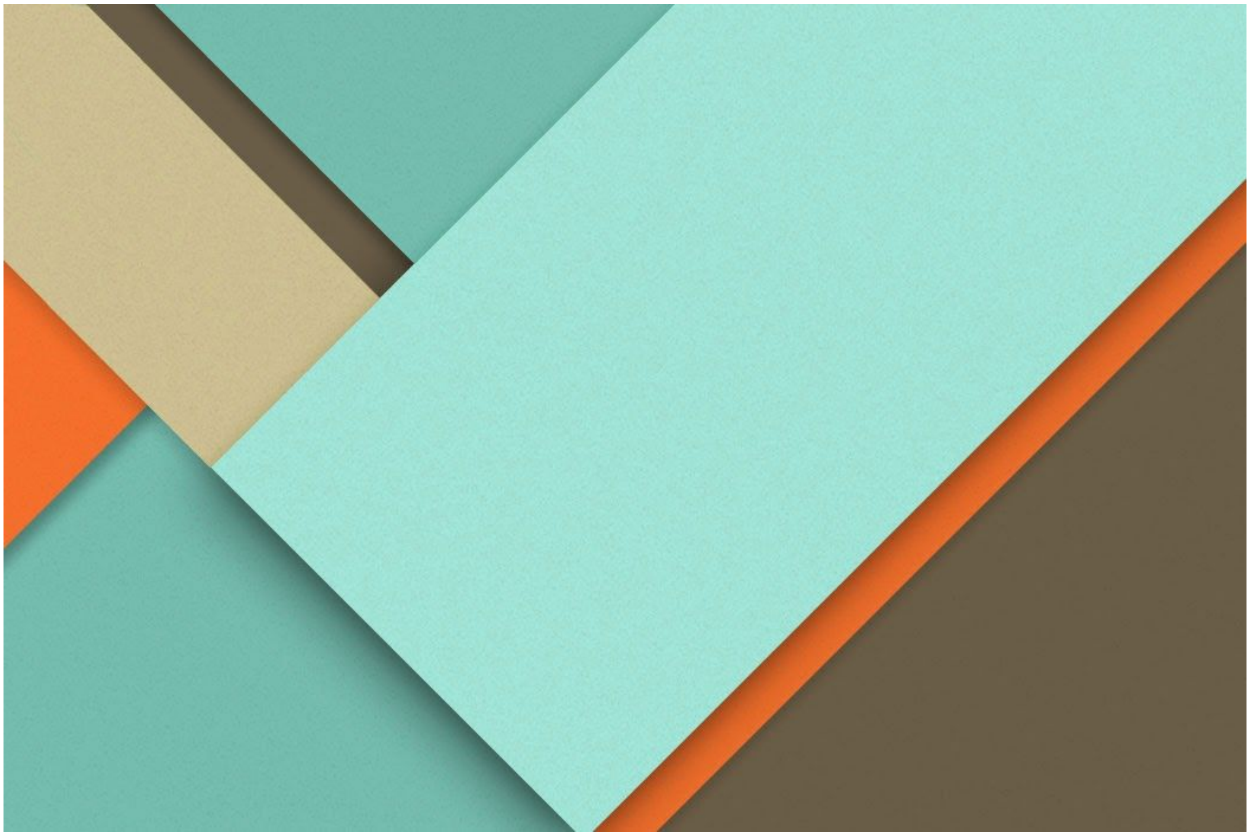

Industrial Organization of the Turkish Banking Sector

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Introduction

The industrial organization is a field of economics deals with the structure of firms in the economy and explores the competition and concentration of firms in the market and related regulatory policies on the industry. As well as agriculture, manufacturing, and tourism, banking is also a sector that “industrial” term in an industrial organization refers to. The industrial organization of the banking sector analyzes the large players in the sector and market conditions such as concentration and competition level among the players.

Although in some economic models the financial structure had been disregarded concerning its effect on real economic outcomes, the financial market conditions might have a direct effect on real economic variables such as premiums charged for external financing of firms. The concept of “financial accelerator” that is brought up by Bernanke, Gertler, and Gilchrist indicates that in times of adverse macroeconomic shocks, relatively small-sized businesses (such as SME’s) have more limited access to the credit compared with the large players in the economy. Since the small firms are more vulnerable to experience the pro-cyclical (downsizing accordingly with the economy during the recession) scenario during the economic recession, the chances of bankruptcy increase. Henceforth, the external financing (borrowing from banks) for the relatively small firms becomes costlier due to the increased amount of premium on the borrowed finance since financing small firms carry more risks for banks. Therefore, lack of or limited access to the credit during the recession creates even more cutbacks in the production and it leads to a further decline in GDP growth.

