ANALYSIS OF SYSTEMATIC RISK IMPACT OF COMMON STOCK ON FINANCIAL RATIOS OF ACCEPTED PLANTS IN TEHRAN STOCK EXCHANGE

*Leyla Salari
Technical University of Bandar Abbas
*Author for Correspondence

ABSTRACT
The main purpose of this research is to investigate the relation between systematic risk of common stock and financial ratios of accepted plants in Tehran Stock Exchange using capital asset pricing model (CAPM). To do so, 226 plants whose required data for four-year period of research (2006-2009) were available are selected. Studying data is performed based on 8 independent variables (financial ratios) and also systematic risk is considered as dependent variable. Moreover, hypotheses test is done based on simple and multi variable Regression. Statistical significance of the models is done in accordance with F and t statistics. Ultimately, concluded results reveal that there is significant relation between 5 research variables (including 1. Current ratio 2. Quick ratio 3. Liabilities ratio to total assets) and systematic risk. That is, they can be used by investors for prediction and better decision making.

Keywords: Stock Exchange, Systematic Risk, Financial Ratios

INTRODUCTION
Investment frequently is considered as one of the most vital factors of economic development and growth process. In fact, investors always tend to invest their financial sources in a way that it causes to the most return and the least risk. So it is not uncommon that they particularly pay attention to investment risk. One approaches to estimate systematic risk of plants is applying accounting information. For this reason knowing the relation between systematic risks and accounting information is extremely remarkable.

According to GAAP, the main aim of accounting is to present applicable information for investors and other users so that they can assess and predict the future cash flows in terms of price, date and uncertainty.

Accounting interests also transfer some information to stock markets. In addition to interests, other accounting information is available for investors in the capital market. For instance, annual financial reports of the plants such as balance sheets and income statements provide more accounting information (Hasan, 2006).

Investors and financial analyzers use accounting information in order to make decision about their investments. Therefore, it can be mentioned that this kind of information like interest reflects some factors to stock market and affects the value market of assets.

In accordance with capital asset pricing model, market value of an asset is a function of expected cash flows of the assets, cash flow risk of that asset (B), rate of market risk and risk-free return rate (Azar, 2002).

Probably, risk-free return rate and rate of market risk which are assigned in CAPM have relation with interior variables of the plant but accounting information of the plant might be useful to estimate expected cash flows and risk of securities of the plant.

Basics of Financial engineering and risk management (Ra’yi, 2009).

Statement of Research Problem
Risk and return have crucial role in investing. In case future events are not exactly predictable and some occurrences are referred to the others, danger probability might be approaching.
Research Article

Risk is divided into two kinds: systematic risk and non-systematic risk. Non-systematic risk can be eliminated using variety but systematic risk cannot be removed in this way. In fact, systematic risk index is considered as Beta coefficient of a share of market which shows the sensitivity of stock of a plant or a particular asset in terms of market risk occurring. Experts argue that the systematic risk difference of the plants might be due to their different financial decisions. On the other hand, accounting information as well as financial ratios is influenced by financial decisions. Therefore, here is a question:

Is there any relation between systematic risk of common stock and financial rations?

Importance of research

Beta coefficient of a share is considered as systematic risk index because using it, return rate changes of the stock and the total rate of stock market can be compared. Investors’ expected return rates can be remarked as function of extent Beta of accepted plants in Stock exchange.

Predicting the expected return on stock of accepted plants in Tehran Stock Exchange is very important for investors and systematic risk (beta) is one of the most effective factors of predicting the expected stock return. Being aware of systematic risk of common stock of various plants, financial investment can be done more securely.

In case there is relation between accounting variables and systematic risk or Beta, owners’ equity might be able to make better decisions. Similarly, investors may be able to predict future fluctuations of systematic risk based on mentioned accounting information.

In addition, in case there is relation between Beta and financial ratios, some evidences can be provided to know the prediction content and applicability of accounting information.

Financial management (Shabahang, 1993)
Accounting and Business Researches (Balkuyi, 1999)

Research Purpose

Investors use all related information to securities pricing in order to increase their sources as much as possible. One of the most important information which assigns return and securities pricing is related to Beta.

So, the main purpose of this research is to investigate some experimental evidences on relation between systematic risk of common stock and financial ratios. Knowing effective elements of accounting on systematic risk (Beta), owners’ equity will be able to make decision more appropriately.

In this way, financial ratios can be useful as systematic risk criteria. This research studies the impact of financial ratios on systematic risk.

