7. Medium-Term Projections

This chapter summarizes the underlying forecast assumptions and presents the medium-term inflation and output gap forecasts as well as the monetary policy outlook for the upcoming 3-year horizon.

7.1. Current State, Short-Term Outlook and Assumptions

Financial Conditions

In the first quarter of 2017, portfolio flows to emerging economies increased due to the alleviated uncertainties over the post-election economic policies of the US and improving outlook for global economic growth. With the support of the tightening in monetary policy, Turkey attracted higher portfolio inflows and the Turkish lira diverged positively from other emerging market currencies, partially compensating its past losses. Moreover, credit conditions continued to recover in the first quarter of 2017 with the help of supportive macroprudential policies, public credit guarantees and fiscal incentives. In fact, in the first quarter of 2017, total credit growth exceeded past years' averages amid the brisk course of consumer loans and TL-denominated commercial loans.

The policy stance of the CBRT remains tight against the inflation outlook, stabilizing for FX liquidity and supportive of financial stability. To preserve inflation outlook against the adverse impact of excessive exchange rate movements inconsistent with economic fundamentals, the CBRT opted for a strong monetary tightening in early January 2017. Additionally, the marginal funding rate was raised by 75 basis points at the January MPC meeting, while the late liquidity window lending rate was hiked by a total of 225 basis points in January, March and April meetings, leading to further monetary tightening.

Inflation

Consumer inflation was 11.29 percent in the first quarter of 2017 exceeding the January projections. In addition to the cost pressures such as the lagged effects of the depreciation of the Turkish lira and the increase in import prices, the partial recovery in demand conditions coupled with rising inflation expectations led to a widespread upward trend in consumer prices. Food inflation saw an upsurge in this period amid base effects and supply-side factors.
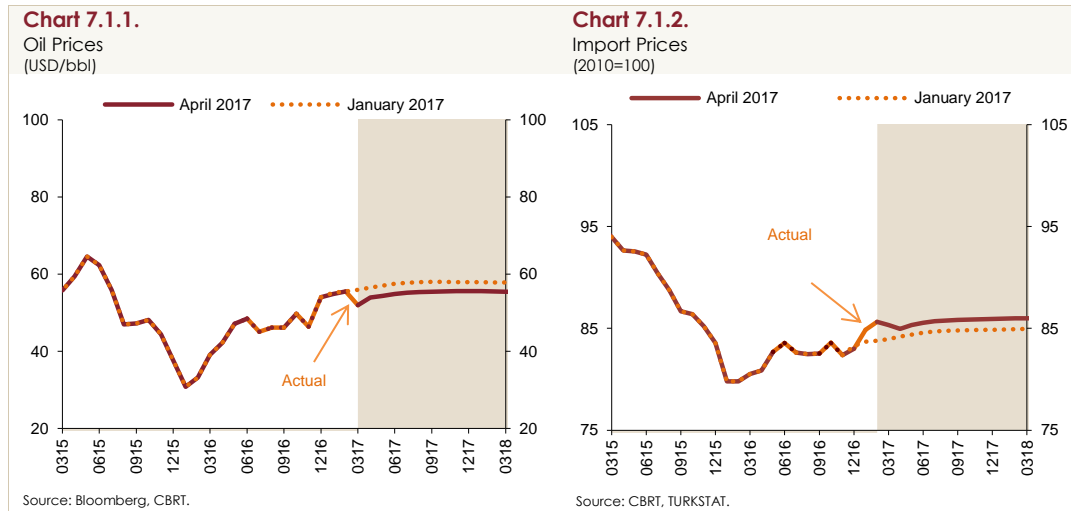
Demand Conditions

Growth figures for the first three quarters of 2016 were revised upwards according to the GDP data released by the TURKSTAT, while the underlying trend of economic activity in the fourth quarter posted a mild recovery, which is consistent with January projections. Private consumption expenditures, which increased on the back of incentives and measures, as well as the robust course of exports, played a great role in the rebound in the fourth quarter. The recently released indicators hint at a sustained moderate course in economic activity in the first quarter of 2017. Against this background, output gap forecasts for the last two quarters of 2016 and the first quarter of 2017 were revised upwards compared to the January Inflation Report (Table 7.1.1, Chart 7.2.3).

As an indicator of external demand, the annual growth rate of export-weighted global production index, which is updated according to the growth forecasts of Turkey's trading partners, has remained almost flat since the previous reporting period (Table 7.1.1).

Oil, Import and Food Prices

Owing to the recent developments, assumptions for crude oil prices for the upcoming period were revised slightly downwards compared to the January Inflation Report. The crude oil price assumption in annual averages, which was 57 USD in the previous Report, was set as 55 USD for 2017. Meanwhile, assumptions for USD-denominated import prices were revised considerably upwards for 2017 (Table 7.1.1, Charts 7.1.1 and 7.1.2).

