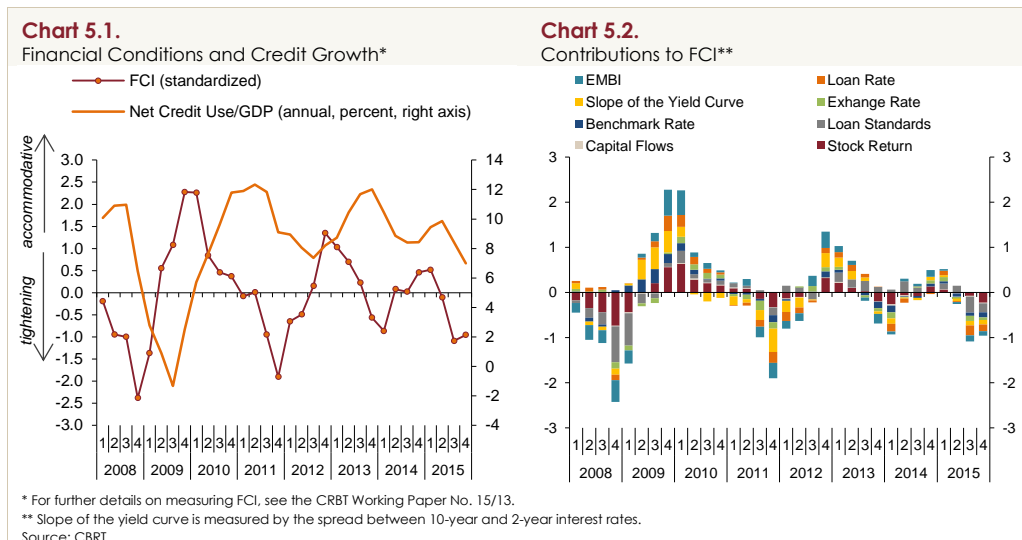


## 5. Financial Markets and Financial Intermediation

Uncertainties over the Fed's policy rate decisions waned in the last quarter of 2015. The Fed decided to raise policy rates in December and announced that future policy rate hikes would be gradual. This supported the alleviation of uncertainties in international markets. Meanwhile, the sluggish economic activity in the last quarter in China and the depreciation of the Chinese renminbi against the US dollar led global markets to grow more uncertain. Moreover, geopolitical risks and the persisting downside risks to growth performance in oil-exporting emerging economies stood among other factors to feed into uncertainties in markets. Exchange rates in emerging economies with high sensitivity to global shocks saw notable fluctuations.

Commodity prices remained low, giving further support to economic activity and the current account balance, while waning domestic uncertainties improved the risk sentiment of Turkey. In the last quarter, Turkey diverged positively from other emerging economies, particularly in the foreign exchange market, and the exchange rate volatility trended downwards in this period. Yet, fluctuations in global markets in the early weeks of 2016 caused Turkey's risk premium to heighten similar to other countries, which led to higher volatility and the depreciation of the currency.

Despite a slight increase in the last quarter, the FCI for Turkey has yet to enter into an accommodative zone (Chart 5.1). Even though this period was marked by weakening domestic risks, global market risks weighed further on financial markets. Accordingly, all FCI components continued to contribute negatively to financial conditions (Chart 5.2). Given these tight financial conditions, loan growth remained on a downtrend. A gradual recovery is expected in credit and financial markets for the period ahead, yet uncertainties hang over global markets.



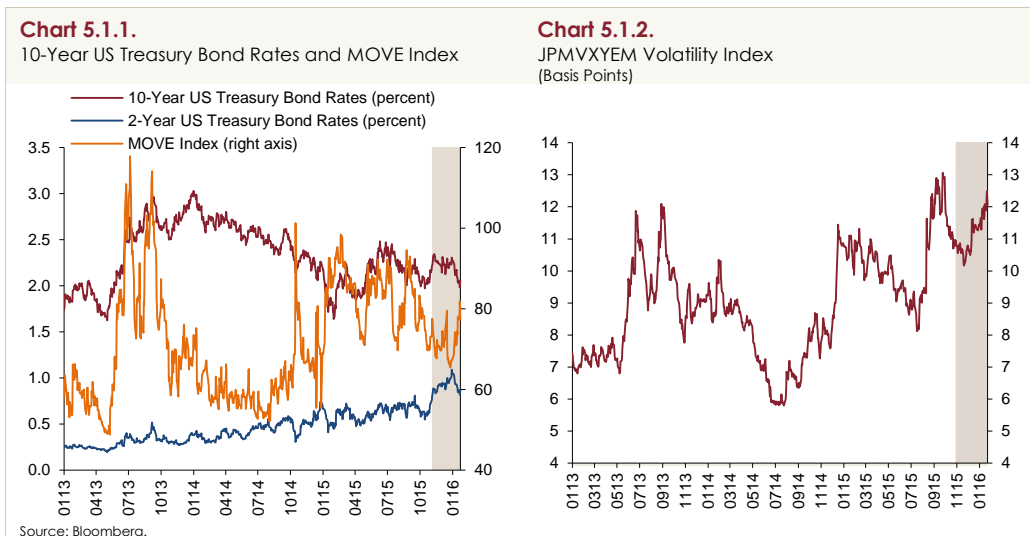
## 5.1. Financial Markets

### Global Risk Perceptions

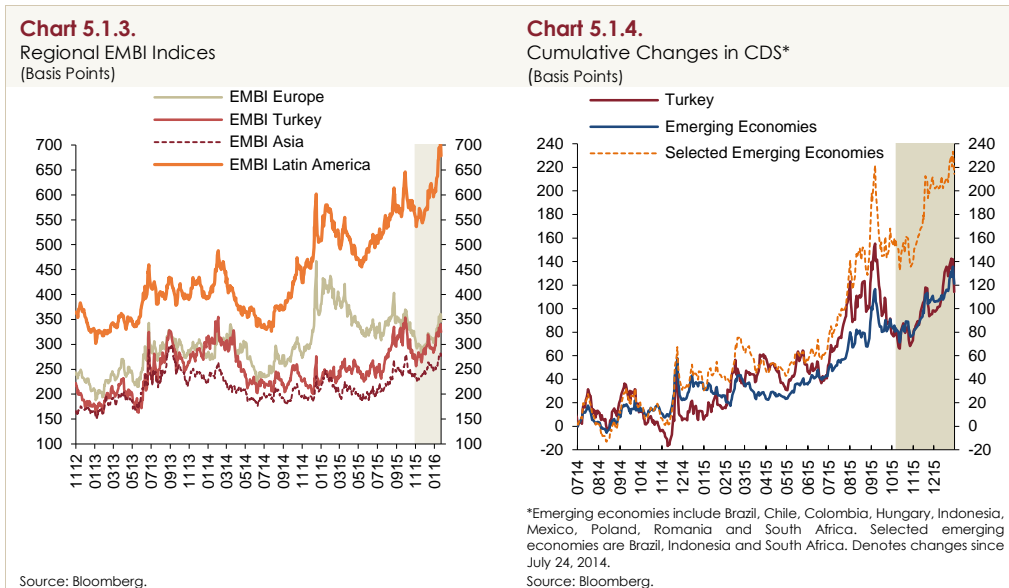
In its December 2015 meeting, the Fed delivered the long-awaited policy rate hike with the statement that future policy rate increases would be gradual and dependent on inflation and the overall economic outlook. Because of this communication, the 10-year US bond rates saw a relatively limited rise following the rate hike, while 2-year US bonds registered a notable increase (Chart 5.1.1). The MOVE index, indicating the volatility of bond markets, followed a fluctuating course in this period.

The Euro area economic activity recovered slightly according to data of the last quarter of 2015. However, given elevated downside risks to the inflation outlook and the slightly weak prospects for inflation dynamics, the ECB cut its deposit rate by 10 basis points to minus 30 basis points and decided to extend the asset purchasing program through March 2017 or even longer if warranted.

Meanwhile, the ongoing deceleration and the stock market crash in China as well as the devaluation of the Chinese renminbi against the US dollar were the major factors heightening the global market uncertainty, particularly in January. On the other hand, further downside risks to growth, especially in oil-exporting emerging economies, were other factors to aggravate uncertainties in global markets given plunging oil prices and geopolitical risks. Accordingly, the emerging market exchange rate volatility posted a remarkable increase in the inter-reporting period (Chart 5.1.2).

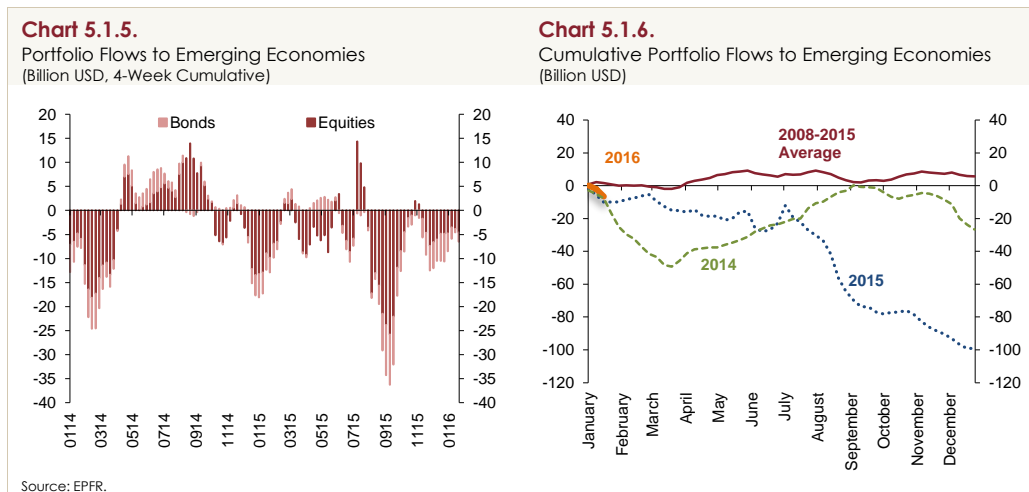


Spillovers from the Chinese economy, the lower-than-expected growth rates across emerging economies and geopolitical tensions inhibited the global risk appetite, which caused the EMBI and the CDS premiums to rise dramatically in emerging markets (Charts 5.1.3 and 5.1.4). Similarly, risk premium indicators for Turkey increased as well.

