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The Relationship between Capital Structure and the Efficiency in both State and Private Banks by the Use of DEA Technique

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Abstract *The aim of this research is to study the relationship between capital structure and the efficiency in both state and private banks by the use of DEA (Data Envelopment Analysis) technique. The research hypotheses are based on the existence of the relationship between capital structure and the banks efficiency. The sample research includes 18 banks during the years 2006-2010. The input and output variables for each bank are calculated from the financial statements, by the use of intermediate approach in evaluating banks, and they are used as input and outputs of DEA techniques. Data for examining the research hypotheses are two approaches of ((OLS and panel data)), the research results show that for private banks, the results of two approaches have conformity with each other, and there are no interbank effects, but in public banks, there are interbank effects and there is a meaningful relationship between the efficiency and the debt ratio in the first hypothesis and lack of meaningful relationship in the 2nd and 3rd hypotheses, and also there is meaningful relationship between the two variables of efficiency and debt ratio with several using control variables. In those, in addition to efficiency and the debt ratio from the control variables such as profitability; tangible assets, intangibility of assets, and bank size (logarithm of assets) have been used too.*

Key words Capital structure, Efficiency, DEA technique, Panel data

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1. Introduction

Financial supplying decisions are considered as the main fields of decisions of financial managers, in line with increase of the shareholders' wealth. Financial managers are always involved in adopting decision related to financial supplying with cost-benefit analysis attitude of each method and also matching the return rate of investments and the rate of paid interest, this phenomenon is one of the most challenging topics in the field of capital markets due to the emergence of agency paradigm and also the changing returns and the risk caused by the financing performance of banks. The existing theories can only describe some of the specific aspects of variety and complexity of financing choices. Most of the financial managers agree that the concept of leverage is one of the most important financial concepts and this concept has a special use and position in the capital structure. A bank that has no debts is a bank with whole capital structure, but in real world, there is no such kind of bank and all of the banks use different scales of leverage. The main goal of this research is to survey the relationship between the capital structure and the banks efficiency by the use of DEA technique. Generally, this research shows that what level of debt could act as an effective tool and result in more efficiency, and to show that whether the capital structure in more efficient banks is covering the debt ratio to

higher capital or lower capital compared to other banks, and whether the ownership structure has an influence on the capital structure and efficiency of the banks or not.

2. Research background

Several studies and researches have been conducted in the field of capital structure, and most of these researches refer to this point that the owners' aim in this relationship is to achieve a structure that through it they could maximize the company value. The advanced theory of capital structure of companies was first discussed by Franco Modigliani and Merton Miller. Franco Modigliani and Merton Miller confronted the traditional view of financing of companies with a basic challenge. In the traditional view, the debt is the cheaper source of financing, due to this, companies can reduce the financing cost through the more use of debt (use of leverage) and ultimately, improve the performance level. The managers' important issue, such as managers of banks, schools and hospitals is to evaluate the units which are under the self-management and being informed about the performance of units under their management. Performance measurement requires the comparison of outputs and data of that unit. Charnes, Cooper & Rhodes provided an applicable method for determining the performance amount of a set of decision making units that had multi data and outputs, which is known as DEA. Data envelopment analysis is a non-parametric method for evaluating the relative performance of homogeneous units, including several inputs for generating several outputs. From the first study of Data envelopment analysis, regular rapid researches started and significant amount of researches were published about the DEA, and applicable researches emerged for measuring the performance and efficiency in general and private units. The conducted researches in this field are briefly presented below:

Among the French manufacturing companies, Margaritis and psillaki studied the relationship between capital structure and the performance of company. The researchers used the DEA technique for measuring the performance of the surveyed companies. They were looking for finding the debt ratio in the companies with high performance. In other words, more efficient companies have tendency toward having more or less debts. The result indicates that the more efficient companies (companies with higher performance) have tendency toward having higher financial leverage.

Allen N Berger and et al., surveyed the capital structure and the performance of companies in the banking industry in a research named capital structure and performance of companies, and they used the benefit as the performance index. This research proved that using the leverage, reduces the agency cost and ultimately results in improvement of the performance of the companies.

