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The effect of fair value accounting on the drops in stock prices of banks listed on the Tehran Stock Exchange

Somayeh Imani[a], Sina Kheradyar[a,*], Keyhan Azadi Hir[a]

[a]*Department of Accounting, Rasht Branch, Islamic Azad University, Rasht, Iran*

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Abstract

This article examines the effect of fair value accounting and some other influential variables as control variables on the risk of dropping stock prices of banks listed on the Tehran Stock Exchange during the period 2007-2021. The negative skewness coefficient of daily returns has been used to measure the risk of dropping stock prices of the company and used the formula of Hsu et al. [12] for fair value. The analysis of corporate financial information was performed by Autoregressive Distributed Lag (ARDL) in the Eviews software environment. The findings of the present study showed that fair value accounting had no significant effect on stock price drops not only in the short run but also in the long run.

Keywords: Stock Price Drop Risk, Fair Value Accounting, Autoregressive Distributed Lag.
2020 MSC: 91G15, 91G45

1. Introduction

Today, the stock market in developed countries as one of the tools to equip and direct the capital of this country for economic development is one of the most effective tools in the free market economy system. There are several industries operating in the Tehran Stock Exchange. The banking industry, as one of the active industries in the Tehran Stock Exchange, has been able to allocate oneself a significant share of market value [7].

*Corresponding author
Email addresses: somaye.imani.researcher@gmail.com (Somayeh Imani), kheradyar@iaurasht.ac.ir (Sina Kheradyar), ka.cpa2012@yahoo.com (Keyhan Azadi Hir)

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One of the topics that has been widely discussed by financial researchers in relation to stock price behavior is the sudden changes in stock prices; that occurs in two forms: drops and jumps in stock prices [13]. Given the importance that investors place on their stock returns, The phenomenon of dropping stock prices, which leads to a sharp decline in stock returns; compared to mutations, it receives more attention. Dropping stock prices is a very large and unusual negative change in stock prices; that occurs without the occurrence of a major economic event; and is considered as a phenomenon synonymous with negative skewness in stock returns [1]. Many researchers believe that the drop in stock prices is due to the management of its internal information. The managers of the economic unit are as much interested in spreading good news about the company; they also try to hide bad news. The existence of a series of special conditions can double the motivation of managers to hide the bad news of the company [16]. Managers who have dual duties; given the power they have over a board of directors, they can better hide the bad news of the company [10]. In fact, in a company where the chairman or vice-chairman of the board is the Managing Director, the role of supervisor of the Managing Director's affairs is weakened by the chairman of the board of directors or the deputy chairman; and it makes managers better to hide the bad news of the company due to their power [4]. But on one level due to considerations; The benefit of the cost of hiding bad company news was not possible; and in such a frontier, with the disclosure of bad news and the notification of investors, the stock price of the company decreases sharply [6].

One factor that can affect the risk of falling stock prices is fair value accounting. Fair value accounting is a method of financial reporting that allows companies to report assets and liabilities based on price estimates which is received in case of sale of assets or they will pay in case of debt settlement [21]. Under fair value accounting, companies report losses as a result of a decrease in the value of their assets or an increase in their liabilities [11]. These losses may lead to a reduction in property rights and profits. Advocates of fair value accounting believe that this method discloses complete information and accounting transparency means that the financial statements are prepared correctly and accurately and provide complete information about the activities of the institution and the financial situation of the company [8]. Because of fair value accounting; Profit and loss statements reflect the true economic value of the company's activities and the balance sheet of assets, liabilities and owners' equity at fair value [15]. Therefore, it can be said that this method provides clearer information. Accordingly, the present study intends to address the effect of fair value accounting on the fall in stock prices of banks listed on the Tehran Stock Exchange. The findings of the present study, while filling the gap in the research literature of the country, will provide appropriate tools for other researchers and capital market decision makers.

2. Research methodology

2.1. Research method

The multivariate regression statistical method is used to examine the relationship between the independent and dependent variables and data analysis is based on the method of studying composite data. Also, the banks listed on the Tehran Stock Exchange will form the statistical community of the research. Therefore, banks are present as the level of analysis of the present research. The sampling method was the elimination method. Thus, all member banks of the statistical community that had the following conditions were considered as a statistical sample. and those banks that had not these conditions; have been removed from the statistical sample. The period studied in this research is from 2007 to 2021 for 15 years. The conditions for selecting a sample are as follows:

1. The companies in question from the beginning of 2007 to the end of 2019, are members of the stock exchange.

2. The end of their financial year is March 20.
3. During the period under review, do not stop operations or change the financial period.
4. Their financial statements have been published by the stock exchange organization in the mentioned years.

