II. Non-Financial Sector

Household assets and liabilities continued to grow and the biggest contribution to household assets' growth arises from the increase in deposits denominated in Turkish Lira and the biggest contribution to household liabilities' growth is attributable to the use of housing loans. It is expected that the liabilities will show a slight increase in the following period owing to the rise in maturity limits for general purpose loans, installment limits for individual credit cards and loan to value ratio for housing loans. However, since the rate of increase in household assets exceeds the rate of increase in liabilities, the household financial leverage ratio (liability/asset) continues to decline.

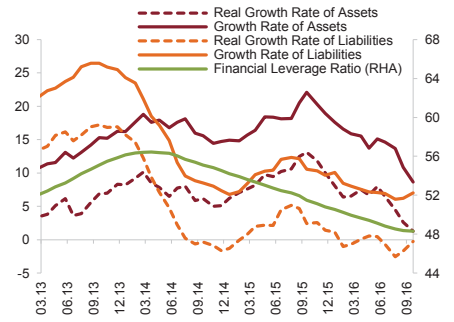
Although the real sector financial liabilities as a share of GDP have slightly increased compared to the previous reporting period, they are below the average of emerging markets. The continuation of the upward trend in the FX short positions of companies is regarded as a fragility factor in terms of FX risk but the factors that reduce these risks should not be ignored. As a matter of fact, most of the FX financial liabilities of the real sector are composed of loans with maturities over five years. These debts are mostly concentrated in the energy, transportation, health and construction sectors, which have a significant share in total exports (e.g. manufacturing industry) and government service / product purchasing guarantees within public-private partnership (PPP) projects. The fact that the developments in international markets and the fluctuations in exchange rates are reflected in the product pricing in these sectors; the natural protection provided by the export revenues and the government purchasing guarantees are expected to support the real sector against the demand and exchange rate shocks that may arise in the forthcoming period. In addition, the NPL ratio of FX loans is well below to TL NPL ratio, which supports our predictions in terms of exchange rate risks.

II.1 Household Developments

Household financial assets and liabilities continued to increase in 2016 at lower rates (Chart II.1.1). When the increase in assets and liabilities is adjusted for inflation, it can be observed that financial assets and liabilities did not show any real growth compared to the same period of the previous year. The decelaration in assets' growth is mainly attributable to the moderation in deposit growth which previously recorded high growth rates as a result of high volatility in exchange rates (Chart II.1.2). The decelaration in liabilities' growth is mainly due to the macroprudential measures which were intensively effective starting from 2013 until the last September (Chart II.1.2). Since assets' growth rate exceeded the liabilities' growth rate, the financial leverage ratio (liability/asset) decreased in comparison to the last Report period (Chart II.1.1). The ratio of household assets and liabilities to GDP remained flat at 45 percent and 22 percent respectively.

The household financial leverage ratio (liability/asset) continues to decline.

Chart II.1.1
Household Financial Assets' and Liabilities' Growth Rates and Financial Leverage Ratio
(Annual Percentage Change, Percentage Share)

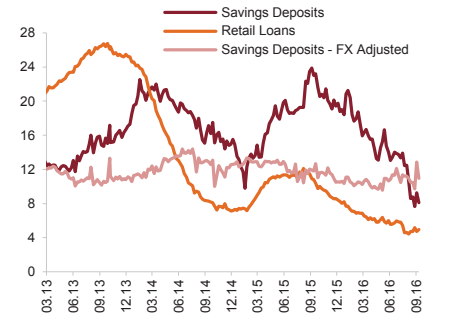


Note: The leverage ratio refers to the sum of the last 12 months liabilities to the sum of the last 12 months assets. Nominal terms are deflated by CPI.

Source: CBRT, BRSA, CMB, MKK, TOKİ

The growth rate of household savings deposits outperforms the growth rate of retail loans.

Chart II.1.2
Growth in Household Loans and Deposits
(Annual Percentage Change)

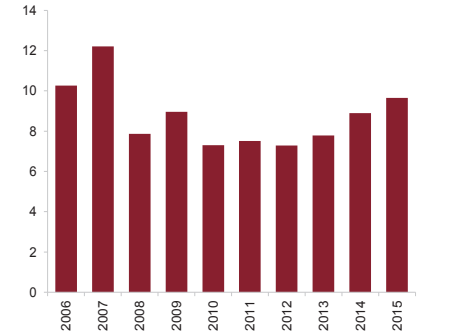


Note: Loans (credit cards included) extended by resident banks. FX savings deposit has been adjusted for exchange rate effect with the (0.6$+0.4€) currency basket has been used to adjust the exchange rate effect.

Source: CBRT, BRSA

Household saving rate has continued its gradual increase in 2015 and reached the highest level of the last 8 years.

Chart II.1.3
Household Saving Rate
(Percent)



Note: Household savings to disposable income ratio. Savings are calculated by subtracting consumption from disposable income data taken from Turkstat Household Budget Survey.

Source: TURKSTAT

In line with the improvement observed in the financial leverage ratio since the second half of 2014, the household saving rate kept increasing. According to the survey results compiled by TURKSTAT, the household saving rate rose for three consecutive years and reached its highest level of the last 8 years in 2015 (Chart II.1.3). The growth rate of retail loans falls short of the growth rate of savings deposits, which is the most important component of household financial assets. This indicates that the saving rate continued to rise in 2016 as well. The automatic enrollment in the private pensions system which will take effect in 2017 is expected to support the upward trend in saving rates.

Table II.1.1
Growth in Household Loans and Deposits

	09.15		09.16		Percentage Change	Contribution to Change
	Billion TL	Share	Billion TL	Share		
Total Assets	**889.2**	**100.0**	**965.9**	**100.0**	**8.6**	**8.6**
TL Savings Deposits	**425.5**	**47.9**	**486.1**	**50.3**	**14.2**	**6.8**
FX Savings Deposits	**275.0**	**30.9**	**263.3**	**27.3**	**-4.3**	**-1.3**
- (Billion USD)	91.5		87.8		-4.1	
Precious Metal Deposits	**10.2**	**1.1**	**10.3**	**1.1**	**0.9**	**0.0**
- (Billion USD)	3.4		3.4		1.1	
Bonds and Bills	**19.8**	**2.2**	**18.5**	**1.9**	**-6.3**	**-0.1**
- Public Sector	6.2	0.7	5.8	0.6	-7.6	-0.1
- Private Sector	13.5	1.5	12.7	1.3	-5.8	-0.1
Mutual Funds	**78.1**	**8.8**	**93.9**	**9.7**	**20.2**	**1.8**
Pension Mutual Funds	44.2	5.0	58.0	6.0	31.3	1.6
Other Mutual Funds	33.9	3.8	35.9	3.7	5.7	0.2
Equity Securities	**41.5**	**4.7**	**45.5**	**4.7**	**9.5**	**0.4**
Repo	**0.5**	**0.1**	**0.5**	**0.1**	**-0.1**	**0.0**
Currency in Circulation	**38.5**	**4.3**	**47.9**	**5.0**	**24.3**	**1.1**

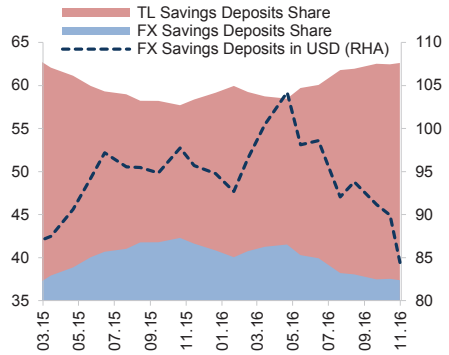
Note: Currency in circulation as of September 2016 is calculated by taking the household share in total in 2016-II Financial Accounts Report as constant .

Source: CBRT, CMB, MKK (Latest Data: 09.16)

Three items are notable in the household financial assets' growth. The first one is the increase in the TL denominated savings deposits stemming from the withdrawal of FX deposits; the second and third are the rise in the pension investment funds and the equity securities investments respectively (Table II.1.1). Household FX denominated savings deposits decreased by approximately $ 20 billion owing to a stronger preference for saving deposits in domestic currency in the last 6 months. As a result, the share of FX deposits in household deposits declined from 42 to 38 percent (Chart II.1.4). Analysis of the deposit developments with respect to the breaks in quantity shows that the shift to the TL is observed in all quantities compared to the same period and the end of the last year. A significant portion of the fall in FX savings deposits stemmed from the decline in-large quantity deposits which exceed 1 million TL (Chart II.1.5).

Households shift from FX denominated to TL denominated savings deposits in the last 6 months.

Chart II.1.4
Savings Deposits of Resident Households By TL and FX Breakdown (Percentage Share, Billion USD)

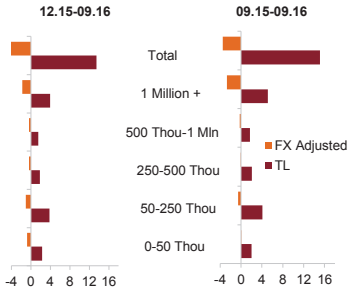


Source: CBRT (Latest Data: 04.11.16)

In an effort to boost domestic saving rates, the government has contributed by 25 percent of the amount contributed by investors to the private pension system since 2013. The number of participants in the system and the amount of participants' funds increased rapidly and exceeded 6 million and 50 billion TL (2.6% of GDP) respectively with the government contribution advantage (Graph II.1.6). The automatic enrollment mechanism is pre-determined to take effect in 2017; thus, the number of participants and the amount of funds invested are expected to grow significantly in the following period. It is intended that around 13 million paid employees under 45 will be enrolled to the system. The government will also provide a one-off 1000 TL contribution per employee in the automatic enrollment of employees in addition to the current 25 percent contribution. It is also expected that the government contributions will limit the opts out of the system.

