Comparative empirical analysis on the effect of mortgage loan on capital adequacy ratio

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7 May 2017

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A R T I C L E I N F O

Article history: Received 7 May 2017 Received in revised form 25 May 2017
Accepted 25 September 2017
Published 30 September 2017

Keywords:
Capital adequacy ratio
Mortgage
Islamic banking
Retail credit

A B S T R A C T

Capital adequacy ratio is the main indicator for banks to proceed with their operations. Standards for the calculation of the ratio are based on Basel Accord. Key factor for the calculation is credit risk. Credit risk is a function of credit and collateral type. In this case, mortgage has lower risk weight based on its collateral structure on credit risk. This research evaluates the effects of mortgages on capital adequacy ratio to understand the effects of collateral based credits. The findings show positive results between capital adequacy ratio and mortgages of participation banks. However, mortgages have negative impact on capital adequacy ratio of conventional banks. Participation and conventional banks of Turkey are compared on linear regression to analyse the effects of mortgages on capital adequacy ratio. Results are important for further research and professionals.

1. Introduction

Mortgage loans are among the basic activity areas of banks. With the development of retail banking as of 1970, the importance of mortgage loans increased (Beck & Brown, 2015). Mortgage loans are important financing type with its strong collateral and cross-sale ability (Dinc, 2017). Today, 10% of the total loans of Turkish Banking Sector, which has a total loan of 1.6 trillion TRL, consists of mortgage loans (BRSA-Banking Regulation and Supervision Agency, 2017). The house financing is organised in the context of mortgage in Turkey. Mortgage is the basic house financing method, which has found widespread application in the major parts of the world. The method was developed to enable low-income community to own houses by providing them with long-term loans.

The mortgage loans in Turkey were regulated with the Capital Market Law 2944, Item 38A for the first time. The current regulation on mortgage was made on 6th March 2007 with the Law on the Amendments
in Several Laws on Mortgage Financing System, 26454. As of this date, the use of mortgage financing became widespread, and its share in total loans increased.

Mortgage financing is a type of retail loans. The legal standard for mortgage funds is the same with that of conventional banks and for participation banks. Participation banks are Islamic banks operating in Turkey based on non-interest principles. It differed in the Islamic Law as the purchase of the house in advance by the participation banks and making the client pay it in installments as interest-free institutions. Aside from this, the mortgage loans practices and costs of conventional banks and participation banks are similar in practice. In addition, there are no differences in the risk assessment on capital adequacy of participation banks and conventional banks. There are the risk weights that are associated with the type and collateral of the loan in the risk assessment of the standard loan risk in capital adequacy assessments. In this context, a relative low-risk weight is calculated for mortgage loans.

In this study, the effect of the mortgage loans produced by conventional and participating banks on capital adequacy ratios was investigated. In this context, the relation between capital adequacy and mortgage loans was examined, and information was provided on the legal infrastructure of the assessment. In the following part in which the development of mortgage loans was investigated in Turkey, the differences between the participation banks and conventional banks were shown with up-to - date statistical data. The data used in the study belongs to the December 2005 when the Islamic banking start operation under the name of participation bank for the first time - February 2017. In the last part, the effects of mortgage loans on the capital adequacy ratios of both banking groups were investigated with linear regression method.

2. Capital adequacy ratio and mortgage loans

Capital adequacy ratio (CAR) is the value showing the equity rates included in the risks undertaken by the banks. The regulatory and auditory bodies are definitive in the calculation of this value. The design of the CAR is the responsibility of the organization as the bank auditing committee in Bank of International Settlements (BIS), which is also known as Basel Committee, of Basel Accord.

The frame of the CAR regulations of the Basel Accord has differentiated through time. While in the first accord, Basel I, only the credit risk is associated with equity in the calculation of CAR; the market risk is added to the credit risk in Basel II. Basel III, on the other hand, has revealed a structure that involves the credit risk, market risk, operational risk and equity relations. In this context, several sub-regulations were made in the calculation of the main amount as the basis of the credit risk according to the type and collateral of the loan. The definition and the value of the CAR that will be applied by Turkish Banking System have been defined in the Banking Law 5411, Item 45 as follows;

"*Holding sufficient equity against the damages that may occur due to the risks in the application of this law means the capital adequacy. Banks have to calculate, see the accuracy, sustain and report the capital adequacy ratio that will be defined not less than eight percent according to the methods and principles foreseen in the regulations that will be made by the Board*", and BRSA (Banking Regulation and Supervision Agency) was authorized to make the sub-regulations.