Related Literatures: Basic Theories

In 1952, Harry Markwitz presented theory of portfolio. His hypothesis states that investors necessarily do not tend to increase the returns as much as possible. If they did, they would just invest in one product which had the most expected return. Taking a short glimpse, it can be seen that investors own portfolio. Justifying this manner it can be mentioned that investors simultaneously pay attention to two phenomena: risk and return. Through investing in securities set without decreasing the return rate, risk probability will be reduced.

Financial accounting especially CAPM recognizes systematic risk of market risk and the differences between systematic risks of plants might be due to their different financial decisions. That is, accounting information mirrors financial decisions and operations of the plant. Thus, financial ratios may remark some information about systematic risk of common stock.

Capital asset pricing model also states that financial ratios can be used instead of systematic risk. Basing on CAPM, systematic risk of common stock has direct relation with financial leverage but indirect relation with liquidity, profitability and activities. In this way, financial ratios can be considered as useful criteria of systematic risk.

1. Harry Markwitz
2. Capital Asset Pricing Model
Research Article

3. Investment Management (Jahankhani, 1997)

Research Background
Many accounting researches based on capital market display the useful role of accounting information in assigning the risk of securities. Here is an example:

Hamada’s Research: Hamada studied a research called the impact of investment structure on systematic risk of common stock. Having studied theoretically he concluded that systematic risk of a plant which has liabilities is more than the average Beta of a plant which has no debt. Proving this, he selected and studied 3004 plants of New York Stock Exchange. Finally, he concluded that there is significant relation between financial leverage and systematic risk.

Bior and Mingoled’s Research: Bior and Mingoled’s (1975) studied 254 plants. In this research they also investigate the ratio of net income to common stock value, the ratio of asset return and the ratio of owners’ equity of common stock. Finally, they concluded that there is a poor significant relation between the factors.

Primble’s Research: In 2003, applying correlation statistic method and Regression analysis, Primble studied 123 plants whose variables were accounting Beta, profit changes, growth, size, dividend payout ratio, current ratio, financial leverage, interest coverage ratio and operation leverage; in conclusion over 57% of systematic risk changes were determined by selected variables of the model.

Loher and Neoman’s Research: In 2008, applying correlation method and Regression analysis, Loher and Neoman studied 50 plants. Their variables were risk accounting Beta; in conclusion it proved the role of downside risk in portfolio selecting.

Domestic Researches
Ghalibaf’s Research: In 1999 Ghalibaf studied the relation between financial leverage, systematic risk and non-systematic risk. Results revealed that there is neither significant relation between financial leverage and systematic risk nor between financial leverage and non-systematic risk.

Ahmadpour’s Research: In 1999 Ahmadpour studied a research called prediction of systematic risk using accounting information. Applying Regression analysis, he investigated the relation between financial leverage, operation leverage degree, size of plant, sale and systematic risk (Beta) concluded results displayed that financial leverage has direct and indirect relation with systematic risk and size of the plant respectively while there was no significant relation between operation leverage and systematic risk.

Saidi and Safaripour’s Research: In 1999, Saidi and Safaripour studied 32 plants. They tried to assess the impact of Beta criterion to Sharp and Trino index on systematic risk; results showed that comparing with customary counterpart criteria, downside risk criterion determines stockholders’ surplus return more acceptably.

Accounting and Business Researches (Blukui, 1999)

Research Hypotheses
1. There is significant relation between ratio of operation profit to assets and systematic risk of common stock.
2. There is significant relation between ratio of working capital to total assets and systematic risk of common stock.
3. There is significant relation between ratio of assets turnover and systematic risk of common stock.
4. There is significant relation between ratio of liabilities to total assets and systematic risk of common stock.
5. There is significant relation between current ratio and systematic risk of common stock.
6. There is significant relation between quick ratio and systematic risk of common stock.
7. There is significant relation between ratio of owners’ equity to assets and systematic risk of common stock.
8. There is significant relation between ratio of liabilities to owners’ equity and systematic risk of common stock.
MATERIALS AND METHODS
Methodology
This paper is to study the impact of systematic risk of common stock on financial ratios of accepted plants in Tehran Stock Exchange. Thus, it can be considered as an experimental-practical study.

Studying Duration and Statistic Population
Population of this research (2006-2009) contains entire accepted plants in Tehran Stock Exchange which have the following conditions:
1. They should be accepted in Tehran Stock Exchange by the end of 2005.
2. Their stocks should have been transacted frequently during 2006-2009.
3. End of their fiscal year should be Esfand (the last month of the Iranian year).
4. They should not be an investing plant.
Sampling of the present research includes all plants of population. Considering the mentioned conditions, 226 plants are to be studied in this research. Moreover, required information is extracted from basic financial statements as well as annual and monthly statements of Tehran Stock Exchange. Having collected data, research variables are processed by Excel software and then calculated by SPSS software.