The concept of "financial accelerator" concerns the lending behavior of banks in the industry and the industrial organization of the banking sector may affect the level of the effect of financial accelerator. In this sense, market concentration and competition in the banking sector are worth to mention. The incremented level of concentration is caused by the dominance of large banks in the industry and it changes the investment decisions of big banks. The large and long-run investments by the big banks in concentrated markets lead to the reduced availability of the adjustments on lending conditions (Turgutlu 4). One might claim that it does not reduce the effect of “financial accelerator” since the large market share of big banks does not change their lending behavior for small and medium-sized businesses. However, the deteriorated ability to adjust the lending conditions of the long-run and large investment projects may increase the costs of banks during the recessions and it may increment the cost of external financing for SMEs even more drastically.

On the other hand, higher market concentration in the banking industry may increase the availability of monitoring of agents (borrowers) and decrease the external financing premiums. Consequently, the reduced costs of external financing may weaken the effect of “financial accelerator”.

Moreover, the increased concentration level among state-owned banks may determine the credit access level of borrowers and in this respect counter-cyclical decisions by state-owned banks would not be an exception. To investigate the existence of counter-cyclical behavior of state-banks and the role of market concentration in that behavior the loans to the SME’s by state-owned and privately-owned banks are taken into the account in this report.

Measuring the Market Concentration in the Turkish Banking Sector

To determine the market or industrial structure the market ratio is regarded as a relevant structural feature. Market concentration assesses the share of the production is produced by certain number firms, in other words, it is the function of the number of firms and their shares in total production. As the small number of firms take a higher share of production in the market concentration increases.

The market concentration can be estimated by several methods where the Herfindahl-Hirschman index (HHI) and the concentration ratio (CR) are used in this report.

The concentration ratio simply takes the output of k banks and finds the ratio of the sum of the outputs of k banks to the total output in the banking sector. In the Turkish Banking sector, seven largest banks are Türkiye Cumhuriyeti Ziraat Bankası A.Ş., Türkiye İş Bankası A.Ş., Türkiye Halk Bankası A.Ş., Türkiye Garanti Bankası A.Ş., Yapı ve Kredi Bankası A.Ş., and Türkiye Vakıflar Bankası T.A.O., respectively, in 2018.

Top 7 Turkish Bank (Asset Size Ratio)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Akbank T.A.Ş.	0.122	0.121	0.119	0.118	0.115	0.120	0.112	0.109	0.105	0.104	0.102	0.090
Türkiye Cumhuriyeti Ziraat Bankası A.Ş.	0.144	0.148	0.156	0.157	0.138	0.125	0.127	0.131	0.135	0.138	0.140	0.147
Türkiye Garanti Bankası A.Ş.	0.120	0.126	0.132	0.129	0.126	0.123	0.120	0.116	0.114	0.109	0.105	0.098
Türkiye Halk Bankası A.Ş.	0.072	0.072	0.076	0.076	0.079	0.083	0.086	0.082	0.084	0.089	0.099	0.103
Türkiye İş Bankası A.Ş.	0.143	0.138	0.142	0.137	0.139	0.135	0.129	0.126	0.123	0.120	0.117	0.114
Türkiye Vakıflar Bankası T. A.O.	0.076	0.074	0.081	0.077	0.077	0.081	0.083	0.084	0.082	0.082	0.087	0.091
Yapı ve Kredi Bankası A.Ş.	0.090	0.090	0.081	0.088	0.093	0.094	0.091	0.096	0.099	0.097	0.096	0.095
CR7 (Concentration Ratio of 7 Banks)	0.766	0.770	0.787	0.782	0.768	0.762	0.748	0.744	0.742	0.740	0.747	0.738

Table 1: Prepared by author[1]

In table 1, the ratio of assets of the seven largest Turkish banks to the total assets in the Turkish banking sector is illustrated. Moreover, while calculating the concentration level of the seven largest banks (CR7), the ratio of their assets to the total assets in the Turkish banking sector has been utilized. As we can see in Table 1, in 2018 the concentration level had been 0.738. It did not change drastically after 2005, but his its lowest level in 2018. We can detect the steady decline in CR7 after 2009 which was the post-crisis period in the Turkish economy.

Another widely used statistic to calculate the concentration level is the Herfindahl-Hirschman index (HHI). Although there are criticisms on HHI such that embodiment of size and number of firms in the industry altogether leads to the arbitrary assignment of weights to the number and weight of firms, HHI often thought to be an ideal measure of market concentration (Kwoka 2).

[1] Source: BDDK

HHI also looks at the bank to the sector production ratio, however, it covers all banks and weights banks according to their share of their products in the sector. Here, instead of the total products, the assets of banks are utilized to calculate HHI. In this report, the HHI is calculated by summing the squared ratios of assets of banks in the Turkish banking sector to the total assets in the sector. Since those ratios are squared it gives more weight to the big banks (in terms of their asset ratio) in the sector and covers all banks in the Turkish banking industry.

