The effect of adjusting prices on the stock prices and investment decisions (Relationship of earnings and book value of equities with the stock market value)

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Abstract

Background: One of the primary objectives of an accounting system is to provide relevant, timely, and reliable information for the users. The orientation of the historical cost accounting towards the past events of the business unit and that the investors' willingness to have an image of the future of the firm have led to the idea that accountants must provide the type of information that enables investors make better predictions about the future of the firm. Objective: Accordingly, the present study explored the impact of accounting information (profit per share and book value per share adjusted for inflation) on the stock market prices. To this end, a total number of 169 firms were selected as the research sample over a 5-year period. The collected data were analyzed using the Eviews Software. The statistical method used in this study was the Olson Evaluation Model. After the adjustment of the historical financial information in accordance with the general level of prices, the relationship of such information with the stock market value was tested. Results: The results indicated that both historical financial statements and inflation-adjusted financial statements are significantly associated with the stock market value. As a result, it is recommended that such statements are used together rather than being presented as alternatives.

INTRODUCTION

The transition from undeveloped to developed economies requires investment. Directing the funds towards capital markets is in the need of making investors interested in the capital market. To this end, investors need the type of information to help them choose the best investments and the best portfolios [19]. With the expansion of privatization that leads to increased private sector stakeholders, the need for the provision of accounting and financial information, especially the exploration of the effect of changing prices and inflation-adjusted financial statements on net income and book value of stocks and consequently the stock prices on investors as a vulnerable group in Tehran Stock Exchange is of significant importance. In addition, the financial information reported in the financial statements in accordance with accounting standards is generally based on historical value sand the studies dealing with stock pricing the shares and the determination of variables affecting the stock price are performed based on such information.

If the dissemination of information based on inflationary information could provide appropriate valuation of pricing models, it can be said that such information would be useful to shareholders. However, it should be noted that the primary objective of the accounting system is to provide useful information to users inside and outside the organization. Such information is useful if it can provide information sufficient to make decisions. The main purpose of the present study to answer the question whether information based on inflationary accounting is useful to users, especially investors or not.

Statement of the problem:

Financial statements as final products of the accounting information system are nothing but goods. Besides, the main cause of the existence of accounting is a demand for financial information and accountants and business entities also have the ability and willingness necessary to provide useful information. Therefore, concepts such as the quality of the goods and services offered are also necessary for the final products of accounting, financial statements, so that decisions related to the pricing of securities be taken efficiently. The
importance of providing proper models for the pricing of financial assets due to the high inflation and the lack of financial expertise of many ordinary investors is known well to anyone. In addition, given that the figures provided by financial statements are related to past; it is recommended to adjust such figures and then examine the relationship between the adjusted costs and stock prices as well as to examine the impact of inflation on these models in order to find out whether the adjusted costs will play a role in explaining stock prices or not.

Significance of the study:
In addition to the existing information, investors need additional information to be able to explain the stock market prices in the best way possible. One of the main factors influencing the financial information contained in financial statements and has not been mentioned in financial statements so that such statements are not adjusted accordingly is inflation. A conflicting issue among accounting theories that caused ongoing controversies among accounting theorists is the impact of price changes on previous financial events or according to accountants, historical accounting costs. Despite of all the scientific and empirical debates on this issue, there is a consensus among accounting scholars based on which since data from past performance serve as an informational basis for taking decisions for the future, such data must correspond to the current economic facts so that decision makers including managers, investors, banks, and governments come up with better decisions. Therefore, historical information should be adjusted based on inflation so that such information becomes more realistic.

Given the importance of inflation and its effects as well as the high inflation rates in developing countries, including Iran, the investigation of the impact of inflation on accounting data and the necessity of providing adjusted accounting data that may provide a suitable context for decisions taken by different users will add to the significance of the present study.

Research question:
The main research question addressed in this study is:
Can financial reporting adjusted in terms of the general price level affect decisions taken by investors or not?

Research hypotheses:
The following hypotheses will be tested in this study:
1. Earnings per share and book value per share are significantly correlated with the stock prices.
2. The adjusted earnings per share and adjusted book value per share are significantly correlated with the stock prices.
3. The differences between the amounts recorded in financial statements and the adjusted amounts (earnings per share and the book value per share) will affect the stock prices.

