

## 3. Medium-Term Projections

### 3.1 Current State, Short-Term Outlook and Assumptions

#### Changes in Key Forecast Variables

**The Turkish economy posted a significant recovery in the third quarter due to the strong credit impulse, and economic activity was more robust than projected in the October Inflation Report.** Accordingly, output gap forecasts for the third and last quarters of 2020 have been revised upwards from the previous reporting period (Table 3.1.1, Box 3.1). Although economic activity has lost some pace in the recent period due largely to pandemic measures and partially to the tightening in financial conditions, it followed a considerably strong course in the last quarter of 2020. The decelerating impact of the strong monetary tightening delivered in November and December MPC meetings on credits and domestic demand is expected to become more significant in the upcoming period.

**In the final quarter of 2020, consumer inflation stood at 14.6%, materializing above the upper bound of the forecast range in the October Inflation Report.** Inflation followed a higher-than-projected course due to the rapid recovery in domestic demand, cumulative cost effects – particularly through the exchange rate, and food price developments (Table 3.1.1). In this period, food inflation remained on the rise partly due to international prices. While demand and cost pressures on consumer prices increased in sectors where demand conditions were strong due to the credit expansion, costs had a more limited impact on inflation in sectors that are more sensitive to pandemic measures.

**Table 3.1.1: Changes in Key Forecast Variables\***

	2020-III	2020-IV
Output Gap	2.0	2.8
(%)	(-1.8)	(-0.9)
Consumer Inflation	11.7	14.6
(Quarter-end, Annual % Change)	(11.7)	(12.1)
B** Index Inflation	11.6	14.5
(Quarter-end, Annual % Change)	(11.6)	(12.4)

\* Numbers in parentheses denote the values from the October Inflation Report.

\*\* B index is the CPI excluding unprocessed food, alcohol, tobacco, energy and gold.

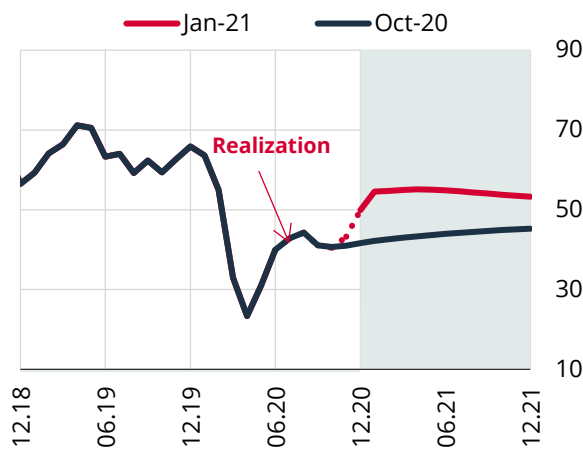
#### Assumptions for Exogenous Variables

**The growth assumption for external demand has been revised upwards for 2020 while the recovery trend projected for 2021, excluding the base effect of this revision, has slightly increased, particularly for the second half of the year.** While comprehensive restriction measures implemented by countries point to predominantly downside risks to the growth outlook in the fourth quarter, economic activity hovers below its pre-pandemic levels. Uncertainties surrounding recovery remain high depending on the course of the pandemic, the vaccination process, and the possible effects of economic policies.

**Forecasts are based on a framework in which global expansionary policies would continue to support global financial conditions.** Advanced and emerging economies maintain their expansionary monetary and fiscal stances. While long-term interest rates continue to hover at their historic lows in advanced economies, statements from central banks as well as market expectations suggest that the low-rate environment will persist for a long period of time.