Halcoz and Sela Morris used the DEA technique for evaluating the performance of the Greece banking. This study was conducted by the use of some financial ratios during 1997-1999. The model which has been used in this research was a model without input and it only had output, in a way that some of the financial ratios were considered as the output of each bank. In this research it had been shown that, DEA can be used both as an alternative and as a supplementary for methods of analysis of financial ratios, for evaluating the performance of the organization. The research results show that the banks with more assets have higher performance and in addition to that, a part of increase in performance is caused by merging the small banks and creating big banks.

Yan Li and Chuan Zhi measured the technical performance of China coal companies through the use of DEA technique, and then studied the relationship between the efficiency and the capital structure in those companies. Research findings showed that there is an inverse and U-like relationship between the capital structure and the technical efficiency, they also showed that the companies should make a specific debt ratio for themselves, in a way that if the debt ratio become more than that specific ratio, the technical efficiency reduces.

In a research named a survey on the influence of internal factors of companies on the formation of capital structure of companies that are members of Tehran stock exchange, Sinaei examined the influence of internal factors of companies such as asset status, company's size, benefit amount, growth status, financing type, and companies risks on the leveraged financing method used by companies. The research results proved the influence of specific factors of each industry on the capital structure of companies.

In another study, NaderiKazaj and Sadeghi studied the efficiency of interest-free banking system and interest banking system. This research firstly compares the efficiency of interest-free banks and then

introduces the most efficient one world widely, through the use of DEA. In another part of the research, the efficiency of 41 Islamic banks in 2000 and 46 Islamic banks in 2001 were estimated by the use of DEA, and more efficient banks were specified.

The research results showed that the performance of interest-free banks of Bahrain and Qatar and generally, the efficiency of the interest-free banks which work in competitive conditions close to the interest banks, have more efficiency than the banks who work under the banking system of interest-free (Iran, Sudan, Pakistan).

Islami Bigdeli and Kashanipour studied the comparison and evaluation of efficiency measurement methods of Bank Tejarat branches and providing an appropriate pattern. In this study, they measured the performance of 142 branches of bank Tejarat by the use of triple methods (DEA, Stochastic Frontier Analysis (SFA), and financial ratios). In each of the triple methods, 142 branches were ranked according to the performance amount. The comparison of Bank Tejarat branches ranking in different methods of two by two shows that there is a difference between the ranking results of triple methods with current ranking method of Bank Tejarat and the ranking results of triple methods are different from each other. But, at the same time, in comparing the three models, the DEA model has proved the best in evaluating the bank efficiency.

3. Research Methodology

The current research tries to survey this question that: what level of debt could be an influential tool resulting in higher performance, and whether this capital structure in high- efficiency banks covers debt ratio to higher or lower capital compared to the other banks, and is the ownership structure influential on the capital structure and bank efficiency or not? Thus this research is an applicable research. The research method is quasi-experimental and it is based on the after-event approach (through the past information).

Research Hypotheses

According to the theoretic concepts of the research, this research has 3 hypotheses which are described as:

1. Theory of efficiency-Risk: more efficient banks have higher debt ratios than the other banks in the previous year.
2. Theory of Value-Franchise: more efficient banks choose lower debt ratios than the other banks.
3. Ownership structure has an influence on the capital structure and performance.

Population and choosing companies:

The research population includes the state and private banks (12 state banks and 6 private banks) during years 2006-2010 (5-year period).

1. They should be active from 2006 to 2010.
2. They should not change their fiscal year in these specific periods.
3. The required financial information, especially the notes accompanied by financial statements should be available.

Methods of Data Collection:

For collecting data and information in this research, firstly the library method was used. In the library method, the theoretic concepts of research were gathered through Persian and Latin technical books and journals, and then the required data for research were extracted through the banks financial statements (Balance sheet, Profit and loss statement) and technical websites.