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
HHI	0.096	0.095	0.093	0.094	0.098	0.097	0.093	0.091	0.088	0.087	0.086	0.086	0.087	0.086

Table 2: Prepared by author[2]

The HHI index is considering that the market is concentrated if the index exceeds 1 and the concentration level increases as HHI increases. If the result is less than 1 then the market is considered as non-concentrated. According to the calculations in Table 2 Turkish banks are non-concentrated since the highest HHI which was recorded in 2009 does not exceed 1 and HHI steadily deteriorates after 2009. One can observe that the results of the HHI index (Table 2) of the Turkish banking sector are relevant to the CR statistic that is developed in Table 1.
Another considerable measure for market concentration might be the profit margins of firms in the industry. High-profit margins might reflect the existence of monopoly or oligopoly in the industry; therefore, it can be a signaling variable for high market concentration. On the other hand, by analyzing the changing profit margins of players in the industry with the nonexistence of the entry barrier to the industry, one can deduce how market concentration changed over the period. Since the profits of firms in the perfectly competitive market are zero the decreasing profits of firms over a sufficiently long period with the no entry barrier may indicate decreasing market concentration, hence, the entrance of new firms and rotation to the competitive market in the sector.

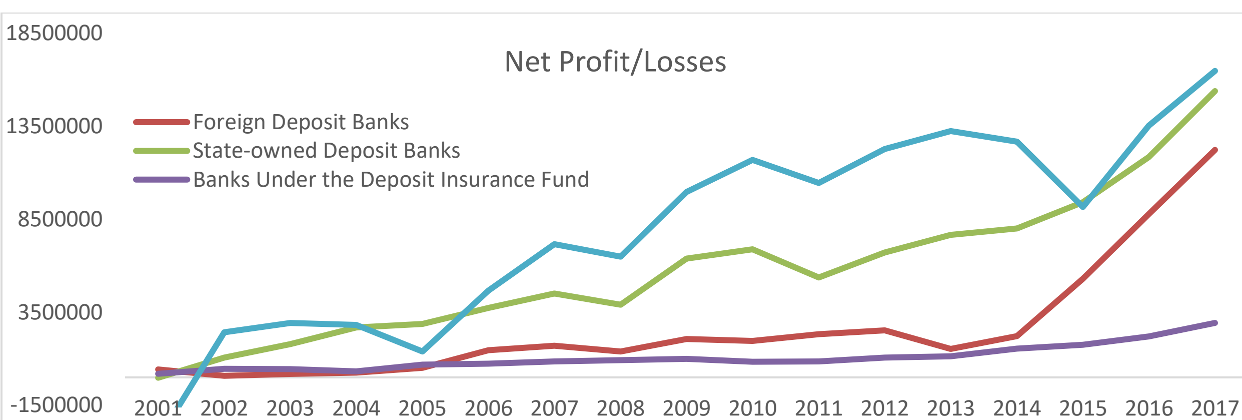


Figure 1: Prepared by author[3]

[2] Source: BDDK
[3] Source: BDDK

However, Figure 1 where the net profit or losses of Turkish banks are depicted might not be a good indicator of market concentration. Turkish banking system went into the deep restructuring process in 2001 which started with the “Disinflation Program” in 1999 and the restructuring process directed to avert the causes of the 2001 crisis to happen again. Therefore, net profit and losses of Turkish banks around 2001 is not a good metric to estimate the market competition and concentration level. Although banks’ profits sharply increased after 2015 (Figure 1), the calculated HHI over the asset share of banks in the industry (Table 2) does not reflect this profit increase as an increased concentration, however, it shows that the concentration in the Turkish banking industry was even lower than the pre-2013 period in recent years.

In this respect, Kwoka’s criticism of HHI’s arbitrary assignment of weights and numbers can be relevant. Along with the Kwoka’s criticism, it is sensible to observe that in recent years the accelerated credit expansion led by state-owned banks increased the asset shares of state-owned banks in the total system and the change in shares led to the comparatively lower HHI values, hence, decreased concentration in the banking industry.