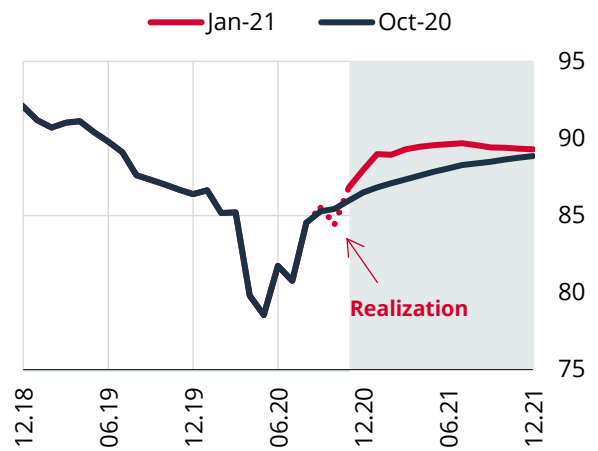
**Assumptions for USD-denominated import prices have been revised upwards, most significantly for international crude oil prices.** The average oil price assumption for 2020 remained consistent with the October Inflation Report at USD 42.3. Based on the recent rise in oil prices and the strengthened projections for a recovery in global economic activity, expectations for crude oil prices have also been revised upwards. The average crude oil price for 2021 implied by the 14-day average futures price curve until the forecast date of the Report is USD 54.4. Futures price curves suggest that crude oil prices will weaken somewhat in 2022 and drop to USD 52.1 on average (Chart 3.1.1, Table 3.1.2). Meanwhile, USD-denominated import prices point to a higher-than-projected course in prices of commodities such as industrial metal and agricultural products, as is the case in crude oil (Chart 3.1.2). Accordingly, assumptions for USD-denominated import prices for 2021 have been revised upwards from the October Inflation Report (Table 3.1.2).

**Chart 3.1.1: Revisions to Oil Price Assumptions\*** (USD/bbl)



Sources: Bloomberg, CBRT.  
\* Shaded area denotes the forecast period.

**Chart 3.1.2: Revisions to Import Price Assumptions\*** (Index, 2010=100)



Sources: CBRT, TURKSTAT.  
\* Shaded area denotes the forecast period.

**Considering the recent trends in unprocessed food prices, exchange rate developments and international prices, the food inflation assumption for 2021 has been revised slightly upwards.** Annual inflation in the food and non-alcoholic beverages group rose by 5.67 points to 20.61% in the last quarter. The high course in food inflation was driven by exchange rate developments and international food prices. In addition to the outlook of agricultural commodity prices, cumulative cost effects-driven administered price adjustments and the minimum wage hike will exert upward pressure on this group's inflation in the first quarter of the year. Under a framework in which supply-side factors will prevail for a while and exchange rate effects will wane in the following period, the food inflation assumption has been revised up by 1 point compared to the October Inflation Report and set at 11.5% for 2021 (Table 3.1.2). The course of international prices and demand effects depending on the possible improvement in the tourism outlook during the year constitute the most significant upside risks to this assumption.

**Table 3.1.2: Revisions to Assumptions\***

	2020	2021	2022
Export-Weighted Global Production Index (Annual Average % Change)	-6.6 (-6.9)	4.7 (5.1)	4.3 (-)
Oil Prices (Average, USD)	42.3 (41.6)	54.4 (43.8)	52.1 (-)
Import Prices (USD, Annual Average % Change)	-6.0 (-5.9)	6.5 (5.0)	0.3 (-)
Food Price Inflation (Year-end % Change)	20.6 (13.5)	11.5 (10.5)	9.4 (-)

\* Numbers in parentheses denote the values from the October Inflation Report.

**Medium-term projections rely on an outlook in which fiscal and financial policies will be determined in tandem with the monetary policy and in line with the projected disinflation path.** The rise in real wages is expected to support domestic demand in the first quarter of the year but affect inflation adversely throughout the year particularly via the cost channel. The increase in inflation inertia in activity fields, particularly in the services sector, where the employees are predominantly minimum wage earners is considered a factor that may delay the disinflation process. Actually, as also stated in the January MPC decision, wage adjustments that remain important for the inflation outlook constitute one of the leading factors that require the tight monetary policy stance to be maintained for a longer period than projected earlier.