Data Analysis Method:

In this research, according to the data type and the methods of available statistical analysis, the method of combined data was used, because for surveying the capital structure relationship and banks efficiency, the independent and dependent variables will be studied in two different aspects. On one hand, these variables are examined in different banks and on the other hand, they are being examined during the years 2006-2010. For calculating the banks efficiency, the DEA technique has been used. After determining the high performance banks, the reciprocal relationship between debt and efficiency was used by the use of two models of efficiency regression model and financial lever, and we studied the influence of ownership

structure on the capital structure and efficiency. For evaluating the regression models, two approaches of ols and panel data were used, and for this reason, two software of SPSS written 11/5 and Stata software written 9/1 were used. For measuring the banks efficiency in this research, by the use of intermediate approach, three input indexes and two output indexes were determined. Inputs include: Staff number, total deposits and fixed assets. Outputs include: Facilities in the form of commercial law (Partnerships and direct investments), and facilities in the form of Islamic contracts (Loans and credits). According to the research of Namazi, Ibrahimi, the above mentioned indexes are considered as the input and output variables in the DEA technique. In this research, to some reasons (intermediate approach toward the principles and philosophy of Islamic banking and interest-free banking law which says that bank is the attorney of the depositor) the intermediate approach toward banks has been used. In the intermediate approach, the outputs value (Credits granted) is the criterion, due to the fact that in the banking industry, they have more importance than the number of outputs. One of the limitations of the DEA technique is that the number of decision making units in each group (or industry) should be equal or more than one of the below numbers:

Three times the number of inputs plus the chosen outputs or two times the multiplied amount of inputs and outputs.

Thus, the number of studied banks should be equal or more than 15.

Number of inputs: 3 Number of outputs: 2

2(no. of output *no. of input) = 12 or

3(no. of output + no. of input) = 15

After specifying the efficient banks by the use of DEA technique, we determine the reciprocal relationships of efficiency and debt as the hypotheses examination through the two below models. Regression equation for the bank efficiency model is as followed:

$$EFF_{i,t} = a_0 + a_1 LEV_{i,t-1} + \alpha_2 LEV^2_{i,t-1} + a_3 Z_{1i,t-1} + u_{i,t} \quad (1)$$

Where:

EFF: The amount of efficiency of bank in t year.

LEV: Equals the debts ratio to the whole assets in the previous year.

Z1: A vector of control variables.

U: The random error.

According to the agency cost hypothesis, the influence of debt (LEV) must be positive, yet there is a possibility that in high levels of debt, the influence of debt on efficiency be negative. Calculating these variables and their expected influence on efficiency is as mentioned below:

Profitability: It is measured through the profit ratio (EBIT) to the whole assets. Generally, we expect that the previous profitability has a positive influence on the efficiency. The banks that are more profitable, are usually managed better, thus it is expected that these banks be more efficient.

Bank size: It is measured by the use of natural logarithm of bank assets. It is possible that the influence of this variable on the efficiency be positive, because it is expected that the bigger companies use the better technology, have more diversification of investments and also be managed better.

The objectivity of assets: It is calculated through the fixed assets ratio to the whole bank assets. The physical assets would be simply controlled and they are appropriate for collateral valuation and thus these assets result in reduction of agency conflicts.

Intangibility of assets: It is measured by the use of intangible assets ratio to the bank assets. This variable could be considered as a representative for the future growth opportunities which has positive influence on the efficiency.

Bank's financial leverage model (Debt): The capital structure equation connects the debt ratio to assets with the efficiency criterion. Also, the aforesaid equation connects this ratio with several other factors which are described commonly related to the financial leverage in other researches.

The financial leverage equation is:

$$LEV_{i,t} = \beta_0 + \beta_1 EFF_{i,t-1} + \beta_2 Z_{2i,t-1} + V_{i,t} \quad (2)$$

In this equation:
LEV: is the debts ratio to the whole assets in t year.
EFF: is the efficiency point in the previous year,
Z2: represents the other related factors to debt that are not connected to efficiency (EFF).