Evaluating Differences between State-owned, Privately-owned, and Foreign Banks’ Credit Behaviors

The market shares of banks can be distinguished into the shares of state-owned, privately-owned, and foreign banks and it may have a potential effect on banks' behaviors. One might expect that the increasing share of state-owned banks might lead to the effectively increasing influence of counter-cyclical behavior of state-owned banks during the recession times and might weaken the financial accelerator concept. In their research Baum et al. to observe the effect of government before, during, and after the election and recession periods did an empiric research on credit giving behaviors of state-owned Turkish banks and found that government-owned banks’ behavior does not meaningfully differ during these periods from privately-owned and foreign banks’ credit giving behaviors (2010). However, their research covered the period between 1963 and 2007. However, while analyzing the IO of the Turkish Banking sector and possible differences in behaviors of state-owned, foreign, and privately-owned banks considering the worsened economic conditions under the AKP rule in 2018 which was differing from the economic decline during the great recession, relying on the pre-2007 behavior of state-banks may not be a valid argumentation. The market shares of banks can be distinguished into the shares of state-owned, privately-owned, and foreign banks and it may have a potential effect on banks' behaviors. One might expect that the increasing share of state-owned banks might lead to the effectively increasing influence of counter-cyclical behavior of state-owned banks during the recession times and might weaken the financial accelerator concept. In their research Baum et al. to observe the effect of government before, during, and after the election and recession periods did empiric research on credit giving behaviors of state-owned Therefore, to observe the possible differences between government and non-state banks credit giving and its reliability or relationship with the financial accelerator concept market;

· change in market concentration of state-owned and other (privately-owned and foreign) banks over recent years,

· total amount of loans given by these categories of banks,

· net interest income to loan ratios of banks belong to each category,

· provision for loan losses and others which is utilized to assess the changing amount of risky loans over the recent years and through the different category of banks (such as state-owned) of banks belong to each category

· and total loans given to Micro, Small, and Medium-sized Enterprises (SMEs) over the recent years and comparative analysis of total loans given to SMEs in 2009 and 2018 (according to the economic recession) by banks belong to each category

will be analyzed.

Ownership in Turkish Banking Sector

State-owned deposit banks in Turkey are Türkiye Cumhuriyeti Ziraat Bankası A.Ş., Türkiye Halk Bankası A.Ş., and Türkiye Vakıflar Bankası T.A.O. Although there are solely three state-owned banks in the Turkish banking sector, their assets in the market were constituting 34.1% of total assets in 2018. In this respect, Türkiye Cumhuriyeti Ziraat Bankası A.Ş held 14.7% of total assets in the banking sector, where Türkiye Halk Bankası A.Ş. and Türkiye Vakıflar Bankası T.A.O. were holding 10.5% and 9.1% of total assets, respectively.

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
0.313	0.310	0.294	0.289	0.295	0.297	0.301	0.309	0.326	0.341

Table 3: Asset share of state-owned banks (prepared by author)[4]

One can observe that after 2011 shares of state-owned banks' assets started to increase and the increment gained a higher slope approaching to 2018 (Table 3). Between 2015 and 2016, the growth in the share of total assets of state-owned banks was 2.55%, however, the growth-share of total assets accelerated between 2016 - 2017 and 2017 - 2018, and they were 5.657609613 and 4.485177714, respectively.