By imposing the above restrictions; The sample includes 12 banks listed on the Tehran Stock Exchange.

2.2. Research model and how to calculate variables

Due to the fact that this research uses past information to test hypotheses, it is a post-event research. On the other hand, this research is a quasi-empirical research in the field of financial accounting research. The statistical model used in the research is a multivariate regression model.

$$\text{Crash Risk}_{it} = \alpha_{it} + \alpha_1 Fair_{it} + \alpha_2 MB_{it} + \alpha_3 LEV_{it} + \alpha_4 ROE_{it} + \alpha_5 SIZE_{it} + \varepsilon_{it} \tag{2.1}$$

2.2.1. Dependent variable: risk of falling stock prices (Crash Risk)

The Negative Coefficient of Skewness of daily returns (NCSKEW) has been used to measure the risk of falling bank stock prices. To calculate the bank's risk scales, the daily return from the development of the market and industry regression model for each year and each bank is estimated [19]:

$$r_{j,t} = \alpha_j + \beta_{1\cdot j} r_{m\cdot t-1} + \beta_{2\cdot j} r_{i\cdot t-1} + \beta_{3\cdot j} r_{m\cdot t} + \beta_{4\cdot j} r_{i,t} + \beta_{5\cdot j} r_{m\cdot t+1} + \beta_{6\cdot j} r_{i,t+1} + \varepsilon_{j,t} \tag{2.2}$$

Where $R_{j,t}$ is the stock return of bank j on day t, $r_{m,t}$ is the market return on day t and r_{it} is the industry return on day t. R_{it} is represented as the bank return, which is defined as the natural logarithm of one plus the residual return of the above equation [17]. NCSKEW stock price is calculated as follows:

$$NCSKEW_{J,t} = -(n(n-1)^{\frac{3}{2}} \sum R_{j.t}^3)/(n-1)(n-2)\left(\sum R_{j.t}^2\right)^{\frac{3}{2}} \tag{2.3}$$

Where n is the number of observations of daily returns during the year t and is the denominator of the normalizing factor fraction. $NCSKEWt$ is defined as the negative skewness of the bank's daily return in fiscal year t, which according to the research of China et al. [5], the company with high skew yield in year t is likely to have high yield skew in year $t+1$.

2.2.2. Independent variable: fair value accounting

Fair value accounting refers to the ratio of total assets and liabilities recognized or performed at fair value by the bank to the total assets of the bank. This fair value is calculated by dividing the following ratio by the total assets of the bank [9]:

$$Fair - Value_{i,t} = Cash_{i,t}\left(1 + r\left(\frac{x}{360}\right)\right) - DIV_{i,t} \tag{2.4}$$

So that it is equal to the cash and assets of the bank for company i at the beginning of period t; and x is the length of time that the fair value of the company's assets is calculated. And in this research is equal to one chapter (90 working days) is considered [10]; So the value $(x/360)$ will be 0.25. It is worth noting that the length of the calculated period for the fair value of assets can be considered more or less than one chapter, given the importance of the time period and r is equal to the risk-free interest rate, and $DIV_{i.t}$ is equal to the dividend payout ratio of the bank's shares [14].

2.2.3. Control variables

MB: as a growth opportunity for the company and is calculated from the ratio of market value to book value of equity.

LEV: It was the financial leverage of the company and is obtained to dividing the book value of total liabilities by total assets at the end of the year.

ROE: It represents the return on equity and is calculated from the dividend before the contingent items on the book value of equity at the end of the year.

SIZE: It indicates the size of the company and from the logarithm of the market value of equity is obtained at the end of the year.