V: is the stochastic error factor which allows considering the influences of other factors in our experimental model.

According to the efficiency-risk hypothesis, if B1>0, the efficiency has a positive influence on debt, While, if B1<0, according to the value-franchise hypothesis, the influence of efficiency on debt is negative. Z2 includes variables that control the bank characteristics. These variables are the variables being used in the agency cost model, such as: profitability, bank size, assets structure (tangibility or intangibility). The below issues were studied in the regressions equation: 1. The underlying postulates of the regression model 2. Correlation between the variables, in regression models.

The underlying postulates of model: Three conditions are known as the postulates of regression. A) The remaining has normal distribution, and the one sample Kolmogorov-Smirnov test was used for studying the normality of distribution of observations. B) The remaining must be uncorrelated, and the Durbin–Watson statistic was used for that. The values close to two Durbin-Watson statistics show the independency of the remaining. C) The remaining variance must be fixed, for studying the variances equality hypothesis, the diagram of scatter of standardized remaining was used against the standard evaluated values. In this diagram if we see regular patterns of crescent-shaped or funnel-shaped, we must doubt about the linear regression model.

Reliability and validity of the data: At first the reliability and validity of dependent variables and research control were surveyed. The reliability of research variables means that the measuring tool must measure the specific feature, not another feature; In other words, the measuring tool must exactly measure the thing which the researcher wants. For studying the data credibility we must study the different variables of the data in terms of reliability. For this purpose, we must compare the collected data with the achieved information through other informational banks.

The research validity is based on the research repetitions. According to the conducted tests, due to the fact that the possibility amount has been less than 5%, all the dependent variables and the research control during the research period were at the valid level.

Research findings:

First hypothesis test
Theory of Efficiency-Risk: More efficient banks have more debt ratio than the other banks.
For surveying the above mentioned theory, we study the below statistical hypotheses and model.
H0: More efficient banks did not have higher debt ratio in the previous year.
H1: More efficient banks had higher debt ratio in the previous year.

$$EFF_t = \alpha_0 + \alpha_1 LEV_{t-1} + \alpha_2 \mathrm{LEV}_{t-1}^2 + \alpha_3 X_{1,t-1} + \alpha_4 X_{2,t-1} + \alpha_5 X_{3,t-1} + \alpha_6 X_{4,t-1} + \varepsilon \quad (3)$$

EFF: Dependent variable of bank efficiency
LEV and LEV2: financial leverage variables and its square in the previous year
X1-X4: Respectively, profitability variables, tangible fixed asset, intangible asset and bank size in the previous year were considered.

According to the table1, the statistic amount of F and -p of related amount of regression model meaning were confirmed in both of the ownership types. In this table, the amount of determination coefficient is 0.505 and this number is 0.491 in the state banks. In the first stage, the Breusch–Pagan test is conducted. For private banks the test statistic of 0.89 was achieved with possibility of 0.3445 which shows that there are no interbank influences and due to this, there is no problem in using the usual method. Thus,

the model was estimated by pool method in SPSS software, which the results would be explained here later. Of course, panel method results are compatible with pool method (without interbank influences). But, for state banks, the test statistic is 13.97 with possibility of 0.0002 which shows the interbank influences, for this we should use the panel data method. Then, for determining the fixed or random influences, Hausman test was conducted and its statistic was 13.07 with possibility of 0.0420, and ultimately we should use fixed influences. As a result, the model was estimated through the fixed influences in Stata software, and its results are shown in table3. The pool method results of SPSS are shown in table2 and they have conformity with the fixed influences method. Then, the aforesaid model is fitted with data. Analysis of the mentioned regression model variance of table1by separation of bank ownership type is as followed.

Table 1. Analysis of regression model variance of first hypothesis

Ownership	Determination coefficient	Adjusted determination coefficient	Test statistic F	p-amount	Durbin-Watson statistic
Private	0.505	0.330	2.890	0.040	1.715
State	0.491	0.416	6.584	0.001	2.018

Now we survey the meaning of the regression coefficient (α_i values). We survey the meaning of the independent variables in model by the use of statistic t and related p- amount.