[4] Source: BDDK

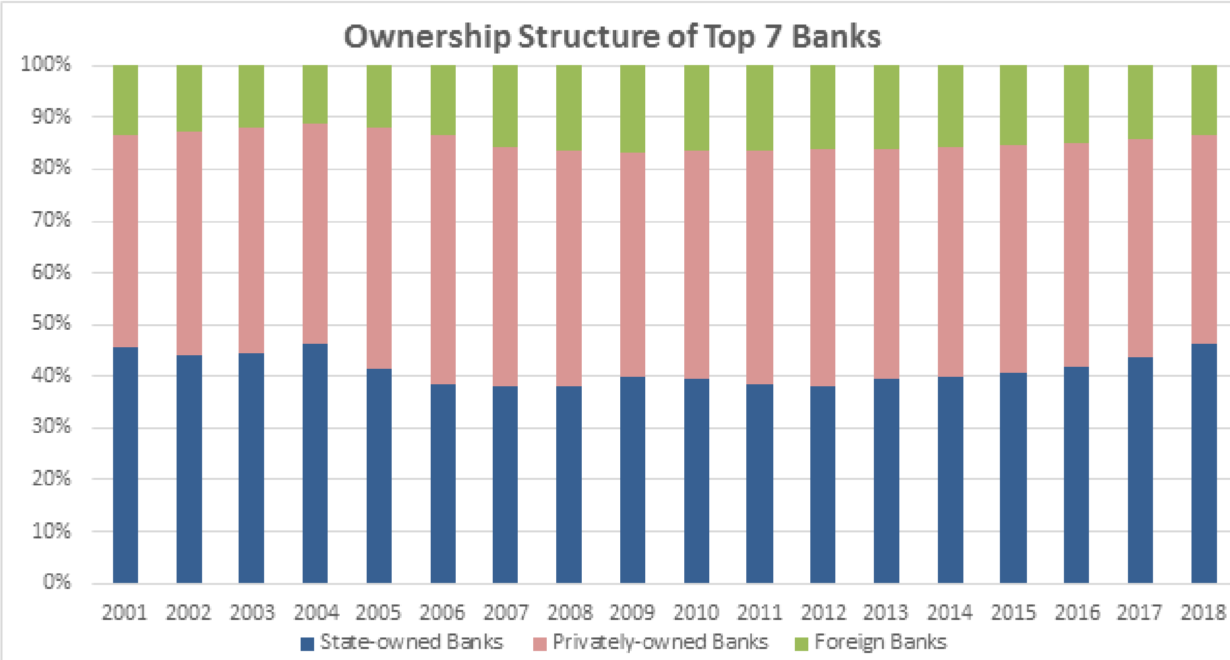


Figure 2: Prepared by author[5]

As it is shown in Figure 2 in 2018 the assets of state-owned banks were consisting 46.2% of the largest seven banks in Turkish banking sector. Meantime, the assets of privately-owned and foreign banks were holding 40.5% and 13.3% share of seven largest banks in the sector, respectively.

Total Amount of Loans Given by Banks (Categorical to Their Ownership Structure)

The tendency of the increasing share of state-owned banks' assets can also be detected while analyzing the total amount of loans given by state-owned banks in recent years. However, the increase in issued loans is not restricted to the state-owned banks, but the foreign and privately-owned banks had also increased the issued loans towards 2017. In this sense, the overheating economy due to the aggregate demand boost and the inflationary pressure over the price stability after 2017 can be partly supported by the increased loans given by Turkish banks.

[5] Source: BDDK

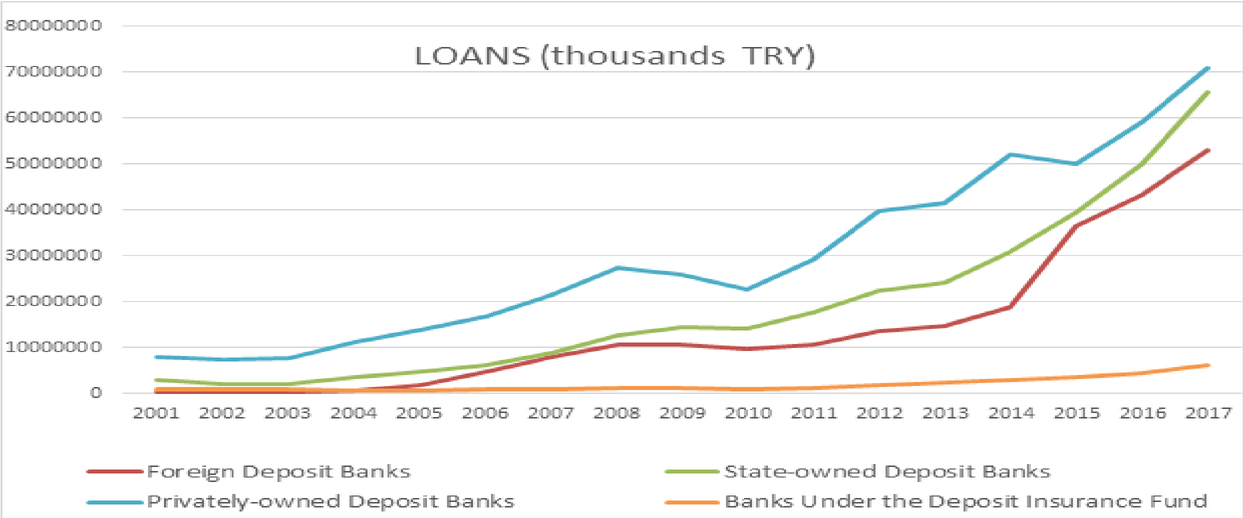


Figure 3: Prepared by author[6]

Nonetheless, one important notice is the higher slope of the increase of given loans by state-owned banks compared with the foreign and privately-owned banks. Although, Figure 3 indicates a massive increase in the given loans by foreign banks between 2014 and 2015, in that period issued loans of privately-owned banks decreased. However, these changes in the loan sizes of foreign and private banks are not coincidental since Türkiye Garanti Bankası A.Ş. converted to the foreign bank from privately-owned bank. Therefore, loan size of privately-owned banks significantly decreased and Türkiye Garanti Bankası A.Ş. started to hold main shares of foreign banks to advance Denizbank A.Ş and QNB Finansbank A.Ş. which were the largest players among foreign banks in the Turkish banking sector. It is worth to mention that the share of assets of Denizbank A.Ş and QNB Finansbank A.Ş. was 3.8% and 4.3% in 2018, accordingly (Table 4).