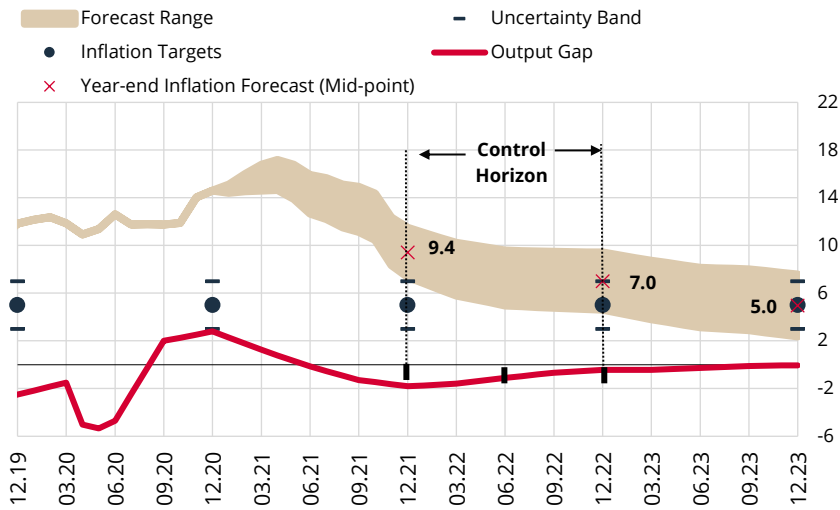
**In the scope of policy coordination, credit developments stand as another factor that may be effective in the upcoming period.** In order to contain existing macrofinancial risks driven by domestic and external imbalances and for the disinflation process to start, it is essential that loans – particularly personal loans – move towards a moderate path. Recent trends in the credit market are considered to be favorable in this regard. On the back of a strong coordination between monetary, credit and fiscal policies, determining the macro policy mix in a way that will support the disinflation process and the current account balance is crucial for maintaining healthy and stable growth.

## 3.2 Medium Term Projections

The CBRT formulates monetary policy decisions with a medium-term perspective based on all factors affecting inflation as well as their interaction, focusing on the alignment of future inflation with the target.

**Under the assumptions explained in Section 3.1 and short-term projections, inflation is projected to converge gradually to the targets.** Accordingly, inflation is projected to be 9.4% at the end of 2021, and fall to 7% at the end of 2022 before stabilizing around 5% in 2023, which is the medium-term target. With a 70% probability, inflation is expected to be between 7.3% and 11.5% (with a mid-point of 9.4%) at the end of 2021 and between 4.6% and 9.4% (with a mid-point of 7%) at the end of 2022 (Charts 3.2.1).

Chart 3.2.1: Inflation and Output Gap Forecasts\*



Sources: CBRT, TURKSTAT.

\* Shaded area denotes the 70% confidence interval for the forecast.

***The tightness of monetary policy stance towards the 5% inflation target will be determined as follows:***

The level between the realized/expected inflation rate path and the monetary policy rate path will be set by aiming for a strong disinflationary balance until the 5% target is reached, and this balance will be preserved continuously. Besides the current information set, if any new information arrives pointing to the risk of inflation expectations and pricing behavior diverging from the medium-term target path, additional front-loaded tightening will be implemented.

***Based on the revisions in the assumptions for the effects of the tight monetary policy stance to be maintained decisively until there are strong indicators that point to price stability and a permanent fall in inflation, forecasts of the October Inflation Report have been kept unchanged.*** Economic activity in the third and last quarter of 2020 proved stronger than projected in the October Inflation Report. Although credit growth has recently decelerated considerably, cumulative effects of the brisk credit growth in the pandemic period keep domestic demand buoyant. Despite the high level of Covid-19 cases, persisting uncertainties over the vaccination process and the global economy, exports maintain their upward trend. The uptrend in international food and commodity prices following the previous reporting period remain as an upside risk to the inflation outlook. The pandemic-driven supply constraints that appeared in certain sectors, cumulative exchange rate effects, revisions in unit labor costs and administered prices are other risk factors regarding inflation expectations and the inflation outlook. The strong monetary tightening implemented in November and December MPC meetings in view of these risks still has a tightening impact on financial conditions. This trend is expected to generate a more noticeable deceleration impact on credit and domestic demand in the future. Hence, the effects of demand and cost factors on inflation will wane gradually.

***Under a policy framework of enhanced predictability and transparency, a price stability-oriented tight monetary stance and strong policy coordination will initiate the disinflation process and alleviate macrofinancial risks, hence make a downward contribution to the sovereign risk premium.*** The decision to sustain the tight monetary policy stance decisively for a long time coupled with the ongoing decline in the risk premium are projected to generate positive effects on inflation expectations. These developments are considered to help the strengthening of capital inflows to Turkey and accumulation of the CBRT's international reserves, in turn. Moreover, they will support reverse currency substitution by building an environment that enables a change in residents' portfolio preferences in favor of the Turkish lira.