Table 2. Estimation of regression coefficients of first hypothesis in pool method

p- amount	Test statistic T	Amount of α_i	Regression coefficients	Ownership
0/347	-0/966	-0.500	(Constant)	Private
0/052	-2/088	-2/974	LEV	
0/037	2/267	3/381	LEV2	
0/364	0/933	4/359	Profitability	
0/048	2/129	3/082	Tangible fixed asset	
0/485	-0/713	-1/005	Intangible asset	
0/120	1/635	0/204	Bank size	
0/151	-1/462	-1/194	(Constant)	State
0/105	1/659	3/902	LEV	
0/085	-1/765	-2/871	LEV2	
0/416	-0/822	-2/220	Profitability	
0/004	-3/065	-3/103	Tangible fixed asset	
0/546	-0/609	-0/139	Intangible asset	
0/001	3/901	0/195	Bank size	

Table 3. Estimation of regression coefficients of first hypothesis in Panel data method (fixed influences)

-p Amount	Test statistic T	Amount of α_i	Regression Coefficients	Ownership
0.425	-0.81	-0.7534	(Constant)	State
0.001	-3.43	-9.601	LEV	
0.001	3.55	8.146	LEV2	
0.657	-0.45	-0.8648	Profitability	
0.003	3.11	6.21	Tangible fixed asset	
0.183	-1.35	-0.3718	Intangible asset	
0.000	3.99	0.6398	Bank size	

Thus, in private banks, if the financial leverage value was less than 0.439 and if in state banks, the financial leverage value was less than 0.679, the previous year debt has a negative influence on the current year efficiency and for more values, it has positive influence.

Thus, we can write the bank efficiency model for state and private banks as below:

Private: $EFF_t = -0.5 - 2.974 LEV_{t-1} + 3.381 \mathrm{LEV}_{t-1}^2 + 3.082 X_{2,t-1}$

State: $EFF_t = -1.194 - 2.871 \mathrm{LEV}_{t-1}^2 - 3.103 X_{2,t-1} + 0.195 X_{4,t-1}$

According to the debt efficient in the private and state banks equations it can be accepted that debt is effective on efficiency and the zero hypothesis or this hypothesis that "more efficient banks did not have higher debt ratio in the previous year" is rejected.

Second hypothesis test:

Theory of Value-Franchise: more efficient banks choose lower debt ratios than the other banks.

For surveying the research hypothesis, we study the statistic hypotheses and the below model.

H0: More efficient banks do no choose lower debt ratio.

H1: More efficient banks choose lower debt ratio.

For studying the simultaneous influence of efficiency variables, profitability, tangible fixed asset, intangible asset and bank size on the bank financial leverage we use the regression model. The surveyed model is as below:

$$LEV_t = \alpha_0 + \alpha_1 EFF_{t-1} + \alpha_2 X_{1,t-1} + \alpha_3 X_{2,t-1} + \alpha_4 X_{3,t-1} + \alpha_5 X_{4,t-1} + \varepsilon \quad (4)$$

LEV: Dependent variable of Bank financial leverage.

EFF: Bank efficiency in previous year.

X_1-X_4: Respectively variables of profitability, tangible fixed asset, intangible asset and bank size in previous year are considered.

At this stage, the Breusch–Pagan test is conducted. For private banks, the test statistic of 1.18 with possibility of 0.2776 is achieved which shows that there are no interbank influences, and due to this there is no problem in using the common method. Ultimately, the model is estimated through the ols method in SPSS software, and the results would be explained later. The related estimation was conducted through the panel method and it was determined that it is compatible with the pool method (without interbank influences). For state banks, the test statistic of 24.35 with possibility of 0.000 is achieved which shows that there are interbank influences, and due to this we should use the panel data method. Then, for determining the fixed influences or the random influences, the Hausman test was conducted, and its statistic is 17.26 with possibility of 0.0040 is achieved and ultimately we should use fixed influences. Ultimately, the model was estimated through the fixed influences in Stata software and the results are shown in table6. In table5, the results of old method achieved by SPSS is shown and it was determined that it is compatible with the fixed influences. Later, the aforesaid model is fitted with data. Variance analysis of the mentioned regression model by separation of bank ownership type is shown in table 4.