Assets Shares of Foreign Deposit Banks in Turkey (percentage points)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
QNB Finansbank A.Ş.	3.765	3.671	4	3.98	4.191	4.036	3.983	3.834	3.911	4.066	4.305
Türkiye Garanti Bankası A.Ş.	12.6	13.207	12.9	12.634	12.34	12.04	11.593	11.375	10.949	10.508	9.832
ING Bank A.Ş.	2.338	1.908	1.8	1.815	1.935	2.042	2.013	2.202	1.914	1.709	0.881
Deutsche Bank A.Ş.	0.097	0.239	0.3	0.193	0.1	0.144	0.155	0.135	0.13	0.098	0.073
Denizbank A.Ş.	2.724	2.655	2.9	3.1	3.405	3.634	3.679	3.767	3.975	3.911	3.765
Citibank A.Ş.	0.772	0.611	0.7	0.623	0.572	0.396	0.388	0.374	0.316	0.274	0.275
Burgan Bank A.Ş.	0.493	0.483	0.4	0.424	0.342	0.417	0.459	0.477	0.529	0.543	0.536
Turkland Bank A.Ş.	0.145	0.143	0.2	0.19	0.228	0.251	0.269	0.26	0.222	0.158	0.099
HSBC Bank A.Ş.	2.082	1.734	1.8	2.079	1.949	2.215	1.791	1.415	0.939	0.796	0.897
Odea Bank A.Ş.	-	-	-	-	0.28	0.985	1.357	1.435	1.475	1.07	0.859
Arap Türk Bankası A.Ş.	0.113	0.121	0.1	0.26	0.212	0.205	0.197	0.18	0.187	0.164	0.164

Table 4: Prepared by author[7]

[6] Source: BDDK
[7] Source: BDDK

Nonetheless, after 2015 given loans by private and foreign banks started to increment, but the rate of increase in issued loans by state-owned banks was rising from 2013 and creates a convex shape (Figure 3) due to the dramatic increase in the issued loans after 2015 which exceeds other banks in the sector in its rate.
In this stage, considering the credit expansion of the banking sector and distinguished role of government-owned banks in this credit expansion observing and analyzing total, net profits and losses, and provision for loan losses of banks in certain ownership categories (such as state banks) would be sensible and insightful.

Net Interest Income Per Unit of Loan	Banking Sector	Foreign Banks	State-owned Banks	Privately-owned Banks
2009	0.799261807	0.730626749	0.854320447	0.778249228
2010	0.812900382	0.762673932	0.795988924	0.821929204
2011	0.671610408	0.661877163	0.660675015	0.659185197
2012	0.670543451	0.688159185	0.691422904	0.632279559
2013	0.687897843	0.675038321	0.71704983	0.659712001
2014	0.619717232	0.631574595	0.595223064	0.612075992
2015	0.586970206	0.62837297	0.548804448	0.563240583
2016	0.573522739	0.608026876	0.557653063	0.540827065
2017	0.568003168	0.633858642	0.508147063	0.553906231

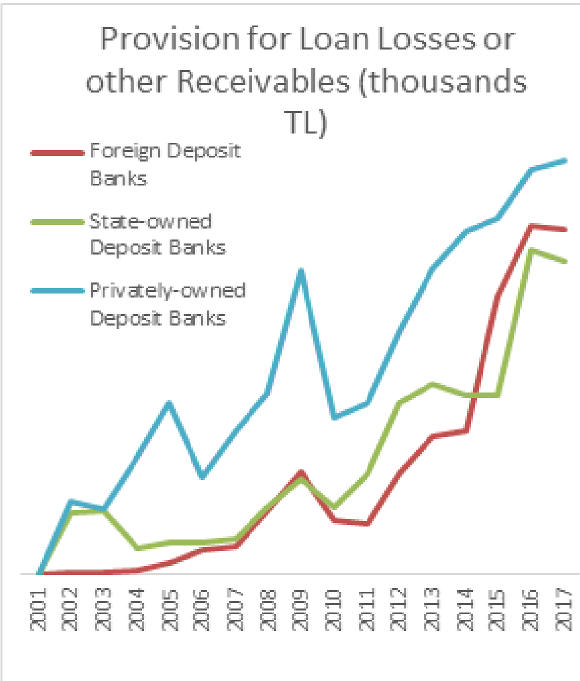
Table 5: Calculated and prepared by author[8]

