2017, the difference remains at the same level due to the price increases in the components that negatively contribute to rich's inflation. Figure 3 shows the inflation difference between poor and rich in expenditures of 12 basic goods and services determined by TurkStat since our last brief (April 2016). On the basis of April 2016 prices, transportation created 23.8 points difference against the richest households, within one year. With this, transportation increased its reduction effect on the difference between poor and rich by exceeding 22 points of differences created by both housing and food separately. It is possible to state that, this is the effect of the simultaneous increase in oil prices and USD/TL exchange rate since December 2016 (Additional Figure 1). On the other hand, we observe that almost all of the other components that make a difference against the richest households increased their reducing effect on the inflation difference between rich and poor. The difference between two expenditure groups remaining at a certain level can be explained by the cumulative contribution of these items to the rich's inflation.

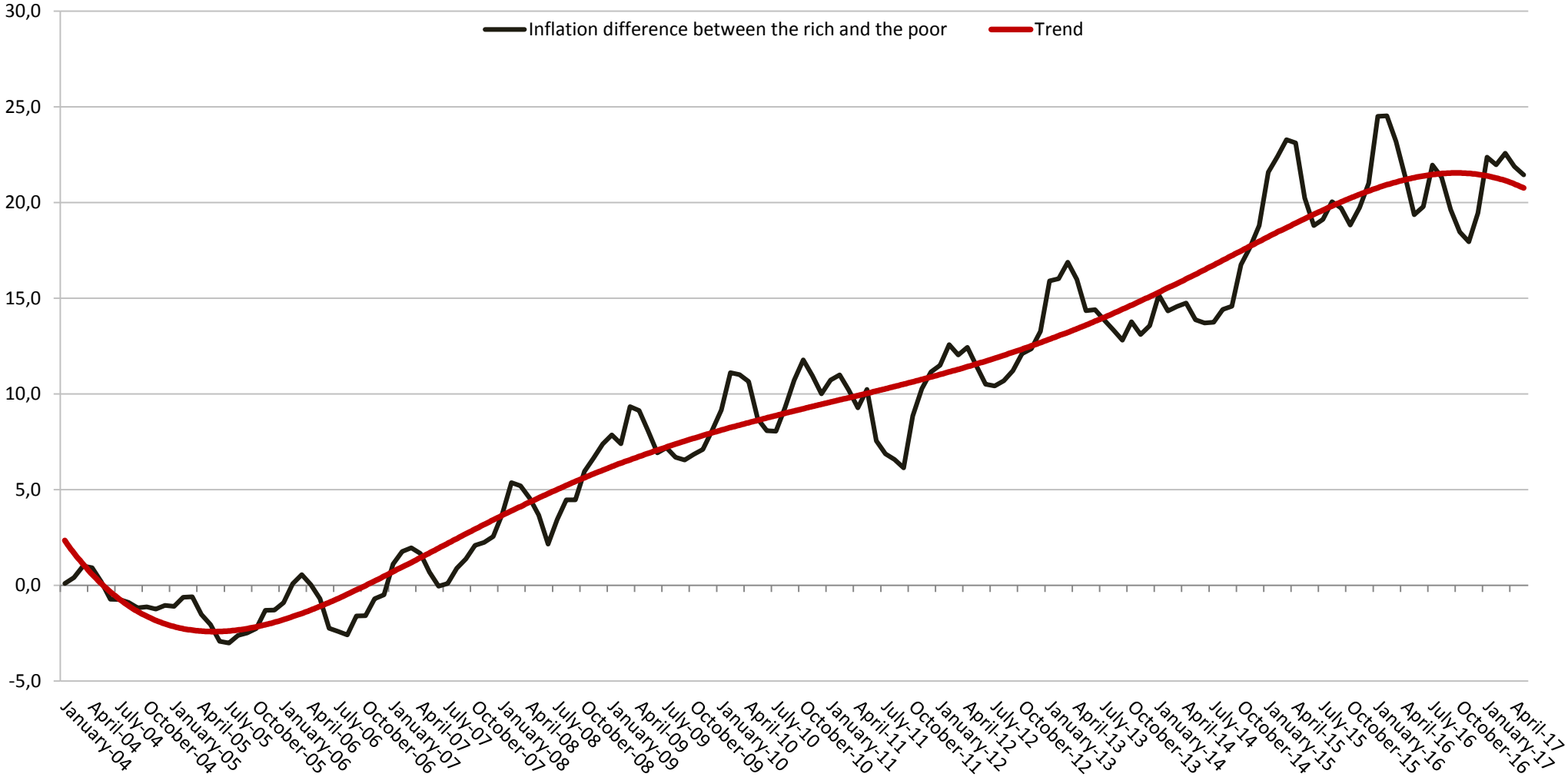
Long term evolution of the inflation difference between poor and rich