In this context, the risk weights of the loans were defined in the Regulation and Assessment of the Capital Adequacy of Banks, which was released in the Official Gazette on 23/10/2015 with the number 29511. The mortgage loans were mentioned in the content of this regulation. In this context, the risk weight calculated in the mortgage loans was determined as 50%. This value is the same with the risk weight recommended for mortgage loans in the Basel I design (Calem, Lacour, 2004; 649). "The Regulation on the Amendments in the Regulation on the Measurement and Assessment of the Capital Adequacy of Banks" with the date 20/1/2016 and number 29599, which made amendments in this regulation, updated the risk weight of the mortgage loans as 35%.

The relevant statement of the regulation is as follows; *"Thirty-five percent risk weight is applied to the receivables that are guaranteed in the context of item*
(c) of Item Forty-Five as the mortgage established on all of the immovable assets owned by the creditor that will be used either as residence or for renting. In case the consideration occurs that requires the application of a different risk weight by non-performing loan statistics for the receivables, the risk weight in question may be differentiated by the Board in an amount not less than thirty-five percent. Additional conditions may be established by the Board to apply this item".

Basel II considers retail types of credits have lower default risk and point to a new area for research (Claessens et al., 2005; 12)

2.1. Mortgage loans and the relation with CAR

In this context, the non -performing rates are determinant in defining the risk weights applied in Mortgage Loans. When the background of the regulations is analyzed it is observed that the risk weight calculations are lower in mortgage loans (Arslan, 2007; 47). The association of mortgage loans and non-performing loan rates is due to the Subprime Mortgage Loans problem, which emerged at the beginning in global finance crisis. The problems that emerged in the crisis showed that the mortgage finances, which were considered as having lower non-performing loan risks, to a group thatactuallycannot afford to pay installments and had low repayment performance (Demyanyk, Hemert, 2011; 1849) . The advantage in prices that occur due to low risk weight providing finance opportunity to the subprime group caused that a balloon was formed in housing market and the crisis emerged afterwards.

There is also relation between risk weight and mortgage loan interest rates. Basten and Koch conducted a study on the Swedish economy that adopted Counter -Cyclical Capital Buffer for the first time, and showed that the 1% capital requirement for capital that came with the application affected the interest rates of the mortgage loans in an upward manner (2015; 38). In addition, Vandenbussche et al. conducted another study in which they showed that such an effect had a downwards and strong effect on the prices of the houses, and showed the macro effect of Counter-Cyclical Capital Buffer and similar practices after they investigated the European market (2015; 371).

The risk weight practices about the calculation of capital adequacy, which is the influential power on the rates of the mortgage loans, directly influence the rates of the mortgage loans and the prices of the houses. It might be considered that the macro effects of such regulations may be wider in economies like the one of Turkey where construction sector is dominant. Especially when 20% of the total loans of the banking sector is allocated directly to construction sector and when the share of the housing financing in retail loans is considered, it is observed that the macro effects of sub-regulations are related closely to

assets of banking sector. Stability in housing market reveals a strong banking structure both in loans side and in the collateral side.

2.2. The development of mortgage loans in Turkey

Mortgage loans have an important place in the retail-banking sector in Turkey. In this context, nearly half of all retail financing consists of mortgage loans. The development of mortgage loans in retail loans is given in Fig 1. The share of mortgage loans in retail loans was 10% in 2002, and has been 47% since 2005.

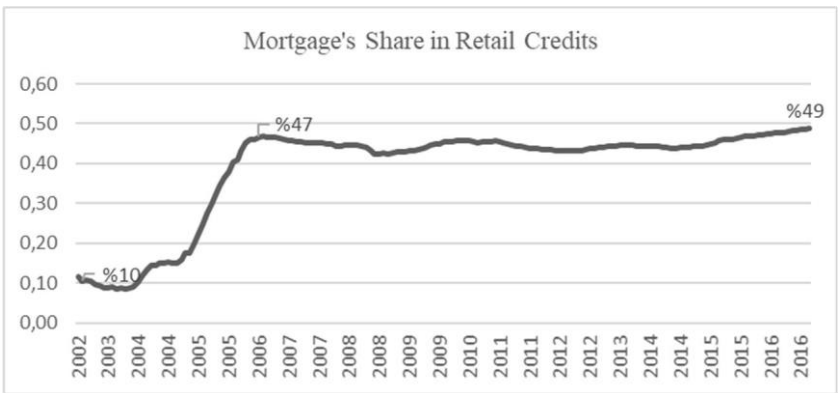

Fig. 1. The share of mortgage loans in total retail credits (Source: BRSA data set)