Households have stronger preferences for TL in all sized savings deposits.

Chart II.1.5
Contribution of Resident Households' Deposit Amounts to Growth by Periods (Percentage Points)



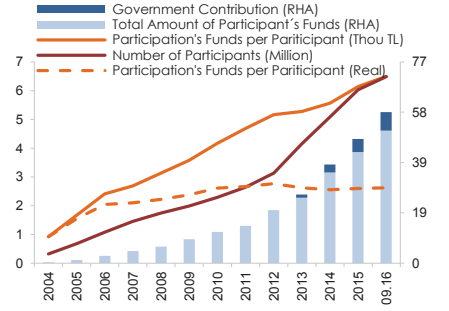
Note: FX savings deposit has been adjusted for exchange rate effect with the (0.6$+0.4€) currency basket.

Source: CBRT(Latest Data: 09.16)

As of September 2016, household equity securities in nominal terms and in real terms deflated by the BIST Stock Index, increased compared to the previous year (Chart II.1.7). The stronger preferences for the investments in the Turkish stock market contribute to domestic funding of investments and allow the individual investors to have a share in the growing economy. However, it should be emphasized that the domestic investors in Turkey have a short-term investment horizon and target speculative returns. The average holding period for stocks in the Istanbul Stock Exchange in 2015 was

It is estimated that 13 million paid employees under 45 years old will enroll to the private pension system with automatic enrollment of employees in 2017.

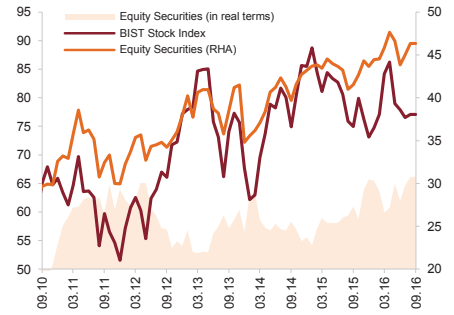
Chart II.1.6
Private Pension System in Turkey
(RHA: Billion TL)



Note: The year end projection is used for GDP of 2016. Participation's Funds per Participant is deflated by CPI to obtain in real terms.

Source: CBRT, PMC (Latest Data: 09.16)

Chart II.1.7
BIST Stock Index and Household Equity Securities Portfolio (Thousand, Billion TL)



Note: Equity securities is deflated by CPI and a constant to obtain in real terms.

Source: CBRT, Bloomberg (Latest Data: 09.16)

287 days for foreign investors and 40 days for domestic investors[1]. A longer term horizon in equity securities would provide higher returns and support the production capacity of Turkey.

The ongoing decelaration in households financial liabilities for a considerable time may give way to moderate growth in the following period due to recent easing of macroprudential policies on retail loans. In accordance with the BRSA regulation amendments in September 2016, the maturity limits for general purpose loans and the installments limit on credit card spending were increased from 36 months to 48 months and from 9 months to 12 months, respectively, and the loan to value ratio for housing loans was raised from 75 percent to 80 percent. Meanwhile, there has been a decline in retail loan interest rates following the cut in policy rates since the first quarter of the year. Owing to the amended regulations and market conditions, retail loans, mainly general purpose and housing loans, began to accelerate starting from October. However, since the households' asset growth rate has outperformed the liability growth rate for a long time and the number of customers demanding retail loans narrowed recently, as of September the households' borrowing tendency decreased.

Households' financial liabilities have continued to grow at moderate pace.

Table II.1.2
Household Financial Liabilities

	09.15		09.16		Percentage Change	Contributions to Change
	Billion TL	Share	Billion TL	Share		
Total Liabilities	**430.9**	**100**	**461.1**	**100**	**7.0**	**7.0**
(Based on Type)						
Housing	155.5	36.1	168.1	36.5	8.2	2.9
Vehicle	15.1	3.5	16.6	3.6	10.3	0.4
General Purpose	164.6	38.2	172.9	37.5	5.0	1.9
Individual Credit Cards	83.9	19.5	89.4	19.4	6.5	1.3
Asset Management Comp' Rec.	11.8	2.7	14.1	3.0	19.2	0.5
Total Liabilities	**430.9**	**100**	**461.1**	**100**	**7.0**	**7.0**
(Based on Counterparty)						
Banks	396.9	92.1	422.3	91.6	6.4	5.9
Financing Companies	9.5	2.2	12.3	2.7	29.4	0.6
TOKİ	12.7	2.9	12.5	2.7	-1.8	-0.1
Asset Management Comp'	11.8	2.7	14.1	3.0	19.2	0.5

Note: Housing loans include TOKİ's (Housing Development Administration of Turkey) receivables from house sales in installments. TOKİ data is as of June 2016.

Source: CBRT, TOKİ (Latest Data: 09.16)

[1] MKK BIST Trends Report (Vol XV)

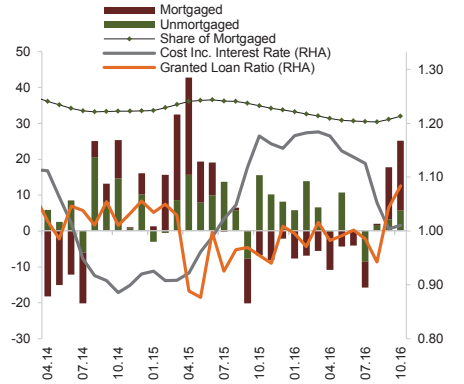
Households continued to prefer banks as a major source of funding. However, retail loans extended by financing companies increased 29.4 percent compared to the previous year and the share of financing companies' loans in total household liabilities increased by 0.5 percentage points (Table II.1.2). Households used financing companies' loans mainly for technology products and durable goods purchases (See Box II.1.I.) The largest contribution to retail loans in this period is attributable to the rise in housing loans in line with the decline in loan interest rates (Table II.1.2). Historical data also reveals that low interest rate periods have an augmenting effect on housing loan demand. Accordingly, as long as the low interest rate environment is preserved in the upcoming period, the positive contribution of the housing loans will continue. On the other hand, despite the rise in the amount of general purpose loans, the share of these loans in household liabilities decreased compared to the previous year (Table II.1.2).

The demand for housing increased compared to the previous Report period. Housing demand accelerates in line with the decline in interest rates. As a result of the enhancement in market conditions in favor of housing loans, mortgaged residential sales contributed positively to the growth rate of house sales since August. Additionally, banks have higher motivation for granting loan with the higher demand in housing. Accordingly, in September and October the ratio of number of people who were granted housing loans to the number of people, who applied for a loan (Granted Loan Ratio), exceeded the period average (Chart II.1.8).

The average maturity of housing loans remained stable around 8 years, while the average maturity of vehicle and general purpose loans continued to decline in line with the maturity limits introduced to the vehicle and general purpose loans in 2013 (Chart II.1.9). However, the maturities of vehicle and general purpose loans were expected to increase in tandem with the ongoing decline in market interest rates and the regulation amendment in September 2016. After the regulation amendment, the newly extended general purpose loans were concentrated over 36 month-maturities.

Mortgaged residential sales have significant contribution to the acceleration in the housing market in recent months.

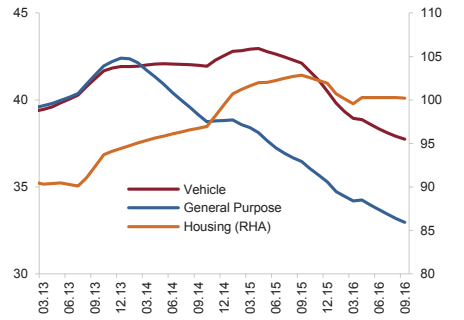
Chart II.1.8
Contribution to Housing Sales Growth, Housing Loan Monthly Interest Rate and Granted Loan Ratio
(Percent, Percentage Point)



Note: The share of mortgaged represents the share of mortgage sales in the sum of housing sales in the last 12 months. Granted Loan Ratio represents share of granted housing loans in the total application, the average of 2014-2016 (78,1 percent) is indexed to 1.

Source: CBRT, TURKSTAT (Latest Data: 09.16)

Chart II.1.9
Average Retail Loan Maturity
(3 Months MA) (Month)

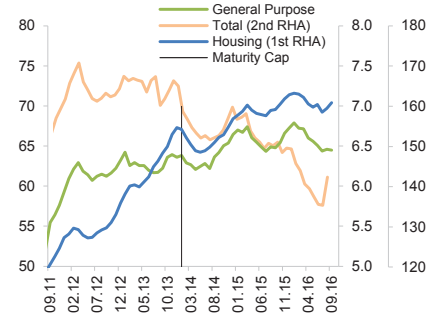


Note: The average retail loan maturity is calculated according to original loan maturity.

Source: CBRT (Latest Data: 09.16)

There are approximately 7 and 65 borrowers for housing and general purpose loans, respectively, per 100 employed persons.

Chart II.1.10
Borrowers to Employed People (Retail Loans)
(Percent)



Note: Employment data is as of August. The data covers retail loans extended by banks. The total borrowers include the sum of housing, general purpose, vehicles loans and individual credit card borrowers. In case a customer has more than 1 retail loans in a bank, it is counted as 1. The maturity cap line represents the announced 36 month and 48 month maturity limitations, respectively, for general purpose and vehicle loans at the end of 2013. In the last September, the maturity cap for general purpose loans was relaxed to 48 months.