Food inflation in the first quarter of 2017 stood slightly above January projections with 12.53 percent. This rise was led by the impact of adverse weather conditions on the food supply coupled with the effects of the for food price inflation was kept unchanged at 9 percent for end-2017 and 7 percent for end- depreciated Turkish lira and the recent rebound in the exports of fruits and vegetables. Meanwhile, measures to be taken by the Food Committee are expected to limit this rise to some extent in the upcoming period. Accordingly, the assumption 2018.

Chart 7.1.1.
Oil Prices
(USD/bbl)

Source: Bloomberg, CBRT.

Chart 7.1.2.
Import Prices
(2010=100)

Source: CBRT, TURKSTAT.
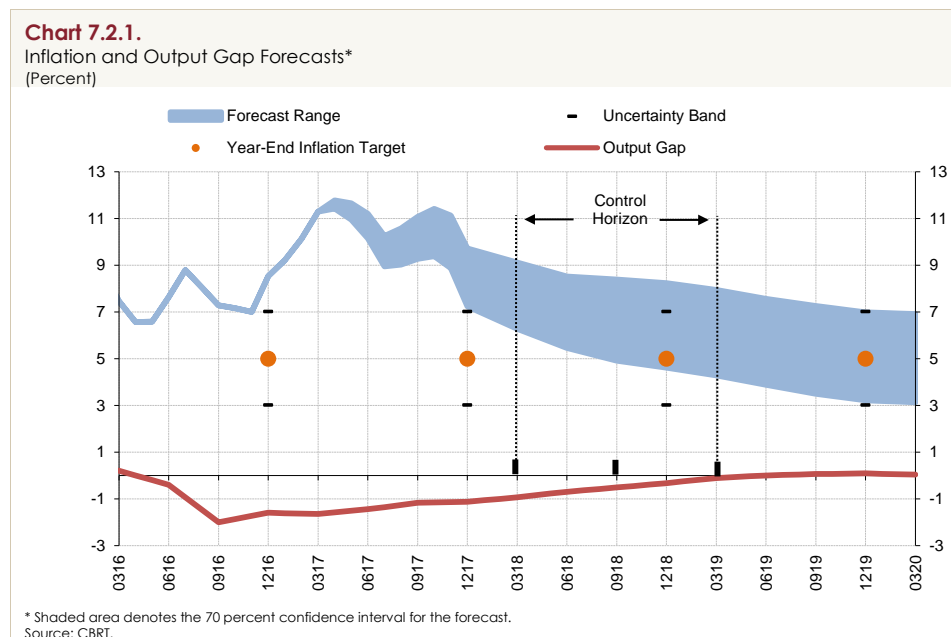
Fiscal Policy and Tax Adjustments

Medium-term projections are based on the assumption that fiscal discipline will be maintained and administered prices and taxes will not be subject to any unanticipated increases. Accordingly, it is expected that the effects of tax increases in 2016 on annual inflation will gradually vanish, which will thus support disinflation. Forecasts are based on the assumption that adjustments to taxes and administered prices will be consistent with the inflation target and automatic pricing mechanisms.

Table 7.1.1.
Revised Assumptions

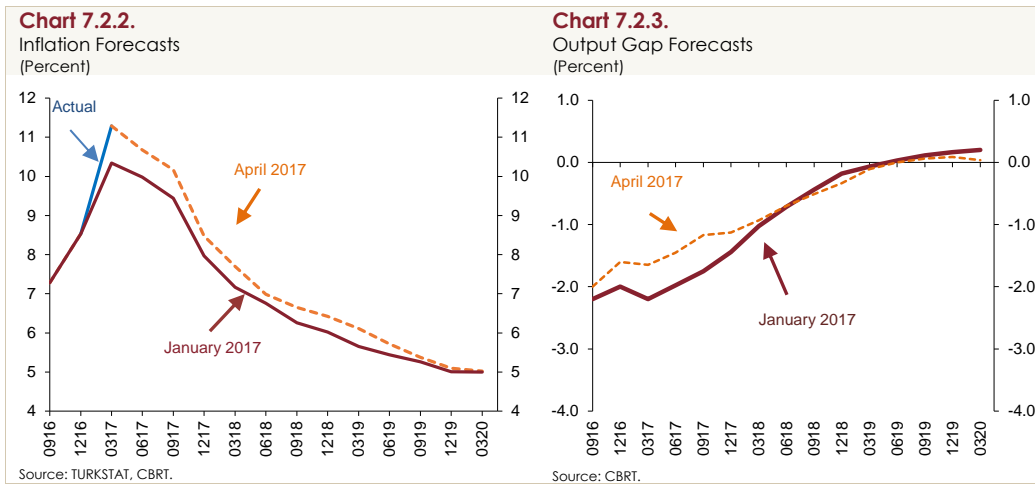|		January 2017	April 2017
Output Gap	2016Q4	-2.0	-1.6
	2017Q1	-2.2	-1.7
Food Inflation	2017	9.0	9.0
(Year-end Percent Change)	2018	7.0	7.0
Import Prices	2017	3.0	4.4
(Average Annual Percent Change, USD)	2018	0.7	0.5
Oil Prices	2017	57	55
(Average, USD)	2018	58	55
Export-Weighted Global Production Index	2017	1.9	1.8
(Average Annual Percent Change)	2018	1.9	2.0