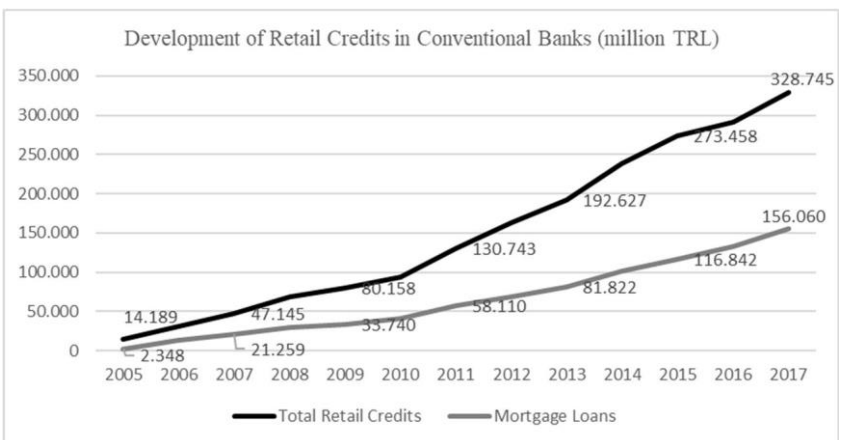

Fig. 2. The development of retail credits in conventional banks (Source: BRSA data set)

2.2.1. The development of mortgage loans in conventional banks

Specifically, in conventional banks, the development of total retail loans and mortgage loans is given in Fig 2. While the total retail loans were in 15.2 billion TRL in 2005, the amount of mortgage loans was 2.4 billion TRL. According to February 2017 data, total retail loans were 329 billion TRL. In the same period, the total amount of the mortgage loans was 156 billion TRL.

In this context, the share of the mortgage loans in total retail credits of conventional banks is parallel to sector data. Within the Turkish banking system, the conventional banks being dominant explains the similarity between the sector data and the data of the conventional banks. The development of mortgage loans in retails credits in conventional banks is given in Figure 3.

The data show that the participation banks, which are the other elements of the Turkish banking system, do not have a determinant power or has not formed such a power in terms of Mortgage Loans.

When the data of the sector are assessed, the deposit bank data and the effect of the study are similar in some terms.

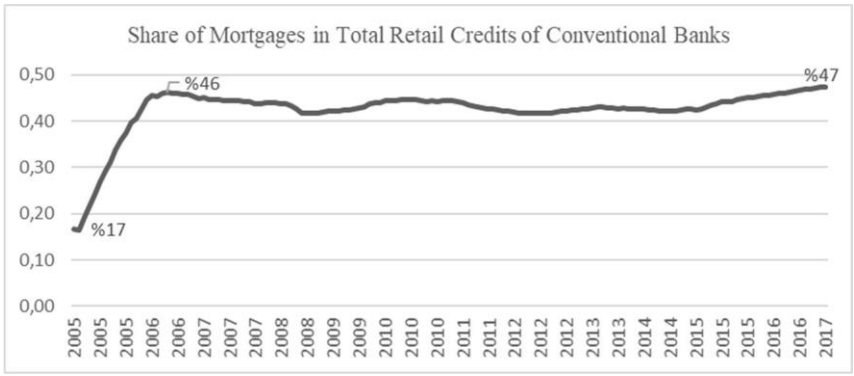

Fig. 3. The share of mortgage loans in retail credits of conventional banks (Source: BRSA data set)

2.2.2. The development of mortgage credits in participation banks

Participation banks show differences in terms of trends. Although there was a strong growth in the mortgage finances and retail credits, the trend has a downward inclination in recent years. As it may be seen in Fig 4, the retail credits of participation banks was 495 million TRL in 2005, and reached 13,6 billion TRL in 2017. In the same period, mortgage finances reached 11,8 billion TRL from 209 million TRL. The inclination to decrease in the recent term may be handled as a conjectural effect. As it may be seen in Fig 5, the long-term share of mortgage finances in total retail credits is sustained as 90%.