To calculate and analyze the profitability of interests on loans the measure of Net Interest Income Per Unit of Loan is developed. Per unit of loan is defined as a thousand TL (Turkish Lira). By dividing the net interest income of Turkish banks to the total amount of loans (in thousands) issued in that year we get the statistic. Analyzing the overall interest income of banks is not sensible in a way that it disables us to observe the cause of changes in interest income (whether it is related to the change in interest on loans or the number of issued loans). Dividing by the number of given loans (in thousands) one could observe the changing interest rates of banks on issued loans. As statistic decreases it demonstrates the decreasing interest rates on loans and hypothetically and in nominal terms, it would never go below zero since interest rates are positive (especially in Turkey due to constant high inflationary pressure over the recent years). By looking at the statistic we observe the overall declining trend of net interest income overall the Turkish banking sector over recent years. However, Table 5 demonstrates that after 2013 state-owned banks' interest income per defined unit of a loan decreased significantly and in 2017, they were still holding the lowest interest income over the per unit of loan concerning other players in the Turkish banking sector. This result supports an increasing loan issuance of state-owned banks after 2013 since for investors borrowing money from state-owned banks is cheaper due to the lower cost of borrowing – interest rate.
Considering the expansion of loans evaluating the provisions for loan losses may assess the degree of risky loans. Provisions are defined as money set aside from the bank's equity to cover

[8] Source: BDDK

the probable, but an uncertain failure of bank's loans where borrower from banks is unable to pay back her obligation.

However, the total provision of banks for loan losses is not a perfect measure to analyze the risky investment of banks since the provision may increase due to credit expansion. However, the dramatic changes in the growth rate of the provision will tell us the emerged probability of failure of the issued loans.



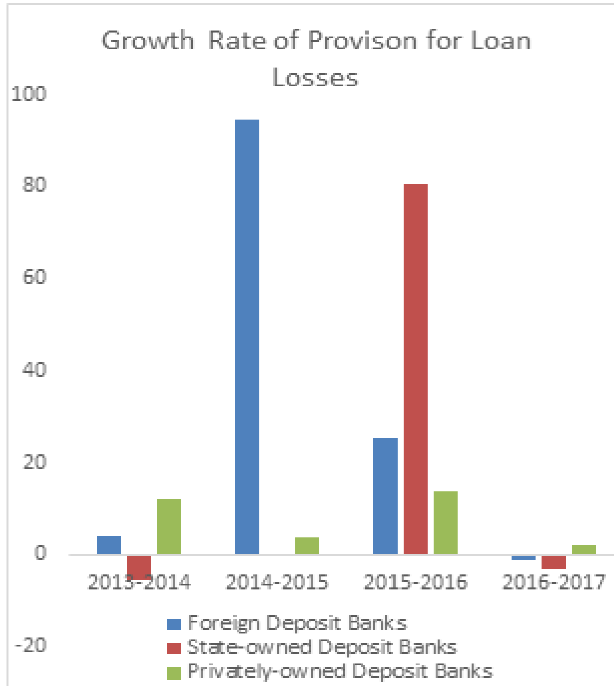


Figure 4 & 5: Prepared by author[9]

Though the total issued loans by state-owned banks have more size than foreign bank loans and much lower interest per unit of loan, we still observe that the total separated amount of provisions for loan losses by state-owned banks is less than foreign banks. Another distinguishable point is the growth dramatic growth rate in the state-owned banks' provisions for loan losses between 2015 and 2016. In this regard, the growth of provisions of foreign banks between 2014 and 2015 is related to the conversion of Türkiye Garanti Bankası A.Ş to the foreign bank, therefore, it does not have a signaling value. However, about 80% growth of state-owned bank provisions between 2015 and 2016 (Figure 5) indicates the increasing probability of borrowers' obligation failures from state-owned banks considering that credit expansion that was boosted by relatively low interest in given loans attracted a lot of investors. Ekinci et al. indicate that the increase in the money set aside for provisions is associated with the increase in unsecured assets and it demonstrates the increasing credit risk for Turkish banks (6). The differing behavior of state-owned banks before the 2018 recession creates an expectation of countercyclical behavior during the recession which is contradicting the concept of financial accelerator. Expansionary behavior of Turkish government-owned banks during the

[9] Source: BDDK

2018 recession can be tracked down by observing the given SME and consumer loans since the government wants to increase aggregate demand and also decrease the interest rates that were incremented by the central bank in response to the immense inflationary pressure in 2018.