Review of Literature:
In economy, inflation refers to the general increase in the price level compared to a given purchasing power. Inflation has been high in recent years in Iran so that prices have been on the rise each year followed by the decreased purchasing power or the decreased monetary value accordingly. Chronic inflammation is a relatively long-term phenomenon in the Iranian economy and the escalation of inflation has been a fundamental problem in recent years. The results of studies conducted indicate that the expansion of factors affecting inflation in the Iranian economy. The most important factors in this regard are as follows: Providing budget deficit through borrowing from the Iranian Central Bank and consequently the increased liquidity, increasing the prices of energy carriers, and the omission of industrial subsidies in management particularly in managing currency, currency devaluation, and eventually global raise in prices.

Research on accounting for price level changes:
The issue of inflation is a major and constant fact of life almost all over the world. Changes in the value of a country’s currency have become a reality for accountants. However, there is no theoretical and practical consensus about the methods of the cost adjustment.

Henry Sweeney (1936) who examined the effects of price level adjustments on the financial statements is discussed, stated that if the currency does not remain constant, its use as a measuring unit will lead to major uncertainties. Following this study, the American Accounting Association investigated the effects of inflation on accounting standards. They came to the conclusion that the effects of inflation are not sufficient enough to basically adjust financial statements.

Moreover, Python (1973) suggests that the comparison of the historical financial statements to each other is somewhat misleading as effects of inflation are not considered.

After presenting different views on disclosure or non-disclosure in inflation-based financial reporting, the Financial Accounting Standards Board (FASB) developed the Standard 33 dealing with the aim of financial
reporting by entities. According to Paragraph 50 of the Standard 33, that management should be accountable for the owners’ interests to the extent possible in adverse economic conditions such as the high level of inflation and stagnation.

Some of the studies done on the content of financial statements are presented as follows:

Dastgir and Omid Ali [2004] studied barriers facing the use of accounting for inflation in Iran and concluded that the most important factors that accounts for non-application of accounting for inflation in Iran are the serious lack of senior managers’ familiarity with accounting for inflation, the inadequacy of price growth indices, the increases in tax liabilities resulting from the revised assessment, the excess of accounting for inflation costs over its earnings, and the lack of government support for the implementation of accounting for inflation.

Nikbakht and Tanani [20] examined the relationship between inflation-adjusted profitability ratios and the stock returns in companies operating in oil and petrochemical industry in the Tehran Stock Exchange. They collected the financial information from the company’s balance sheet and profit and loss statements for the fourth consecutive years from 2002 to 2005. Then they adjusted the data based on the price index and examined their relationship with the stock returns. Correlation analysis through multivariate linear regression analysis was used to analyze the data. The findings showed that there is no significant relationship between inflation-adjusted profitability ratios and the stock returns in companies operating in oil and petrochemical industry.

Qadri and Saeedi studied the predictive power of book value, net income, operating cash flow and investment as a proxy for accounting information in relation to the stock market value of companies. The results indicated that the book value and costs cost accounting earnings are more related. Besides, the inclusion of (operating and investment) cash flow does not significantly increase the explanatory power of the models.

Dastgir and Nikzad Chaleshtori [6] examined the relationship between the information contained in the financial statements based on historical cost and the information contained in the financial statements based on current values. Based on these results, it was noted that there is a significant relationship between the historical net profit and adjusted net profit as well as between the historical value and the current value of equities. However, there is no significant relationship between returns on investment from the adjusted information and returns on investment derived from historical data.


Yuki Ijiri [34], one of the pioneers in the accounting profession, has pointed to the difficulties arising from the application of accounting for price level changes. Referring to the lack of a proper understanding of the data adjusted based on the general level of prices, he stated: “There is still the question: what do the data adjusted based on the general level of prices mean?”

Fama [10] proposed the Control Theory that is based on two assumptions: 1) An increase in inflation will lead to a decline in economic activities. 2) The stock market predicts corporate profits decrease in relation to the reduction of economic activities. Therefore, the expected inflation shows unrealistic effects in the regression of stock returns during inflation. That’s why inflation is used rarely as a control variable in economic and basic activities.

Hendrickson (1992) has raised a number of questions in a re-evaluation of financial statements in accordance with the general level of prices, e.g. whether such statements are useful for creditors’ of investors’ decision-making models or not. In response to such questions, he believes that it is not possible to provide final answers to these questions due to the lack of sufficient research on this issue.

Davis-Friday and Rivera selected a sample of Mexican companies listed on the U.S. Stock Exchange to examine the impact of accounting for inflation on the relationship between accounting data and market value of the sample companies. The results suggest that accounting data obtained through accounting for inflation models in Mexico and GAAP models are associated with each other in terms of value.