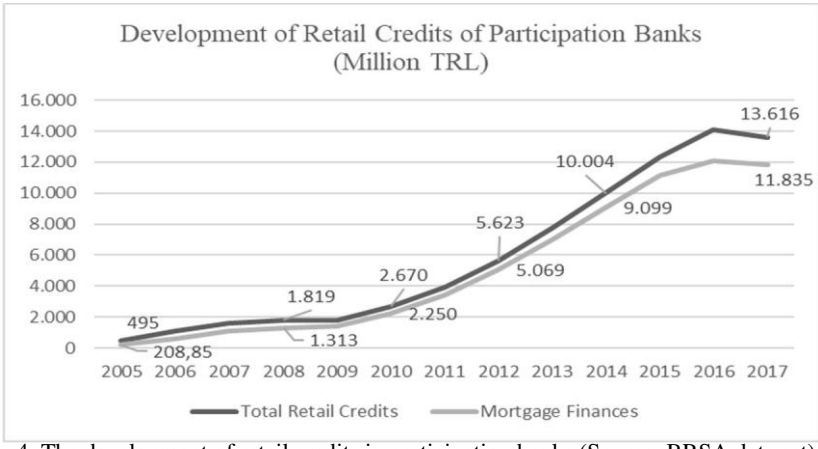

Fig. 4. The development of retail credits in participation banks (Source: BRSA data set)

This situation shows that the fragile trend of retail credits stems from the slowdown of the strong increase of mortgage finances. The trend of mortgage finances sharesin retail credit shown in Figure 5. The share of mortgages finances in retail credits lost in its trend since 2016. The share of mortgage finances was around 90% during the period of 2011-2015.

Since then, its share has decreased to lower percentages of retail credits. This can be seen as a conjectural effect of slowing construction industry and the price hikes of real estate investments in Turkey. However, the share of mortgage finances is still strong with the participation banks. This situation can be considered as a characteristic of participation banking.

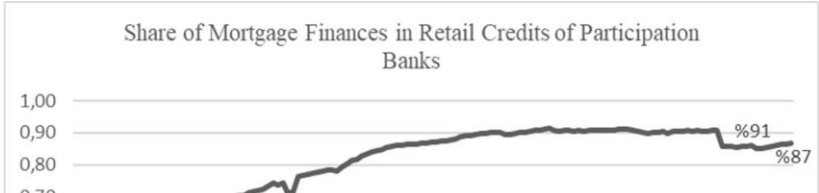

Fig. 5. The share of mortgage credits in retail credits of participation banks (Source: BRSA data set)

3. A comparative analysis on the CAR effect of mortgage loans

Comparative analyses have been conducted all over the world on mortgage loans of conventional and participation banks. However, it is observed that these studies were conducted on the acquisitions. Hanif and Hijazi (2010) conducted a study and investigated the prioritisation of Islamic criteria in terms of legal standards.

3.1. Islamic banking and CAR

When this topic is analysed in terms of the topic of the present study, it may be considered that the calculation of capital adequacy ratio with 50% risk weight is more accurate for the relation between the risk and interest-free status without discrimination between the financing types of AAOIFI (AAOIFI, 2009). In this context, the belief that AAOIFI may handle the capital adequacy as a guarantee due to its elimination of the risk may disrupt the interest-free status is determinant (Ariss&Sarieddine, 2007) . In this context, the mortgage loans risk weights are within the AAOIFI standards in calculation of capital adequacy calculations applied in Turkey.

Another party that regulates the capital adequacy standards of the interest-free finance organisations is the Islamic Financial Services Board (IFSB), located in Malaysia. IFSB regulated two separate CAR standards according to establishment types of the interest-free finance organisations. There is a CAR standard regulated for the organisations except for the insurance companies and is known as “IFSB-2 Capital Adequacy Standards for Organisations that Only Provide Islamic Financing Services”, which was released in 2005 (IFSB, 2005). In addition, another CAR standard was released in 2009 known as IFSB-7 to handle the issues like sukuk (interest-free debenture), securitisation, and real estate investments (IFSB, 2009). IFSB-2 standard was revised in 2013 with the IFSB-15 Revised Capital Adequacy Standard for Organisations Providing Islamic Financing Services (except for the Islamic Insurance and Collective Investment Organisations) (IFSB, 2013). In the context of this standard, although the calculations differed for interest-free financing organisations, the requirement of 8% was defined as the basic rate. IFSB standards included the Displaced Commercial Risk, that is interest- free financing organisations in the loss of CAR calculations. In addition to this, it is also included in the Profit Equalisation Reserve and Investment Risk Reserve, which are known as buffer in the CAR calculation model.