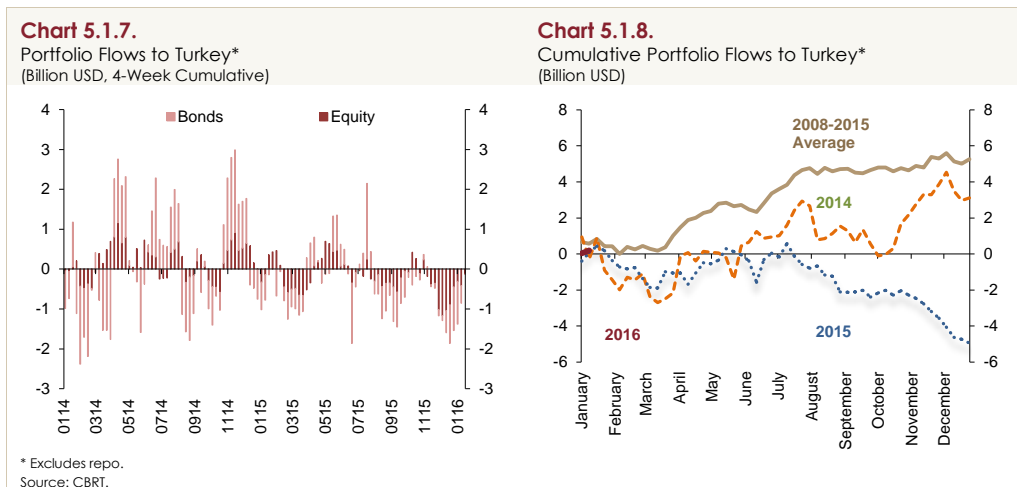


Portfolio Flows

In line with the above global developments, emerging economies continued to experience portfolio outflows both in stock and bond markets in the last quarter of 2015 as well. An analysis of all funds invested in emerging economies suggests that the outflows appeared similar in all emerging economies (Charts 5.1.5 and Chart 5.1.6).

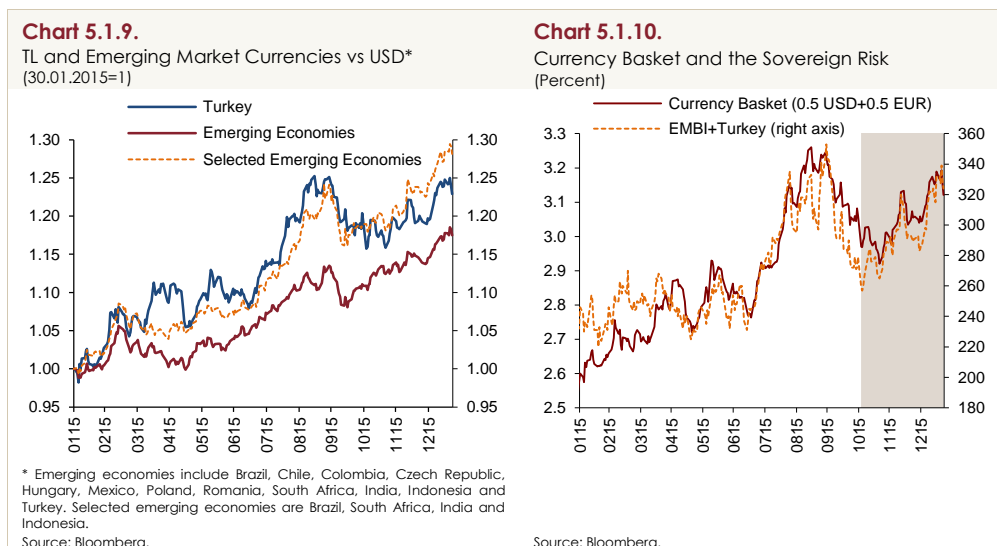


Due to weakening capital flows to emerging markets and elevated regional geopolitical risks, Turkey experienced outflows both in the stock market and bonds market, while portfolio flows lagged notably behind past years' averages in cumulative terms (Charts 5.1.7 and 5.1.8).



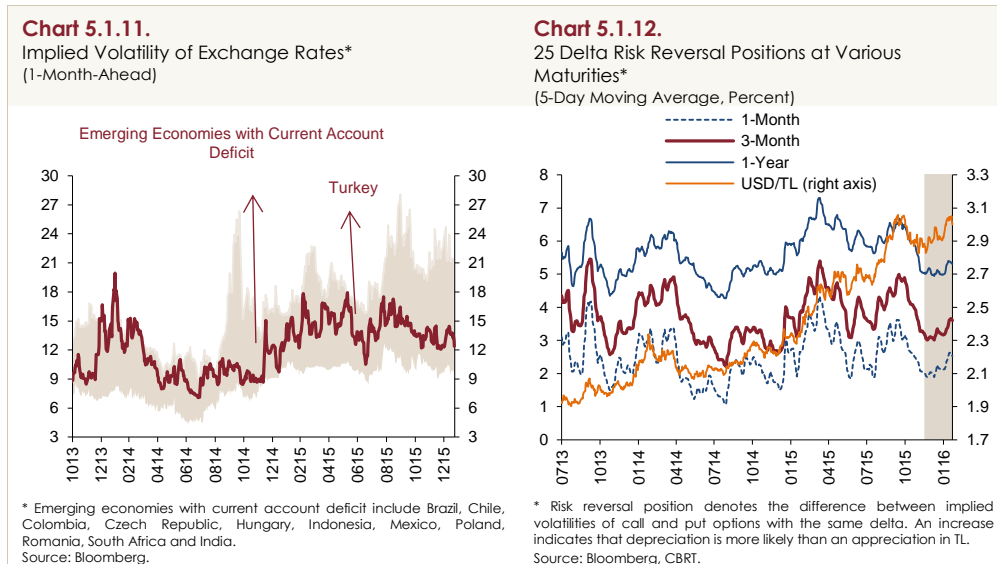
### Exchange Rates

The last quarter of 2015 was marked by spillovers from uncertainties to global financial markets and the depreciation of emerging market currencies against the US dollar (Chart 5.1.9). Due to the vague global atmosphere coupled with particularly elevated pre-election domestic uncertainties, the Turkish lira saw a volatile course in the last quarter and depreciated against the US dollar. In the second and third quarters of 2015, the Turkish lira followed a more volatile course than the Brazilian real, South African rand, Indian rupee and Indonesian rupiah, whereas it diverged positively from these currencies thanks to the waning domestic uncertainty since November 2015 (Chart 5.1.9). On the other hand, the increased volatility in global markets driven by the Chinese economy since early 2016 led to accelerated depreciation of the Turkish lira compared to the last quarter of 2015. Accordingly, EMBI+ risk premiums and the currency basket rose moderately in the inter-reporting period, while these two indicators have become more correlated since April 2015.



In the last quarter of 2015, implied exchange rate volatility of the emerging market currencies increased, and the divergence in exchange rate volatility among countries grew more apparent. In this period, implied volatility of the Turkish lira trended downwards starting from August and neared the

second-quarter levels of 2015 (Chart 5.1.11). However, amid a lower global risk appetite in early 2016, the implied volatility of the Turkish lira has recently followed a fluctuating course. Accordingly, risk reversal positions remained flat in the last quarter of 2015 given the decline in implied volatilities, while they increased due to partly rising volatilities in early 2016 (Chart 5.1.12).



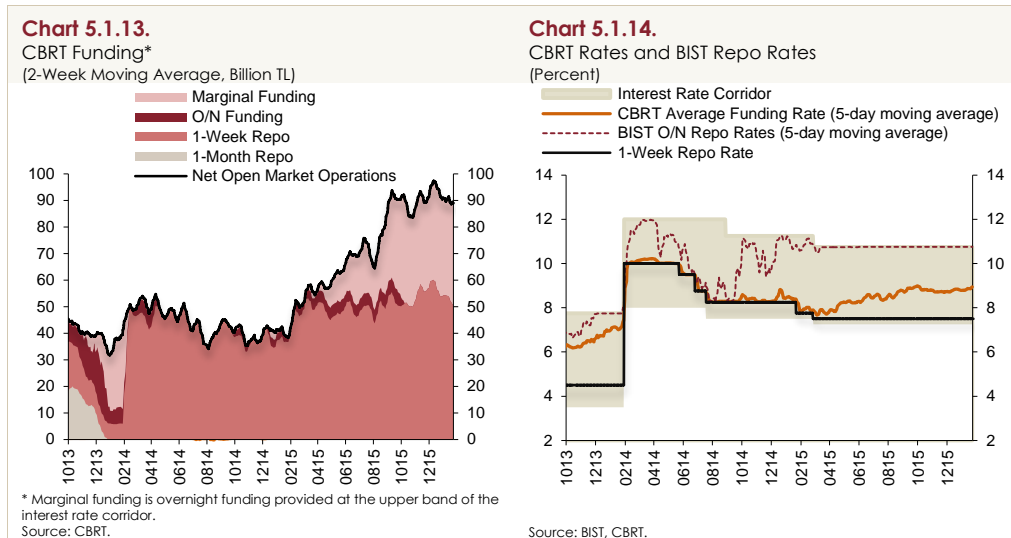
### Monetary Policy

As per the road map released in August 2015 regarding the policies to be implemented before and after the normalization of global monetary policies, the CBRT's monetary policy stance remained tight against the Turkish lira, stabilizing for the FX liquidity, and supportive of financial stability. Following the announcement of the road map, the lower interest rate on borrowing facilities provided for primary dealers by the CBRT was terminated and collateral conditions were eased to simplify the operational framework of the liquidity policy. The newly adopted arrangements on the use of foreign exchange deposits as collateral against Turkish lira transactions aimed to enhance the efficiency of banks' liquidity management. Moreover, the CBRT took further steps to stabilize FX liquidity and support core liabilities and long-term borrowing.