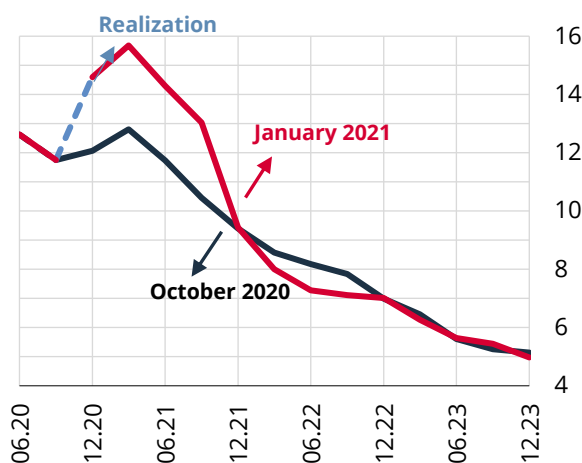
**Table 3.2.1: Revisions to End-2021 Inflation Forecasts and Sources of Revisions**

	<b>2021</b>
2020-IV (October 2020) Forecast (%)	9.4
2021-I (January 2021) Forecast (%)	9.4
<b>Forecast Revision Compared to the 2020-IV Period</b>	<b>0.0</b>
<b>Sources of Forecast Revisions (% Points)</b>	
Turkish Lira-Denominated Import Prices (Including the Exchange Rate, Oil and Import Prices)	-0.4
Food	+0.2
Administered Prices	-0.3
Unit Labor Cost	+1.0
Output Gap	0.0
Inflation Expectations	-0.5

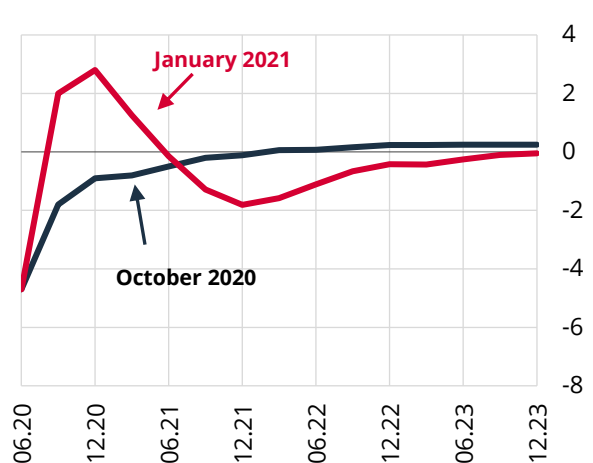
Source: CBRT.

**Year-end inflation forecasts for 2021 and 2022 have been kept unchanged at 9.4% and 7.0%, respectively.**

Compared to the previous reporting period, the revision due to Turkish lira-denominated import prices brought the inflation forecast down by 0.4 points, while unit labor costs drove the forecast up by 1.0 point due to the increased minimum wage for 2021. Meanwhile, higher-than-expected food prices pushed the inflation forecast up by 0.2 points while administered prices brought the forecast down by 0.3 points, largely due to adjusted tobacco taxes. Moreover, the likely improvement in inflation expectations prompted by the tight monetary stance is estimated to drive the year-end forecast down by 0.5 points (Table 3.2.1). Forecasts are produced under the assumption that monetary policy will be tight enough to ensure inflation remains in line with the forecast targets for 2021 and 2022.

**Chart 3.2.2: Inflation Forecast**

Sources: CBRT, TURKSTAT.