7.2. Medium-Term Forecasts

Given a tight policy stance that focuses on bringing inflation down, inflation is estimated to converge gradually to the 5-percent target. Accordingly, inflation is likely to be 8.5 percent at end-2017, and stabilize around 5 percent in the medium term after falling to 6.4 percent at end-2018. Hence, inflation is expected to be, with 70 percent probability, between 7.3 percent and 9.7 percent (with a mid-point of 8.5 percent) at end-2017 and between 4.6 percent and 8.2 percent (with a mid-point of 6.4 percent) at end-2018 (Chart 7.2.1).

Chart 7.2.1.
Inflation and Output Gap Forecasts*
(Percent)

* Shaded area denotes the 70 percent confidence interval for the forecast.
Source: CBRT.

Year-end inflation forecasts for 2017 and 2018 were revised upwards by 0.5 and 0.4 points, respectively, compared to the 2017 January Inflation Report (Chart 7.2.2). The upward revision in TL-denominated import prices drove the year-end inflation forecast for 2017 upwards by 0.1 point compared to the previous Report. On the other hand, output gap forecasts, which were revised upwards due to the relative improvement in economic activity, pushed the year-end forecast for 2017

up by 0.2 points. Lastly, the higher-than-projected first-quarter inflation in 2017 compared to the January Inflation Report coupled with the increase in the underlying trend of inflation are estimated to drive the year-end inflation forecast up by 0.2 points. Accordingly, consumer inflation forecast for end-2017, which was announced as 8.0 percent in the January Inflation Report, was raised to 8.5 percent.

The consumer inflation forecast for 2018 was also revised upwards from 6 percent to 6.4 percent. This revision was driven by the updated year-end inflation forecast for 2017 and the increase in the underlying trend of inflation. The projection of a decline in inflation from 8.5 percent at end-2017 to 6.4 percent by end-2018 is based on the policy stance that focuses on bringing inflation down as well as on an outlook where cumulative exchange rate effects will disappear and economic activity will remain moderate in 2018.

Chart 7.2.2.
Inflation Forecasts
(Percent)

Chart 7.2.3.
Output Gap Forecasts
(Percent)

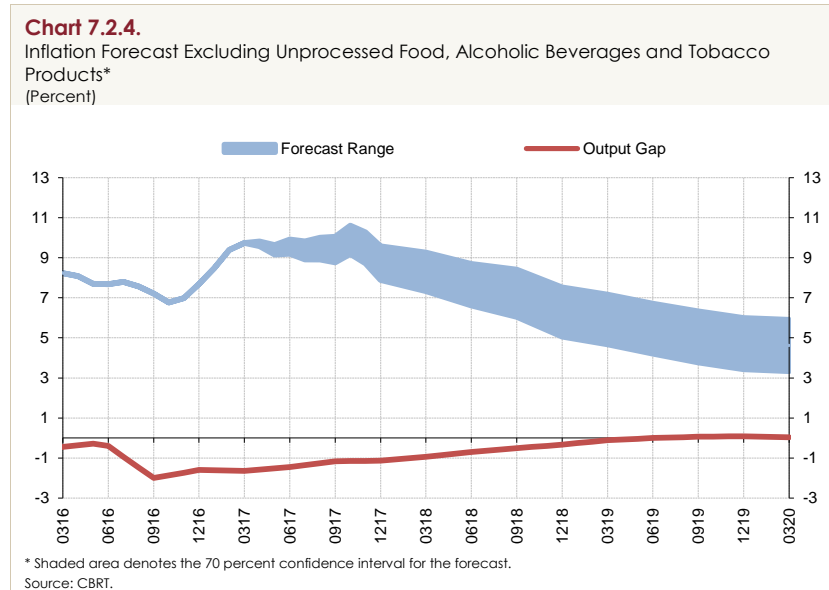Source: TURKSTAT, CBRT.

Source: CBRT.