As discussed above, while inflation of the poor is more likely to rise with price increases in basic needs (food, housing, energy), inflation of the rich is more likely to rise with luxury consumption items (transport, clothing and foot wear, education). One cannot ignore the detrimental effects of the global price increases in food and energy, starting in the second quarter of 2007, on the inflation difference between rich and poor. The time trend of the inflation gap confirms this fact. Figure 4Figure 4 shows the change in inflation rate over time between the poorest and the richest quintiles.

As observed, the inflation difference between rich and poor stays relatively small from 2003 to 2006 and is in favor of the lowest income quintile for almost two years. However, the inflation difference grew consistently since the third quarter of 2005 and it was against the poor. During the 2009 crisis, the increase in inflation difference remained stagnant and even decreased due to declining food and energy prices. However, the inflation difference started to raise again due to increase in food and especially energy prices. Inflation gap became 11 points in May 2012 and then rose up to 18.1 points in December 2014 due to the significant increase in food prices.

This difference continued to fluctuate because of the increase in food and decline in domestic energy prices in 2015 and reached 25 points at the end of May 2015 (Figure 3). Due to the decrease in food prices in beginning of 2016, inflation difference between rich and poor declined to 21.4 points as of April 2016. As of November 2016, the inflation difference between the rich and the poor declined until 17.9 points due the price increase in transportation and other components which negatively contribute to rich's inflation. However, food prices have begun to reincrease since January 2017. As a result, the balancing effect of the increase in transportation prices kept the difference at a certain level (21.5 percent).

Figure 4: Inflation difference between the richest quintile and the poorest quintile



Source: TurkStat, Betam

Additional Table 1: Decomposition of inflation difference between rich and poor

	Contribution to Poor Household's Inflation	Contribution to Rich Household's Inflation	Contribution to Inflation Difference
(01) Food and non-alcoholic beverages	108,3	44,7	63,6
(02) Alcoholic beverages and tobacco	14,7	8,9	5,8
(03) Clothing and footwear	8,8	17,9	-9,1
(04) Housing, water, electricity, gas and other fuels	126,5	61,9	64,6
(05) Furnishings, Household Equipment, Routine Maintenance of the House	14,4	19,2	-4,8
(06) Health	5,7	7,1	-1,4
(07) Transport	17,5	78,6	-61,1
(08) Communication	8,8	10,3	-1,5
(09) Recreation and Culture	4,5	11,7	-7,2
(10) Education	1,1	10,6	-9,5
(11) Hotels, Cafes and Restaurants	12,6	20,4	-7,8
(12)Miscellaneous Goods and Services	7,0	17,1	-10,1
Total	**330,0**	**308,5**	**21,5**