**Chart 3.2.3: Output Gap Forecast**

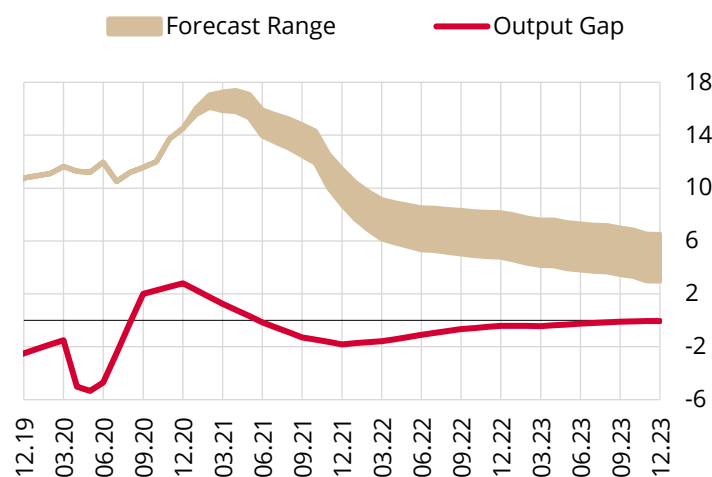
Source: CBRT.

**Forecasts are based on the assumption that a pandemic-led shock will not arise in global growth as well as the external demand outlook, and the recovery in Turkey-specific risk perceptions will continue amid improvements in the global risk appetite.** Intensified efforts to vaccinate against the Covid-19 virus accompanied by the expectations that advanced economies will maintain their expansionary monetary and fiscal stance increased the global risk appetite in the last quarter of 2020. Moreover, the low interest rate environment in advanced and emerging economies is expected to last for a long time. Projections rely on an outlook in which maintaining the tight monetary policy stance within a simple framework until there are strong indicators that point to price stability and a permanent fall in inflation will contribute further to the improvement in the country risk premium.

**Economic activity is slowing down recently owing to the effects of pandemic-related measures and monetary tightening.** Following the strong rebound in the third quarter of the year amid alleviated pandemic-related restrictions and the strong credit impulse, economic activity displayed a robust course in the last quarter as well. Although the lagged effects of the slowdown in credits are expected to become more significant in the upcoming period, annual inflation may continue to move upwards for a few more months due to the supply-side inflationary factors that are quite effective in the short run. Increasing commodity prices despite the appreciation of the Turkish lira, and supply constraints that became more evident in some sectors have combined to keep producer inflation on the rise. As for the administered prices, as opposed to the rises in electricity, natural gas and raw milk reference purchase prices; the tax adjustment in tobacco products played a role in the short-term inflation outlook. The additional inflation inertia to be caused by the revised minimum wage through the services prices in particular, necessitates an extended period of a tight monetary policy stance compared to past projections. The tight monetary stance will serve as a significant buffer against external and temporary volatilities in the context of inflation expectations, pricing behavior and financial market developments. Moreover, due to cumulative effects of the monetary stance on demand conditions, the output gap is expected to contribute to disinflation in the second half of the year.

**Unpredictable price fluctuations in items beyond the monetary policy domain, such as unprocessed food, energy and tobacco products, are among the main factors that cause deviation in inflation forecasts.** Core inflation indicators obtained by excluding these items contain more information as to the underlying trend of inflation. Therefore, forecasts for inflation excluding unprocessed food, energy, alcoholic beverages, tobacco products and gold (the B index) are also shared with the public. In this context, annual inflation in the B index is expected to slightly increase in the upcoming period, before assuming a downtrend following the first quarter of 2021 (Chart 3.2.4).

**Chart 3.2.4: Annual Inflation Forecast for the B Index \***



Sources: CBRT, TURKSTAT.

\* Shaded area denotes the 70% confidence interval for the forecast.

### 3.3. Key Risks to Inflation Forecasts and Possible Impact Channels

The macroeconomic risks that may lead to a change the outlook underlying the inflation forecasts and the associated monetary policy stance are detailed in Chapter 1.2. Evaluations of the channels through which these risks may change inflation forecasts and the direction of this change are summarized in Table 3.2.2.