The course of annual inflation is projected to be influenced by the base effects stemming from unprocessed food, tobacco products and clothing prices coupled with temporary tax reductions throughout 2017 (Chart 7.2.1). Particularly, the base effect from unprocessed food prices accompanied by the lagged effects of exchange rate movements are estimated to feed into the fluctuations in inflation in the short term. Inflation is expected to assume a downward trend on the back of the tight monetary policy stance as of the second half of the year. Gradual elimination of the impact of hikes in inflation in energy, alcoholic beverages and tobacco products last year will also be influential in this decline. The CBRT will remain focused on the underlying trend rather than temporary fluctuations in the upcoming period.

GDP data for the last quarter of 2016 and recent indicators suggest that economic activity proved slightly stronger than projected in the January Inflation Report. Owing to the supportive effects of measures and incentives on domestic demand as well as the improvement in perceived uncertainty and tightness in financial conditions, the rebound in economic activity is estimated to gain pace in the second quarter. Accordingly, output gap forecasts for 2017 were revised upwards (Chart 7.2.3). However, the output gap is likely to support disinflation further owing to the tight monetary policy stance in 2017.

Unpredictable price fluctuations in items beyond the monetary policy domain, such as unprocessed food and tobacco products, are among major factors that cause a deviation in inflation

forecasts. Hence, inflation forecasts excluding unprocessed food and tobacco products are also announced. Accordingly, inflation forecasts excluding unprocessed food, alcoholic beverages and tobacco products are presented in Chart 7.2.4. Despite the volatile course of the consumer inflation and ignoring the effects of withdrawal of the temporary tax reductions in furniture and white goods in October, inflation excluding unprocessed food and tobacco is expected to remain flat and decline gradually to 4.6 percent in the medium term.

Chart 7.2.4.
Inflation Forecast Excluding Unprocessed Food, Alcoholic Beverages and Tobacco Products*
(Percent)

* Shaded area denotes the 70 percent confidence interval for the forecast.
Source: CBRT.

Comparison of the CBRT's Forecasts with Inflation Expectations

It is critical that economic agents take the inflation target as a benchmark in their plans and contracts and focus on the underlying trend of medium-term inflation rather than on temporary price fluctuations. Likewise, it is crucial that the CBRT's current inflation forecasts be compared with inflation expectations of other economic agents to serve as a reference guide. Currently, the year-end, 12-month-ahead and 24-month-ahead inflation expectations of the Survey of Expectations' respondents are above the CBRT's baseline scenario forecasts (Table 7.2.1). The hovering of inflation expectations above the target and particularly the exceeding of the 24-month-ahead inflation expectations beyond the uncertainty band necessitate the tight monetary policy stance to be sustained.

Table 7.2.2.
CBRT Inflation Forecasts and Expectations

	CBRT Forecast	CBRT Survey of Expectations*	Inflation Target
2017 Year-end	8.5	9.3	5.0
12-month-ahead	7.5	8.3	5.0
24-month-ahead	6.0	7.9	5.0

* As of April 2017.
Source: CBRT.

7.3. Risks and Monetary Policy

Prospects about post-election US economic policies had alleviated effects on financial markets since early 2017. Compared to the previous reporting period, indicators of economic activity point to stronger global growth in 2017, driven especially by advanced economies. However, uncertainties over the Brexit process and ambiguities regarding post-election economic policies in the US keep downside risks to global growth brisk. The upward trend in advanced economies' long-term bond yields, which started in November came to a halt, and portfolio flows to bond and stock markets of emerging economies resumed thanks to abated ambiguities over the Fed policy accompanied by optimistic expectations in financial markets. Although global financial conditions have improved slightly in the recent period, the direction and volume of portfolio flows to emerging economies will depend on the pace of the Fed's monetary tightening cycle.

Despite the relative improvement in global financial conditions, domestic financial conditions tightened slightly in the first quarter of 2017 due to the partially persistent volatility in the FX market and the tightening in monetary policy. On the other hand, the Turkish lira has recently diverged positively from other emerging market currencies and partly compensated for past losses. Moreover, macroprudential policies supportive of the financial system as well as public incentives and public credit guarantees allowed credit conditions to recover further. The recovery in consumer loans and TL-denominated commercial loans observed in the first quarter of 2017 is monitored closely with regard to its effects on aggregate demand and economic activity.

Downside risks to economic activity have recently abated. The growth outlook for 2017 is expected to be more favorable compared to 2016, which was marked by several concurrent adverse shocks. The relative stability in tourism revenues, the stronger confidence channel, the favorable effect of the cumulative exchange rate depreciation on net exports and the normalization of commercial relations with Russia will all contribute to growth. Moreover, measures and incentives to stimulate consumption and investment expenditures, fading perceptions of uncertainty and the improvement in the tightness of financial conditions will also enhance growth. Accordingly, economic activity is expected to strengthen as of the second quarter of the year. On the other hand, the pace of recovery in tourism revenues, uncertainties regarding monetary policies of advanced economies, the course of capital flows and geopolitical developments will continue to constitute downside risks to growth in 2017.