Source: CBRT, TURKSTAT(Latest Data: 09.16)

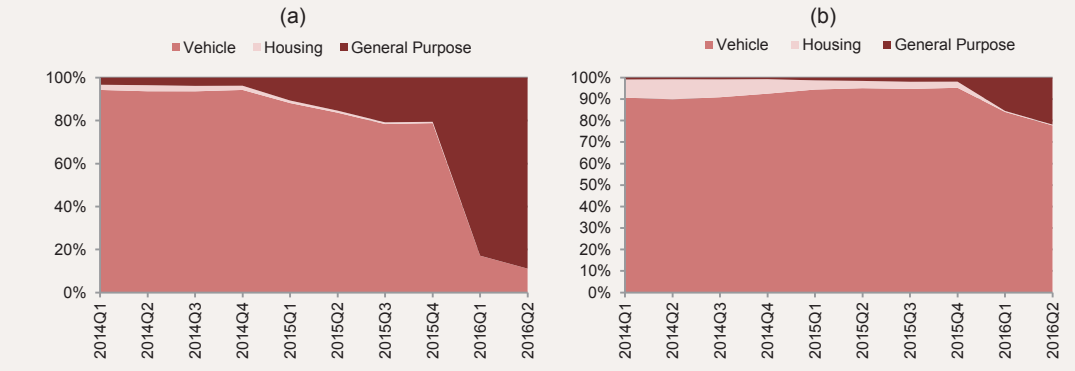
The number of borrowers to the number of employed can be used as an informative indicator for the capacity of the credit market. The aforementioned ratio for housing loans have remained flat at 7 percent since the beginning of 2015 (Chart II.1.10). In Turkey the total retail loans to GDP is lower compared to similar countries. Moreover the number of housing loan borrowers is also limited. On the other hand, the ratio for general purpose loans, which holds the second largest share in retail loans, is very high at 65 percent since 2012. The number of borrowers decreased due to seasonal effects and macro prudential measures implemented at the end of 2013, but returned back to pre-policy change levels in the following period (Chart II.1.10). Thus, it is expected that the maturity limit easing will have a limited impact on the number of borrowers for general purpose loans as this market is already close to saturation when the high ratio for general purpose loans is considered,

Box II.1.I Financing Companies as a Source for Household Funding

Households gather much of their financing needs from banks in Turkey. Household borrowing from other financing sources seems to be limited. Recently, due to the moderate growth of bank loans and opening of new financing companies, financing companies have been growing more important. In September 2016, the retail loans extended by financing companies increased by 29.4 percent compared to the previous year and reached TL 12.3 billion. As a result, the share of financing company loans in household liabilities increased to 2.7 percent (Table II.1.2). Financing companies' existing loan products are very similar to bank loans and financing companies provide funds for various needs of households such as vehicles, housing, consumer durables and the service sector. In Turkey, financing company loans are widely used to finance installment payments for personal and commercial vehicle purchases. As a matter of fact, the amount of the vehicle loans extended by the financing companies has exceeded the amount of vehicle loans provided by banks starting from 2015.

An analysis of financing companies' new retail loans with respect to quantity and amount shows that since the beginning of 2016, households have started to use financing companies for their purchases, which would otherwise be funded by general purpose loans. While the number of new retail loans issued by financing companies was approximately 125 thousand in 2015, it exceeded 1 million in the first half of 2016. In this period, general purpose loans extended by financing companies constituted approximately 82 percent of the total retail loans in quantity and 22 percent in value (Chart II.1.I.1.(a) and Chart II.1.I.1.(b).

Chart II.1.I.1
Shares of New Retail Loans by Quantity (a) and Amount (b)
(In Retail Loans Extended by Financing Companies)

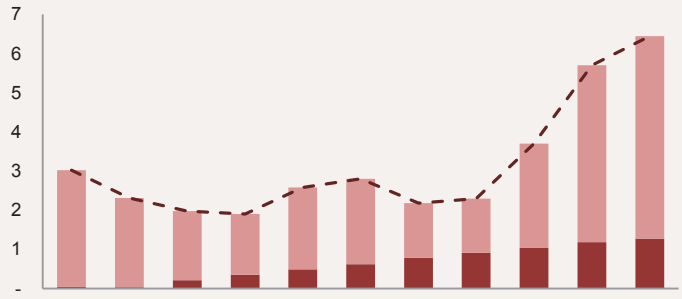


Source: Association of Financial Institutions

The different business model of financing companies compared to banks pave the way for the increasing demand for their loans. Furthermore, the installment limits imposed by the BRSA on spending with credit cards in 2013 are thought to have prepared a potential for the growth. The advantage of financing companies is their access to large sales channels which allows consumers to have easy and on-site financing in a shorter time than general purpose bank loans. Households appear to prefer the financing company loans particularly for their spending

on technological products and durable goods. Therefore, the amount of financing companies' general purpose loan per borrower is much less than the bank's. Nonetheless, despite the considerably lower amounts, general purpose loans extended by financing companies contributed significantly to the total growth (both by banks and financing companies) recorded in the last one year. For example, the contribution of financing companies to total general purpose loan growth of 4.5 percent in October 2016 compared to previous year is 1.2 percent (Chart II.1.I.2).

Chart II.1.I.2
Annual Growth of General Purpose Loans and Financing Companies' Contribution
(Annual Percentage Change, Contribution to Growth in Percentage Points)



	01.16	02.16	03.16	04.16	05.16	06.16	07.16	08.16	09.16	10.16	11.16
Banks	2.98	2.28	1.76	1.55	2.09	2.18	1.39	1.38	2.65	4.52	5.17
Fin. Com.	0.04	0.03	0.21	0.35	0.49	0.62	0.78	0.91	1.05	1.18	1.27
Total	3.02	2.31	1.97	1.90	2.58	2.80	2.18	2.30	3.70	5.70	6.44

Note: The annual growth rate represents the annual percentage change in the sum of consumer loans provided by banks and financing companies. November data is as of 4th November 2016.

Source: CBRT

Financing companies can contribute to financial stability by deepening the financial sector and increasing risk diversification. Similarly, it is expected that financing companies can increase the operational efficiency of the Turkish financial system via the competition channel. Meanwhile, steps have been taken by regulatory authorities to designate the risk framework of financing companies. The BRSA's regulations on capital and provisions for financing companies prevent the emergence of regulatory arbitrage. Moreover, the CBRT's decision to add financing companies to the reserve requirement framework starting from 2014, is compatible with this framework. These institutions will continue to operate effectively and have positive effects on financial deepening in line with the necessary regulations are made.

Box II.1.II

Real Estate Certificates

The real estate sector continues to be vivid owing to Turkey's demographic and economic structure while funding requirements of the sector on both supply and demand sides are largely met by bank loans. Real estate certificates stand out as an alternative source to bank loans for financing real estate projects. It is also a potential tool for customers who don't have the financial power to buy a real estate as a whole but have the will to benefit from real estate price increases. Besides, real estate certificates are considered as one of the financial instruments which might support the urban transformation process.

Real estate certificates is defined as "securities which have equal par value representing particular single spaces or a limited area of single spaces of real estate projects issued for financing real estate projects that will be built or are being built"[1].

Real estate certificate issuance starts with the application of the issuer who has a land or construction servitude title for the new project and has accomplished a real estate project within the last 5 years that had the value at least 50 per cent of the new project, for a granting permit to CMB and for public listing to the BIST. Funds acquired by issuance shall not exceed half of the new project's appraisal value.[2] Ten percent of funds prior to the construction start and the remaining part of funds in direct proportion to advance the project are transferred to the issuer's account by a competent body or a bank if there is bank guarantee regarding the issuance. Funds blocked by the bank are meanwhile utilized in capital market instruments approved by CMB. Ownership regarding the certificate is transferred to the certificate owner within the scope of determined rules and procedures as soon as project finishes (principal act) while certificate owners who do not request the principal act to be performed in predetermined "principal act tenure" are paid the real estate sale price (deputy act).

One of the areas that real estate certificates are expected to be used is urban transformation projects. Urban transformation projects are expected to provide people with houses that are more resistant against earthquakes, while increasing housing demand can be met by building more houses than the existing housing stock. The Ministry of Environment and Urbanization estimates that 6 to 7 million houses need to be rebuilt across the country[3]. These houses will be finished in 20 years' time, while 350 thousand houses on average will be rebuilt annually. Therefore, an existing 50 thousand annual house building capacity of TOKİ[4] implies that the private sector must take a role in these urban transformation projects.

[1] Communiqué on Real Estate Certificates

[2] In case of issuer of the certificate is TOKİ, İLBANK or subsidiaries of these institutions, mentioned features in the text for initiation of issuance operation and issuance cap are not demanded.

[3] http://www.csb.gov.tr/gm/altyapi/index.php?Sayfa=sayfahtml&Id=2091

[4] http://www.toki.gov.tr/faaliyet-ozeti

Besides being a required source of funding for transformation of real estates, real estate certificates are a suitable model for protecting house-owners' rights. Thus, the Communiqué on Real Estate Certificates have a specific section related to the certificates issued for urban transformation projects that relatively increases funding capacity and featuring right ownership protection for this type of issuance. The certificate issuance cap for urban transformation projects is the total value of that project. Accordingly, a general issuance cap of 50 percent is not applied to urban transformation projects but it is possible to finance these projects thoroughly by real estate certificates. Real estate certificates regarding urban transformation are revocable during its maturity period, within the scope of procedures and principles determined on the date of issuance and in a way to provide protection for the time value of money. Public guarantees to complete these kinds of projects are also provided.