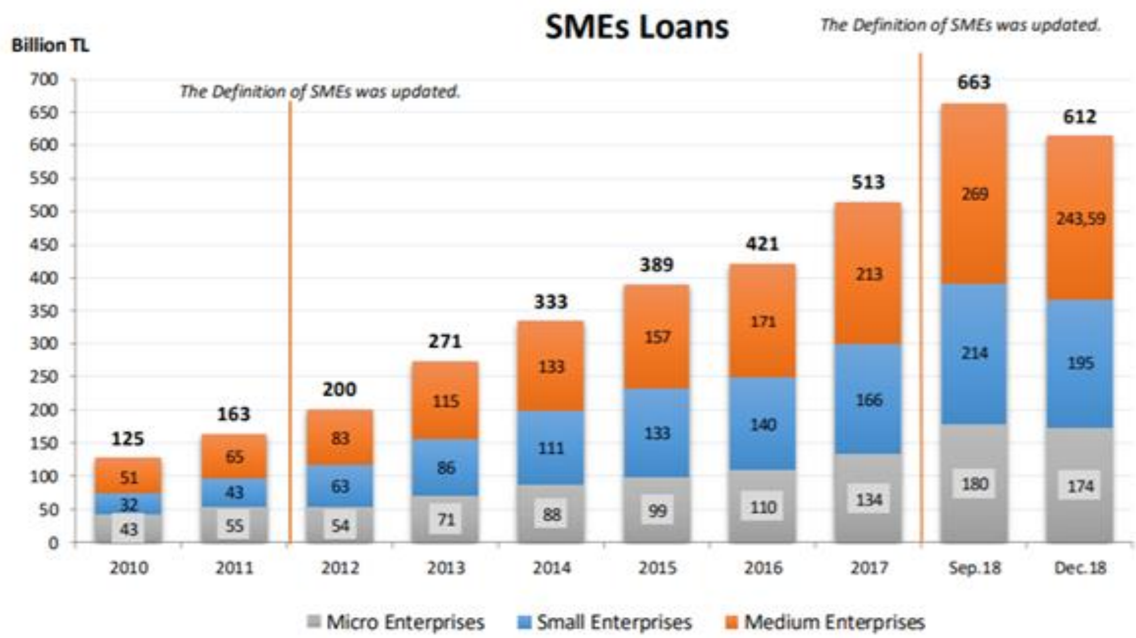


Figure 6: Source BDDK

Figure 6 indicates that there has been a huge increase in SME loans and this increase accelerated after 2016. However, the changing share of state-owned banks in given SME loans is considered to analyze. The stagflation period in 2018 where the inflation roofed, and GDP declined and the sharp depreciation of Turkish Lira during the summer of 2018 in absence of strong economic policies are characterizing the economic recession that Turkey entered in 2018.

Table 6 depicts the reflection of economic recession on privately-owned and foreign banks where loans given too SME's fell after the long period of growing rate.

Total loans given to SMEs (billion TL)	2007	2008	2009	2016	2017	2018	2019 (till October)
Privately-owned banks	48.137	47.626	42.777	159.537	184.323	208.332	188.047
Foreign banks	7.798	13.721	13.709	100.781	115.516	125.759	121.692
State-owned banks	15.128	16.721	18.154	121.43	164.835	215.189	240.865
Banking Sector	84.605	84.605	83.271	420.539	513.222	611.342	608.191

Table 6: Prepared by author[10]

[10] Surce: BDDK

It also supports the financial accelerator concept where external funding for investors increase since the financial firms become more hesitant to give loans to small and medium-sized enterprises due to the risk of borrowers' failure of debt obligation due to the economic crisis. However, in this project it is argued that the market concentration may change the behavior of actors in the financial market in several ways;

1. Increasing market concentration leads to the creation of large players in the banking sector. Large and long-term loans given banks are sticky in the sense that terms of debt obligations are less vulnerable to the monetary policy changes. However, it is leading to the countercyclical behavior of big banks during the recessions.
2. On the other hand, countercyclical behavior in large and long-term loans may also increase the costs of borrowed financial funds from banks for SMEs and accelerate the effect of financial accelerator.
3. Increasing share of state-owned banks in the banking industry can lead to a decrease in the effect of financial accelerator during recessions due to the possible countercyclical behavior of government-owned banks to mediate the impact of the recession.

In this respect, we can observe the countercyclical behavior of state-owned banks in the Turkish banking industry while looking at Table 6. Although private and foreign banks deteriorated the SME loans after the economic recession, in 2019 state-owned banks increased SME loans to the 240.865 billion TL from 215.189 billion TL in 2018. We can also detect that the slope of change of SME loans by state-owned banks dramatically increased from 2016 to 2017 and from 2017 to 2018 compared with other banks in the banking sector.

Nonetheless, we cannot observe the same pattern in which state-owned banks demonstrate countercyclical behaviors such as credit expansion throughout the Great Recession period. Albeit asset share of state-owned banks in the banking sector were not differing significantly from 2018 shares in 2009 (Table 3), the gap between SME loans given by state-owned banks and privately-owned banks was huge, 15.128 billion TL versus 48.137 billion Tl, respectively. However, after 2016 this gap quickly closed and state-owned banks' SME loans exceeded the level of all the other banks in the Turkish banking industry.

Henceforth, our report concludes that there is strong credit expansion led by the state-owned banks in the Turkish banking sector and It may lead to the potential decreasing effect of financial accelerator during the recession.

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