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A study on effective factors influencing on equity risk in banking industry

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C H R O N I C L E

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A B S T R A C T

Measuring the effects of various factors influencing on risk of return in banking system plays essential role on making managerial decisions. This paper investigates the effects of seven factors including equities, leverage, dividend, size, growth domestic products, bank concentration and market return on risk of return in selected banks listed on Tehran Stock Exchange. The study selects the necessary data through financial statements announced on exchange as well as macro-economic figures reported by central bank of Iran to examine the hypotheses of the survey. Using some regression technique, the study has determined that only bank size and growth domestic product influence significantly on risk of return on Tehran Stock Exchange.

1. Introduction

Measuring the effects of various factors influencing on risk of return in banking system plays essential role on making managerial decisions. There are literally various micro and macro-economic factors influencing on banking industry (Abdelghany, 2005). According to Beaver et al. (1970) and Beaver and Manegold (1975), although the accounting job has accepted the premise that the purpose of accounting is to help decision making, the use of this technique within the area of financial statement has been impeded by an inability to specify the decision processes of external users of accounting information. Chan et al. (1971) considered cross-sectional differences in returns on Japanese stocks to the underlying behavior of four variables: earnings yield, size, book to market ratio, and cash flow yield. Alternative statistical specifications and different estimation methods were used to comprehensive, high-quality information that extended from 1971 to 1988. The sample included both manufacturing and nonmanufacturing companies, firms from both sections of the Tokyo Stock Exchange, and delisted securities. They reported a significant relationship between these variables and expected returns in the Japanese market. Of the four variables investigated, the book to market ratio and cash flow yield had the most significant positive impact on expected returns.

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Chen (2011) proposed a market-valued capital ratio as an indicator to gauge the riskiness of banks. The study examined the cross-sectional relationship between the market-valued capital ratio and stock returns of some listed Japanese banks and reported that banks with lower market-valued capital ratios maintained higher returns on average than banks with higher market-valued capital ratios. Nevertheless, the study indicated that this negative relationship between market-valued capital ratio and average stock returns could essentially be attributed to changes in exposure to risk factors. They provided some evidence to indicate that the market-valued capital ratio could serve as a strong predictive indicator for bank's share performance during the financial crisis in the late 1990s, even after controlling for a variety of other traditional risk measures.

2. The proposed study

The proposed study of this paper considers the following seven hypotheses,

1. There is a relationship between banks' equities and risk of banks' return.

2. There is a relationship between banks' leverages and risk of banks' return (Fama & French, 1995).

3. There is a relationship between banks' dividends and risk of banks' return (Gup, 1989).

4. There is a relationship between banks' sizes and risk of banks' return (Fama & French, 1992).

5. There is a relationship between growth domestic product and risk of banks' return.

6. There is a relationship between banks' concentration and risk of banks' return.

7. There is a relationship between changes on market returns and risk of banks' return.

The proposed study uses the following model to examine the hypotheses of the survey (Jensen, 1972),

$$RISK_{i,j,t} = \alpha_0 + \beta_1 BC_{i,j,t-1} + \beta_2 BC^2_{i,j,t-1} + \beta_3 DFL_{i,j,t-1} + \beta_4 DOL_{i,j,t-1} + \beta_5 DPR_{i,j,t} + \beta_6 Size_{i,j,t-1} + \gamma_1 GDPGr_{j,t} + \gamma_2 BNKCONC_{j,t} + \gamma_3 DMR_{j,t} + \varepsilon_{i,j,t} \quad (1)$$

where *BC* represents the banks' capital, which is calculated as a ratio of total equities on total assets, *DFL* represents the degree of financial leverage, which is calculated as a ratio of changes of net profit on changes on operating profit and *DOL* represents the degree of operating leverage, which is calculated as a ratio of changes of operating profit on changes on sales. In addition, *DPR* represents dividend paid to shareholders, *SIZE* represents the size of the firms, which is calculated by taking the logarithm of total assets. In this survey, *GDPGr* represents the growth on growth domestic products and it is extracted from central bank of Iran, *BNKCONC* states the banks' concentration, which is calculated by Herfindahl index and finally, *DMR* represents the changes on market return, which is calculated as follows,

$$\sigma_n = \sqrt{\frac{1}{N}\sum_{t=1}^{N}\left(R_{i,t} - \overline{R_i}\right)^2}, \quad (2)$$

where $\bar{R}_i$ and $R_{i,t}$ represent the average and the returns of banks, respectively. The study has been accomplished by gathering the information of selected banks from Tehran Stock Exchange over the period 2005-2012. Table 1 demonstrates the summary of some basic statistics.