Owing to the measures taken under the road map announced in August, excessive volatilities in exchange rates and loans abated. The CBRT assesses that the tight monetary policy in effect strengthens the resilience of the economy against global shocks and enhances financial stability. The CBRT's assessment still prevails that the tight monetary policy may be implemented within a narrower interest rate corridor, should global volatilities see a permanent decline or the policy tools to enhance gains in external balance and financial stability prove more effective.

In view of inflation expectations, the pricing behavior and other factors affecting inflation, the CBRT maintained its tight monetary policy and liquidity stance in the last quarter of 2015. Accordingly, the one-week repo rate, the overnight lending rate and the overnight borrowing rate were kept unchanged at 7.5, 10.75 and 7.25 percent, respectively, in this period. One-week repo auctions continued to be the main tool for the CBRT funding, while the share of the marginal funding remained high (Chart 5.1.13). Thus, the average funding rate, which increased in the third quarter, followed a flat

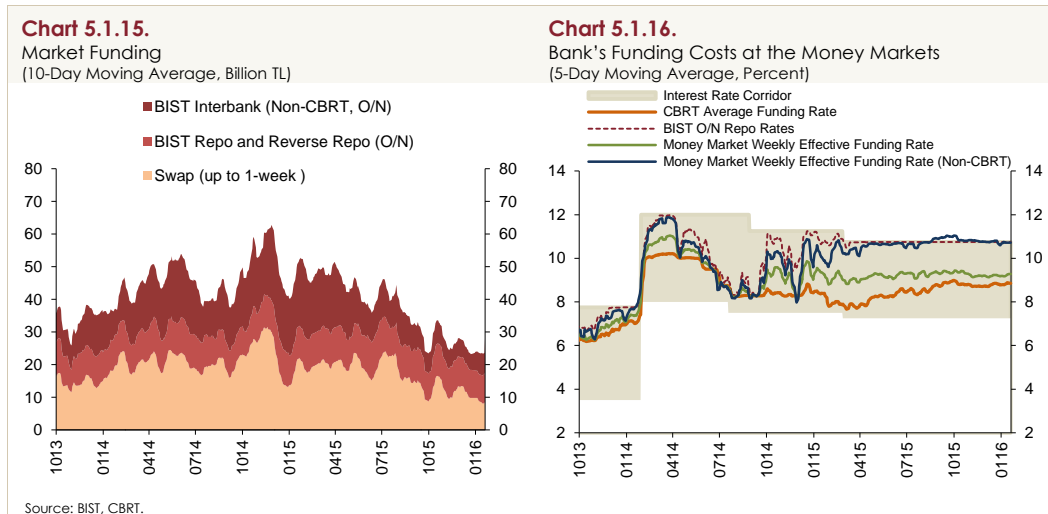
course in the last quarter and settled at around 9 percent in January 2016. Additionally, the interbank overnight repo rates were kept at the upper band of the interest rate corridor as in the rest of the year (Chart 5.1.14). Future monetary policy decisions will be conditional on the inflation outlook. Taking into account inflation expectations, the pricing behavior and the course of other factors affecting inflation, the CBRT will maintain its tight liquidity policy stance as long as deemed necessary.



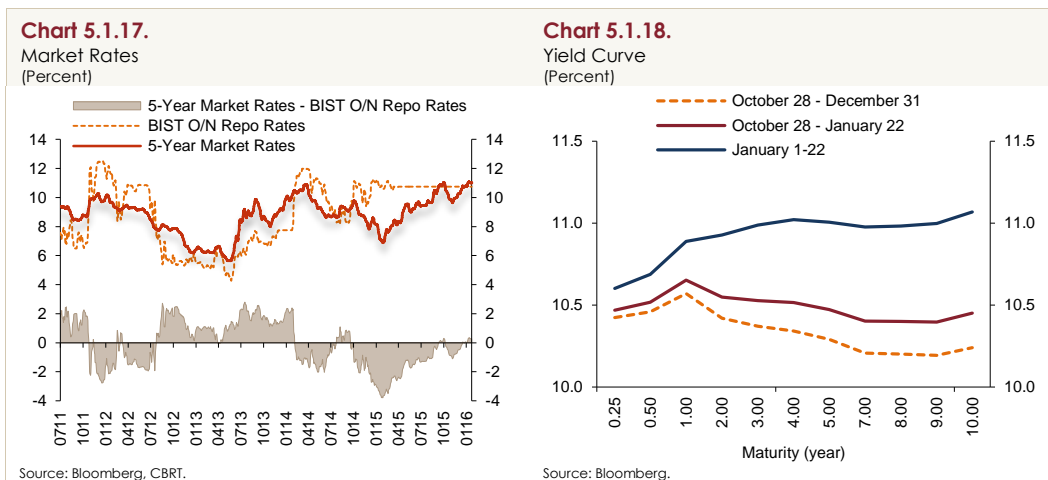
In addition to funds provided by the CBRT, short-term funds provided from various markets also play a significant role in meeting the Turkish lira liquidity requirement of the banking system. In the money market, non-CBRT funding with up to one-week maturity is mostly provided via swap markets. This is followed by funds transacted under the BIST Interbank Repo and Reverse Repo Market and those which are exchanged by intermediaries under the BIST Repo and Reverse Repo Market. Following the release of the road map, arrangements regarding the use of FX deposits against collateral were amended. The need for exchange rate swap declined slightly in this period (Chart 5.1.15). Moreover, the average cost of non-CBRT funds, which hovered above the marginal funding rate in the third quarter of 2015, neared the marginal funding rate again in late 2015. The effective funding rate calculated by the weights of CBRT and non-CBRT funds in total funds, which was around 9.2 percent in January, neared the average funding rate in this period (Chart 5.1.16).

As of January 7, the FX deposit limits have been increased from 3 billion USD to 3.6 billion USD and from 900 million EUR to 1.8 billion EUR in view of the fact that the need for swap markets may lessen amid increased use of FX deposits as collateral and the higher limit allotments to banks.

The increase in the ratio of the FX collateral that can be pledged by banks within the CBRT against their borrowings from the CBRT Interbank Money Market is expected to support the demand for FX-denominated bonds issued abroad by the Treasury. Accordingly, the maximum ratio of 50 percent that banks are able to pledge as FX-denominated collateral against their borrowings at the CBRT Interbank Money Market were raised to 70 percent as of January 13, 2016. This arrangement is expected to play a stabilizing role against the stress likely to be experienced in credit risk pricing due to global factors.

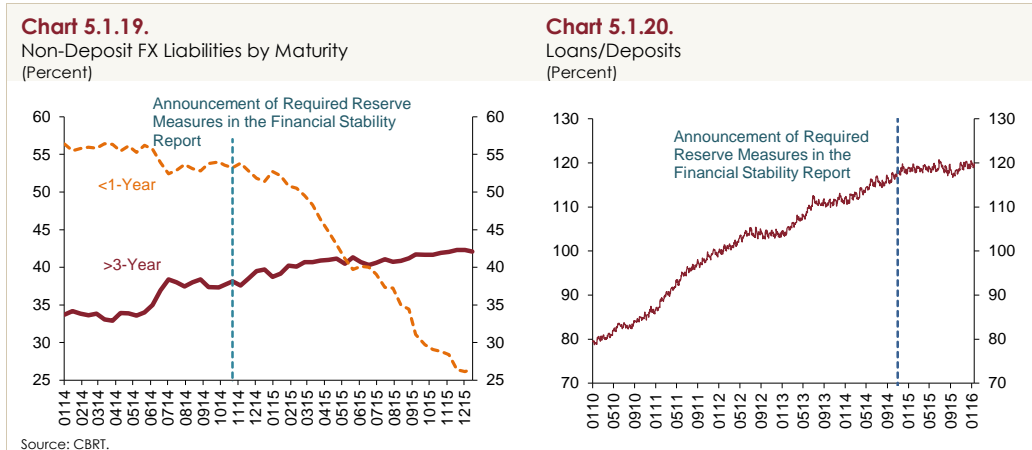


The spread between 5-year market rates and the BIST overnight repo rates hovered at negative values in the last quarter of 2015, yet turned slightly positive in early January due to the rise in 5-year market rates (Chart 5.1.17). Owing to the adverse effects of vague global markets, geopolitical risks and exchange rate volatilities on inflation, long-term rates registered an increase in the last quarter. The yield curve shifted upwards in the early weeks of 2016, particularly in long terms, and the yield curve turned positive, in turn (Chart 5.1.18).