Even if the real estate sector has reached a considerable size in our economy, real estate-based finance/investment instruments' progress has been relatively limited. The Communiqué on Real Estate Certificates ensures a more comprehensive application framework. In addition to an expected contribution to urban transformation projects and diversifying funding sources of construction companies, the certificates may function as an alternative investment instrument for the small savers by increasing savings and bringing under-the-mattress savings to the economy.

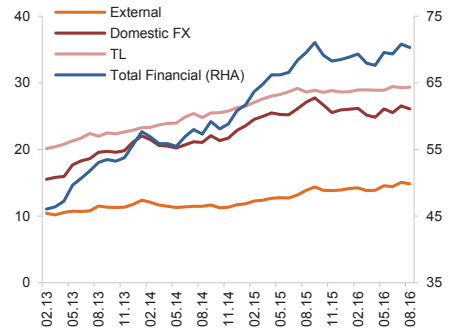
II.2 Corporate Sector

The ratio of real sector financial indebtedness to total GDP has remained mainly flat (Chart II.2.1). The level of indebtedness which tended to increase continuously until the last quarter of 2015 decreased slightly in the following period. It has started to increase again from April 2016 and now it is close to the September 2015 value. The deceleration of the real sector leverage from the third quarter of 2015 has been mainly caused by the slowdown in FX loans opened by the domestic banks. The highest share in real sector financing belongs to long-term bank loans, which are on an upward trend (Chart II.2.5). While the resources provided by issuances and non-bank financial institutions have a limited share within the total, they continue to rise in the last period.

While the ratio of total corporate credits to GDP is well below the average of emerging markets in the first quarter of 2016, it is close to the average when China is excluded (Chart II.2.2). While the developing market average increased by 20 percentage points compared to the previous two years, the increase in Turkish firms was 10 percentage points. However, according to the average of emerging markets outside of China, the debt of firms increased more in Turkey. It is estimated that the public-private partnership (PPP) projects (eg power plants, airports, city hospitals, etc.) rising in recent years have a significant contribution to this development. As a matter of fact, Turkey is one of the countries that make the most investments in PPP compared to GDP among emerging market economies. Although an important part of these projects is the real sector risk, the fact that the public sector provides contracting firms with the purchase guarantee for the services at the FX indexed price delivers protection to the companies against the financial risks. The repayment of debts due to these investments over time will be a significant factor that lowers the debt burden of the real sector (Box II.2.II)).

Firm Liabilities have been stable in recent years.

Chart II.2.1
Financial Liabilities of Corporate Sector
(Per cent of GDP)

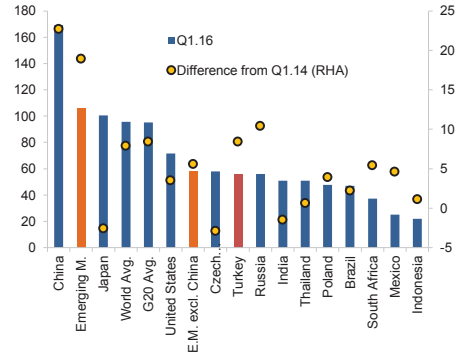


Note: Composed of loan liabilities and issues. External liabilites include data from foreign branches and affiliates of resident banks. External TL liabilities are included in total FX liabilities.

Source: CBRT and BRSA (Latest Data: 08.16)

Companies' financial indebtedness is below the emerging market average.

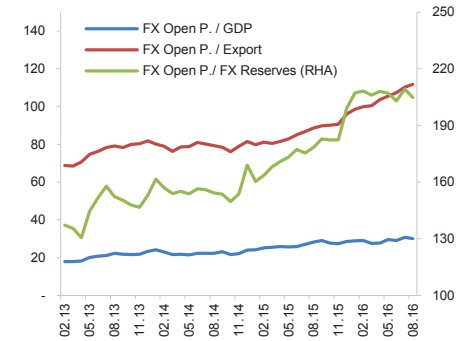
Chart II.2.2
Corporate Loans / GDP for Selected Countries
(Percent, Point)



Source: BIS (Latest Data: 03.16)

FX open position of corporate sector continues to increase.

Chart II.2.3
Corporate Sector FX Open Position as a Share of Macro Variables
(Percent)

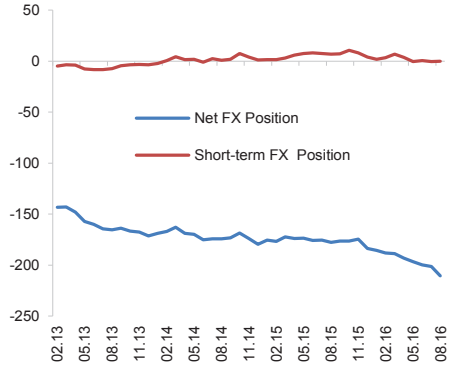


Source: CBRT (Latest Data: 08.16)

II.2.1 FX Risk of Corporate Sector

Firms do not have FX open position in short run.

Chart II.2.4
Corporate Sector FX Open Position
(Billion USD)

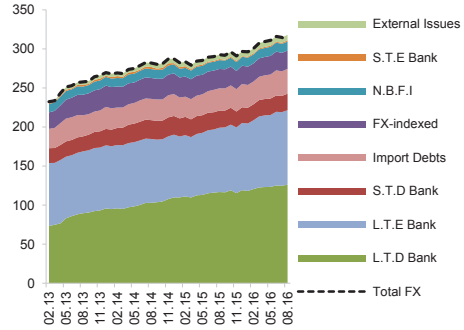


Source: CBRT(Latest Data: 08.16)

Net foreign exchange open positions of the corporate sector continue to trend upward (Chart II.2.3). The ratio of open positions to CBRT foreign exchange reserves approaches to 200 percent and to the annual exports of goods and services is close to 100 percent. The fact that the short-term open position is close to zero is a positive indicator that depicts the resistance of companies to short-term FX shocks (Chart II.2.4). On the other hand, the ongoing bullishness in the long-term open position keeps exchange rate risks alive. When the open position amount is examined on an aggregate basis, it may be viewed as a risk factor; however, the impacts of these risks will depend on the financial structures of the firms, the maturity of their debt, their hedging methods and their pricing power. The fact that nearly all of the PPP investments which require long-term and large-volume financing are funded by FX-denominated sources also made an important contribution to the upward trend in the open position (See Box II.2.II).

The biggest share in corporate FX liabilities belongs to long-term domestic and foreign bank loans.

Chart II.2.5
FX Liability Composition of Corporate Sector
(Billion USD)



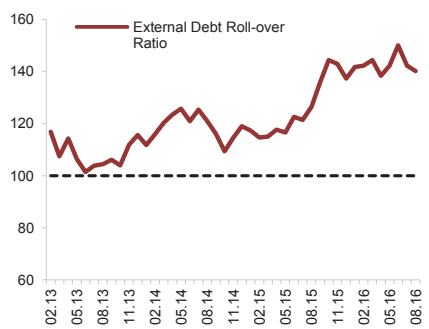
Note: S.T.E: Short-term External, N.B.F.I: Non-Bank Financial Institutions, S.T.D: Short-term Domestic, L.T.E: Long-term External, L.T.D: Long-term Domestic

Source: CBRT (Latest Data: 08.16)

Long-term domestic and foreign bank loans have the highest share in the real sector foreign currency debt distribution (Chart II.2.5). Looking at the developments in the last year, domestic FX loan usage is stable, while the growth rate of external FX loan is rising (Chart III.1.6). The cautious attitude of domestic banks towards FX risk and the weak trend in investment demand have been influential on the slowdown in domestic FX loan growth. In addition, the rapid increase in PPP investments, which are often externally funded, in recent years accounts for a large increase in foreign loans relative to previous years.

External debt roll-over ratio is increasing.

Chart II.2.6
External Debt Roll-Over Ratio
(6 Months M.O, Percent)



Source: CBRT (Latest Data: 08.16)

Domestic FX bank loans with original maturity longer than five years constitute more than 50 percent of the total and the share continues to increase compared to the previous reporting period (Chart II.2.7). In external liabilities, loans over five years have the biggest share in total with 32.1 percent and their share is rising. Despite the significant shocks experienced in recent years, the fact that foreign debt rollover ratios still remain above one hundred percent confirms that the capacity of firms to renew their external debt is strong (Chart II.2.6).

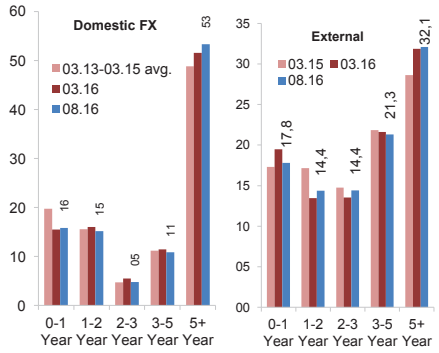
When examined on a sectoral basis, FX loans are mostly concentrated in the manufacturing industry, electricity, gas and water, transportation and construction sectors (Chart II.2.8). The manufacturing sector, which realizes more than 90 percent of the total exports in the country, has a significant portion of the FX loans. In the electricity, gas and water, transportation, warehouse and communication, construction and health sectors, the volume of FX usage has increased especially with the recent investments in PPP. Concentration of investments in energy, transportation, health and construction sectors on projects such as renewable energy power plants and distribution, airports, bridges, highway and city hospitals, which have public service purchase guarantees with FX indexed prices, protects firms against credit and exchange rate risks in the long run (Box II.2.II). The fact that these sectors, which hold more than 65 percent of total FX loans, have high export revenues and government purchasing guarantees with FX indexed prices provide protection to the firms in these sectors. Moreover, due to the low price elasticity of the demand, firms in the sector can reflect international developments and exchange rate fluctuations in goods and services pricing, and this significantly reduces the exchange rate risk of firms.