Consumer inflation has surged since November 2016 and exceeded the upper band of the January Inflation Report forecasts. The upward trend in inflation was largely driven by the depreciation of the Turkish lira and the rise in import prices in addition to the increase in food prices. The rapid depreciation of the Turkish lira spread across the consumer price index, particularly to energy and durable goods items. As also indicated in the previous Report, due to the base effects stemming from the prices of unprocessed food, tobacco products and clothing as well as temporary tax reductions, consumer inflation will fluctuate throughout 2017. Inflation is expected to peak in April and May particularly due to the base effect from unprocessed food and the lagged effects of the exchange rate, and then to fall thereafter as the impact of last year's price increases in energy, alcoholic beverages, tobacco products and food diminishes gradually. The tight monetary policy stance will support the disinflation process.

Medium-term inflation forecasts are based on an outlook where aggregate demand conditions continue to support disinflation, albeit at a more limited extent in comparison with the January Inflation Report. The upward revision in GDP for 2016 and the acceleration in credits indicate that the recovery in economic activity might be stronger than expected. However, elevated unemployment rates suggest that the demand-side risks on inflation are balanced. The effects of production and employment incentives and measures to boost the credit market on aggregate demand conditions will be closely monitored in the upcoming period.

Risks to food inflation, another major determinant of inflation forecasts, are considered to be on the upside. Due to the recovery in the exports of food products and the impact of the exchange rate developments, food inflation might overshoot current projections, which are based on the assumption that measures taken by the Food Committee will considerably balance the upside risks to food prices.

Although cost pressures are partly contained on the back of the recent rise in the risk appetite, the escalation in inflation poses a risk to the pricing behavior. Thus, the tight stance in monetary policy will be maintained until the inflation outlook displays a significant improvement. The CBRT formulates monetary policy by taking the medium-term inflation outlook into account, thus focusing on the developments in the underlying trend of inflation rather than the anticipated fluctuations in inflation driven by the base effects during the course of the year. Inflation expectations, pricing behavior and other factors affecting inflation will be closely monitored and further monetary tightening will be delivered if needed.

Developments in fiscal policy and tax adjustments are monitored closely with regard to their effects on the inflation outlook. The baseline monetary policy stance is formulated under the assumption that fiscal discipline will be maintained and there will be no unanticipated hikes in administered prices. A revision of the monetary policy stance may be considered, should the fiscal policy deviate significantly from this framework, and consequently have an adverse effect on the medium-term inflation outlook.

In recent years, sustaining fiscal discipline has been one of the key factors in lowering the sensitivity of the Turkish economy against external shocks. The room provided by fiscal discipline facilitated the implementation of an expansionary fiscal policy. Structural measures to provide room for counter-cyclical fiscal policies will enhance the coordination of monetary and fiscal policy, and improve macroeconomic stability.

Box 7.1	Identifying the Credit Channel Through a Structural Model

Macro data and empirical studies employing data on banks, firms and households indicate that the credit channel is becoming more important to business cycles and financial cycles (Boivin et al., 2010; Jimenez et al., 2012; Kashyap and Stein, 1993). Making use of a structural model, this box describes and analyzes the credit channel, a subject of great importance for a better understanding of the monetary policy transmission mechanism[1] as well as the establishment and maintenance of financial stability.

Both the microeconomic theory (Walsh 2010) and macroeconomic models with micro foundations (Gertler and Gilchrist, 1993; Bernanke and Gertler, 1995; Bernanke et al., 1999; Kiyotaki and Moore, 1997) provide detailed explanations of the existence of the credit channel as a separate transmission channel. This box first provides a description of the credit channel, and then analyzes the interactions among economic mechanisms that comprise the credit channel through a structural model without getting into detailed theoretical explanations.

The main mechanisms through which monetary policy interacts with financial and corporate sectors within the context of the credit channel can be summarized as follows:

1) Bank Lending Channel: The bank lending channel predicts that any additional liquidity generated by expansionary monetary policy causes banks' deposits to increase, which are then transformed into loans conditional on the regulations for required reserves and capital adequacy ratio, etc. As a result, these loans generate further liquidity in the market.

2) Balance Sheet Channel: The balance sheet channel foresees that as banks do not have complete information about the re-payment risk of the borrower, they take into account the balance sheet or the solvency of the loan applicant, and ask for a collateral for the loan.[2] Accordingly, banks' lending rate depends on the balance sheet of the borrower and the value of the collateral. Meanwhile, because the balance sheet and the value of the collateral are related to asset prices, they are also influenced by current and future monetary policy decisions. Thus, the balance sheet channel functions through a circular mechanism that reinforces the change in asset prices, which is called the financial accelerator mechanism and the impact of this channel is fast and strong. In particular, through the financial accelerator mechanism, a decline in asset prices will affect the balance sheet of the borrower and diminish the value of the collateral. Banks react by raising the loan rates and lowering the loan supply based on the consideration that re-payments of loans may be problematic. The additional tightening in credit supply will further worsen the balance sheet of the borrower, and lower the value of his assets. This negative loop in asset prices, i.e. the financial accelerator mechanism, will manifest itself as re-payment problems and bankruptcies, which will translate into deteriorated bank balance sheets, and cause the bank capital channel to take effect.