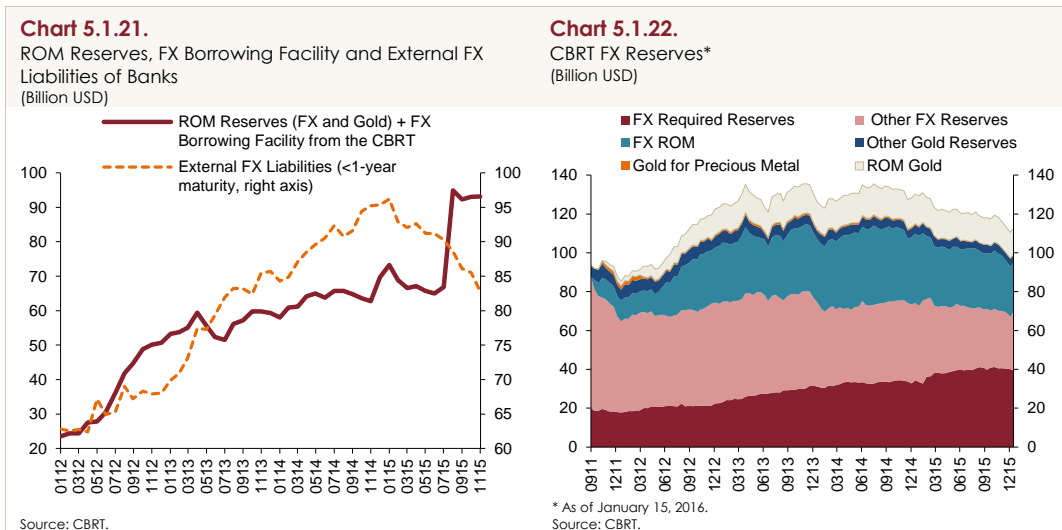


Besides interest rate and liquidity policies, the CBRT continues to employ other policy instruments to support financial stability. These measures aim at limiting macrofinancial risks and contributing to a balanced growth by promoting prudential borrowing. Thanks to the measures taken by the CBRT, maturities of non-core short-term FX liabilities continued to extend across 2015 (Chart 5.1.19). As announced on August 29, the CBRT raised the remuneration rate for the TL required reserves by 50 basis points each in September, October and December. This adjustment aimed at reducing intermediation costs of the banking sector and supporting core liabilities. In fact, the loan-to-deposit ratio has settled on a relatively more stable track since the introduction of these measures in November 2014 (Chart 5.1.20). Moreover, as per the decisions announced on January 9 regarding the scope of reserve requirement ratios, development and investment banks' borrower funds were subjected to reserve

requirements and reserve requirement ratios for these liabilities will be 11.5 percent for Turkish lira and 13 percent for FX liabilities. Additionally, deposits and participation funds obtained from banks abroad were subjected to the reserve requirement ratios for liabilities other than deposits and participation funds, since these liabilities are regarded as non-core liabilities.



In the road map regarding the steps to be taken during the normalization of policies, the CBRT included some measures to enhance the flexibility of the foreign exchange liquidity management. To this end, transaction limits for banks at the CBRT Foreign Exchange and Banknotes Markets were raised on September 1, 2015. Consequently, the sum of FX deposit limits allocated to banks and gold and foreign exchange assets held at the CBRT under the ROM reached a level that is considerably above the external debt payments of banks which are due within one year (Chart 5.1.21). Moreover, on December 26, the calculation of the FX amount to be held against Turkish Lira liabilities under the ROM was re-arranged to strengthen its stabilizing feature. Accordingly, the calculation of FX amount was based on the average of the exchange rates prevailing before the start of the maintenance period rather than the exchange rates prevailing on the liability date.



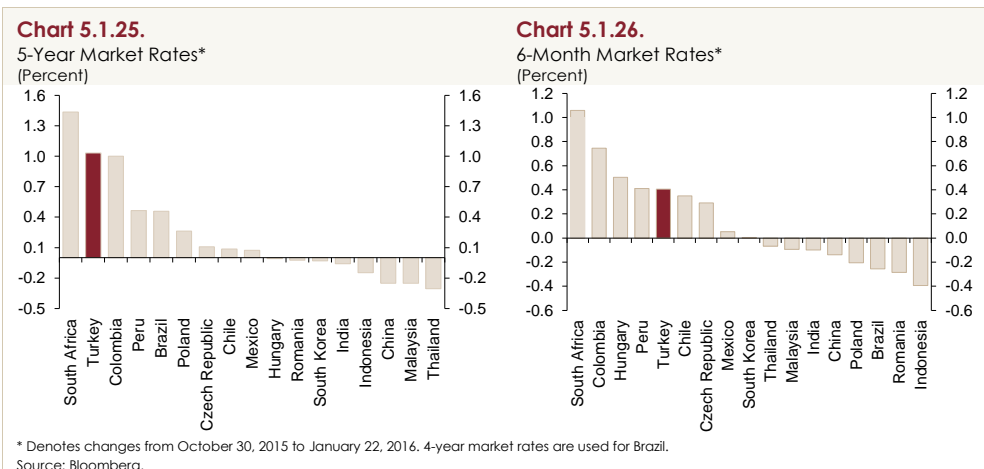
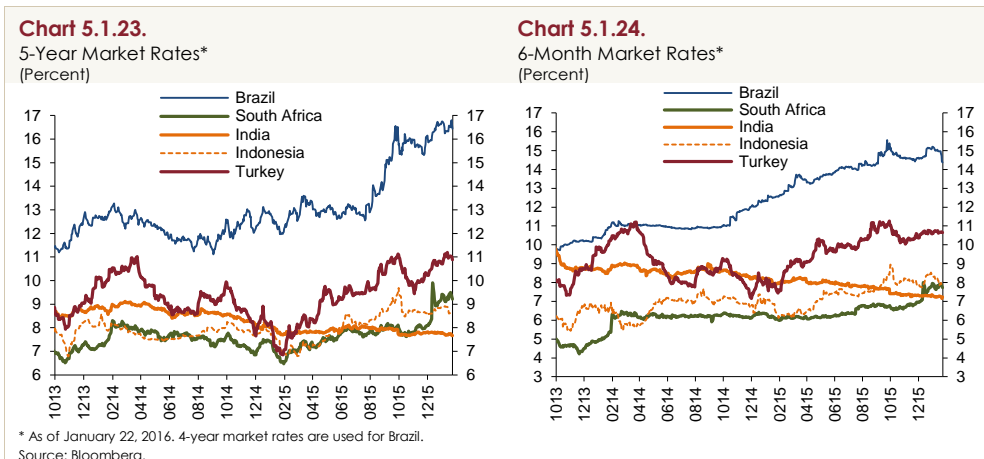
CBRT reserves posted a decline in January 2016 compared to the previous reporting period (Chart 5.1.22). Banks' reserves maintained against FX reserve requirements and the CBRT's other FX



reserves remained nearly unchanged, while FX selling auctions that support FX liquidity increased, and the amount maintained by banks under the ROM declined. ROM utilization rates of financial institutions remained high in the last quarter and reached 89.1 percent (53.4/60) for FX and 89.2 percent (26.8/30) for gold as of the maintenance period of January 15. The CBRT sold 22.8 billion USD through FX selling auctions and direct FX sales to energy-importing state economic enterprises in 2015. The FX amount obtained by rediscount credits stood at 15.2 billion USD in this period.

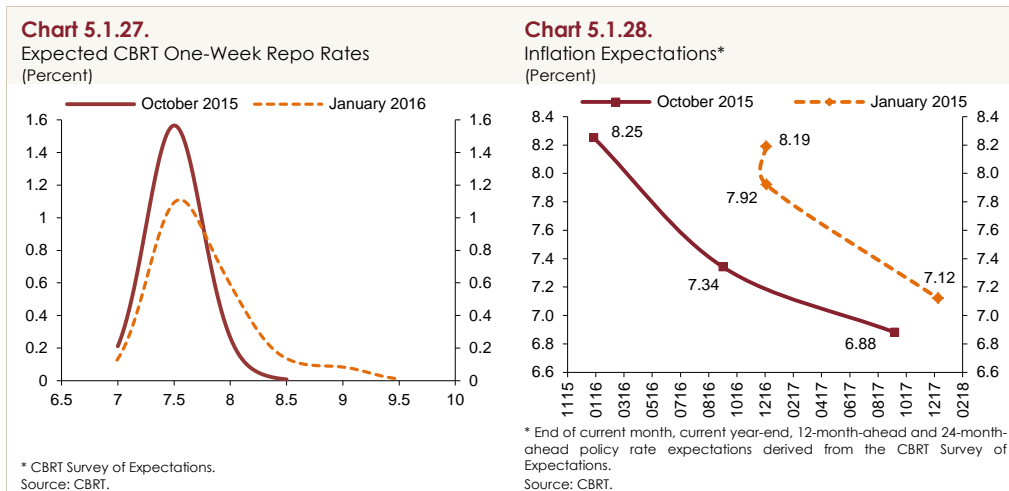
### Market Rates

In the last quarter of 2015, market rates in emerging economies trended upwards (Charts 5.1.23 and 5.1.24). On a country level, market rates have remained flat in India since October 2015, but increased in Brazil, Indonesia, South Africa and Turkey. Turkey's market rates recorded an increase in long maturities due to external uncertainties as well as geopolitical risks and higher inflation expectations (Chart 5.1.23). Market rates rose by around 100 basis points in 5-year maturity, and 41 basis points in 6-month maturity compared to the previous reporting period (Charts 5.1.25 and 5.1.26). The relatively high increase in market rates in long maturities was also reflected on the slope of the yield curve in January (Chart 5.1.18).