Research Variables
Systematic Risk: is a part of risk which cannot be reduced by variety of stock. Its measurement unit is Beta which through comparing return rate of all existent securities measures the closeness of return rate fluctuation of one kind of securities. It is calculated by the following formula:
\[ B = \frac{\text{cov}(R_m, R_i)}{\sigma_m^2} \]
Accounting ratios as Independent variable: accounting information which are applied in this research includes 8 financial ratios: ratio of total liabilities to owners’ equity, ratio of working capital to total assets, ratio of operational profit to total assets, ratio of current assets to current debt, ratio of total liabilities to total assets, ratio of long-term liabilities to owners’ equity, current ratio and quick ratio.

RESULTS AND DISCUSSION
Research Findings
In order to test research hypotheses simple and multi variable Regression are used in this study. F Statistics is also used to test Regression total coefficient as well as t-test is used for significance of coefficient at level 5%.
Summarized statistical significance test of all hypotheses:

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Studied financial ratios</th>
<th>Statistics F</th>
<th>Sig</th>
<th>Statistical Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1</td>
<td>operational profit ratio to assets</td>
<td>0.879</td>
<td>0.349</td>
<td>NO</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>working capital ratio to total assets</td>
<td>8.642</td>
<td>0.003</td>
<td>YES</td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td>Current ratio</td>
<td>469.769</td>
<td>0</td>
<td>YES</td>
</tr>
<tr>
<td>Hypothesis 4</td>
<td>Quick ratio</td>
<td>812.334</td>
<td>0</td>
<td>YES</td>
</tr>
<tr>
<td>Hypothesis 5</td>
<td>Asset inventory turnover ratio</td>
<td>1.858</td>
<td>0.173</td>
<td>NO</td>
</tr>
<tr>
<td>Hypothesis 6</td>
<td>Debt Ratio to total assets</td>
<td>2.08</td>
<td>0.15</td>
<td>NO</td>
</tr>
<tr>
<td>Hypothesis 7</td>
<td>owners’ equity ratio to assets</td>
<td>2.08</td>
<td>0.15</td>
<td>NO</td>
</tr>
</tbody>
</table>
Summarized statistical significance test of coefficient of hypotheses

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Studied financial ratios</th>
<th>Statistics F</th>
<th>Sig</th>
<th>Statistical Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1</td>
<td>operational profit ratio to assets</td>
<td>-0.938</td>
<td>0.349</td>
<td>NO</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>working capital ratio to total assets</td>
<td>2.94</td>
<td>0.003</td>
<td>YES</td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td>Current ratio</td>
<td>21.674</td>
<td>0</td>
<td>YES</td>
</tr>
<tr>
<td>Hypothesis 4</td>
<td>Quick ratio</td>
<td>-28.501</td>
<td>0</td>
<td>YES</td>
</tr>
<tr>
<td>Hypothesis 5</td>
<td>Asset inventory turnover ratio</td>
<td>-1.363</td>
<td>0.173</td>
<td>NO</td>
</tr>
<tr>
<td>Hypothesis 6</td>
<td>Debt Ratio to total assets</td>
<td>1.442</td>
<td>0.15</td>
<td>NO</td>
</tr>
<tr>
<td>Hypothesis 7</td>
<td>owners’ equity ratio to assets</td>
<td>-1.442</td>
<td>0.15</td>
<td>NO</td>
</tr>
<tr>
<td>Hypothesis 8</td>
<td>Debt Ratio to owners’ equity</td>
<td>0.747</td>
<td>0.455</td>
<td>NO</td>
</tr>
</tbody>
</table>

**Conclusion**

**Hypothesis 1**
Hypothesis 1 of the present research states that there is significant relation between operation profit ratio of to assets and systematic risk of common stock. Its F Statistics equals 0.879 which is less than critical point and also sig=.349 which is less than 5%. That is, regarding 95% p-value this relation cannot be considered significant. So there is no significant relation between ratio of operation profit to assets and systematic risk of common stock. Moreover, two studied variables have positive relation but this coefficient 0.001 is not significant statistically.

**Hypothesis 2**
Hypothesis 2 states that there is significant relation between working capital ratio to total assets and systematic risk of common stock. Sig= 0.003 which is less than 5% shows that Regression is significant. So the relation between operational profit ratio to assets and systematic risk can be confirmed. Coefficient of relation between systematic risk and ratio of operational profit to assets equals 76.609. Considering p-value and t statistics, significance of this relation can be confirmed. That is, there is significant relation between working capital ratio to total assets and systematic risk of common stock and this ratio can be used to measure risk.