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[1] This box does not discuss the traditional transmission mechanisms of the monetary policy, namely the interest rate, the exchange rate and the expectation channels. See Walsh (2010) for details about these channels.
[2] The balance sheet channel stems from asymmetrical information problems between the borrower and creditor like moral hazard, adverse selection and monitoring-evaluation costs and the interaction among the borrower firm and household balance sheets and bank's balance sheets when financial frictions exist. The lower the value of items included in the borrowers' balance sheets such as the firm's net value, household's net leverage ratio, value of the collateral against loan vis-à-vis the amount of the loan, the greater the problems stemming from information asymmetry. For example, as the firm's net value decreases, the additional lending rate demanded by banks (also called external financing premium or credit spread) will increase due to mounting asymmetrical information issues.

3) Bank Capital Channel: In addition to the financial accelerator mechanism triggered by a fall in asset prices as described within the context of the balance sheet channel above, changes in bank capital also act as an accelerator. Bank regulators impose regulations on banks' capital such as the minimum capital adequacy ratio (MCAR), which requires the ratio of bank equity to risk-weighted total assets to be above a certain level. Banks that do not comply with this regulation are subject to financial or non-financial fines as well as other sanctions. Given that increasing capital is costly and time-consuming especially during periods of financial distress, banks hold additional capital as a precaution to stay above the MCAR. However, despite this additional capital, in periods of financial distress, banks may experience such losses in the re-payment of loans that their capital adequacy ratios may approach or even reach a level that triggers a punishment. In such cases, banks raise lending rates and cut down on lending, which leads to an additional fall in asset prices, and hence a recurring negative loop with an additional fall in re-payment of loans, and a deterioration in balance sheets of borrowers, thereby reinforcing the impact of the balance sheet channel. In other words, the balance sheet channel and the bank capital channel interact with each other, which causes stronger falls in asset prices and lending volume and more dramatic increases in lending rates.