2.3. Analysis methods and data collection tools

The present study applied the approach to distributive interruptions (ARDL) for the collective review of variables. Most recent studies suggest that the ARDL model is superior to other common methods for investigating co-integration, such as the Engle and Granger methods. The first reason is that regardless of whether the available variables are in model $I(0)$ or $I(1)$, it can be used. Another reason is that this method is relatively more efficient in small or limited samples compared to other methods. Therefore, this method has been used in this study. It should be noted that the ARDL method Cannot be used in the presence of $I(2)$; The general form of the ARDL pattern $(p, q1, q2, ..., qk)$ can be expressed as follows [19]:

$$\begin{aligned} \varphi(L,P)Y_t &= \sum_{i=1}^{k} \beta_i(L,q_i)X_{it} + \delta W_t + \mu_t \\ Q(L,P) &= 1 - \varphi_1 L - \varphi_2 L^2 - ... - \varphi_p L^p \\ \beta_i(L,q_i) &= \beta_{i0} + \beta_{i1}L + \beta_{i2}L^2 + ... + \beta_{iq_i}L^{q_i} \qquad i = 1,2,3,...,k \end{aligned} \tag{2.5}$$

In the above relation, L represents the time interrupt operator of the first order, such that $LY = Y_{t-1}$, Expresses the dependent variable, X_t represents the vector of explanatory variables, q_i the number of optimal interrupts associated with each of the explanatory variables, P the number of optimal interrupts related to the dependent variable and W_t are vectors of definite variables such as the width of the origin, seasonal variables, time trends or exogenous variables with fixed intervals. The corresponding equation is estimated using Eviews software. In the next step, using one of the criteria of Akaik, Schwartz-Bayesian, Hanan-Quinn or adjusted coefficient of determination, the optimal interruptions of the model are selected. From the above criteria, Pesaran and Shin [18] propose the Schwartz-Bayesian criterion for determining the optimal interruptions of the model. This criterion saves the number of interruptions due to the small sample size; In the end, fewer degrees of freedom are lost. To determine the long-run relationship, the value of t-statistic can be compared with the critical quantities presented by Benerji, Dolado, and Mister [3]. The value of t-statistic to test the hypothesis of a long-run relationship ($H_0 : \sum_{i=1}^{p} \varphi_i - 1 \geq 0$) is calculated as follows:

$$t = \sum_{i=1}^{p} \hat{\beta}_i - 1 / \sum_{i=1}^{p} S_{\hat{\beta}_i} \tag{2.6}$$

Where $S_{\hat{\beta}_i}$ is the standard deviation of the coefficients of the intermittent variables. If the computational value of t is greater than the critical value, Hypothesis zero based on which indicates

the absence of a long-term relationship is rejected and we accept the existence of a long-term relationship. In addition, Eviews software provides an error correction model (ECM) according to the selected model. In order to derive the error correction model based on the $ARDL(p, q_1, q_2, ..., q_k)$ model, the variables $W_t, Y_t, X_{1t}, ..., X_{kt}$ are considered in terms of values with interrupts and their first-order difference; and the ECM model gives the following relation.

$$\Delta Y_t = -\Phi(L,P)ECM_{t-1} + \sum_{i=1}^{k}\beta_{i0}\Delta X_{it} + \delta\Delta W_t - \sum_{j=1}^{p-1}\varphi_j\Delta Y_{t-j} - \sum_{i=1}^{k}\sum_{j=1}^{q_{t-1}}\beta_{ij}\Delta X_{i,t-j} + U_t \quad (2.7)$$

The above equations are estimated by the OLS method; And by performing the necessary tests, the short-term dynamic structure of the model is determined. In the error correction model, ECM_{t-1} indicates the rate of adjustment toward long-run equilibrium. This coefficient shows what part of the imbalance of the dependent variable Y_t during the previous period; Corrects in the current period. It is expected that the sign of this variable is negative and its value is between zero and -1. In this research, the library method was used to collect data and information; and data related to sample companies were extracted from sources such as Denasaham, Rahavard Novin, Bourse site, etc.

3. Findings

In order to study the general characteristics of variables and their detailed analysis, it is necessary to be familiar with descriptive statistics related to variables. Table 1 shows the descriptive statistics of the data related to the variables used in the research.