While the share of large firms in FX and TL loans increased compared to the previous report period, the share of micro and SMEs decreased significantly (Chart II.2.9). According to the Bank Credits Tendency Survey in the third quarter of 2016, loan demand is rising for large firms and SMEs in a similar manner; however, credit standards are tightened more for micro and SMEs. In other words, this decline in the share of SME loans stemmed from the cautious attitude of banks alongside demand. The FX indexed loans, which are largely used by SMEs, have negatively grown in the last half of 2015 and first quarter of 2016 and obtained above-zero growth rate in the recent months but the growth is still below the FX loan (excluding FX-indexed loans) growth.

When FX loans are grouped according to the amounts, it is observed that the loans concentrate in firms with high-amounts of FX loan debt (Chart II.2.10). Of the approximately 27 thousand firms with FX loan balances, one hundred thousand firms with FX liabilities worth of over 100 million TL hold 75 percent of total FX debt. The weighted average maturity of all FX loans used by these companies is over 7

The maturities of FX liabilities continue to lengthen

Chart II.2.7
Maturity Breakdown of Corporate Sector FX Liabilities
(Percent Share)

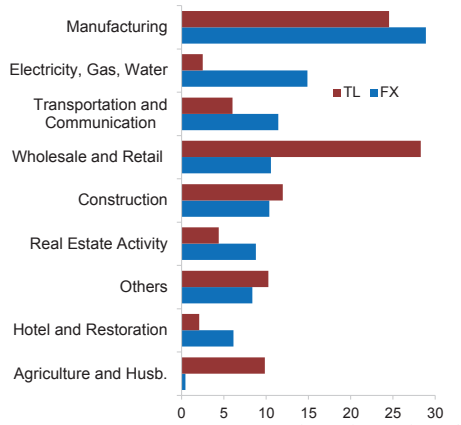


Not: Domestic loans are grouped by original maturity and external debts are by remaining maturity.

Source: CBRT (Latest Data: 08.16)

FX loans are mostly used by the manufacturing industry.

Chart II.2.8
Sectoral Breakdown of Corporate Sector FX Liabilities (As of 09.2016)
(Percent share)

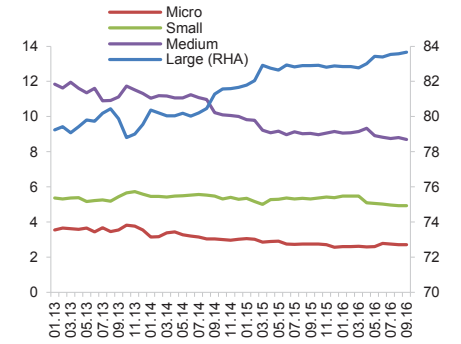


Not: Loans extended abroad and used via the intermediacy of domestic banks are included.

Source: BAT Risk Center (Latest Data: 09.16)

The share of large firms in the FX loan stock is increasing.

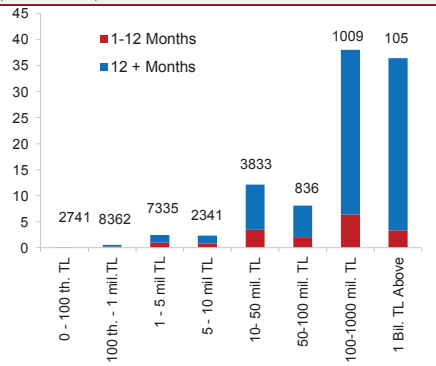
Chart II.2.9
Firm Size Breakdown of Domestic FX Corporate Loans
(Percent share)



Source: CBRT (Latest Data: 09.16)

FX loans are concentrated in very large amounts.

Chart II.2.10
Breakdown of Corporate FX Loans by Amounts
(Percent Share)

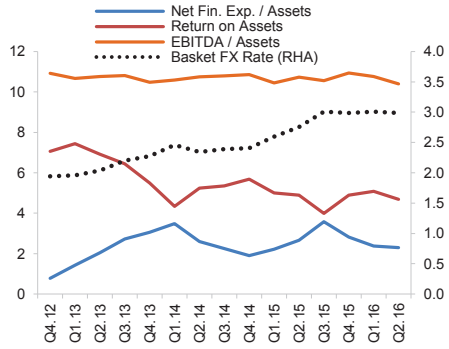


Not: Loans extended abroad and used via the intermediacy of domestic banks are included.

Source: BAT Risk Center (Latest Data: 09.16)

While net profits are declining, the net real operating profit is stable

Chart II.2.11
Profitability and Financial Expense Indicators for Publicly Listed Companies
(Percent)

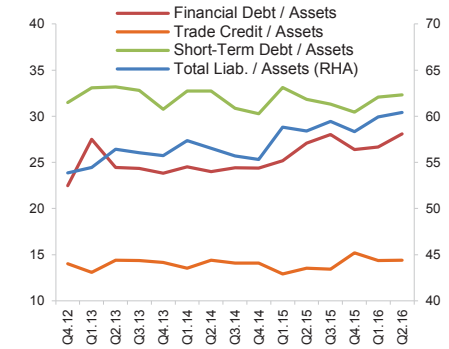


Not: Return on assets: Net profit / Assets; EBITDA: Net Profit + Financial Expenses + Tax Expense + Depreciation and Amortization Costs
Financial companies, holdings, and firms in BIST emerging companies list are excluded. In total, 234 firms are included.

Source: FİNNET (Latest Data: Q2.16)

While the leverage ratio is rising, short-term borrowing is flat.

Chart II.2.12
Indebtness and Leverage Indicators for Publicly Listed Companies
(Percent)



Not: Financial companies, holdings, and firms in BIST emerging companies list are excluded. In total, 234 firms are included.

Source: FINNET (Latest Data: Q2.16)

years. In addition, when 30 firms that use FX credits in the highest amounts constituting 20% of the total FX credits are examined, it is observed that their investments are mostly concentrated in PPP projects such as energy, airport, highway, city hospital and telecommunication and export intensive sectors such as automotive and metal industries. The fact that PPPs have a large share of government procurement guarantee and that the export-intensive sectors have natural protection against foreign exchange risk, provides additional resistance to the firm against demand and exchange rate shocks.

In the following section, a detailed financial analysis of non-financial BIST firms for which current FX asset-liability positions can be obtained is presented.

II.2.2 Financial Ratio Analysis of BIST Firms

The net return on assets of publicly traded real sector companies decreased slightly in the second quarter of 2016, while it tended to increase from the third quarter of 2015 (Chart II.2.11). Earnings before interest and tax as a share of assets (EBITDA / Assets) maintain a horizontal trend although they show a limited decrease in the last period. The movement in the net end of period profit very much depends on the changes in financial expenses of the firms. Furthermore, changes in the financial expenses are largely due to exchange rate movements. It is predicted that the exchange rate movements depending on the global developments will affect the financial expenses in the upcoming period.

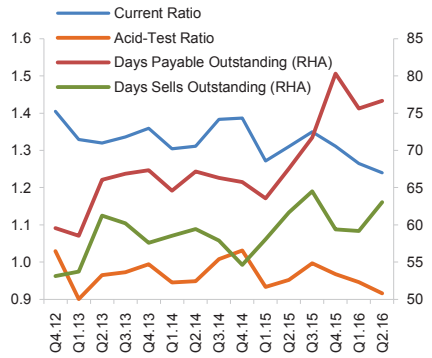
The leverage ratio of BIST firms which had declined in the last quarter of 2015 is on an upward trend as of 2016 (Chart II.2.12). While the main source of the increase was long-term financial liabilities, short-term debt remained flat. The financial debt is expected to increase slightly in the upcoming period due to interest expenditures and exchange rate developments and this increase will be expected mainly in long term financial debt, which will keep the short and medium term risks at manageable levels.

BIST firms' liquidity ratios have been on a downward trend since the third quarter of 2015 (Chart II.2.13). The decrease in the

current ratio and the acid-test ratio is due to the limited increase in short-term assets of firms compared to previous periods. The strong increase observed in the Days Payable Outstanding (DPO) within the year 2015 supported the liquidity of the companies in the related period but the positive contribution from here has come to an end as DPO has become relatively flat in 2016. It is assessed that the strong increase in the DPO is caused by the cost reduction of import financing abroad after the regulations made in April 2015. After the amendment, the companies started to finance their imports on more favorable terms. The flattening tendency of DPO observed in the last two quarters indicates that the positive effect of the amendment has been completed. Another important indicator for company liquidity, Days Sales Outstanding (DSO), has increased recently, which shows that firms fund each other for longer periods.

The commercial debt payment capacities are rising while the liquidity ratios tend to decrease.

Chart II.2.13
Liquidity Indicators for Publicly Listed Companies
(Value, Days)



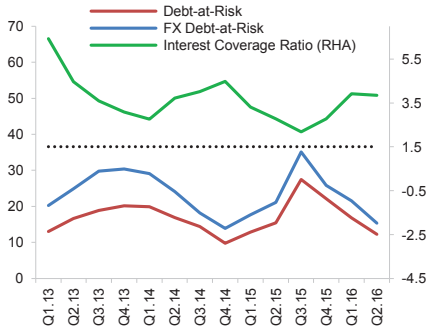
Note: Current Ratio= Current Assets / Short term Liabilities;
Acid-test Ratio= (Current Assets – (Inventories+Other Current Assets)) / Short-termLiabilities; Days Payable Outstanding= 365* Trade Debts / Cost of Goods Sold
Days Sales Outstanding=365*Trade Receivables/ Net Sales
Financial companies, holdings, and firms in BIST emerging companies list are excluded. In total, 234 firms are included.