Table 4. Analysis of regression model variance of second hypothesis

Ownership	Determination coefficient	Adjusted determination coefficient	Test statistic F	p- amount	Durbin-Watson statistic
Private	0.465	0.316	3.124	0.033	1.929
State	0.502	0.442	8.459	0.001	1.910

According to the statistic F, related p- amount of meaning of regression model is confirmed in both kinds of ownerships (in both cases, the p- amount is less than 0.05). In this table, the values of the determination coefficient in private banks are estimated 0.465, and this number is 0.502 in the state banks,

which shows a percentage of changes in the dependent variable, which are determined by the independent variables. Now we want to study the meaning of regression coefficients (α_i values). Meaning of the dependent variables in model will be surveyed by the use of t statistic and related p- amount.

Table 5. Estimation of regression coefficients of second hypothesis in old method

p-Amount	Test statistic T	Amount of α_i	Regression coefficients	Ownership
0/354	0/952	0/333	(Constant)	Private state
0/253	-1/181	-0/169	EFF	
0/178	-1/401	-2/800	Profitability	
0/988	0/016	0/011	Tangible fixed asset	
0/699	0/393	0/325	Intangible asset	
0/019	2/581	0/161	Bank size	
0/001	3/647	0/658	(Constant)	
0/417	-0/819	-0/075	EFF	
0/001	-5/066	-7/391	Profitability	
0/942	-0/073	-0/047	Tangible fixed asset	
0/346	-0/953	-0/143	Intangible asset	
0/036	2/161	0/074	Bank size	

Table 6. Estimation of regression coefficients of second hypothesis in panel data method (fixed influences)

Amount of -p	Test statistic t	Amount of α_i	Regression coefficients	Ownership
0.000	6.05	1.957	(Constant)	State
0.459	0.75	0.473	EFF	
0.883	0.15	0.134	Profitability	
0.000	-3.85	-1.717	Tangible fixed asset	
0.102	1.67	0.207	Intangible asset	
0.002	-3.22	-0.208	Bank size	

Thus, we can write the banks financial leverage model as below:

Private Banks:

$$LEV_t = 0.333 + 0.161X_{4,t-1}$$

State Banks:

$$LEV_t = 0.658 - 7.391X_{1,t-1} + 0.074X_{4,t-1}$$

According to the lack of meaning of efficiency coefficient in private and state banks equation, the zero hypotheses or the hypothesis that "more efficient banks do not choose lower debt ratio in next year" will not be rejected.

Third hypothesis test:

Ownership structure has an influence on the capital structure and efficiency.

For surveying the aforesaid hypothesis, we study the below statistical hypotheses.

A) For comparing the mean of efficiency of private and state banks, we use two independent sample t-student tests. The studied hypotheses are as below:

$$\begin{cases} H_0 : \mu_1 = \mu_2 \\ H_1 : \mu_1 \neq \mu_2 \end{cases}$$

Which μ_1 and μ_2 are respectively the mean of efficiency of private and state banks. But before conducting this test, firstly we should consider the hypothesis of equality of variances of two groups, by the use of Levene test. The test result is shown in table 7.

Table 7. Levene test for equality of variances of two groups in comparing efficiency

P-Amount	Test statistic F
0/513	0/431

According to the p- amount of this test, the hypothesis of equality of variances of two groups in significance (meaning)level of 0.05 is not rejected (p-Amount >0.05), then the two independent sample of t-student test is used for comparing the mean of efficiency of private and state banks. The results are shown in table 8.