Table 1: Descriptive statistics related to research variables

Variables	Average	Middle	Max	Min	SD
Crash Risk	-5.37	-6.38	14.43	-22.85	7.39
FV	0.239	0.211	0.362	0.063	0.032
MB	2.28	1.91	5.9	0.50	1.34
LEV	0.558	0.571	1.09	0.06	0.18
ROE	0.42	0.47	5.81	-2.26	1.65
SIZE	13.95	13.66	18.45	10.81	1.54

The table above shows the descriptive statistics for the model variables, which represent the descriptive parameters for each variable separately. These parameters mainly include information about central indicators, such as maximum, minimum, mean and average, as well as information about dispersion indicators, such as standard deviation. The most important central indicator is the average, which represents the equilibrium point and center of gravity of the distribution, and is a good indicator to show the centrality of the data. For example, the average variable of a Crash Risk is -5.37 which shows that most of the data related to this variable is centered around this point. Also, the median of the fair value accounting (FV) is equal to 0.211; Which indicates that half of the data is less than this value and the other half is more than this value. Dispersion parameters are generally a criterion for determining the degree of dispersion of data from each other; Or the extent of their dispersion relative to the average. One of the most important parameters of dispersion is standard deviation. The value of this parameter is 1.54 for the company size variable and 0.18 for the financial leverage variable.

Before testing the research hypotheses to determine the relationship between research variables, a single root test for the variables should be performed. The econometrics and unit root text indicate that the unit root test based on panel data is more powerful and accurate than the unit root test of time series. In this research, in order to test the unit root has been used the Lin and Chou method has been used. Hypothesis zero in this test indicates the instability of the variable. in this case, if the probability values are less than 0.05, assumption zero will be rejected.

H0: Variables are unstable.

H1: Variables are stable.

Table 2: Stability test results for model variables

Variables	Coefficient	Sig
Crash Risk	-11.4	0.00
FV	-18.9	0.00
MB	-15.8	0.00
LEV	-38.7	0.00
ROE	-29.1	0.00
SIZE	-16.4	0.00

Stability results for panel data are presented in the table above 2. Based on the results, all variables are stable because the probability values of all variables are less than 0.05; and the zero hypothesis based on instability will be rejected.

To estimate the research models, first, the optimal model selection test is performed. In order to determine the optimal interruption, the Schwarz-Bayesian criterion was used, That the results are presented in Table 3.

Table 3: Optimal model selection test

Variables	Coefficient	Sig
D(-1) FV	0.009	0.7171
D(-1) MB	-0.251	0.0000
D(-1) LEV	0.008	0.7432
D(-1) ROE	0.178	0.0000
D(-1) SIZE	0.141	0.0000
Optimal interruption in model	(1,1,1,1,1)	

According to the results of the above test, the optimal model for determining the relationships of selected variables can be determined. According to the results of the above test, the optimal model can be used to determine the relationships of the selected variables. For example, the optimal interrupt for a five-factor model was (1,1,1,1,1); And the numbers from left to right represent the number of interruptions 1 for the independent and control variables, respectively. To confirm the robustness of the selected model, the following diagram 1 shows that the optimal models are preferable to other self-explanatory vector modes:

Since the selected criterion for determining the optimal interruptions of the model is Schwartz-Bayesian and also, the basis of the Schwarz-Bayesian criterion is large and is the absolute value of this criterion. Therefore, using this criterion, some of the best states for selecting the optimal interrupt are drawn; for example, in the research model, the interval (1,1,1,1,1,1) with a statistical value of (11.65) on the interrupts (2,1,1,1,1,1) (3,1,1,1,1,1) and other interruptions with a standard

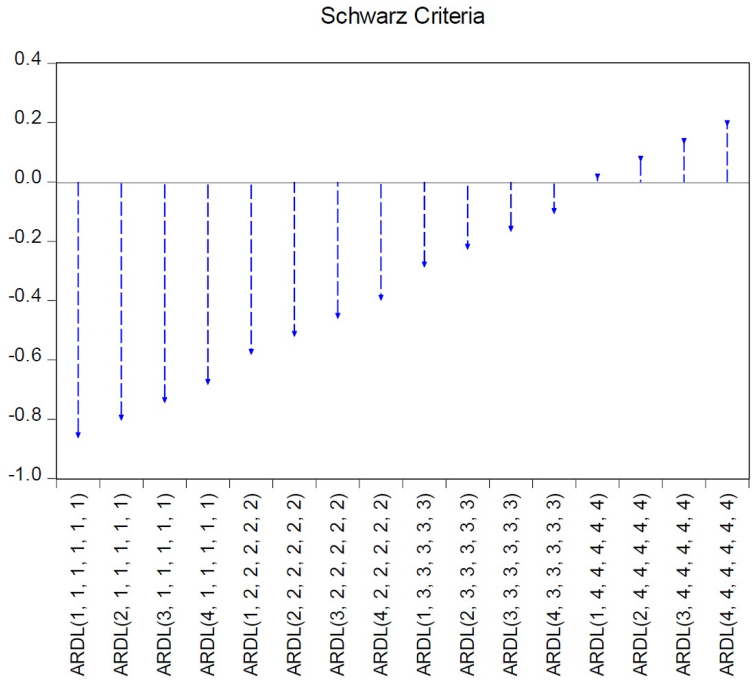

Figure 1: Drawing some examples of the best cases for selecting the optimal interrupt in the research model