**Hypothesis 3**
Hypothesis 3 states that there is significant relation between current ratio and systematic risk of common stock. Linear Regression is used to test this hypothesis. Basing on outputs of SPSS software, F statistics = 469.769 reveals that Regression is significant and its coefficient can be analyzed. It means with 95% p-value, Regression is significant and this hypothesis is confirmed.

**Hypothesis 4**
Hypothesis 4 states that there is significant relation between quick ratio and systematic risk of common stock. Statistics = 812.334 reveals that Regression is significant. Like the previous hypothesis, both Regression and coefficient of quick ratio are significant. That is, within 95% p-value quick ratio is significant and it can be applied to measure risk. Relation of two variables is negative. It means increasing one of them, the other variable will decrease. That is, systematic risk will decrease if quick ratio increases.

**Hypothesis 5**
**Hypothesis 5** states that there is significant relation between assets turnover ratio and systematic risk of common stock. F statistics is less than critical point and Regression cannot be regarded significant. T statistics is also less than critical point so its significance is not confirmed. That is, there is no significant relation between assets turnover ratio and systematic risk of common stock and this relation cannot be confirmed.

**Hypothesis 6**

Hypothesis 6 states that there is significant relation between debt ratio to total assets and systematic risk of common stock. F statistics = 2.080 displays that Regression is not significant. Thus, within 95% p-value, Regression is not significant.

Basing on concluded results which shows t statistics= 1.442 is in critical area, coefficient of ratio of liabilities to total assets within 95% p-value cannot be considered significant. That is, there is no significant relation between debt ratio to total assets and systematic risk of common stock.

**Hypothesis 7**

Hypothesis 7 states that there is significant relation between owners’ equity ratio to assets and systematic risk of common stock. F statistic= 2.080 reveals that Regression is not significant. Thus, within p-value 95%. Regression is not significant.

Basing on concluded results which shows statistics= -1.442 is not in critical area and coefficient of debt ratio to total assets within 95% p-value cannot be considered significant. That is, there is no significant relation between owners’ equity ratio to assets and systematic risk of common stock.

**Hypothesis 8**

Hypothesis 8 states that there is significant relation between owners’ equity ratio to assets and systematic risk of common stock. F statistic= .558 reveals that Regression is not significant and coefficient analysis cannot be regarded.

Basing on concluded results which shows t statistics=.747 is not in critical area and coefficient of debt ratio to total assets within 95% p-value cannot be considered significant. That is, there is no significant relation between owners’ equity ratio to assets and systematic risk of common stock.

**Comparing the Present Research with Previous Ones**

Many researches are done on the relation between accounting variables and risk indexes. While some of these researches display that there is significant relation between systematic risks of common stock and accounting variables, the other ones show that there is no significant relation between them.

**Findings of the Present Research are consistent with Findings of:**

1) Mada’s research that shows systematic risk of a plant which owes liabilities is more than a plant which has no debt. 2) Primble’s research that shows changing of systematic risk is determined by financial leverage and operational leverage. 3) Loher and Neoman’s research that proves the role of downside risk in selection of portfolio. 4) Ghalibaf’s research that shows using financial leverage can increase systematic risk of the plant. 5) Saeidi and Safdari’s research that shows criterion of downside risk determine the return of surplus stock.

**Findings of the Present Research are Inconsistent with Findings of:**

1) Biorominglond’s research that shows there is very poor relation between research variables and systematic risk. 2) Ahmadpour’s research that shows financial leverage has direct relation and size of plant has indirect relation with systematic risk while operational leverage has no significant relation with it.

**Finding Analysis**

In order to study the relation between accounting variables and systematic risk of common stock, 8 financial ratios are used. Generally speaking, conclusions display that financial ratios especially working capital ratio to total asset, current ratio and quick ratio have significant and positive impact on systematic risk.
Suggestions
1. Impact of stock exchange on economic growth of a country in undeniable. The main job of this market is to activate capitals effectively and to devote these sources to the most suitable way. To do so, existence of an effective market is necessary. One of the conditions of this market is that the whole existent information such as accounting information which is reliable and related should be available to all traders for free and fairly.
2. Regarding significant relation between financial ratios and systematic risk, stock exchange authorities necessitate to provide a clear data atmosphere so that analyzers to be able to do statistical researches and investors also can make proper decisions and orientations.
3. Informing process, authorities of capital market can measure Beta of each plant as a decision-making criterion during various periods and report them for users in annuls or monthlies of stock exchange.
4. Considering Beta criterion as assessment index of risk, authorities being aware of theses measure can widen their observations and determine some rules for plants with high Beta.

REFERENCES
Persian References
Afschar Asadollah (No Date). Financial Management (Soroush publication).