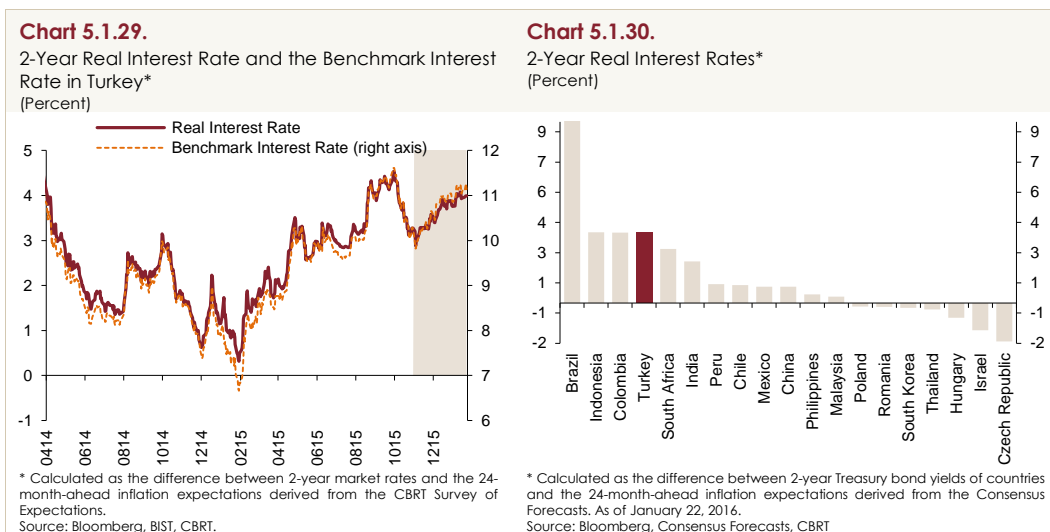


Following the February decision of the MPC, the CBRT kept the one-week repo rate at 7.5 percent. In the road map released in August, it was announced that the interest rate corridor might be

made more symmetric around the one-week repo rate in the context of the steps to be taken regarding the simplification of the monetary policy (Chart 5.1.14). Accordingly, the mid-point of the distribution of the expected one-week repo rate was 7.5 in the previous Inflation Report, while in January, the midpoint of the expectation distribution shifted rightwards by around 50 basis points (Chart 5.1.27). Inflation expectations, which are influential in long term market rates, remained almost unchanged for the current year-end compared to October. On the other hand, 12-month-ahead inflation expectations registered a remarkable increase by around 60 basis points, while 24-month-ahead expectations posted a moderate rise by around 25 basis points (Chart 5.1.28).

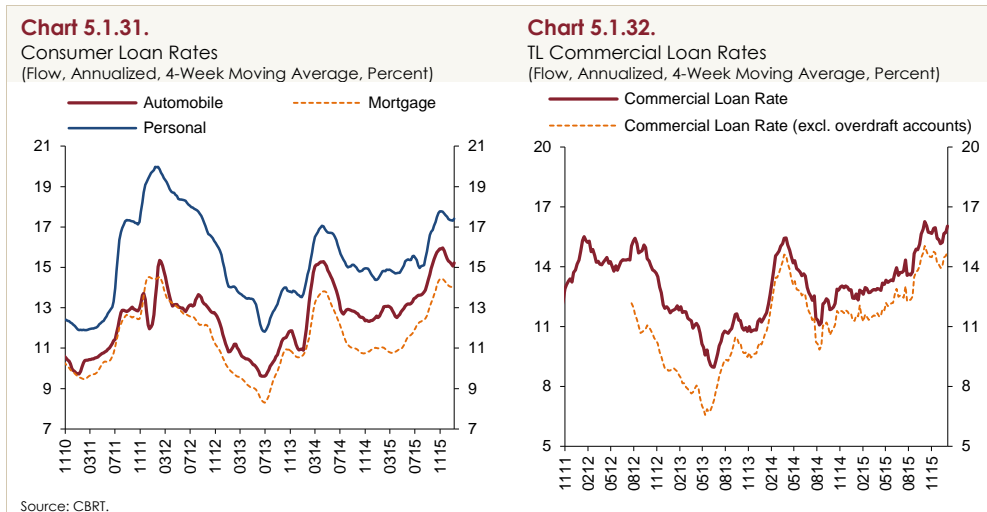


The benchmark interest rate in Turkey, which has been fluctuating since the third quarter of 2015, trended upwards in the last quarter of the year due to the recently waning global risk appetite and increasing inflation expectations (Chart 5.1.29). Nominal rates on 2-year bonds increased by around 80 basis points, while the moderate rise in 24-month-ahead inflation expectations pushed the 2-year real interest rates by 70 basis points in the inter-reporting period. A comparison of 2-year real interest rates across emerging economies suggests that Turkey moves similar to Indonesia and Colombia with real interest rates ranging between 3 to 4.5 percent, while Brazil diverges significantly upwards with real interest rates hovering around 10 percent (Chart 5.1.30).

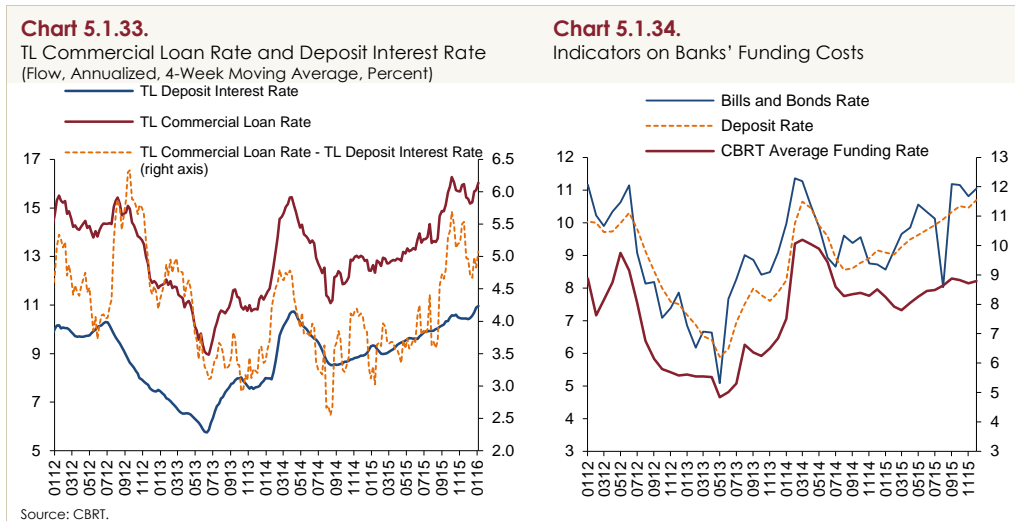


### Loan Rates and Banking Sector Funding Costs

Rates on loans extended to the non-financial sector recorded a year-on-year increase in 2015. Loan rates soared particularly in the third quarter. Meanwhile, the rise in loan rates lost momentum in the last quarter of the year and decreased during November and December. The analysis of consumer loans by sub-items shows that personal and mortgage loan rates posted a quarterly increase by 47 basis points and around 60 basis points in the last quarter of the year, respectively, while automobile loan rates remained unchanged (Chart 5.1.31). At the year end, the commercial loan rate remained unchanged from the third quarter. Similarly, the commercial loan rate excluding overdraft accounts rebounded back to its third-quarter level (Chart 5.1.32). The slight fall in loan rates in the last quarter of the year is consistent with the Loan Tendency Survey results, predicting tighter domestic and external financing conditions.

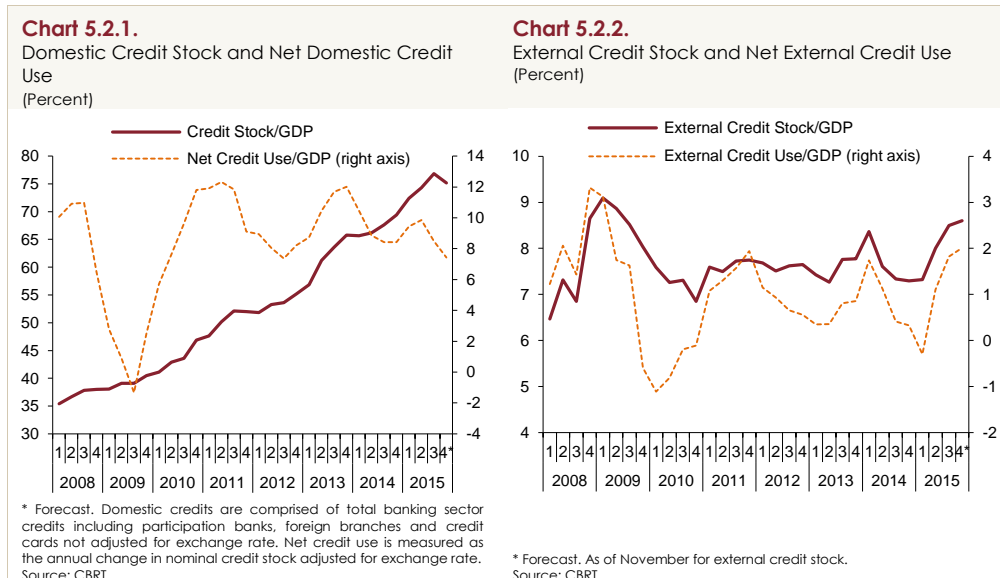


Rates on deposits with maturities shorter than three months, which are the primary financing resources of the banking sector, rose by around 35 basis points quarter-on-quarter owing to the CBRT's tight liquidity stance and slightly rising weighted funding costs in this quarter. Due to the downturn in commercial loan rates in the last weeks of the year, the spread between commercial loan rates and deposit rates narrowed by around 30 basis points to 500 basis points (Chart 5.1.33). The weak and fluctuating fund flows towards emerging economies also had spillovers on bills and bonds issued by banks. Bills and bonds rates deteriorated remarkably at the end of the third quarter and rose by around 85 basis points compared to the second quarter. In the last quarter of the year, bills and bonds rates followed a flat course and stood at 11 percent in December (Chart 5.1.34).