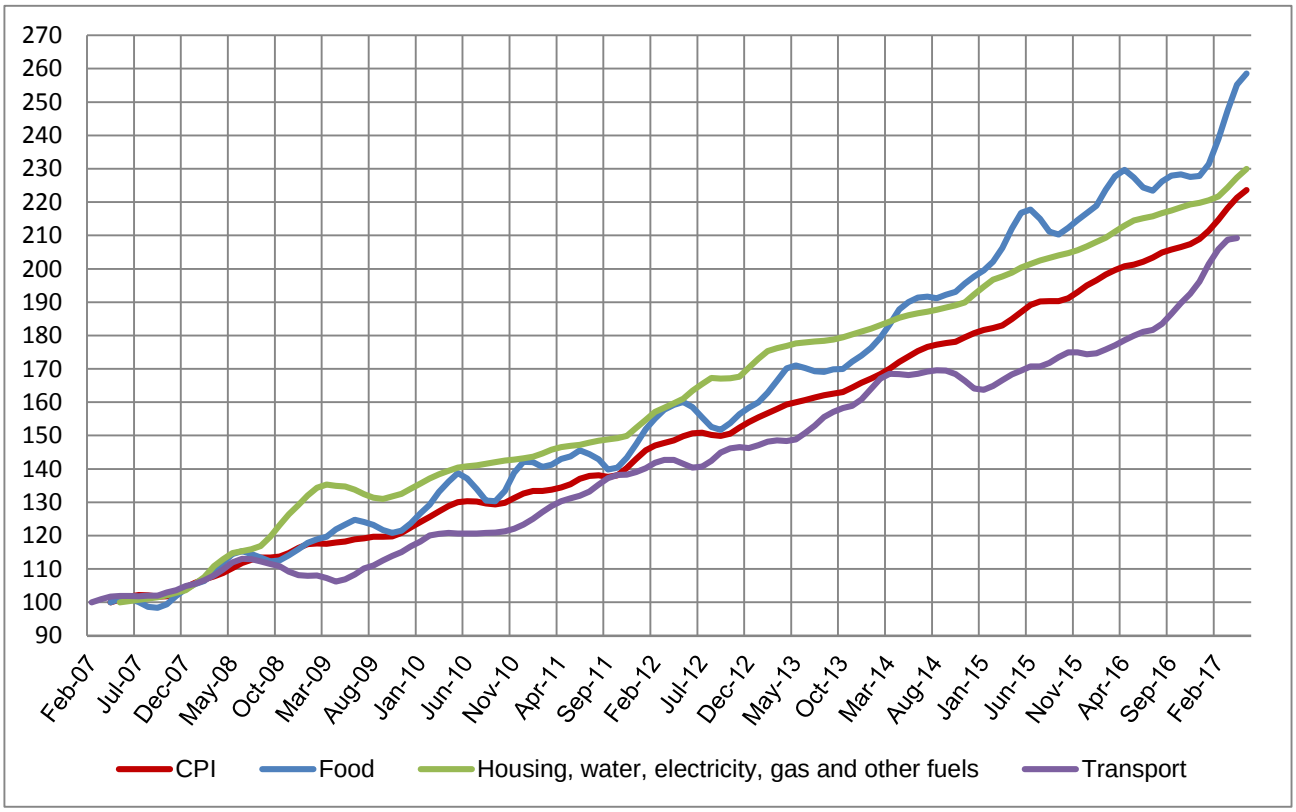
Source: TurkStat, Betam

Box 1 : The evolution of food and energy prices

The inflation gap between rich and poor is largely determined by the differences in price changes of expenditure components such as "food and non-alcoholic beverages", "housing, water, electricity and other fuels" and "transportation". The first two of these three expenditure items have the largest weight in the average consumption basket of the lowest income quintile, while transport has the largest weight in the average consumption basket of the highest income quintile. Since the prices of "housing" and "transportation" are determined by energy prices to a great extent, the difference between rich and poor inflation is somewhat mutually compensated. The relative increase in energy prices raises the inflation of the poor via housing spending and the rich inflation via transportation. In this case, the increase in the prices of "food" more rapidly than that of CPI is seen as the most important determinant of the inflation gap between poor and rich.

The evolution of the price indices of these three expenditure components from January 2007 to May 2017 is shown below. Divergence from CPI started in 2008, while the housing and food indices surpassed CPI, transport index fell below CPI until today. However, it is observed that developments clarifying the inflation difference between rich and poor have emerged roughly since 2014. From this date, there is a significant acceleration in food price growth. On the other hand, the strong decline in energy prices in the same period kept the transportation price index below CPI and these developments increased the inflation gap to 22 percentage points in 2016. Since 2017, we observe a stagnation in inflation difference between the rich and the poor due to the reincrease in energy and the accelaration in transportation prices.