3.2. Literature analysis

There are also several other studies that investigate the relation between the mortgage loans and capital adequacy of the banks but are not comparative. Vandenbussche et al. (2015) used the panel data regression method). Among their findings, they also determined that the requirement of higher capital also required higher mortgage loan cost. They included consumer loans as a variable in their study. Büyükşalvarcı and Abdioğlu (2011) conducted a study on the banks in Turkey, and used scale, profitability and other group rations in panel data works as the determinants of CAR. They reported that

the relation between the Loans / Total Assets ratio was negative, and on the other hand, the relation between the specific counterparts and CAR was positive.

Dreca (2013) conducted a study in Bosnia-Herzegovina and took the rate of General Deposit to Total Assets; the rate of Total Loans to active assets; and the rate of specific counterparts to total loans as variables. In the same study, they also used active profitability and capital equity as variables. Among the findings of this study in which panel data linear regression model was used, it was shown that the linear relation between high CAR and stability is between low CAR and high profitability. Meanwhile, Ahmed et al. (2008) conducted a panel data study on Malaysia and took the rate of equity to active assets and the rate of non-performing loans to total loans as variables. In this study, it was observed that high CAR requirements did not affect the risk tolerances, and high CAR requirement held the banks in a smaller scale. Bateniet al. (2014) used a similar method in their studies and worked with the data of the banks in Iran. Among the findings, they reported that there was a positive relation between the loans ratio and CAR unlike other similar studies. On the other hand, they could not find a relation between the rate of the deposits to active assets and CAR.

In another study, Francis and Osborne (2009) used the counterparts' ratio that dealt with the banks in England, and reported that there was a relation between CAR and growth. The studies conducted on CAR in the world show similarities. Although there are limited numbers of studies on Islamic banks, Abusharba et al. (2013) conducted a study on Islamic banks in Indonesia in 2009-2011 and used multiple linear regression method. Among the findings of the study, which included total non-performing loans as variables, there is also the finding claiming that there is a relation between profitability and CAR. However, there is also another finding of the same study claiming that there is a negative effect of the non-performing loans on CAR.

Furthermore, Mehmood et al. (2013) evaluate the variables that effect non-performing loan ratio on Pakistani commercial banks. The results show negative correlation between non-performing loan ratio and statutory liquidity requirements for banks. They also used panel data regression on their research. Mongid's (2016) study on profitability of Islamic Banks in MENA region covers 117 banks. The findings show opposite relation between CAR and profitability. The research includes equity ratio and CAR.Mongid used panel data regression and the model set dynamic.

3.3. Method

There are no studies conducted on Turkey dealing with the direct effect of mortgage loans. In studies conducted internationally, it is observed that the effect of CAR on profitability is investigated more frequently. The basic equation of linear regression model is included in the studies and the variables used in them show similarities. In this context, the basic equation of the model was formed as follows.

$$C_t = \alpha + \beta_1 T_t + \beta_2 N_t + \beta_3 C_t + \beta_4 T + \beta_5 E + \beta_6 R + \beta_7 M + \sigma_{t-1} + \mu_t$$

CAR was taken as the dependent variables. The regression results will be reported for the CAR dependent variable. Also the relation between other variables will be reported as well. In the model; α represents the model constant, β represents the vector of the coefficients, σ represents the coefficient of the Dynamic Variable, and μ represents the error vector.

In the context of the study, the monthly data of the deposit and participation banks that are active in Turkey between 2005 December - 2017 February were obtained from BRSA database, and were modelled with linear regression method. A total of 146 observation points was reached. Both group data were taken as consolidated data. The bank-based data being not received in monthly basis is among the limitations of the study.

The explanations on the variables used in the model are given in Table 1. The variables used in this research are similar to literature. COTC and MOTC ratios are unique for the research purpose. Although the relation between all variables explained COTC and MOTC ratios are main focuses of the paper.

Table 1. The variables used in the model

Rank	Ratio	Type	Source	Formula
1	CAR	Liquidity	Financial Reports	Capital/Credit Risk+MarketRisk+Operational Risk
2	TCTA	Precariousness	Balance Sheet	Total Loans/Total Assets
3	NPL	Precariousness	Balance Sheet	Non-performing Loans/Total Loans
4	Cost of Risk (CoR)	Precariousness	Balance Sheet	Non-performing Loans Equivalent/Loans
5	TDTA	Liquidity	Balance Sheet	Participation Funds (General Deposit)/Total Liabilities
6	EQTA	Liquidity	Balance Sheet	Shareholder Equity/ -Total Assets
7	COTC	Precariousness	Balance Sheet	Consumer Credits/Total Credits
8	MOTC	Precariousness	Balance Sheet	Mortgage/Total Credits
9	CAR t-1			Dynamic Variable

3.4. Findings

The model was run for the participation banks and conventional banks. A two-stage process was followed in the estimation of the multi-variate regression models. Firstly, the reference model, which included all the variables, was estimated, and then the models that gave the most meaningful coefficient values were reached by eliminating the variables that produced meaningless coefficient estimations one-by-one.