**Table 3.2.2: Key Risks to Inflation Forecasts\***

Key Risks	Indicators Monitored
<p><b>Cost Pressures</b></p> <ul style="list-style-type: none"> <li>▪ The uptrend that has recently become more evident in international food and other commodity prices led by global demand developments and the recovery in economic activity pose upside risks to the inflation outlook. Secondary effects of supply-side inflationary factors on expectations and their interaction with financial indicators will be monitored closely.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Crude oil and supply-demand balance</li> <li>▪ OPEC+ decisions</li> <li>▪ Industrial metal prices</li> <li>▪ Agricultural commodity prices</li> <li>▪ Supply-demand balance in agricultural products</li> </ul>
<p><b>Uncertainties Regarding the Monetary Policy Transmission</b></p> <ul style="list-style-type: none"> <li>▪ As the cumulative effects of the rapid credit growth of 2020 continue on domestic demand, the decelerating effects of monetary tightening may not be observed fast enough and this may delay the disinflation process.</li> <li>▪ Residents' demand for FX/gold continues and sensitivity of portfolio preferences to negative news keeps the risks that may lead to a delay in the disinflation process alive.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Course of demand and growth components</li> <li>▪ Aggregate demand and credit composition</li> <li>▪ Loan and deposit rates</li> <li>▪ Credit conditions (Bank Loans Tendency Surveys)</li> <li>▪ Dolarization indicators</li> </ul>
<p><b>Sectoral Divergences During the Normalization Process</b></p> <ul style="list-style-type: none"> <li>▪ During the normalization process that will start once the effects of the pandemic wane on a global scale, the likely recovery in domestic demand and tourism may exert an upside pressure on inflation rates of certain goods and services items that were adversely affected by the pandemic such as clothing and footwear, accommodation, education, entertainment and culture, package tours etc.</li> <li>▪ Sectoral divergences in demand conditions and closures, and measures introduced to maintain employment due to the pandemic make it harder to measure output gap and unit labor costs, and increase uncertainties with respect to inflation forecasting.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Global course of pandemic</li> <li>▪ Export, tourism and transportation developments</li> <li>▪ Various demand and inflation indicators by sectors and subsectors</li> <li>▪ Wage and labor cost indices</li> <li>▪ Partial labor productivity per worker and hour</li> </ul>
<p><b>Elevated Levels of Inflation Expectations</b></p> <ul style="list-style-type: none"> <li>▪ The short-term uptrend in inflation may adversely affect medium-term inflation expectations and pose a risk of slowdown in the speed at which expectations converge to forecast targets.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Survey and market based expectations of inflation and exchange rates</li> <li>▪ Indicators pertaining to backward indexation behavior in inflation expectations</li> <li>▪ Inflation uncertainty indicators</li> </ul>

**Table 3.2.2: Key Risks to Inflation Forecasts\***

<p><b>Risks to Monetary, Fiscal and Financial Policy Coordination</b></p> <ul style="list-style-type: none"> <li>▪ The disinflation process may be delayed, should the path of administered prices and tax adjustments significantly exceed the path envisaged in this Report due to the increase in public financing needs in relation to measures to contain the effects of the pandemic.</li> <li>▪ Exogenous factors, which may push credit growth upwards particularly in retail loans and sub-items and curtail tight monetary stance transmission, may deteriorate the inflation outlook via total demand, current account balance and external financing, and risk premium channels.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adjustments to administered prices and taxes</li> <li>▪ Developments in tax revenues and public expenditures</li> <li>▪ Public wage policies</li> <li>▪ Indicators for government budget and public debt stock</li> <li>▪ Fiscal stance (structural budget balance)</li> </ul>
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\* Each risk row on the table presents evaluations on the channel through which inflation forecasts may change. Indicators used in monitoring the risks are listed in the right column



## Box 3.1

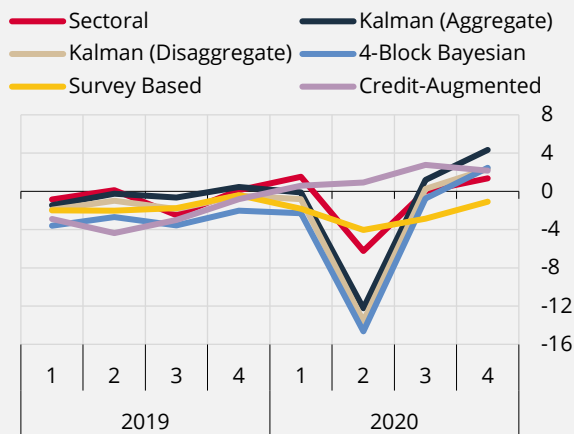
### A Technical Assessment of Output Gap Estimates

Output gap indicators, showing the cyclical pattern of the economy, are used to monitor demand and capacity pressures on inflation. The output gap is defined as the difference between the level of economic activity and its non-inflationary potential level. The inflationary state of the total supply-aggregate demand balance during periods of overheating is referred to as a “positive” output gap. The contraction/cooling phases of business cycles are represented by the situations where the output gap is below zero and has a disinflationary effect.