Table 1
The summary of some basic statistics

Variable	Number	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarko-Bera	
							Statistics	Sig.
RISK	40	44.51044	43.93428	21.55579	0.145850	3.398892	0.407005	0.815868
BC	49	0.117345	0.074677	0.139087	3.391973	14.73188	374.9701	0.000000
BC^2	49	0.032720	0.005577	0.101684	4.773949	27.04094	1366.139	0.000000
DFL	40	0.022225	0.235133	1.136489	-1.369808	5.619956	23.94943	0.000006
DOL	40	1.25194	0.517707	5.220649	5.202733	31.53230	1537.277	0.000000
DPR	56	0.632851	0.723513	0.270177	-0.652365	3.591190	4.787595	0.091282
SIZE	49	18.09497	18.20928	1.481112	-0.294667	2.208801	1.987175	0.370246
GDP	56	2.219643	3.000000	4.35182	-0.990206	2.603878	9.517535	0.008576
BNKCONC	56	2.660313	0.846139	4.285565	2.600019	9.112229	150.2660	0.000000
DMR	41	4.960394	28.44592	48.12869	-0.497384	2.167276	2.875112	0.237508

As we can observe from the results of Table 1, all statistics are within acceptable levels and most of them seem to follow normal distribution. Since, we plan to use regression analysis, it is important not to have a strong correlation between any pair of independent variables. Table 2 demonstrates the results of our survey.

Table 2
The summary of correlation among independent variables

	RISK	BC	BC^2	DFL	DOL	DPR	SIZE	GDP	BNKCONC	DMR
RISK P-Value	1.000000									
BC P-Value	-0.333700 0.0354	1.000000								
BC2 P-Value	-0.353509 0.0252	0.967129 0.0000	1.000000							
DFL P-Value	-0.269229 0.0930	0.046739 0.7746	0.112782 0.4884	1.000000						
DOL P-Value	0.414302 0.0079	-0.021665 0.8944	-0.011866 0.9421	-0.099226 0.5424	1.000000					
DPR P-Value	0.402459 0.0100	-0.233678 0.1467	-0.310484 0.0512	-0.136284 0.4017	0.073428 0.6525	1.000000				
SIZE P-Value	-0.446993 0.0038	-0.390793 0.0127	-0.383037 0.0147	0.054833 0.7368	-0.312718 0.0495	-0.223269 0.1661	1.000000			
GDP P-Value	0.427421 0.0059	-0.388884 0.0131	-0.378942 0.0159	-0.153168 0.3454	0.186542 0.2491	0.265098 0.0983	-0.196379 0.2246	1.000000		
BNKCONC P-Value	0.137273 0.3983	-0.082655 0.6121	-0.115161 0.4792	0.058366 0.7205	-0.069240 0.6712	0.202872 0.2093	-0.005142 0.9749	-0.094517 0.5618	1.000000	
DMR P-Value	-0.046611 0.7752	0.105582 0.5167	0.126332 0.4373	0.021663 0.8944	-0.113079 0.4872	0.107988 0.5072	-0.127305 0.4337	-0.261547 0.1031	0.107166 0.5104	1.000000

As can observe from the results of Table 2, there are not strong correlations among various independent variables. However, we see a strong correlation between BC and BC^2, which means we have consider these two variables independently in the morel. Table 3 demonstrates the results of Chaw and Huasman. Based on the results of Table 3 we may use Panel data with fixed effect. In addition, Fig. 1 demonstrates the results of distributions of residuals.

Table 3
The summary of Chaw and Huasman tests

Test	Statistics	Statistics value	Degree of freedom	Sig.
Chaw	F	11.341090	(10, 21)	0.0000
Hausman	Chi-Square	20.988554	8	0.0072

As we can observe from the results of Fig. 1, residuals seem to follow normal distribution since Jarque-Bera statistics is meaningful. We now present the regression model by extracting BC^2 from the model.