Since nearly all of the models that were estimated gave extremely high r-square values, it is observed that their explanation powers are high. The “F” values that are high and have a value at 1% level indicates to high-level general meaningfulness of the models. The model was run in a static manner and the issue of whether there was an auto-correlation problem was tested with Durbin-Watson test and Durbin-h test. In order to prevent the auto-correlation problem, the model was run in a static way. The results of these tests show that there were no such problems in the model. In the context of these determinations, an auto-correlation result emerges for conventional banks. The conventional banks group did not stay within the acceptable limits of both tests. No drawbacks were considered in interpreting the coefficients of the meaningful models for participation banks. The regression results calculated for CAR are as follows.

3.4.1. The effects of mortgage loans of conventional banks on CAR

The data of the deposit banks for the period of January 2005 - February 2017 were used and the descriptive statistics and correlation matrices are given. Table 2 explains descriptive statistics.

Table 2. Descriptive statistics for conventional banks

	CAR	TCTA	NPL	CoR	TDTA	EQTA	COTC	MOTC	CAR t-1
N of cases	145	145	145	145	145	145	145	145	145
Minimum	0.141	0.324	0.028	0.022	0.540	0.099	0.060	0.022	0.141
Maximum	0.276	0.635	0.066	0.062	0.653	0.146	0.132	0.118	0.276
Mean	0.172	0.523	0.038	0.033	0.601	0.115	0.095	0.101	0.171
Standard Dev	0.026	0.084	0.010	0.011	0.038	0.009	0.016	0.018	0.025
Skewness (G1)	1.645	-0.445	1.044	0.937	-0.201	0.788	-0.541	-2.896	1.583
SE Skewness	0.201	0.201	0.201	0.201	0.201	0.201	0.201	0.201	0.201
Kurtosis (G2)	2.919	-0.713	-0.061	-0.168	-1.690	0.690	-0.014	8.735	2.746
SE Kurtosis	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400

When the Correlation Matrix is analysed as on Table 3, it is observed that there is a strong relation between the CAR variable and all the other independent variables. CAR has a very strong and positive relation with CoR, TDTA and EQTA Ratios. This relation is normal in that it explains the status of the ratios that do not have a negative relation on the CAR value. However, the negative effects on CAR may be observed in correlation matrix because of the risk weight relation of loan-sourced ratios like TCTA, COTC and MOTC. There is a positive and strong relation between CAR ratio and NPL and CoR. In addition to this, the positive relation between TDTA and EQTA ratios that feed the source side is normal. The relation between MOTC Ratio and NPL and CoR Ratios show that the mortgage loans have less back-payment problems. According to the findings obtained, the effect of the consumer loans, which is a type of collateral-free credit for conventional banks, and the effects of mortgage loans whose risk weight is narrowed with real estate mortgage for residential purposes, on CAR are negative. Since the negative effects of the increases in values like NPL on balance sheet image of the banks are known, the expectation of an increase in this value or an expectation of an increase in the CoR value that appear in relation with this value is not acceptable although it shows a positive effect on CAR.

Table 3. Pearson correlation matrix for conventional banks

	CAR	TCTA	NPL	CoR	TDTA	EQTA	COTC	MOTC	CAR t-1
CAR	1.000								
TCTA	-0.888	1.000							
NPL	0.858	-0.811	1.000						
CoR	0.897	-0.881	0.988	1.000					
TDTA	0.671	-0.883	0.695	0.758	1.000				
EQTA	0.781	-0.598	0.680	0.681	0.472	1.000			
COTC	-0.696	0.709	-0.424	-0.508	-0.466	-0.423	1.000		
MOTC	-0.698	0.508	-0.558	-0.572	-0.157	-0.412	0.575	1.000	
CAR t-1	0.976	-0.888	0.862	0.898	0.679	0.739	-0.691	-0.690	1.000

While it is expected that the consumer loans have a positive effect on CAR value because of the profitability effect of consumer loans, the risk weight of these loans being relatively high is the factor that causes that this effect emerges in a negative way on CAR.The regression results are given in Table 4. The independent variables in the model explain 97.2% of the CAR ratio's total variance. The Durbin Watson value is 1.216. Since CAR value is affected by many factors, it was run in a dynamic way to overcome a possible multicollinearity problem; however, the autocorrelation problem was not overcome.