The output gap has an important place in the “forecasting and policy analysis system” (FPAS), which is at the center of the technical background of the inflation-targeting regime. In this box, we compare the inflation forecasting power of output gap indicators monitored by the CBRT. In the light of growth and inflation developments in 2020, evaluations and policy implications are outlined regarding the relative advantages of these indicators.

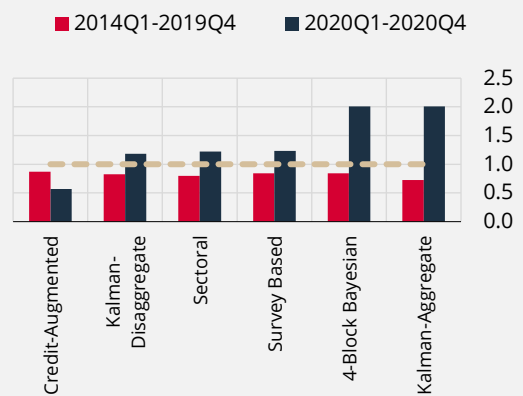
Output gap indicators estimated with different models and approaches are presented in Chart 1. Among these, the “survey-based” indicator is constructed by aggregating variables such as the capacity utilization rate and the airplane occupancy rate that directly point to the output gap by definition. Other indicators are estimated by filtering economic activity indicators. The credit-augmented indicator is calculated as the weighted average of the output gap based on the filtering of national income and the deviation of net credit use from its historical average.

**Chart 1: Output Gap Indicators<sup>1</sup> (%)**



Source: CBRT.

**Chart 2: Forecasting Performance of Models Using Different Output Gap Indicators<sup>2</sup> (Forecast Errors Compared to the Model Excluding Output Gap)\***



Source: Authors' calculations.

\* Forecast errors are calculated separately for 2014Q1-2019Q4 and 2020Q1-2020Q4. The forecast error of the model excluding output gap is indexed as 1.

<sup>1</sup> Studies on the methods of output gap series included in the chart are as follows: Sectoral: Çelgin and Yılmaz (2019), Kalman(Aggregate): Koca (2021), Kalman(Disaggregate): Alp, Ögünç and Sarıkaya (2012), Koca and Kalafatçılar (2021), 4-Block Bayesian: Gökcü, M. (2021), Survey Based: Coşar, Kösem and Sarıkaya (2012), Coşar, Kösem and Sarıkaya (2013), Coşar (2018) and Credit-Augmented: October 2020 Inflation Report Box 2.3.

<sup>2</sup> The quarterly change in the Core-B index (adjusted for tax effects) is used as the dependent variable. The exchange rate (the euro and dollar basket) and commodity prices excluding energy are used as explanatory variables. Forecast performances are compared by adding different output gap indicators separately to the base model constructed with these explanatory variables. Forecasts are made for the period 2014Q1-2020Q4 with the out-of-sample forecast performance method for the next quarter. For example, the 2020Q2 forecast has been obtained by multiplying the coefficients obtained from the model regressed up to 2020Q1 with the 2020Q2 data of the explanatory variables. Then, the 2020Q3 forecast has been obtained with the coefficients obtained from a regression made until 2020Q2 and 2020Q3 values of the explanatory variables. A dummy variable for 2018Q3 is used in the models. The analysis of forecast errors is done excluding 2018Q3. In the chart, the root mean squared errors of forecasts are presented by normalizing this value for the model excluding the output gap.

Although the indicators seem to be compatible with each other in general, they can give quite different signals for the same quarter. During the pandemic period, when supply and demand shocks were seen together, the apparent divergence between indicators, especially in the second quarter of 2020, led to increased uncertainty regarding inflation forecasts. In this period, the sharp contraction in the economic activity caused a decline in national income-based output gap indicators, while the credit-augmented output gap started to show signs of heating due to the rapid credit expansion. With the significant recovery in the economy in the second half of the year, the agreement between indicators has increased. Most of the indicators for the last quarter signal overheating.