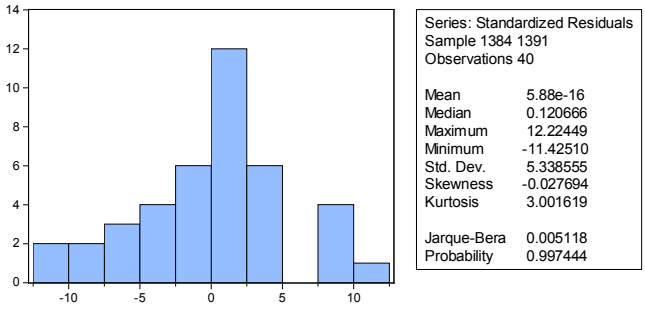


Fig. 1. The summary of distribution of residuals

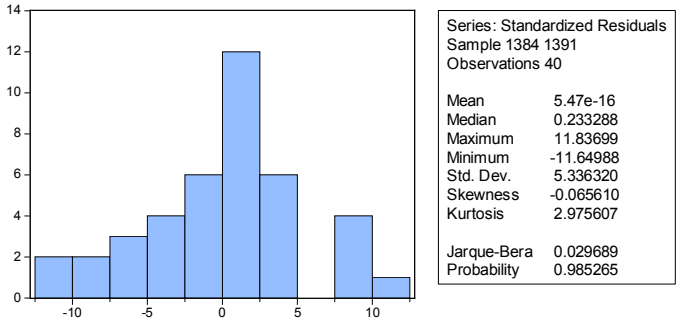
Risk =	350.6 -	4.61 BC -	0.90 DFL +	0.40 DOL +	7.38 DPR -	17.18 SIZE -	0.84 GDP +	1.29 BNKCONC -	0.02 DMR
t-value	9.54	-0.068	-0.8148	1.99	0.88	-8.51	-2.24	1.134	-0.8161
P-value	0.00	0.9462	0.4243	0.0592	0.3896	0.0000	0.0362	0.2694	0.4235

$R^2 = 0.94$ F-valu = 17.85 P-value = 0.000 Durbin-Watson = 2.33

As we can observe from the results of regression analysis, F-value is statistically significant, Durbin Watson value is within acceptable level and R-Square is equal to 0.94, which is statistically significant. According to regression model, only size and GDP are statistically significant and the effects of other variables are not meaningful. Now, we examine the hypothesis by considering the BC^2 in the model. Table 4 demonstrates the results of Chaw and Huasman. Based on the results of Table 4 we may use Panel data with fixed effect. In addition, Fig. 2 demonstrates the results of distributions of residuals.

Table 3
The summary of Chaw and Huasman tests

Test	Statistics	Statistics value	Degree of freedom	Sig.
Chaw	F	11.464883	(10, 21)	0.0000
Hausman	Chi-Square	15.724946	8	0.0465



As we can see from the results of Fig. 2, residuals seem to follow normal distribution since Jarque-Bera statistics is meaningful. We now present the regression model by extracting BC and including BC^2 from the model.

Risk =	349.42 +	45.35 BC^2 -	0.81 DFL +	0.41 DOL +	7.57 DPR -	17.18 SIZE -	0.80 GDP +	1.26 BNKCONC -	0.02DMR
t-value	9.62	0.12955	-0.7351	2.09	0.89	-8.52	-2.11	1.11	-0.751
P-value	0.00	0.8982	0.4704	0.0489	0.3836	0.0000	0.0463	0.2773	0.4608

$R^2 = 0.93$ F-valu = 17.86 P-value = 0.000 Durbin-Watson = 2.32

In addition, As we can observe from the results of regression analysis, F-value is statistically significant, Durbin Watson value is within acceptable level and R-Square is equal to 0.93, which is statistically significant. According to regression model, only size, operating leverage and GDP are statistically significant and the effects of other variables are not meaningful.

4. Conclusion

In this paper, we have presented an empirical investigation to study the effects of seven micro and macro-economic factors on risk of returns in banking system. The proposed study has applied 140 year data of the banks listed on Tehran Stock Exchange and using some regression technique has determined that only size of the firms as well as operating leverage, as micro-economic factors influence on risk of banks. In addition, the study has determined that growth domestic products plays essential role to control the risk of banks' return on the market. This is consistent with our expectations since when the economy faces depression and financial crisis, many firms are not able to pay their liabilities and the burden of financial issues is moved on banks' shoulders. The results of this study were consistent with findings of other studies (Ignatieva & Gallagher, 2011; Khan & Ahmed, 2001; Lam, 2002; Claessens et al., 1995).

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