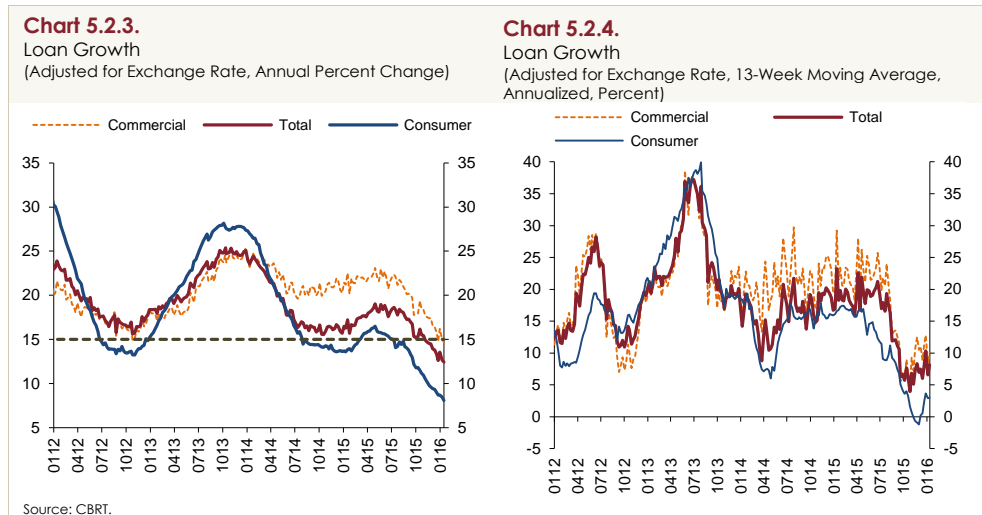
## 5.2. Credit Volume and Monetary Indicators

The net credit use to the GDP ratio, which is critical to financial stability and an indicator of the relationship of credit growth with economic activity and aggregate demand, posted a quarterly decline and stood at 7.4 percent in the last quarter of 2015 (Chart 5.2.1). Following a further decline in the first quarter, the net credits to the GDP ratio is expected to be more stable after the second quarter. Meanwhile, firms' use of net external loans posted a mild increase in the last quarter to 2 percent, implying that firms had no trouble having access to external borrowing (Chart 5.2.2). Moreover, firms' external credit use appears to have crept up year-on-year.



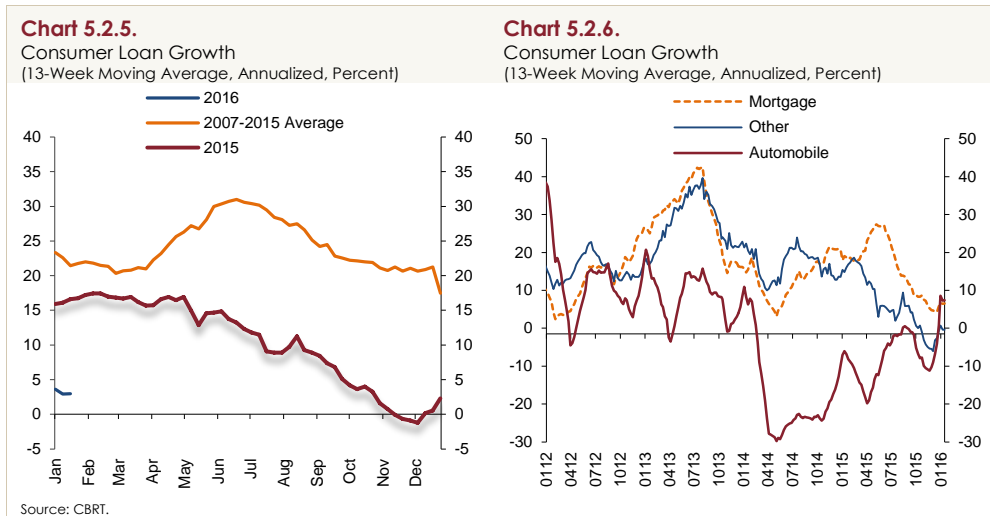
The annual growth rate of loans extended to the non-financial sector, which decelerated due to the CBRT's tight monetary policy and the BRSA's macroprudential measures on consumer loans excluding mortgage in the third quarter, continued through the last quarter of the year. A breakdown of total loans shows that commercial loans continued to grow faster than consumer loans on the back of the measures adopted by the BRSA and the consumer confidence that posted low readings

compared to past averages in the third quarter. Against these developments, loans extended to the non-financial sector in exchange rate adjusted terms grew by 13.6 percent year-on-year at the end of 2015 (Chart 5.2.3). The 13-week moving averages, which display the fourth-quarter developments, show that total loans registered an annualized growth rate of 10.3 percent (Chart 5.2.4).

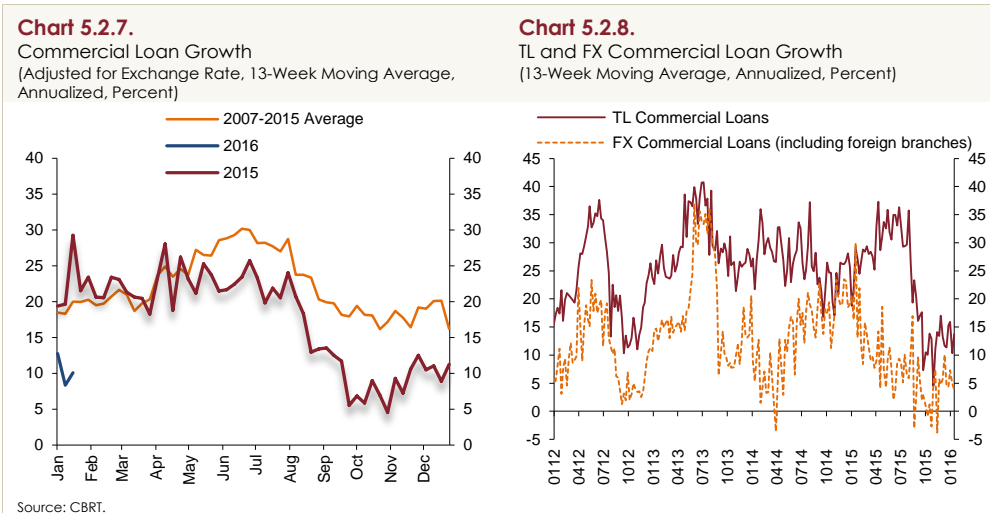


The annualized growth rate of consumer loans remained below past years' averages in the first half of 2015. The annualized growth rate of consumer loans plunged in the third quarter and remained on a downtrend in the last quarter of the year (Chart 5.2.5). The consumer loan growth improved slightly at year-end and hit 3.64 percent in annualized terms. All subcategories of consumer loans had an adverse outlook in the last quarter of the year, which fed into the slowdown in total consumer loan growth. Meanwhile, the Consumer Confidence Index recovered quarter-on-quarter in the last quarter of the year and owing partially to this recovery, all subcategories of consumer loans displayed an improvement, albeit limited. Additionally, the BRSA introduced an arrangement to the risk weight regarding consumer loans and credit cards, which was published in the Official Gazette on January 20 to be enforced on March 31. This arrangement is supposed to reduce the capital amount to be allocated for these credits and affect the growth rate of consumer loans in the upcoming period.

In the last quarter of 2015, the rate of non-performing personal loans and credit cards remained on the rise, resulting in an increase in non-performing retail loans. This is also attributed to the slowdown in the growth rates of consumer loans. The annualized growth rate of mortgage loans with a historically consistent 5-year average maturity and higher interest rate sensitivity was still greater than others, yet it fell below past years' averages, ending the year with 6.7 percent. According to the results of the Loan Tendency Survey, the demand for mortgage loans edged down while loan standards saw a considerable rebound in the last quarter of the year on a quarterly basis. As a result of the macroprudential measures implemented by the BRSA, the growth of automobile loans, which was negative in 2014 and almost throughout 2015, turned positive at the year-end after a prolonged period (Chart 5.2.6).



In the second half of 2015, the annualized growth rate of commercial loans remained slightly below the averages of past years, yet displayed a mild recovery in the last quarter and hit 12.8 percent at the year-end (Chart 5.2.7). These languishing growth figures of commercial loans, which were also seen in the last quarter of the year, appear to be consistent with the weak course of private sector investment in 2015.<sup>1</sup> In fact, the Loan Tendency Survey indicates that the worst impact on the loan demand of enterprises stemmed from the fall in fixed investments in 2015. Meanwhile, the last quarter of the year experienced a limited improvement in commercial loans owing to both TL and FX-denominated loans (Chart 5.2.8).

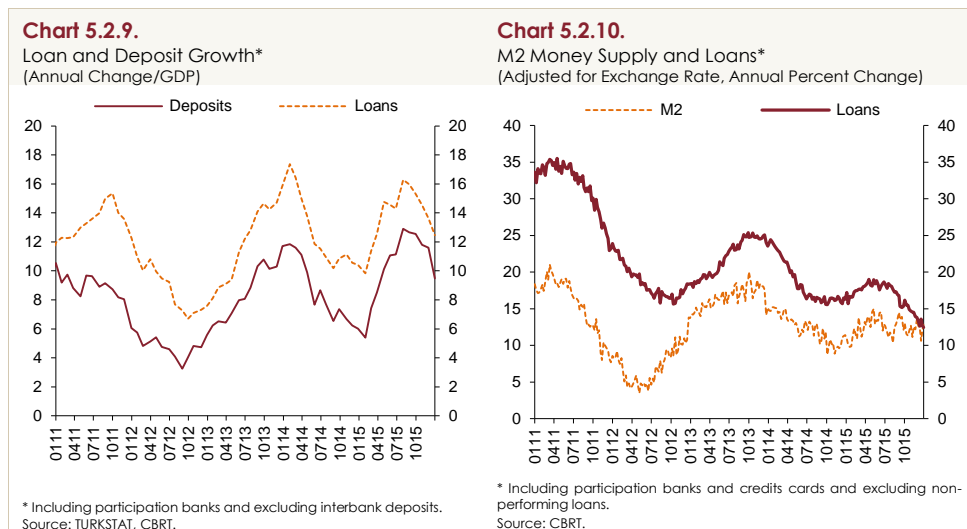


According to the third-quarter Loan Tendency Survey results, standards for commercial loans posted a slight recovery in the last quarter of 2015 on a quarterly basis. However, banks maintained tight standards for loans to enterprises in the last quarter of the year. Short-term and TL-denominated loan standards improved slightly, yet banks' appetite for long-term and FX-denominated loans continued to decline in the last quarter of the year. In terms of scale, the slight recovery in business loan standards applied both to SMEs and large-sized firms.