Kirkulak and Balsari (2009) examined the relationship between the book value of equities and earnings per share of the adjusted financial statements. To do so, they analyzed the increasing informational content of the adjusted data in the Istanbul Stock Exchange. Their findings showed that inflation adjustments have a significant effect on financial ratios that can bring about different assessments of risk. The results also indicated that both the financial statements are related to each other in terms of value. Besides, it is possible to use the adjusted financial statements as supplementary information not as substitute for financial statements.

Al-Hares et al. [2] examined the relationship of the book value of equities, earnings per share, and dividends with the stock market value. The results indicated that the book value of equities, earnings per share, and dividends are associated with the stock market value. Besides, payout policies were found to be a factor influencing the stock market value.
Research Methodology:
Descriptive and inferential statistics were used to analyze the data. Descriptive statistics deal to present a general picture of the data under analysis. Referential statistics, on the other hand, deal with testing the research hypothesis through correlation and regression analysis.

Scope of the study:
A. Time period:
The present study was performed from 2008 to 2012.

B. Location:
Following the objectives of the study, the companies listed in the Tehran Stock Exchange were investigated in this study.

C. Population:
The population under study included the companies listed in the Tehran Stock Exchange. Besides, the research sample included companies that met the following requirements:
1. Companies that were accepted prior to 2008.
2. Companies whose fiscal year ended in 19th March.
3. Companies with no change in their financial period during the performance of the present study.
4. Companies that were not included in investment firms or not involved in financial intermediation.
5. Companies without major transaction inactivity (over two months) in the period under study.
6. Companies whose data were available.
Based on the above requirements, 169 companies were included in the sample under study from 2008 to 2012.

Data collection procedure:
The needed data were collected from http://www.codal.ir/(Publishers Information Center). Then the data were summarized and calculated in the Excel Spreadsheet and the final data analysis was performed using Eviews Statistical Software.

The present study is an applied research in terms of the objectives it follows. The aim of applied research is to develop knowledge in a particular field. In other words, applied research is directed towards the application of knowledge. In addition, the present study employed a correlational-descriptive research design. Correlational research refers to studies that are intended to discover or clarify the relationships between variables through the use of correlation. Since the present study uses historical data relating to the financial statements and stock prices, it can also be regarded as an ex post facto research.

Research Models:
The models used in this study are as follows:

\[
\text{Price}_{it} = \alpha_0 + \beta_1 \text{BV}_{it} + \beta_2 \text{EPS}_{it} + \epsilon_{it} \quad \text{Model (I)}
\]

\[
\text{Price}_{it} = \alpha_0 + \beta_1 \text{BV}^*_{it} + \beta_2 \text{EPS}^*_{it} + \epsilon_{it} \quad \text{Model (II)}
\]

\[
\text{Price}_{it} = \alpha_0 + \beta_1 (\text{BV}^*_{it} - \text{BV}_{it}) + \beta_2 (\text{EPS}^*_{it} - \text{EPS}_{it}) + \epsilon_{it} \quad \text{Model (III)}
\]

Where, \( \text{BV}_{it} \) is the book value for share \( i \) in the year \( t \), \( \text{EPS}_{it} \) is the net profit for share \( i \) in the year \( t \), \( \text{BV}^*_{it} \) is the book value for share \( i \) in the year \( t \) that is adjusted based on the prices general index, and \( \text{EPS}^*_{it} \) is the net profit for share \( i \) in the year \( t \) that is adjusted based on the prices general index.

According to the first research hypothesis, earnings per share and book value per share are significantly correlated with the stock prices.

The model used in this study will be tested using the regression assumptions and then conclusions are drawn about the hypothesis.

1. The distribution of errors should have a normal distribution so the mathematical expectation of errors is zero and variance of the errors is constant. To test this assumption, the data histogram is plotted and the normal distribution curve will be fitted on it.
As can be seen in the above histogram, the errors mean is zero and the standard deviation is approximately 1, indicating the normal distribution of errors. In addition, in the scatter plot of the data shown as follows the data difference from the mean is centered on zero, which shows the normal distribution of errors.

According to the second regression assumption, there is no correlation between the model errors. To check this assumption, the Durbin-Watson statistics were used and the results are shown in Table 1. The value of the Durbin-Watson statistics is between 1.5 to 2.5, which indicates that there is no correlation between the errors in the model or in other words, there is no autocorrelation between errors. In addition, the value of F and the significance level show the high validity of the regression analysis. The adjusted coefficient of determination also shows that 85% of the variability is explained by the independent variables.