CPI and price indices of the three main expenditure components (food, housing, transportation) (2007=100, 3 month moving average)



Source: Turkstat, Betam

We follow TurkStat's methodology in calculating the price indices for different expenditure groups. Choosing 2003 as the base year (2003=100) and weighting indices of sub-groups by expenditure quintiles, we find a price index for each group. We used weights of expenditure groups released by TurkStat for years between 2003 and 2015. However, we used weights of 2015 for the last 16 months since weights of 2016 have not been released yet. We would like to remind that using weights pertaining to 2015 will lead to only marginal bias since the weights of good and services in the consumption basket barely change over time.

We used Laspeyres formula in order to calculate price indices and we designed this formula separately for the poorest and richest expenditure groups which is presented below:

Inflation of the poorest expenditure group	Inflation of the richest expenditure group
$E_t / E_{December(t-1)} = \sum_{i=1}^{12} E_{it} / E_{i\ December\ (t-1)} \times \alpha_{it}$	$E_t / E_{December(t-1)} = \sum_{i=1}^{12} E_{it} / E_{i\ December\ (t-1)} \times \beta_{it}$

E_t: Index at time t
$E_{December(t-1)}$: Index at December (t-1)
E_{it}: : Indices for each item. For example i=01, denotes index of food and non-alcoholic beverages

α_{it}: Subgroup weights of poorest quintile's budget at time t
β_{it}: Subgroup weights of richest quintile's budget at time t

These weights specific to 2015 are shown in the table below. For instance, the calculation of CPI May 2017 for both poor and rich households by using CPI December 2016 is as following:

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Inflation according to expenditure groups**
2016 December	319,35	574,89	198,34	327,01	229,43	174,67	276,27	132,90	205,86	293,62	432,87	349,12	
2017 May	351,53	588,66	210,30	340,46	238,24	191,58	295,21	134,58	222,71	301,31	452,46	372,42	
α_{it}	32%	5%	3%	39%	4%	2%	5%	3%	1%	0%	4%	2%	
β_{it}	14%	3%	6%	20%	6%	2%	25%	4%	4%	4%	7%	6%	
$E_{it} / E_{i\ Dec\ (t-1)}$	**1,10**	**1,02**	**1,06**	**1,04**	**1,04**	**1,10**	**1,07**	**1,01**	**1,08**	**1,03**	**1,05**	**1,07**	
$E_{it} / E_{i\ Dec(t-1)} \times \alpha_{it}$	**0,35**	**0,05**	**0,03**	**0,41**	**0,05**	**0,02**	**0,06**	**0,03**	**0,01**	**0,00**	**0,04**	**0,02**	**1,062**
$E_{it} / E_{i\ Dec(t-1)} \times \beta_{it}$	**0,15**	**0,03**	**0,06**	**0,21**	**0,07**	**0,02**	**0,27**	**0,04**	**0,04**	**0,04**	**0,07**	**0,06**	**1,060**