<sup>1</sup> The relationship between commercial loans and sectoral GDP items is analyzed in detail in Box 5.1.

As for factors affecting commercial loan standards, expectations for overall economic activity, which led to a tightening in loan standards, stood out as the relatively most significant factor in 2015. Financing conditions indicate that domestic financing conditions recorded a notable recovery in the last quarter of the year on a quarterly basis, while external financing conditions continued to deteriorate. Moreover, banks expect that loan standards are likely to tighten further in the first quarter of 2016. On the other hand, banks' expectations for financing conditions in the first quarter of 2016 reveal a mild improvement both in domestic and external financing conditions. On the demand front, loan demand both from SMEs and large-sized firms edged up in the last quarter of the year. However, the loan demand remained low in the last quarter of the year, which stemmed mainly from the ongoing decline in FX-denominated loan demand.

Annual growth rates of both consumer and commercial loans slowed in the last quarter of 2015 on a quarterly basis. Moreover, commercial loans continued to grow at a faster pace than consumer loans in this period. Macroprudential policies enforced in recent years not only pulled the credit expansion rate to sustainable levels, but also directed the loan composition towards production-rather than consumption. Accordingly, faster growth of commercial loans than consumer loans contributes to the balancing process and financial stability at the same time.



In the last quarter of 2015, growth rates of both deposits and loans lost pace on a quarterly basis (Chart 5.2.9). Accordingly, loan-to-deposit ratio assumed a flatter course (Chart 5.1.20). The relationship between M2 and loans shows that the growth rate of loans declined in the last quarter of 2015, while the annual M2 growth rate followed a relatively flat course (Chart 5.2.10).

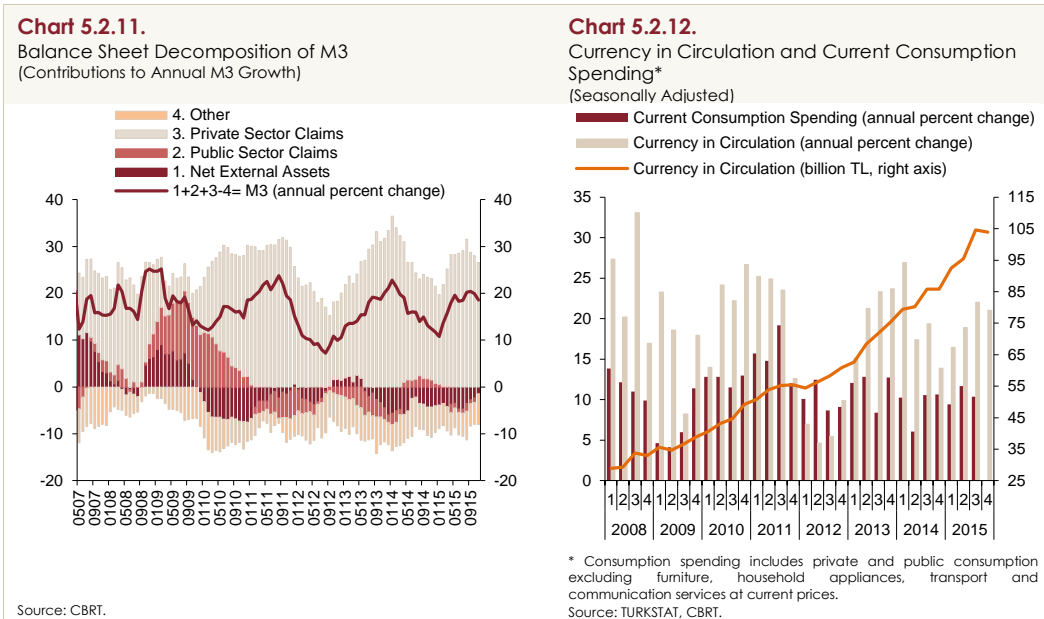
### Monetary Indicators

Credits extended to the private sector continue to determine the annual growth of M3, the broad measure of money supply. The recently slowing growth rate of Private Sector Claims, which mostly include credits extended by banks to non-financial private individuals and institutions, caused the M3 growth to moderate in the third quarter. Meanwhile, the item Other, which displayed a relatively steady course in line with bank profitability, is still a non-deposit funding source for the banking sector, yet continues to contribute negatively to money supply. Being more unstable than the item

Other, Public Sector Claims continue to put downward pressure on the M3 growth for the second quarter in a row (Chart 5.2.11).

Having trended downwards in the last quarter of the year, the annual growth of M3, the broad measure of money supply, receded to 18.5 percent at the end of November. In terms of the decomposition of M3, this trend was determined primarily by Private Sector Claims, which mostly include credits extended by banks to non-financial private individuals and institutions. On the other hand, although declining in recent months, Net External Assets continue to put downward pressure on the M3 growth. The Public Sector Claims item lost its negative effect further in the last quarter of the year. Lastly, the item Other continued with a steady course in line with bank profitability, and remained as a non-deposit funding source for the banking sector (Chart 5.2.11).

In the last quarter of 2015, currency in circulation, which has been increasing during the last year, displayed a year-on-year decline in seasonally adjusted terms. The growth in current consumption spending, which is closely related to the currency in circulation, decreased modestly in the third quarter. Developments regarding the currency in circulation in the last quarter indicate a possible further deceleration in the growth of consumption in this period (Chart 5.2.12).





Box  
5.1

## The Relationship Between Credit and GDP Growth at Sectoral Level

Credits gained importance in the Turkish economy with the adoption of the new monetary policy framework at end-2010, which observes financial stability besides price stability. Accordingly, understanding the relationship between credits and main macroeconomic indicators like inflation, growth and the current account deficit is crucial. This box seeks to contribute to the assessment of the link between credits and GDP growth by analyzing commercial loans and economic activity at the sectoral level.<sup>2</sup>

The sample covers the 2003Q1-2015Q3 period. Commercial loans are captured by the CBRT's sectoral loan data, which are aggregated for the agricultural, industrial, manufacturing, services and construction sectors to comply with the sectoral breakdown of the national income data on the production side. In the spirit of Biggs et al. (2009) and Kara and Tiryaki (2013), the credit and economic growth relationship is analyzed using net credit use and credit impulse. Accordingly, credit impulse at time  $t$  is defined as:

$$CI_t = \frac{(C_t - C_{t-4}) - (C_{t-4} - C_{t-8})}{Y_{t-4}} \quad (1)$$

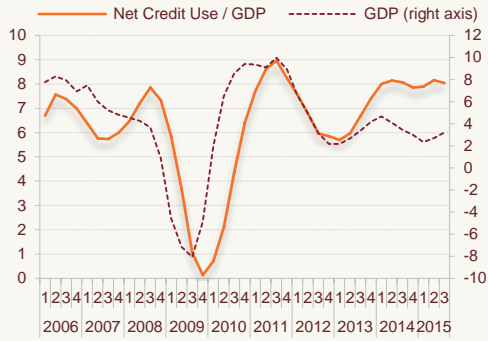
While net credit use is formulated as:

$$NC_t = \frac{C_t - C_{t-4}}{Y_{t-4}} \quad (2)$$

Equations 1 and 2 are adjusted for quarterly frequency. Credit stock ( $C_t$ ) is represented by total commercial loans extended by banks to the non-financial sector at the end of each quarter in nominal and exchange rate unadjusted terms, while GDP ( $Y_t$ ) is represented by the cumulative nominal GDP data over the last 4 quarters. According to Equation 1, the credit impulse shows how the annual change in credit stock in this quarter differs from the annual change in credit stock in the same quarter of the previous year. The net credit use, on the other hand, is the ratio of the annual change in credits by quarters to the nominal GDP. As the GDP is a flow variable and the credit stock is a stock variable, credits are expected to have a more meaningful relationship with GDP in growth terms. Charts 1 and 2 present how net credit use and credit impulse are linked to GDP growth. Accordingly, the turning points in commercial loan growth and real GDP growth are similar. Credits and economic activity are observed to have a stronger relation especially during the global crisis and the subsequent recovery period. As suggested by economic intuition and previous findings, credit impulse appears to have a more significant relationship with economic activity than the net credit use.

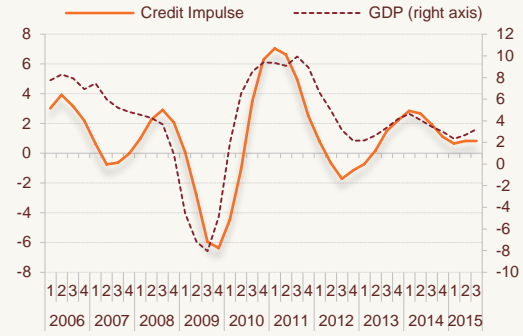
<sup>2</sup> For further details, see Doğan et al. (2016).