<table>
<thead>
<tr>
<th>Coefficient of determination</th>
<th>Adjusted coefficient of determination</th>
<th>Durbin-Watson statistics</th>
<th>F-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.881</td>
<td>0.851</td>
<td>1.782</td>
<td>29.259</td>
<td>0.000</td>
</tr>
</tbody>
</table>

According to the third regression assumption, there is no correlation between the independent variables (i.e. they have no collinearity). Tolerance statistics and variance inflation factor (VIF) are used to test this assumption. Table 2 presents the values of tolerance statistics and VIF. Given that VIF value is less than 10, the non-collinearity assumption is confirmed.
Table 2: Analysis of collinearity

<table>
<thead>
<tr>
<th>Model</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td></td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>C</td>
<td>7.534</td>
<td>0.00</td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>BV</td>
<td>0.282</td>
<td>7.963</td>
<td>0.000</td>
<td>0.396</td>
</tr>
<tr>
<td>EPS</td>
<td>0.523</td>
<td>14.786</td>
<td>0.000</td>
<td>0.396</td>
</tr>
</tbody>
</table>

According to the fourth regression assumption, the dependent variable is normal. Kolmogorov-Smirnov test was used to test this assumption. The results are presented in Table 3. Given that P is the dependent variable in all models under study, the test was performed only in the first model and the normality of the dependent variable was not presented for other models.

Table 3: Normality of the dependent variable

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations</td>
<td>845</td>
</tr>
<tr>
<td>Normal distribution parameters</td>
<td>Mean: 4.567,478, SD: 5.452,454</td>
</tr>
<tr>
<td>The maximum deviation</td>
<td>Absolute value: 0.222, Positive: 0.209, Negative: -0.222</td>
</tr>
<tr>
<td>Kolmogorov-Smirnov Z</td>
<td>6.449</td>
</tr>
</tbody>
</table>

As can be seen in the above table, the significance level of the Kolmogorov-Smirnov statistics is less than 5%, which indicates the non-normality of the dependent variable. Accordingly, Johnson Conversion in the Minitab Software was used to normalize the dependent variable. The results shown in Table 4 show the normality of the converted variable. Besides, the significance level of the normality of the converted variable is 0.67. Since this value is higher than 0.05, the normality is confirmed.

Table 4: Normality of the converted dependent variable

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations</td>
<td>845</td>
</tr>
<tr>
<td>Normal distribution parameters</td>
<td>Mean: 0.002, SD: 0.996</td>
</tr>
<tr>
<td>The maximum deviation</td>
<td>Absolute value: 0.025, Positive: 0.025, Negative: -0.019</td>
</tr>
<tr>
<td>Kolmogorov-Smirnov Z</td>
<td>0.725</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.670</td>
</tr>
</tbody>
</table>

After the confirmation of the regression assumptions, the Chow test was to identify the existence of common effects or cross and temporal effects. The results of the test are shown in Table 5:

Table 5: Results of Chow test to examine the mixed or panel effects

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Statistics</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F test</td>
<td>4.654</td>
<td>(168.674)</td>
<td>0.000</td>
</tr>
<tr>
<td>Chi-square</td>
<td>650.768</td>
<td>168</td>
<td>0.000</td>
</tr>
</tbody>
</table>

As the results of the Chow test indicate, F and chi-square statistics are significant, indicating the suitability of using the panel data. Given the existence of the panel data, Hausman test was used to examine the stability or randomness of the panel data effects as shown in Table 6:

Table 6: Results of Hausman test

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Statistics</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random effects</td>
<td>22.059</td>
<td>2</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The significance level in this table is less than 0.05 so the fixed effects were considered as shown in Table 7:

Table 7: Hypothesis testing using fixed effects

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>t-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2560.421</td>
<td>38.771</td>
<td>0.000</td>
</tr>
<tr>
<td>BV</td>
<td>0.570</td>
<td>16.613</td>
<td>0.000</td>
</tr>
<tr>
<td>EPS</td>
<td>1.396</td>
<td>12.658</td>
<td>0.000</td>
</tr>
</tbody>
</table>
As shown in the above table, the book value and the earnings per share have a direct and significant impact on each other at 1% error level.

According to the second research hypothesis, the adjusted earnings per share and adjusted book value per share are significantly correlated with the stock prices.