Source: FİNNET (Latest Data: Q2.16)

The interest coverage ratio (ICO), a measure of the ability of firms to borrow, is well above the lower limit of 1.5 which is accepted by the related literature (Chart II.2.14). As of the second quarter of 2016, annual operating profits of companies are at about four times higher than their annual interest expenses, and this rate has been increasing since the last quarter of 2015. The international literature points out that if this ratio will fall below 1.5, the borrowing ability of the firm will decline and the cost of borrowing will rise. In addition, the Debt-at-Risk ratio is calculated considering that companies under this threshold will have difficulty in paying their debts. Debt-at-Risk is the ratio of the debts of firms with ICR below 1.5 over the debts of all firms in the sample. This rate is rapidly falling for BIST firms in the recent period. Debt-at-Risk ratio reached 40 percent in the third quarter of 2015, but dropped to 10 percent by the second quarter of 2016. Likewise, among the firms with open foreign exchange positions, FX Debt-at-Risk, which is the ratio of the total FX debt of the firms with ICR below 1.5 to total FX debt in the sample, tends to decrease in the same way. The fact that only 15 percent of total FX debts of firms in open position are at risk suggests that these firms will not suffer from FX debt repayments. The low NPL ratio of firm FX loans clearly supports this argument (Box II.2.I).

The Debt-at-Risk ratio is declining.

Chart II.2.14
Interest Coverage Ratio (ICR) and Debt-at-Risk for Publicly Listed Companies
(Percent, Value)



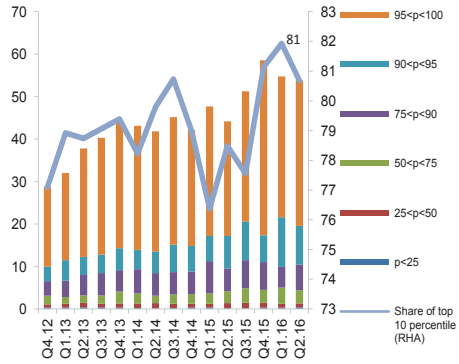
Note:Interest Coverage Ratio= Net Operating Profit (EBIDTA) / Interest Expenses. FX rate expenses are included in the interest expenses.
Debt-at-Risk= Total debt of firms with ICR<1.5 / Total debt of whole firms.
FX Debt-at-Risk= Among all firms with open position, Total FX debt of firms with ICR<1.5 / Total FX debt of whole firms.
Financial companies, holdings, and firms in BIST emerging companies list are excluded. In total, 234 firms are included.

Source: FINNET (Latest Data: Q2.16)

In the second quarter of 2016, of the 22 BIST firms, which are in the largest 10 percentile by asset size, 16 have FX open positions (Chart II.2.15). Among 132 firms that are in net FX short position among all real sector firms in BIST, these 16 firms constitute 81 percent

81 percent of the FX open position belongs to the 16 largest firms by asset size.

Chart II.2.15
Distribution of Publicly Listed Companies' FX Open Position by Their Asset Sizes
(Billion TL, Percent Share)

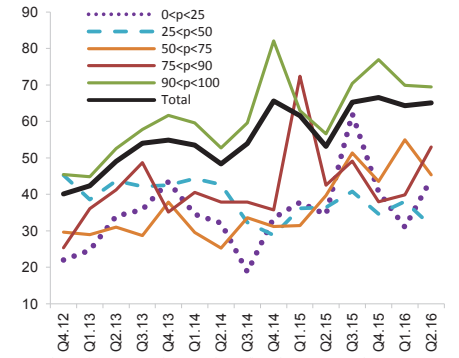


Note: P = 100 is the largest firm, and p = 0 is the smallest firm. The blue line indicates the share of the open position of firms in the region "p> 90".
Financial companies, holdings, firms in BIST emerging companies list, companies that use FX as a functional currency in their balance sheets and firms without FX open position are excluded. In total, 132 firms are included

Source: FİNNET (Latest Data: Q2.16)

Small firms have less FX open positions according to equity size.

Chart II.2.16
FX Leverage (FX Open Position / Equity) in Asset Size Percentiles
(Percent)

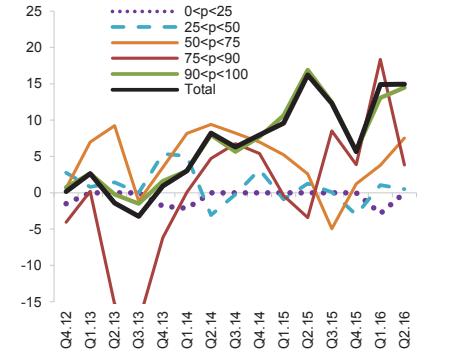


Note: Financial companies, holdings, firms in BIST emerging companies list, companies that use FX as a functional currency in their balance sheets and firms without FX open position are excluded. In total, 132 firms are included

Source: FİNNET (Latest Data: Q2.16)

Large firms hedge more of their open positions via derivative transactions.

Chart II.2.17
Net Derivative Position / FX Open Position in Asset Size Percentiles
(Percent)



Not: FX Open Psion is the open position outside the derivative transactions.
Financial companies, holdings, firms in BIST emerging companies list, companies that use FX as a functional currency in their balance sheets and firms without FX open position are excluded. In total, 132 firms are included

Source: FİNNET (Latest Data: Q2.16)

of the total open position amount. Looking at the past four years, the small numbers of firms constituting the top 5 percent and 10 percent tranches hold the majority of the whole open position. These 16 firms possess 80 percent of the total export revenue of the companies in the sample. The export / open position ratio of these firms, which historically have export revenues above their open positions, rose to 1.05 in the first half of 2016, even though it fell to 0.85 in the second half of 2015. The fact that the exports to total sales ratio of the six firms without FX open positions in the top 10 percent is 15 percent, while it is 29 percent for other 16 firms proves that a significant relationship exists between the foreign exchange position and export revenues. In addition, the increase in the aggregate FX open position in the last year is the result of the rise in the position of large-scale firms and there is not a significant change in the FX open position of a large number of firms located in the lowest 90 percentile. It is an important finding from the analysis that the recent rise in the open position does not originate from the additional risk-taking of small firms, but from a relatively small number of exporting and large-scale firms.

Even though firms in the lower quintiles have FX open positions at a level that is not systemically important, they may be at a high level of open position risk if considered by their sizes. Looking at the open position values of firms relative to their equity sizes, for small firms it is actually lower than the average of the whole sample and for firms in the largest 10 percentile it is above the average (Chart II.2.16). In other words, small-scale firms do not take as much risk as big firms according to their own equity size.

The incidence of hedging FX open position by derivative transactions is also higher for large firms. The net derivative position / open position ratio of the companies in the largest 10 percentile is above the average rate in the sample, and also the firms in the largest 25 percentile exceeded the average in the last period (Chart II.2.17). Companies in the lowest 50 percentile hedge a very small portion of their open positions via derivative transactions. It is positively evaluated for financial stability that 80 percent of total open position is concentrated in large firms that provide better protection against FX risk through derivative transactions.

Box II.2.I

NPL Ratio in Foreign Currency Loans

The most concrete indicator of the effect of past exchange rate movements on the real sector's debt payment capacity is the performance of foreign currency (FX) credits. In this context, considering the significant depreciation in TL in recent years, it is important to monitor recent developments in the non-performing loan (NPL) rates of FX credits with respect to financial stability. Since the FX NPL data is not directly accessible from banks' balance sheets, the CBRT shares the data with the public by calculating the relevant numbers through the financial stability reports. In this box, firstly the method of forming the FX NPL data is presented, and secondly the performance of the FX credits in the recent periods is discussed.

It is possible to create a realistic estimate of the relevant data by compiling data from different sources, as it is not directly accessible due to the accounting practices of the banks. The banks convert the FX NPLs into TL from the balance sheet period's exchange rate in accordance with the uniform accounting system they are subject to. During the time FX NPLs are included in the NPL accounts; their value is kept at the initial TL equivalent amount recorded. Moreover, because of the regulation allowing the FX NPLs to be treated in the same account as the TL NPLs, most of the banks record the FX and TL NPL amounts in one account. It is possible to reach the stock FX NPLs in the independent audit reports of banks. However, it is not possible to make a sound analysis by using these rates, because, the balance of FX NPLs remains in TL and FX loans inserted as a denominator in the computation of FX NPL ratio change depending on the exchange rate.