**Chart 1. Net Commercial Credit Use and Real GDP Growth (Percent)**



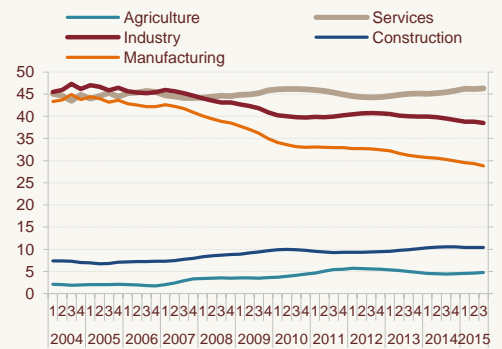
Source: TURKSTAT, CBRT.

**Chart 2. Commercial Credit Impulse and Real GDP Growth (Percent)**



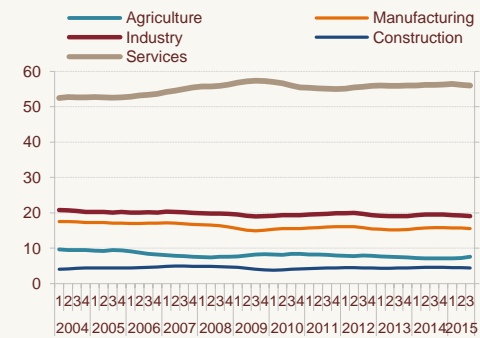
Charts 3 and 4 display the shares of sectoral loans in total commercial loans and the shares of sectoral value added in the national income during the analyzed period. The share of manufacturing sector credits, which was above 40 percent in the first quarter of 2004, fell under 30 percent in the third quarter of 2015. Thus, the manufacturing sector registered the highest fall in commercial loan shares. Besides manufacturing, the credit share of the industrial sector, which covers electricity, gas, steam and mining, displayed a similar outlook and declined. Concurrently, the value added shares of these sectors posted a slight decline. In the meantime, credit shares of services and construction sectors increased mildly, while the services sector registered the highest increase in sectoral GDP shares.

**Chart 3. Sectoral Credit Shares (Percent)**



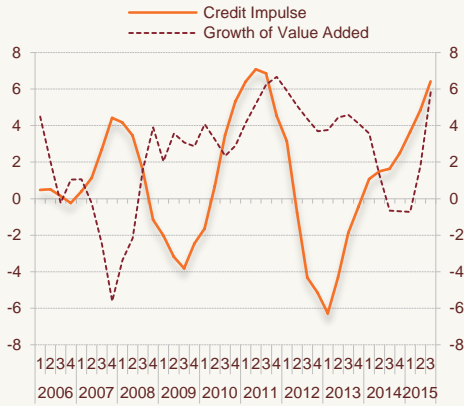
Source: TURKSTAT, CBRT.

**Chart 4. Sectoral GDP Shares (Percent)**

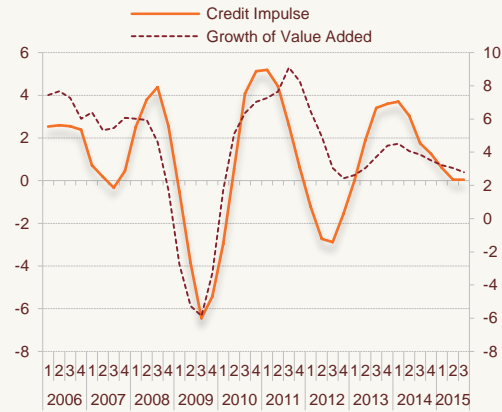


The currency breakdown of credits suggests that TL-denominated credits increased across all sectors in the analyzed period. By maturities, the long-term to short-term loan ratio posted a mild downtrend in all sectors in exchange rate adjusted terms.<sup>3</sup> Given that a major portion of long-term loans is denominated in foreign currency, the downtrend in long-term loans is consistent with that of the FX-denominated loans. The weak course of investment spending since the second quarter of 2011 confirms the slowdown in FX-denominated loans and long-term loans. In fact, TL-denominated short-term loans are mostly used for operational expenses.

<sup>3</sup> Credits with maturities less than one year are classified as short-term, while those with longer maturities are defined as long-term.

**Chart 5. Credit Impulse and Growth of Value Added in Agriculture**

Source: TURKSTAT, CBRT.

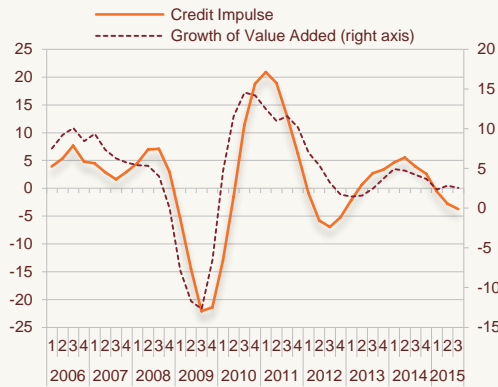
**Chart 6. Credit Impulse and Growth of Value Added in Services**

Charts 5-8 display the credit impulse and GDP growth by sectors. Accordingly, credit impulse varies by sectors and the relationship between credit impulse and value added changes considerably across sectors. In particular, credit impulse is weakly linked to the growth of value added in agriculture. These two series moved in opposite directions from 2005 to 2009, while they had a slightly stronger relationship afterwards. Throughout 2015, agricultural loans gained momentum, while agricultural value added displayed a significant jump. As for the services sector, credit impulse is more strongly linked to value added, yet the former is more volatile than the latter. In particular, credit impulse in the services sector has plummeted since early 2014, while value added in services slowed down only moderately.

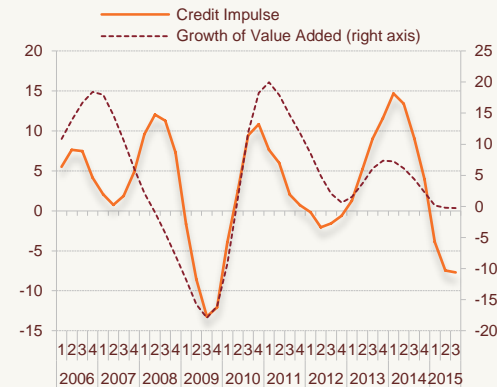
Credit impulse is strongly related to value added in the manufacturing sector. Even though credit impulse is occasionally more volatile than the value added in this sector, the two series have a co-movement for the most part of the sample. Throughout 2015, credit impulse receded in the manufacturing sector, while value added remained flat. As for construction, credit impulse moved in tandem with the value added during the global crisis, while the positive correlation between these two series has decreased notably as of mid-2012. Accordingly, credit impulse increased significantly from the second quarter of 2012 to the first quarter of 2014, while the value added in construction recovered only weakly. In the subsequent period, credit impulse declined to negative values, while the value added in the construction sector registered a milder decline, thus causing a weaker link between these two series.

In short, the graphical analysis suggests that manufacturing sector registered the strongest link between credit impulse and value added. Meanwhile, credit impulse has slowed down considerably in all sectors excluding agriculture since early 2014. This is particularly evident for the construction sector. Despite the plunge in credit impulse, the value added decelerated less notably in construction, manufacturing and services.

**Chart 5. Credit Impulse and Growth of Value Added in Manufacturing**



**Chart 6. Credit Impulse and Growth of Value Added in Construction**



Source: TURKSTAT, CBRT.

Table 1 presents the regression results analyzing the relationship between GDP and credit growth by sectors. This can be captured by the equation  $GDP_{it} = \beta_0 + \beta_1 CI_{it} + \beta_2 NC_{it} + \varepsilon_{it}$  with a maturity breakdown for each sector.  $GDP_{it}$  is the growth of the value added in sector  $i$  at time  $t$ ,  $CI_{it}$  is the credit impulse in sector  $i$  at time  $t$ ,  $NC_{it}$  is the net credit use in sector  $i$  at time  $t$  and  $\varepsilon_{it}$  signifies the error term. Accordingly, it can be inferred that the maturity distinction is important regarding the relationship between credits and the GDP growth. Credit impulse for long-term loans has a positively significant effect on growth of all sectors excluding agriculture; while for short-term loans, credit impulse does not have a statistically significant effect except for construction. On the other hand, net credit use in long-term loans is not statistically significant for the GDP growth by sectors. The regression results testing the relationship between total commercial loans and the real GDP growth, which are presented in the last column of Table 1, are consistent with the finding that credit impulse in long-term loans is related to the real GDP growth.

**Table 1. Regression Results**

	Agriculture	Services	Manufacturing	Construction	Total
Short-Term Credit Impulse	0.294 (0.539)	1.011 (0.914)	0.239 (0.837)	2.650*** (3.453)	0.168** (2.165)
Long-Term Credit Impulse	0.245 (0.943)	1.286*** (4.201)	0.960*** (3.461)	0.470* (1.846)	0.0754*** (3.009)
Short-Term Net Credit Use	-1.591** (-2.068)	-1.097 (-1.212)	0.239 (0.496)	-2.269*** (-3.073)	0.0506 (0.494)
Long-Term Net Credit Use	0.595 (1.656)	-0.668 (-1.429)	-0.290 (-0.724)	0.431 (1.189)	-0.0268 (-0.913)
Constant	10.01*** (4.586)	15.78*** (8.940)	10.26** (2.315)	14.92*** (3.428)	10.66*** (4.209)
Number of observations		43	43	43	43
R2		0.297	0.478	0.331	0.527
Adjusted R2		0.223	0.423	0.261	0.477

t-statistics are in parenthesis, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

In sum, these findings show that the relationship between credit and the GDP may vary across sectors and by maturities. A higher share of loans in sectors like agriculture and construction, where credits are poorly linked to sectoral value added may weaken the relationship between credits and the GDP. Also, the change in the maturity of loans from long-term to short-term may result in weaker link between credits and growth. Finally, the relation between credits and GDP, as also underlined by Kara and Tiryaki (2013), may better be captured by credit impulse rather than net credit use.

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