Such a large divergence among the indicators raises the question of which output gap indicator stands out in explaining inflation. In this context, we evaluated the one-quarter-ahead forecast performance of output gap indicators for the Core-B index. The results show that models using output gap in the 2014-2019 period made nearly 20% less mistakes than the model that did not use output gap (Chart 2). Due to their lagged effects on inflation, the forecast performance of the models using output gap indicators increases, as the forecast horizon gets longer.

Analyses made for the pre-2020 period indicate that none of the indicators is systematically superior in forecasting inflation. However, for 2020, using an output gap indicator in the forecasting model does not lead to an improvement in inflation forecasts, except for the model that uses the credit-augmented output gap indicator. When the credit-augmented output gap is used, an approximately 40% lower forecast error is made for 2020 compared to the base model that does not include the output gap. Factors such as supply shocks that have an important role in the decline of national income in the second quarter, the rapid credit expansion supporting consumption despite increasing unemployment, and the marked divergence in sectoral demand conditions all made it difficult to measure the output gap and its impact on inflation.

Past studies of the Turkish economy point out that (i) credit developments can provide additional information when used in conjunction with the output gap to predict inflation, (ii) items affected by credits are mostly in the core goods group, (iii) the effect of credits on inflation is more lagged compared to the output gap and (iv) as a credit indicator, the net credit use stands out as a functional indicator (Özmen and Sarıkaya 2014, Ögünç and Sarıkaya 2015, CBRT 2020). Credit data are published in a timely manner and hence become available earlier than GDP and unlike filter-based gaps net credit use is not revised with the data flow. These two factors can be considered as additional advantages of using credit data. Developments in 2020 have shown that the inflation forecasting performance can improve significantly if the financial cycle is also taken into account while evaluating the total supply-aggregate demand balance (output gap). However, since the inclusion of credits does not provide a systematic advantage valid for all periods, expert judgements are important in deciding when to give more weight to a certain indicator. When other determinants of inflation are also considered, aggregate demand conditions, which were stronger than previous projections in the second half of 2020, signal overheating in the economy, and a significant upward revision is made in the output gap estimates.

## References

- Alp, H., Ögünç, F., and Sarıkaya, Ç. (2012). Monetary Policy and Output Gap: Mind the Composition. Central Bank of Turkey, Research Notes in Economics, No:12/07.
- Çelgin, A. and Yılmaz, T. (2019). Sectoral Output Gap (In Turkish). Central Bank of Turkey, Research Notes in Economics, No:19/10.
- Coşar, E. E. (2018). A Revised Direct Output Gap Measure for the Turkish Economy (In Turkish). Central Bank of Turkey, Working Papers, No:18/04.
- Coşar, E. E., Kösem, S., and Sarıkaya, Ç. (2012). Alternative Output Gap Measures (In Turkish). Central Bank of Turkey, Research Notes in Economics, No:12/22.
- Coşar, E. E., Kösem, S., and Sarıkaya, Ç. (2013). Do We Really Need Filters In Estimating Output Gap?: Evidence from Turkey. Central Bank of Turkey, Working Papers, No:13/33.
- Gökcü, M. (2021). The Tale of Two Episodes: Estimating Time-Varying Potential Output and NAIRU Using a Multivariate Filter for Turkey. Ongoing study.

Koca, Y. K. (2021). An Estimated Small Open Economy DSGE Model for the Turkish Economy. Ongoing study.

Koca, Y. K. and Kalafatcılar, M. K. (2021). Decomposition Output Gap Into Demand Components. Central Bank of Turkey, Research Notes in Economics, Ongoing study.

Öğünç, F. and Sarıkaya, Ç. (2015). Information Content of Credit in Explaining Inflation (In Turkish). Central Bank of Turkey, Research Notes in Economics, No:15/12.

Özmen, M. U. and Sarıkaya, Ç. (2014). Sensitivity of Inflation to Output Gap and Credit (in Turkish). Central Bank of Turkey, Research Notes in Economics, No:14/17.

CBRT (2020). An Evaluation of the Effect of Demand Conditions on Inflation. Inflation Report 2020-IV, Box 2.3.