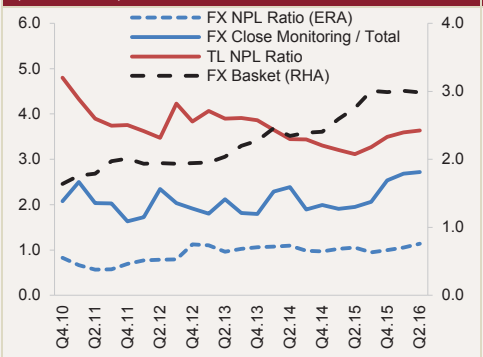
Following a specific reference date, the TL-denominated FX NPL balances are obtained from the quarterly published independent audit reports of banks, and quarterly approximate flow NPL values at bank level are computed by differencing quarterly. The amount of approximate flow NPL amounts in each quarter is converted to the basket exchange rate using the 3-month average exchange rates in the same period, and these current flow values are added cumulatively to the NPL stock in the reference date to calculate the stock FX NPL amount for each quarter. Finally, the FX NPL stocks in each quarter are converted back to TL over the average basket exchange rate in each respective date. Although the exchange rate effect is eliminated while the flow NPLs are being computed, the stock FX NPL value of the reference date will inevitably carry valuation effects. Using a reference date with foreign exchange rates had been experiencing minimal fluctuations for a few years would ease this problem. An analysis of historical exchange rate developments indicates that the TL/Euro and the TL/US dollar remained largely stable, even down to some extent, from the end of 2008 to the end of 2010. In order to minimize the potential biases related to the choice of reference date, we picked the last quarter of 2010 as the reference date.

Even though the FX NPL data for some banks go as early as the 2000s, post-2008 reporting is more reliable for many banks. The six largest banks with 63 percent of total company FX loan

stock, which also reported FX NPL regularly since 2008, were included in the study. Loans borrowed from foreign countries intermediated by domestic banks and FX-indexed loans have not been included in the study.

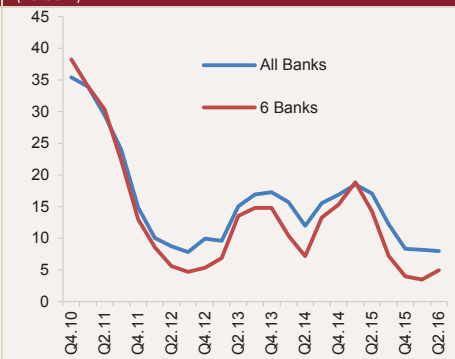
The historical development of the FX NPL ratios calculated in the method outlined above is presented in Chart II.2.I.1. The chart shows that historically, the firms' FX NPL ratios have been well below the TL NPL ratios. In the second quarter of 2016, the ratio of firm's FX NPL ratio was 1.14 percent, which was one third of firms' TL NPL ratio. Another remarkable inference from the graph is that FX NPLs follow a relatively stable path. [1]

Chart II.2.I.1
FX NPL Ratio After Exchange Rate Adjustment (ERA)
(Percent, Value)



Note: Six banks with 63 percent of FX credit stock are included. Loans extended via intermediation of domestic banks and FX- indexed loans are excluded.
Source: CBRT, Authors' Calculations

Chart II.2.I.2
Total Corporate Loan Growth
(Percent)



Note: Loans extended via intermediation of domestic banks and FX-indexed loans are excluded.

Source: CBRT

The low trend of FX NPLs may be due to the upward trend of FX credit growth and/or due to the grace period of FX loans, ranging between 0-5 years, and repayments are due over a long maturity. Relying on these claims, one can argue that FX NPLs may not be a good indicator for evaluating FX loan performance. The fact that the growth rate of FX loans has been weakening since 2010 indicates that the first argument is not valid (Chart II.2.I.2). The average maturity of FX loans that companies borrowed from domestic banks is around 3 years.[2] Chart II.2.I.4 shows how much of the loans, opened annually starting from 2008, was paid until the second quarter of 2016. As shown in the graph, about 90 percent of the total amount of loans opened in 2012, a relatively near past, has been paid. It has been calculated that more than 95 percent of the total amount of loans opened in 2008 and 2009 has been repaid. Therefore, arguments that FX NPLs may be an inadequate indicator does not seem to hold.

[1] The difference between the levels of FX and TL NPL ratios may be driven by the choice of reference date. For this claim to be valid, the bias must decrease very quickly, as one moves away from the reference date. However, the YP NPL ratios do not show a significant upward trend (indicating that the bias of the reference date is limited), and the difference between the two ratios is maintained until the last observation.

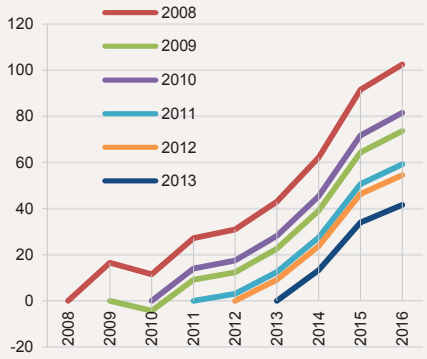
2 The average maturity of loans that companies borrow from abroad is longer than 5 years.

Despite the volatility in the exchange rates during the period examined in this box and, high and permanent depreciations in the TL, the favorable outlook in the historical performance of FX credits confirms the strength of the corporate sector (Charts II.2.I.3 and 4). Regulations introducing limits on the lower amount of FX borrowing for firms with no FX income (e.g. 5 million US Dollars) and constraints on maturity lead to the accumulation of FX debt mostly on large scale firms with capabilities of hedging against exchange rate risks (other than relying on FX revenues) as well as on exporters with natural hedge. Such accumulation is believed to be an important factor in reducing credit risks on FX loans.

Nevertheless, the ratio of FX credits under close monitoring to total FX loans has increased slightly since the last quarter of 2015 (Chart II.2.I.1). This suggests that there may be an increase in FX NPLs in the following periods. However, the historical relationship between FX NPLs and FX credits under close monitoring suggests that the possible increases will be limited.

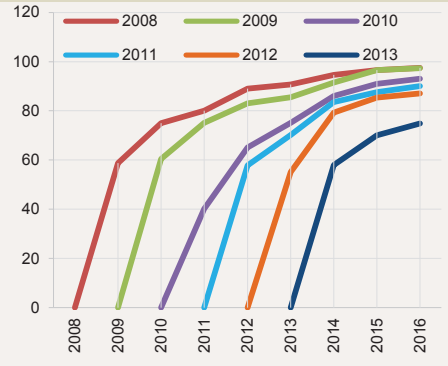
To sum up, the historical development of the FX NPL ratios reveals that FX loans remained strong in the post-2008 period, when the exchange rates displayed high volatility from time to time with rapid and permanent depreciations in the TL. This observation partly alleviates concerns about firms' FX open positions. The low credit risks for FX loans is mainly attributed to the restrictions on foreign currency credits in Turkey, leading the FX debt to accumulate on large scale or exporting companies. Nevertheless, it should be noted that a thorough examination of firms' FX open position should be based on more detailed balance sheet data.

Chart II.2.I.3
Changes in Basket Exchange Rate by Year (Percent)



Note: Each value in the chart shows percentage change in annual average basket exchange rate over time – e.g. the average basket exchange rate in 2011 appreciated by 28 percent until 2014 and 60 percent by 2016. Final data is 06.16.
Source: CBRT

Chart II.2.I.4
Share of FX Loans Repaid in Total FX Loans (Percent)



Note: Each value in the chart shows percentage of the FX corporate loans extended over years are paid over time – e.g. 60 percent of the FX corporate loans extended in 2013 are paid off by the end of 2014 and 75 percent by the end of June 2016. Final data is 06.16.
Source: CBRT, Authors' Calculations

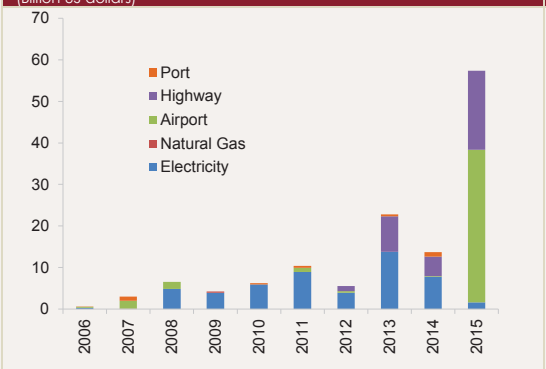
Box II.2.II Real Sector FX Open Position and PPP Projects

In the "Real Sector Developments" section of the report, it is shown that the FX open position, according to the sample of BİST firms, is concentrated among exporters and/or among firms with high FX income, those that are taking hedge positions and financially strong large companies. However, BIST firms constitute only a certain part of the total FX debt and open position of the real sector. When we look at the real sector in general, sectors with only domestic sales of goods and services also hold FX debt. On the other hand, it is known that a considerable portion of the FX borrowing by sectors with domestic sales is due to the financing of public-private partnership projects (PPP), where the risks related to income streams and the exchange rate are assumed by the public sector. In this box, the CBRT and World Bank data are used to calculate the amount of FX loans used for PPP.

Within the scope of PPP projects (local and foreign) real sector companies invest in infrastructure projects (i.e. PPI: private participation in infrastructure) and city hospitals in Turkey. In general, the total amount of PPP investments based on build-operate-transfer and similar models reached 140 billion US dollars for Turkey in the last 10 years according to the data of World Bank and Ministry of Health (Chart II.2.II.1). PPP projects, whose construction and operation durations are quite long (an average of 10 to 49 years depending on sectoral differences), are generally financed by very long term (10-15 years) FX loans. Since the projects do not generate income especially during the construction phase, the loan repayments are delayed between 1-5 years according to the sector structure, which in turn implies that the repayment of the loans used for these investments made in the last 10 years is still ongoing. Therefore, it appears that the related projects have a significant effect on the real sector FX debt position. As a matter of fact, there was a strong increase in PPI investments similar to the sharp upward trend of the FX open position in 2006 and thereafter.