After the confirmation of the regression assumptions, the Chow test was to identify the existence of common effects or cross and temporal effects. The results of the test are shown in Table 8:

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Statistics</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F test</td>
<td>5.454</td>
<td>(168.674)</td>
<td>.000</td>
</tr>
<tr>
<td>Chi-square</td>
<td>725.414</td>
<td>168</td>
<td>.000</td>
</tr>
</tbody>
</table>

As the results of the Chow test indicate, F and chi-square statistics are significant, indicating the suitability of using the panel data. Given the existence of the panel data, Hausman test was used to examine the stability or randomness of the panel data effects as shown in Table 9:

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Statistics</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random effects</td>
<td>103.322</td>
<td>2</td>
<td>.000</td>
</tr>
</tbody>
</table>

The significance level in this table is less than 0.05 so the fixed effects were considered as shown in Table 10:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>t-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3650.593</td>
<td>38.644</td>
<td>.000</td>
</tr>
<tr>
<td>Inflation BV</td>
<td>0.284</td>
<td>9.128</td>
<td>.000</td>
</tr>
<tr>
<td>Inflation EPS</td>
<td>0.005</td>
<td>3.198</td>
<td>.002</td>
</tr>
</tbody>
</table>

As shown in the above table, there is a significant relationship between the adjustments made in the financial statement due to inflation and the stock prices.

The third research hypothesis indicates that the differences between the amounts recorded in financial statements and the adjusted amounts (earnings per share and the book value per share) will affect the stock prices.

After the confirmation of the regression assumptions, the Chow test was to identify the existence of common effects or cross and temporal effects. The results of the test are shown in Table 11:

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Statistics</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F test</td>
<td>8.500</td>
<td>(168.674)</td>
<td>.000</td>
</tr>
<tr>
<td>Chi-square</td>
<td>961.145</td>
<td>168</td>
<td>.000</td>
</tr>
</tbody>
</table>

As the results of the Chow test indicate, F and chi-square statistics are significant, indicating the suitability of using the panel data. Given the existence of the panel data, Hausman test was used to examine the stability or randomness of the panel data effects as shown in Table 12:

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Statistics</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random effects</td>
<td>68.608</td>
<td>2</td>
<td>.000</td>
</tr>
</tbody>
</table>

The significance level in this table is less than 0.05 so the fixed effects were considered as shown in Table 13:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>t-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>4587.012</td>
<td>237.554</td>
<td>.000</td>
</tr>
<tr>
<td>Inflation BV-BV</td>
<td>-0.015</td>
<td>-0.991</td>
<td>.322</td>
</tr>
<tr>
<td>Inflation EPS-EPS</td>
<td>0.003</td>
<td>3.556</td>
<td>.000</td>
</tr>
</tbody>
</table>

As shown in the above table, the difference between the amounts recorded in financial statements and the adjusted amounts is significant only for earnings per share at the error level of 1%. However, this difference is not significant for the book value per share at the error level of 1%.
Results:
The transition from undeveloped to developed economies requires investment. Directing the funds towards capital markets is in the need of making investors interested in the capital market. To this end, investors need the type of information to help them choose the best investments and the best portfolios. One of the primary objectives of an accounting system is to provide relevant, timely, and reliable information for the users. The orientation of the historical cost accounting towards the past events of the business unit and that the investors’ willingness to have an image of the future of the firm have led to the idea that accountants must provide the type of information that enables investors make better predictions about the future of the firm. The disclosure of the effects of price changes enables the users of financial statements have a realistic picture of future cash flows, the management of the corporate affairs, the operational capacity, and the general purchasing power of an entity. The Olson Evaluation Model that employs earnings per share and book value per share was used to analyze the management of the corporate affairs, the effects of price changes enables the users of financial statements have a realistic picture of future cash flows, the management of the corporate affairs, the operational capacity, and the general purchasing power of an entity.

The Olson Evaluation Model that employs earnings per share and book value per share was used to analyze the relationships between the information contained in the financial statements and the general level of prices, the relationship of earnings and book value of equities with the stock market value was explored in this study. The Olson Evaluation Model that employs earnings per share and book value per share was used to analyze the relationships between the information contained in the financial statements and the general level of prices, the relationship of earnings and book value of equities with the stock market value was explored in this study.

The results indicated that both historical financial statements and inflation-adjusted financial statements are significantly associated with the stock market value. As a result, it is recommended that such statements are used together rather than being presented as alternatives.

REFERENCES