Despite this, the most meaningful model was run, and the findings were sharedin Table 6. In this context, the meaningfulness level of all the variables except for the COTC ratio, which shows the rate of consumer loans to total loans, are within the acceptable limits. The negative effects of mortgage loans on CAR may be supported in the coefficient values.

Table 4. Regression Findings for Conventional Banks

	CAR			
Independent Variables	**Coefficient**	**t-Test**	**Coefficient**	**t-Test**
Constant	0.074	2.450 **	0.078	2.634 ***
TCTA	-0.041	-1.616	-0.047	-2.006 **
NPL	-1.204	-2.827 ***	-1.237	-2.939 ***
CoR	1.550	3.133 ***	1.557	3.156 ***
TDTA	-0.048	-1.494	-0.052	-1.690 *
EQTA	0.549	8.371 ***	0.551	8.423 ***
COTC	-0.024	-0.572		
MOTC	-0.133	-3.321	-0.136	-3.443 ***
CAR t-1	0.556	10.313 ***	0.562	10.615 ***
R Square	0.974		0.974	
Flat R Square	0.972		0.972	
F Test	630.842		724.477	
	[0.000]		[0.000]	
Durbin Watson Test/Durbin-h	1.216/4.726		1.223/4.684	
Std. Error (1)	0.004		0.004	
Observation Number	145		145	

(1) Standard error of the delayed variable.

Meaningful t tests at (***) %1, (**) %5, (*) %10 levels.

3.4.2. The effects of mortgage credits of the participation banks on CAR

The data of participation banks for January 2005 - February 2017 period were taken and the basis, and the descriptive statistics and correlation matrices were givenin Tables 5 and 6.

Table 5. Descriptive statistics for participation banks

	CAR	**TCTA**	**NPL**	**CoR**	**TDTA**	**EQTA**	**COTC**	**MOTC**	**CAR t-1**
N of cases	145	145	145	145	145	145	145	145	145
Minimum	0.107	0.571	0.031	0.021	0.590	0.085	0.000	0.047	0.107
Maximum	0.170	0.782	0.080	0.059	0.848	0.145	0.018	0.178	0.175
Mean	0.144	0.673	0.046	0.031	0.719	0.109	0.003	0.118	0.144
Standard Dev	0.013	0.051	0.013	0.009	0.077	0.017	0.005	0.034	0.013
Skewness (G1)	-0.823	-0.100	0.894	1.470	-0.187	0.384	2.157	0.008	-0.746
SE Skewness	0.201	0.201	0.201	0.201	0.201	0.201	0.201	0.201	0.201
Kurtosis (G2)	0.763	-0.722	-0.019	1.415	-1.324	-1.109	3.263	-1.077	0.891
SE Kurtosis	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400

When the correlation matrix of the participation banks was analysed, it was observed that there was a strong relation between the CAR Ratio and many independent variables. There is a negative and weak relation between CAR and TCTA Ratio. The negative effect of TCTA Ratio is natural.

Table 6. Pearson correlation matrix for participation banks

	CAR	TCTA	NPL	CoR	TDTA	EQTA	COTC	MOTC	CAR t-1
CAR	1.000								
TCTA	-0.030	1.000							
NPL	-0.201	-0.541	1.000						
CoR	-0.353	-0.484	0.924	1.000					
TDTA	-0.364	0.587	0.045	0.142	1.000				
EQTA	0.291	0.732	-0.257	-0.353	0.477	1.000			
COTC	0.275	-0.671	0.399	0.334	-0.657	-0.500	1.000		
MOTC	0.394	-0.597	-0.094	-0.149	-0.906	-0.545	0.613	1.000	
CAR t-1	0.905	-0.069	-0.183	-0.331	-0.365	0.245	0.304	0.408	1.000

However, in the existence of a weak relation instead of a strong one in conventional banks, the regulation on the calculation of risk at a rate of 50% granted from the participation fund for participation banks. The NPL and CoR Ratios are also included in a negative correlation with CAR. This relation being reverse of the conventional banks, that is, being in negative direction, is affected by the relation explained with TCTA Ratio.