4) Credit Rationing: The credit rationing mechanism envisions that as the lending rate increases, uncertainty surrounding the creditworthiness of debtors rises. This is mainly due to the fact that borrowers settling for higher lending rates are considered to be borrowers with higher risk of proving insolvent. Also, borrowers utilizing loans with higher rates bear higher risk of insolvency in order to avoid the sizeable payments. Therefore, even if some risky borrowers settle for higher rates, banks avoid lending to those risky borrowers. This is called credit rationing as described by Stiglitz and Weiss (1981) and Jaffee and Russell (1976). Empirical findings regarding credit rationing underline that banks resort to credit rationing mostly and more severely in times of tight monetary policy (McCallum, 1991; Galbraith, 1996).
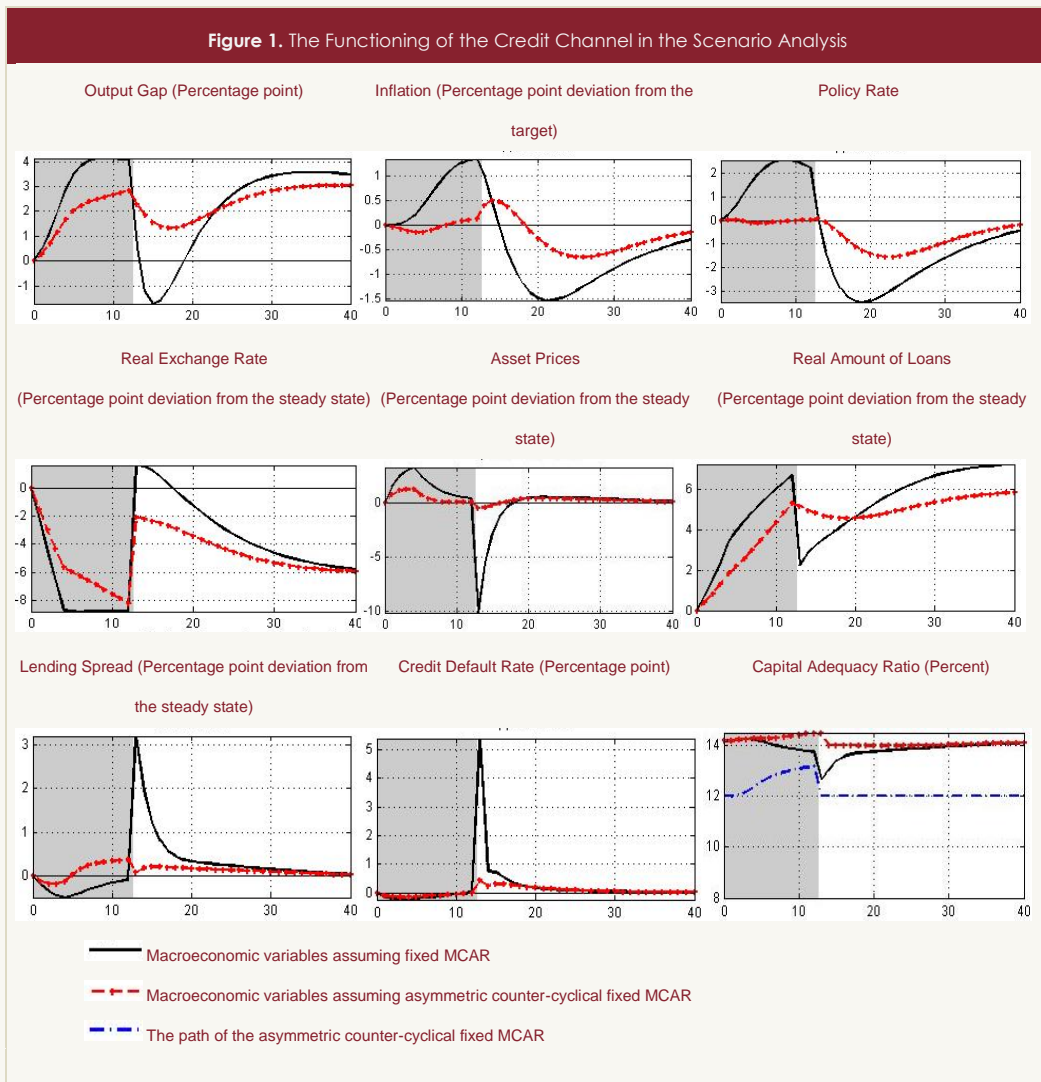
To understand the interaction of the abovementioned channels with macroeconomic variables and other traditional transmission mechanisms of the monetary policy, a dynamic stochastic general equilibrium (DSGE) model is used in the spirit of Benes et al. (2014). The below inequality will be helpful to analyze how the balance sheet channel works. In particular, if a firm wants to borrow a certain amount L_t at a certain lending rate $R_{L,t}$ by submitting a collateral of amount K_t with price $P_{k,t}$, the bank will do a simple calculation before signing the loan contract to see whether the collateral is adequate. Accordingly, provided that the bank can receive at least a certain share[3] α of the risk-adjusted collateral $u_t R_{K,t+1} P_{k,t} K_t$, where u_t denotes risk[4] and $R_{K,t+1}$ is the total risk-adjusted gross return, against the possibility that the firm goes bankrupt at the due date of the loan, then the bank will consider the borrower to be creditworthy. Otherwise, the bank will consider that the firm will declare bankruptcy and will not pay the loan back, and therefore it will not lend to the firm.

$$R_{L,t} L_t \leq \alpha \, u_t \, R_{K,t+1} P_{k,t} K_t$$

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[3] This ratio is assumed to be the power of the legal/regulatory system to sanction and is taken as constant in macroeconomic models. In fact, in a dynamic game theory model, this ratio needs to vary depending on the creditability, commitment or enforcement capabilities between the borrower and the creditor, therefore become an endogenous variable stemming from the contract theory. The assumption of a constant and external ratio simplifies the solution, and therefore is frequently used in the literature.

[4] Whether risk is diversifiable (the net bankruptcy ratio is predictable given a large number of borrowers) or non-diversifiable (the net bankruptcy ratio is unpredictable, for example global systemic risk) is important to the credit channel. As diversifiable risk is predictable, it does not lead to any problems for the financial system if priced correctly, while a mis-pricing risk or a non-diversifiable risk can create fragility in the financial system. The model explained here allows for both diversifiable and non-diversifiable risk assumptions.

As illustrated in this inequality[5], the bank's decision to extend loans depends on the amount and the lending rate of the loan as well as the net value of the asset submitted as collateral ($P_{k,t}K_t$), the risk factor showing the uncertainty on this net value (u_t), and an external ratio originating from the existing legal/regulatory structure (α). Falling asset prices in any period of financial distress will initially spill over into the net collateral value, causing the banks to demand higher lending rates, and cut down on the supply of loans. This will bring about an additional financing constraint for the firm and lead to further losses in the net value of the firm's assets. This negative loop that is called the financial accelerator mechanism will recur and cause declines in asset prices and the loan amount as well as increases in lending rates and bankruptcy rates.