Table 8. Two independent sample of t-student test for comparing the mean of efficiency of private and state banks

Trust distance 95% for the difference between two groups		p-Amount	Test statistic t	Standard deviation	Mean	Sample volume	Ownership
Lower bound	Upper bound						
-0/154	0/047	0/297	-1/048	0/234	0/675	30	Private
				0/223	0/728	60	State

According to the p- amount we can conclude that the zero hypothesis will not be rejected in significance level of 0.05 (p-amount >0.05), which means that the mean of efficiency of private and state banks do not have any differences.

A) For comparing the mean of financial leverage of private and state banks, we use the two independent sample of t-student test. The surveyed hypotheses are as below:

$$\begin{cases} H_0 : \mu_1 = \mu_2 \\ H_1 : \mu_1 \neq \mu_2 \end{cases}$$

In which the μ_1 and μ_2 respectively are the mean of financial leverage of private and state banks. But before conducting this test, firstly we should study the hypothesis of equality of variances of two groups, through the Levene test. The result of this test is shown in table 9.

Table 9. Levene test for equality of variances of two groups in comparing the financial leverage

p- Amount	Test statistic F
0/122	2/441

According to the p-amount in this test, the hypothesis of equality of variances of two groups will not be rejected in significance level of 0.05 (p-amount >0.05). Then we use the two independent sample of t-student test for comparing the mean of financial leverage of private and state banks. The result of the test is shown in table 10.

Table 10. Two independent sample oft-student test for comparing the mean of financial leverage of private and state banks

Trust distance of 95% for difference between two groups		p-Amount	Test statistic T	Standard deviation	Mean	Sample volume	Ownership
Lower bound	Upper bound						
-0/125	0/028	0/214	-1/251	0/228	0/836	30	Private
				0/138	0/884	60	State

According to the p- amount we can conclude that the zero hypothesis will not be rejected in significance level of 0.05 (p-amount >0.05), which means that the mean of financial leverage of private and state banks are not different.

4. Discussion and Conclusion

Based on the results of the first hypothesis test and according to the regression model, about 51% of the efficiency changes of current year in private banks or the previous debts would be determined. In state banks, this amount would be about 50%. According to the amount of possibility, we can accept that the debt has an influence on efficiency. According to the condition of $LEV<-\alpha_1/2\alpha_2$ in private banks, if the financial leverage amount was less than 0.439 (and in state banks. if the financial leverage amount was less than 0.679) the previous year debt would have a negative influence on the efficiency of the current year and for more amounts, it would have a positive influence. And zero hypothesis or the hypothesis that "more efficient banks did not have higher debt ratios in the previous year" will be rejected. Thus we can accept the first hypothesis in a specific scope of debt ratio. According to the results of the first hypothesis test, and based on the regression model and also according to the lack of meaning of the efficiency coefficient in the second regression model, the zero hypothesis or the hypothesis that "more efficient banks do not choose the lower debt ratio in next year" will not be rejected. According to the acceptance of the research first hypothesis, which is based on the existence of relationship between debt and efficiency, we have the possibility to determine the proper level of debt (financial leverage) in the capital structure for achieving efficiency. According to the results of the third hypothesis test, firstly we focused on the influence of ownership on efficiency, which according to the p- amount, of this test, the hypothesis of equality of variances of two groups will not be rejected in the significance level of 0.05 (p-amount >0.05), and we can conclude that the mean of efficiency of private and state banks are not different. Then we focused on the influence of ownership on the financial leverage, which according to the p- amount in this test, the hypothesis of equality of variances of two groups will not be rejected in significance level of 0.05 (p-amount >0.05), which means that the mean of financial leverage of private and state banks are not different.

Suggestion for future researches:

1. The stock exchange could use the DEA technique for providing proper information for investors and creditors' decisions for determining the efficient banks.
2. By the use of input and output variables which are indicated in this research, we can study in other banks and we can find that which of the variables have more influence on the bank efficiency and help the management to invest more and improve the bank efficiency.
3. We can survey the influence of variables of macroeconomic and political factors on the relationship of capital structure and the banks efficiency.
4. Using the productive approach in calculating the banks efficiency and using the different output and input variables and conducting research by the use of parametric methods in econometrics.

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