For participation banks, the negative relation between TDTA Ratio and CAR is another factor that does not fit the situation observed in deposit banks. Right at this point, the definitive factor is the collection of the participation funds with “mudarabah” (Expertise-Capital Partnership Method) and the whole of the funds used by clients being not transferrable to equity. The total equity assets that may be used decrease due to the costs allocated from the funds collected with mudarabah. For this reason, the

profitability of the mudarabah funds is lower; and therefore, its relation with CAR is negative. On the other hand, EQTA Ratio is in positive correlation with CAR because of its properties that are stronger than the mudarabah funds that support the equity assets. It was observed that the COTC and MOTC Ratios of the participation banks is positively correlated with CAR unlike the conventional banks. This situation shows that the mortgage finances and retail credits have higher collateral value for participation banks than the other loans. In this context, the cost that is generated from mortgage finances by participation banks may be tolerated with the strong positive effect on CAR. The findings of regression for participation banks are given in Table 7.

Table 7. Regression Findings for Participation Banks

	CAR			
Independent Variables	**Coefficient**	**t-Test**	**Coefficient**	**t-Test**
Constant	0.016	0.821		
TCTA	-0.008	-0.406		
NPL	0.018	0.149		
CoR	-0.070	-0.450		
TDTA	0.001	0.061		
EQTA	0.169	3.068 ***	0.170	4.710 ***
COTC	0.144	0.928		
MOTC	0.057	1.556	0.074	3.729 ***
CAR t-1	0.751	14.255 ***	0.807	19.744 ***
R Square	0.839		0.999	
Flat R Square	0.829		0.999	
F Test	88.370		36.629	
	[0.000]		[0.000]	
Durbin Watson Test	1.825		1.919	
Std. Error (1)	0.005		0.005	
Observation Number	145		145	

(1) Standard error of the delayed variable.
Meaningful t tests at (***) %1, (**) %5, (*) %10 levels.

The most meaningful model for participation banks was run together with Dynamic Variables. It was observed that the model had no auto-correlation problem for participation banks. In this context, the Durbin-Watson value was determined as 1.825. It was observed that the independent variables in the model explained the CAR total variance at a rate of 82.9%. It was also observed that there was a linear relation between the MOTC ratio and CAR in the model. At this point, the most meaningful model was run and the findings were given.

When the most meaningful model was used, it was observed that Dynamic Variables, EQTA and MOTC Ratios explained the CAR total variance at 99.9%. It may be understood that the basic source of the effect stemmed from EQTA Ratio that showed the rate of equity to total assets. However, it is important that the effect of MOTC Ratio on CAR Ratio existing in the most meaningful model with its

positive effect. The Durbin-Watson value is within acceptable limits in the most meaningful model. Unlike the conventional banks, the lack of autocorrelation problem for the participation banks in the model shows that the sensitivity of the activities of the participation banks to regulations is at a high level. The differentiation of the direction of the relation that occurred in some rations of the conventional banks with the participation banks shows the effect of interest-free principles on the ratios of the participation banks.

4. Results

The mortgage loans have an important place in the Turkish banking system. Mortgage loans have a side that feeds the deferment disagreement due to the structure of the deferments in mortgage loans. In addition, the effect of it is limited on profitability due to the low interest and profit share rates. Unlike these negative sides, mortgage loans have an important place in the financial structure of the banks with its strong collateral structure, which results in low risk weight. In the period, which was investigated in the scope of the study, it was observed that the mortgage loans did not have a positive effect on CAR of the conventional banks. In addition, it was also determined that the consumer loans did not have a positive effect on CAR despite their high profitability effects. Moreover, the strong and negative relation of these ratios with CAR has similar values.

For participation banks, on the other hand, the MOTC and COTC Ratios have a positive effect on CAR. This relation being in a different way seems from the fact that the collateral structures of the consumer and mortgage loans in the loans provided by participation banks are stronger. In addition, the decisiveness of the participation banks on TCTA Ratio and CAR is limited. The fact that there is an assessment at a rate of 50% in addition to the risk weights in CAR calculation of the finances used from the “mudarabah” funds is definitive in this point.

In summary, according to the findings, mortgage loans do not have a positive effect on CAR for conventional banks. However, it is observed that the mortgage finance of the participation banks has a positive effect on CAR. The findings obtained in the study are important for the direction of the investment decisions. The results are important for further research. The observations were not enough to compare the effect of the change in risk weight of mortgage finances.

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