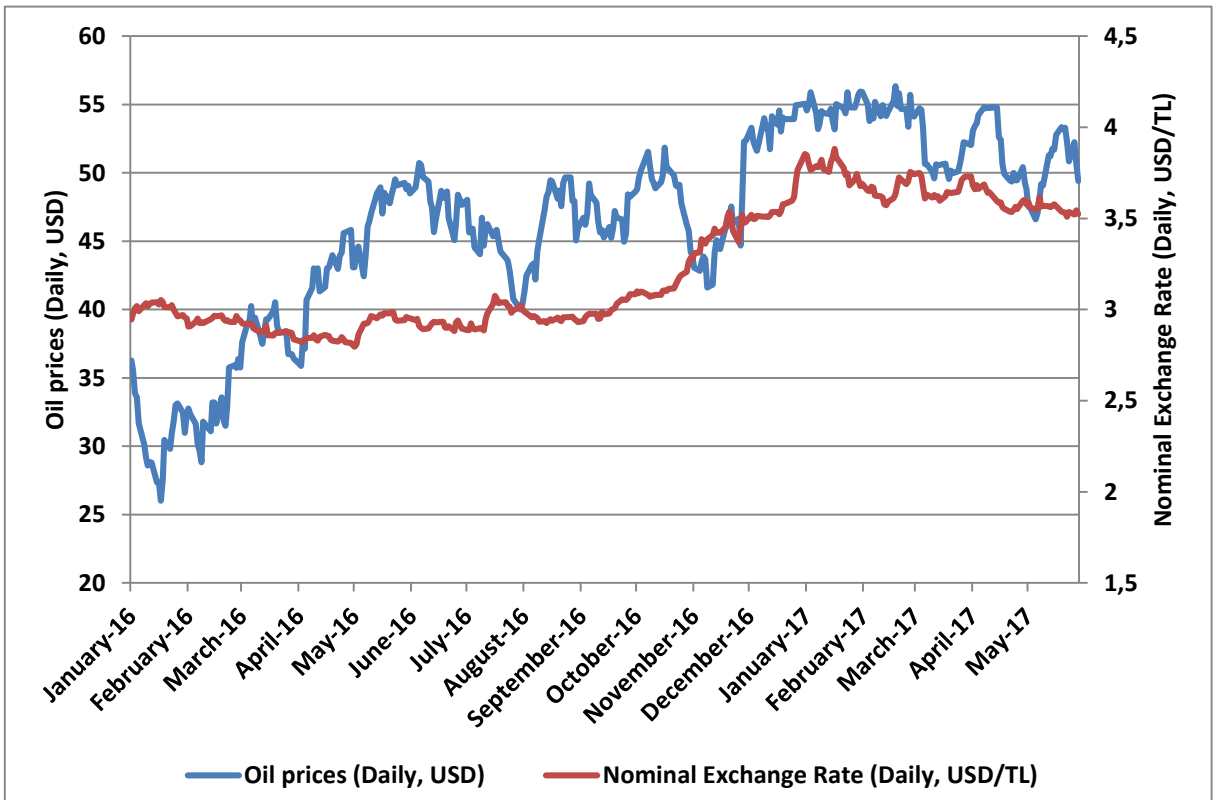
In order to obtain May 2017 CPI for the poorest expenditure group, we multiply E_{it} / $E_{i\ December\ (t-1)}$ x α_{it} for each subgroups with December 2016 CPI calcuted by Betam

$$CPI_{poorest}\ (May\ 2017) = \sum_{i=1}^{4} E_{it} / E_{i\ December\ (t-1)} \times \alpha_{it} \times E_{December(t-1)} = 1{,}062 \times 310{,}6 = 330{,}0$$

In order to obtain May 2017 CPI for the richest expenditure group, we multiply E_{it} / $E_{i\ December\ (t-1)}$ x β_{it} for each subgroups with December 2016 CPI calcuted by Betam

$$CPI_{richest}\ (May\ 2017) = \sum_{i=1}^{4} E_{it} / E_{i\ December\ (t-1)} \times \beta_{it} \times E_{December\ (t-1)} = 1{,}060 \times 291{,}1 = 308{,}5$$

Additional Figure 1: Oil prices (daily,USD) nominal Exchange rate (USD/TL) from January 2016 until today



Source: Turkey Data Monitor, Central Bank of the Republic of Turkey

Additional Table 2: Monthly movement of the inflation gap between rich and poor (2016 April-2017 May)

MONTH	CPI	POOREST	RICHEST	GAP
Apr-16	276,42	295,5	274,1	21,4
May-16	278,02	295,6	276,2	19,4
Jun-16	279,33	297,3	277,5	19,8
Jul-16	282,58	301,7	279,7	22,0
Aug-16	281,76	300,9	279,6	21,3
Sep-16	282,27	301,1	281,5	19,6
Oct-16	286,33	303,7	285,2	18,5
Nov-16	287,81	304,9	286,9	17,9
Dec-16	292,54	310,6	291,1	19,5
Jan-17	299,74	320,4	298,0	22,4
Feb-17	302,17	323,3	301,3	22,0
Mar-17	305,24	326,6	304,0	22,6
Apr-17	309,23	329,4	307,5	21,9
May-17	310,6	330,0	308,5	21,5

Source: TurkStat, Betam