value of less than -11.65 are preferred. With these interpretations, by selecting the optimal models, long-term relationships between variables between research variables are estimated. To determine the long-run relationship, the value of t-statistic can be compared with the critical committees presented by Benerji, Dolado, and Mister [3]. If the computational value of t is greater than the critical value, Hypothesis zero is rejected due to the lack of a long-term relationship and the existence of a long-term relationship is accepted. The result of computational statistics t in the research model was -4.39; and since it is greater in absolute magnitude than the critical value of Benarji, Dolado, and Master [3] (-3.28), Therefore, the null hypothesis is rejected in favor of the opposite hypothesis due to the lack of a long-term relationship. The results of long-term and short-term relationships of variables are presented in the following table 4:

The results show that fair value, both in the short and long term, has a positive effect on falling stock prices and considering that the significance level in all three models is estimated to be greater than 0.05; Therefore, the research hypothesis is rejected statistically. In other words, it can be said that fair value has no significant effect on falling stock prices. Therefore, at the 95% confidence level, the fourth hypothesis of the research is rejected. In the following, the error correction model (ECM) is used to examine how short-term imbalances in the pricing of capital assets towards long-term equilibrium occur. The ECM coefficient shows that in each period a few percent of the short-term imbalance is adjusted to achieve the long-term equilibrium. Based on the results, the ECM coefficient was -0.8 and considering that the level of significance of the coefficients is less than 0.05%, it is significant. This figure indicates that in each period 86% of the short-term imbalance of stock price falls is adjusted to achieve long-term equilibrium; Therefore, it can be said that the adjustment towards equilibrium is relatively fast.

4. Conclusion

This article examines the effect of fair value and some other influential variables as control variables on the risk of falling stock prices of banks listed on the Tehran Stock Exchange during the

Table 4: Estimation of the research model

Variables	Coefficient	Sig
Long-term Effect		
FV	0.143	0.2319
MB	-0.013	0.0673
LEV	0.006	0.8554
ROE	0.048	0.0000
SIZE	0.0011	0.2185
Short-term Effect		
D(-1) FV	0.035	0.1439
D(-1) MB	-0.018	0.0000
D(-1) LEV	0.0007	0.4318
D(-1) ROE	0.02	0.0000
D(-1) SIZE	0.121	0.0652
C	0.089	0.0000
ECM	-0.869	0.0000

period 2007-2021. The findings of the present study showed that fair value not only had no effect in the short term; rather, in the long run, it had no significant effect on stock prices falling. Many have accused fair value accounting of exacerbating the crisis of unsecured loans and the subsequent credit crunch, in the worst in the United States from the time of the Great Depression onwards. Critics of fair value accounting, including politicians, policymakers, auditors, and industry experts, They argue that fair value accounting has created a vicious circle of price reductions and led to the financial crisis. Following the crisis of unsecured loans, critics have argued that the costs associated with a fair value accounting system could create a crisis, a crisis, a vicious cycle of price declines and increase the risk of financial system failures. In an analytical framework, Sifients et al. [20] showed that a shock that reduces the market value of assets in the balance sheet of financial institutions to fair value; It can lead to forced asset pressure to prevent debt ratio breach. Access to surplus assets at a reduced value, it can further reduce the price and create a vicious circle of price reduction and disposal of excess assets. The authors conclude that a combination of market accounting and restrictions on the payment of foreign debt can lead to a downward spiral in asset prices and become an important source of systematic risk in the financial system. Allen and Carleti [2] argued that during a financial crisis, asset prices reflect the amount of liquidity available rather than the underlying asset value. They showed that in such cases, a fair value-based accounting system is not desirable because in a crisis, fair value losses can lead to the bankruptcy of banks being identified by the regulator. As a result of the bank's inability to pay its debts; They are forced to reduce the price of assets, which leads to excessive fluctuations in the price of assets in the short term. In contrast, under an accounting system based on historical cost, banks can still face all of their future debt.

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