Figure 1. The Functioning of the Credit Channel in the Scenario Analysis

Macroeconomic variables assuming fixed MCAR

Macroeconomic variables assuming asymmetric counter-cyclical fixed MCAR

The path of the asymmetric counter-cyclical fixed MCAR

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[5] Another interesting issue here is that this inequality will create a dynamic effect as it is relevant for each period in the future. Existence of this inequality affects the bank's decision-making process not only in the current period, but also in future since there is a possibility that this restriction might not be satisfied in future periods. Therefore, if asset prices are likely to fall in a few years, for example, then the bank will reflect this into the current loan decisions, which will manifest itself as a decline in asset prices at that time. The banks cut down loans independently from each other but collectively with the same expectation that asset prices will go down; while banks cannot internalize this effect of their decisions on the decline in asset prices. In other words, they make decisions without considering that asset prices will fall. The resulting externality leads to market imperfections in the loan market. Regulatory agencies are able to resolve these market imperfections through certain arrangements. For further details about the dynamic effect, externality and the correction of the market imperfections, see Bianchi and Mendoza (2013).

As the bank capital channel takes effect, this negative loop will be even stronger. Delays in re-payment of loans and bankruptcies will increase in periods of financial distress, which may cause the capital adequacy ratio of banks to decline. The bank, seeking to prevent its capital falling below the MCAR, will respond by lowering the amount of new lending and increase the lending rates. In this way, the interaction of the balance sheet channel and the bank capital channel may generate rapid and severe fluctuations in loan amounts and lending rates.

To show how the credit channel functions and how macroprudential policies affect the economy, a scenario analysis was performed through a model, which accommodates these mechanisms (Figure 1). In this hypothetical scenario, an extreme case is simulated where the accumulation of systemic risks affects the overall economy and the credit channel sets to work swiftly and strongly upon the recognition of these risks. In this scenario where the economy is originally at the steady-state equilibrium, productivity growth and risks in the credit market are assumed to be evaluated incorrectly by agents for three years (12 quarters denoted by the shaded area in Figure 1), leading to accumulated systemic risks over the three-year period. In particular, productivity growth is overestimated while credit risks are underestimated by all agents and the actual values are revealed only with the completion of the three-year period.

Under this scenario, we will first analyze the case where the MCAR is kept constant at 12 percent, which is denoted by the black solid line in Figure 1. Owing to the expected increase in productivity growth and the low risk sentiment, economic activity and credits grow fast during the first three years. At the end of this period, all agents in the economy find out that the real pace of productivity growth is lower whereas credit risks are higher than they estimated, hence the credit channel (particularly the balance sheet and the bank capital channels) takes effect. As these two channels interact as explained above, asset prices and loan growth fall by 10 and 4 percent, respectively, while the lending spread is widened by 300 basis points. It should be noted that the financial accelerator mechanisms works swiftly and effectively with the greatest effect occurring in the first quarter as soon as the shock is realized. Upon the rise in lending rates and the decline in credits, the economy contracts dramatically, which is manifested as a 6 percent decline in the output gap in the first year of the shock.

Now, we will analyze the case of the implementation of a more active macroprudential policy under the same scenario. According to this policy, the MCAR is set asymmetrical and counter-cyclical such that it is increased in periods of rapid economic growth and kept constant at 12 percent in periods of economic contraction, which is denoted by the dashed blue line in Figure 1. This policy helps banks to accumulate capital in times of favorable economic growth, which acts as a buffer against potential adverse conditions through the bank capital channel. Under this policy, which is denoted by the dashed red line, bank lending (real amount of loans) increases at a slower pace compared to the case of constant MCAR, which is denoted by black line. This is because banks accumulate capital against higher MCAR in order to avoid punishment. This lower amount of financing provided by banks translate into lower economic growth. However, due to revision of expectations at the end of three years, the negative effect prove quite limited. Thanks to the additional capital they accumulate in the rapid-growth period, banks exit the shaded area with stronger capital. This enables them to respond more softly to the negative shock without a sizeable decrease in lending or an increase in lending rates. Also, the slowdown in the economy is lower compared

to the case of a constant MCAR. Furthermore, the countercyclical MCAR policy is asymmetrical in the sense that in times of favorable expectations denoted by the shaded area, the asymmetrical countercyclical MCAR policy leads to a slower economic growth than in the constant MCAR policy, but the shock is alleviated relatively more rapidly during financial distress.

This scenario shows how the MCAR can be used a macroprudential policy tool. In addition to the MCAR, other macroprudential policy tools such as loan-to-value ratio, limits to loan-to-income ratio, maturity structure, limits to short-position, FX borrowing and lending as well as loan tax can be utilized in Turkey and other countries (Akıncı and Olmstead-Rumsey, 2015; Fendoğlu, 2017). The effects of some of these policy tools on macroeconomic and financial variables can also be analyzed by using the above model.

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