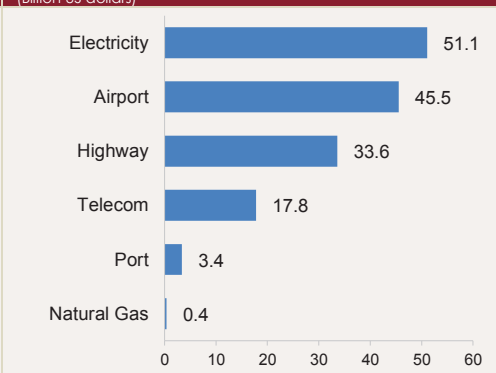
According to the World Bank data, a total of 197 PPI projects, worth 130.4 billion US dollars have been completed or under construction in Turkey since 2006. Most PPI investments are concentrated on economically feasible projects such as electricity generation and distribution facilities (51 billion US dollar), highways and bridges (33.6 billion US dollar), and airports (42 billion US dollar) (Chart II.2.II.2). Among these projects, renewable electricity generation, electricity distribution, highway and bridge and airport projects possess government goods and/or service purchase guarantees based on FX indexed prices, which significantly reduces the risks that the private sector undertakes due to FX indebtedness. For example, the amount of renewable electricity production that cannot be sold or under capacity production due to unexpected events is purchased at pre-contracted FX indexed prices by the state. Similarly, when the number of vehicles passing through bridges and highways and the number of passengers using airports are below pre-contracted limits, government is committed to purchase the difference based on FX index prices. Such a guarantee protects firms against demand shocks and also reduces the foreign exchange risks, associated with FX loan repayments.

Chart II.2.II.1
Annual Infrastructure Investment Amounts and Sectoral Distribution of Projects Contracted since 2006
(Billion US dollars)



Source: World Bank

Chart II.2.II.2
Sectoral Distribution of Total Infrastructure Investment Amount Between Years 2006-15
(Billion US dollars)



Source: World Bank

In addition to PPI projects, city hospitals projects, which accelerated in recent years to reach 29 projects and a projected investment value of approximately 10 billion US dollars, also benefit from the public sector guarantees. City hospital projects, constructed by domestic and foreign private sector companies using domestic or international financing, are also supported by the government through lease agreements or service purchase guarantees. In this way, investors are protected against demand and exchange rate shocks during the operation or rental period in the long term (25 years on average),as do PPI projects.

The companies that undertake PPP investments usually manage their investments through special purpose vehicles (SPV), which are solely established for the projects. Using the Turkish Banking Association (TBB) Risk Center (RM) corporate loan data set and World Bank data and relying on the SPVs, we are able to match a significant portion of the loans used in these projects based on project firms that have been contracted since 2006. On the other hand, it is very difficult to distinguish between the loans that firms have used for PPP projects under the name of holdings or group companies (i.e. instead of an SPV), where these holdings and group companies hold FX loans in various fields with or without foreign partners. This is particularly an issue in electricity sector. In this context, mapping is done in two different ways, rigid and flexible, to increase coverage. Rigid mapping takes into account investments made through using SPVs, while flexible mapping also takes into account PPI investments made by holding and group companies under their own umbrella.

Following solid and flexible mapping methods, 52 percent and 93 percent of the total electricity investments can be matched with the TBB RM data (Table II.2.II.1). The average debt-equity ratio in electricity projects is around 75 percent. Considering this ratio, it is estimated that the companies, which were mapped according to the first method, financed 26.7 billion US dollars investment with US $ 20.7 billion debt and according to the second method, 47.5 billion US dollars investment was financed with 36.6 billion US dollars debt. According to the mapping with TBB RM data, the total FX loan stock that is used to finance electricity projects in the last decade

is computed to be 8.9 billion US dollars as of August 2016, compared to 15.5 billion US dollars based on flexible matching.

Table II.2.II.1
Electricity Generation and Distribution Investments (2006 - 2015) and FX Loan Borrowings, World Bank and TBB RM Data Mapping
(Million US dollars)

Electric Energy Investments			Solid Mapping			Flexible Mapping		
Electricity	Technology	Investment Amount	Investment Amount	Share	TBB RM FX Loans	Investment Amount	Share	TBB RM FX Loans
Distribution	-	14,073.4	8,576.6	60.9%	839.4	13,549.2	96.3%	1,145.5
Generation	Wind	5,440.2	1,316.4	24.2%	665.8	4,596.4	84.5%	1,900.6
	Geothermal	1,368.0	-	0.0%	-	1,368.0	100.0%	832.4
	Large Hydro (>50MW)	6,576.6	2,615.4	39.8%	2,263.60	5,903.0	89.8%	2,769.4
	Small Hydro (<50MW)	1,198.7	251.7	21.0%	427.3	981.3	81.9%	1,095.6
	Natural Gas	8,963.0	4,931.7	55.0%	2,087.70	7,678.4	85.7%	3,505.4
	Coal	13,444.6	8,984.2	66.8%	2,624.50	13,444.6	100.0%	4,198.5
	Total	**51,064.5**	**26,676.0**	52.2%	**8,908.30**	**47,520.9**	93.1%	**15,447.4**

Note: *PPI: Private participation in infrastructure Investment world Bank Data, TBB RM: Turkish Banking Association Risk Center Data, ** Contains PPIs in between 2006-2015, *** Some inconsistency between sums is due to lack of reporting in the PPI data set, **** For the US dollar conversion, the end of month (2016/08) TL/USD exchange rate is taken, 2.95 TL.

Source: Authors' Calculation, World Bank and BAT RM

The total FX credit for investments in electricity generation and renewable electrical energy (e.g. wind, hydroelectric and geothermal) production, where the government provides service purchase guarantees, according to the solid mapping, is 4.2 billion US dollars and according to the flexible mapping is around 7.7 billion US dollars.

Similarly, the total investment value of highway and bridge projects that have been completed or under construction since 2006 is 33.6 billion US dollars (Table II.2.II.2). Approximately 86 percent of these projects, amounting to 28.9 billion US dollars, are financed with loans from domestic and foreign financial institutions. In average, operation duration of these projects is about 22 years. The total borrowing of the relevant SPVs in the TBB RM is USD 5.4 billion.

Similarly, the total investment made in airports is recorded to be 45 billion US dollars in the last decade, although 35 billion US dollars of this amount belongs to the 3rd Istanbul Airport project that is currently in the early construction period. 97 percent of the total airport investments were matched with the TBB RM data, where the FX credit debt of these companies is recorded as 3.6 billion US dollars. Lastly, according to the Ministry of Health, the amount of credit used for the investment to the ongoing city hospitals projects reached 3.8 billion US dollars.

According to our assessment, the total amount of PPP investments with public service purchase guarantee between 2006 and 2015 is estimated to be 118 billion US dollars (Table II.2.II.2). When these investment projects are matched with TBB RM data, according to solid mapping, the lower band of average FX debt is 17 billion US dollars; and 21 billion US dollars according to flexible matching. The World Bank PPI dataset does not cover all the PPI investments in the country due to lack of reporting, nor does it include projects contracted in 2016. This deficiency is particularly important in terms of the coverage of energy (e.g. electricity) investments, which are a large number of project projects. In this context, all the electricity generating and distributing companies in the TBB RM dataset are identified and their FX debt

stock is compiled. As of August 2016, these companies record a total FX liability of USD 33 billion US dollars. To compute how much of this amount possesses public service purchase guarantee, we utilize the share of investments with public service purchase guarantee in electrical energy investments in the World Bank data that is computed to be 56 percent. When we use this number, we calculate that 18.5 billion US dollars of the FX loan debts of all electricity (producing and distributing) companies (worth 33 billion US dollars) possess public service purchase guarantees.

Table II.2.II.2
FX Loans Used for PPP Financing with Public Service Purchase Guarantees Under Different Assumptions
(Billion US dollars)

	Investment Amount	TBB RM FX Loans (Solid)	TBB RM FX Loans (Flexible)	TBB RM FX Loans (Broadest)
Electricity Production and Distribution	29.0	4.2	7.7	18.5
Highway / Bridge	33.6	5.4	5.4	5.4
Airport	46.0	3.6	3.6	3.6
City Hospitals	10	3.8	3.8	3.8
Totals	**118.0**	**17.0**	**21.0**	**31.0**

Source: Authors' Calculation, World Bank and BAT RM

In summary, a significant portion of the FX loans are estimated to be clustered in the PPP projects. The current total FX debt of firms invested in the PPP projects is estimated to reach 46 billion US dollars under the broadest assumptions according to TBB RM data. This number varies depending on the mapping assumptions. According to our analysis, about 31 billion US dollars of this figure has protection against exchange rate and demand risks through public service and product purchasing, leasing or indirect guarantees.

Although our work is aimed at providing detailed information about the subject, we have to make some significant assumptions. The first assumption we make is: parent (holding and group) companies can also debt-finance the equity they are obliged to put in their SPVs. Second assumption is: parent (holding and group) companies can finance their SPVs indirectly through trade relationship with their SPVs by selling services (e.g. construction) and crediting the investment in their own balance sheets. Unfortunately, it is not possible to track these operations from existing data. Therefore, there are serious differences between current investment values and debt stocks. Although a significant part of the differences can undoubtedly be attributed to the repayments of loans used for investments made since 2006, indirect financing methods, listed above, should also be mentioned, which accounts for another important part of the difference. The use of foreign resources in financing of the PPP investments made with foreign partners is another factor that makes it difficult to identify the loan facility. In addition to what has been said, investments made in 2016 have not been included in the study since they have not yet been added to World Bank data. For instance, the total electricity investment made in 2016 is about 5 billion US dollars according to the Ministry of Energy, while 4 billion US dollars of it is under public service purchase guarantee.