JEAS | Journal of Economics and Administrative Sciences
E-ISSN: 2148-1792 P- ISSN: 1302-2024
Volume 3, Supplement Issue2
www.jeasweb.org

Accounting information quality on the forecasted returns based on Fama–French three-factor model

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ABSTRACT

Information credibility for users is increased by auditing, and increased auditing quality results in improving information quality. In fact, auditing reduces information asymmetry between management and users, so that financial statements users can evaluate and predict the company's financial performance. This study aims to examine the effect of accounting information quality on stock returns forecasting in companies listed on the Tehran Stock Exchange from 2009 to 2013. In this study, Dave and Ditchoff earning quality index was used to measure the financial reporting quality, (2002), and to calculate the stock return forecasting, Fama–French Three-Factor Model (1993) has been used. Data analysis of this study was performed using multiple linear regression through combined data. According to results, there is a positive and statistically significant relationship between the financial reporting quality and stock return forecasting. According to results, financial leverage and company size variables have negative effect on the stock returns forecasting.

Keywords: Financial Reporting Quality, Stock Returns Forecasting, Fama–French Three-Factor Model, Combined Data, Financial Leverage, Company Size

Introduction

Information is the essential component of capital markets. Investors accept the risk of bringing their hard-earned capital to these markets and rely on information released by companies. They need reliable, timely and explicit information that can be easily analyzed. Investors need to make sure about accurate, complete, reliable and timely information to survive in the capital market. Proper disclosure of information by companies helps investors and other stakeholders in economic decision making. The accounting information quality and the promotion of information disclosure are awareness-raising techniques that affect price changes and consequently the volatility of stock returns. accounting information quality reduces information asymmetry and the cost of capital, and thus plays a key role in the efficiency of the capital market. If the level of accounting information disclosure increases to the level of annual reporting, shareholders can evaluate inflows and outflows of cash for operating activities better and more accurately that are useful for future profits forecasting, and thus rational stock returns forecasting is achieved, which reduces the volatility of stock returns. Therefore, with increasing the quality of accounting information, stock volatility is expected to decrease (Ahmadpour et al., 2013).

Following the expansion of economic activities, financial markets development and investment prosperity in capital markets, especially stock exchanges by individuals and legal entities, the most important tool to make the right decisions and gain the expected benefit and optimal use of financial resources is access to accurate, timely and explicit and realistic information. access to transparent

information is a basic human right in democratic societies. Citizens are in line for sufficient information about the decisions of their stakeholders (public governments and institutions) as well as decision making basis.

Investors as one of the main elements of financial markets have always been looking for a metric to evaluate the performance of various companies. One of the most important performance metrics is stock returns. One of the models to forecast expected stock returns is capital asset pricing model (CAPM). Due to the limitations of this model, Fama and French (1993) presented a three-factor model. This model has been tested in some countries.

Fama and French gave proof of empirical failures for the capital asset pricing model. Using cross-sectional regression, they confirmed that size, price/earnings ratio, and book-to-market ratio, in addition to market beta (risk), play a key role in describing returns. They also suggested a significant relationship between average returns and stock beta. According to them, different price ratios contain very similar information about returns (Fama and French, 2003, 29).

Poor-quality accounting information is one of the reason for market friction that leads to stock price delayed. The accounting quality measurement is based on the quantitative information contained in the financial statements. Decreasing the accounting information quality is economically costly and leads to increased equity costs and reduced stock returns.

According to the researchers, increasing accounting information quality of companies in this study (quality of accruals) reduces price fluctuations and realized that traded price is closer to intrinsic value. according to their findings, increasing accounting information quality leads to increasing the quality of stock returns forecasting. Therefore, this study aims to investigate the effect of accounting information quality on the returns forecasting based on Fama–French Three-Factor Model in the companies listed on the Tehran Stock Exchange.

Theoretical Foundations of Research

Disclosure and Transparency of Information

Stability of financial markets is always confused by uncertain financial and information exchanges; lack of information is an unchangeable feature of the market. Wherever financial concerns are raised, there is undoubtedly an information problem; the reason for concluding contracts between different types of groups involved in exchanges is to reduce information problems.

Increased transparency of financial information and then relatively stable market will result in decreasing crisis, increasing investor confidence, involving more people in the market, market increased liquidity and increasing the possibility of financing. Following information transparency, the investor accommodates financial resources to companies that can use it efficiently, and this means improving the allocation efficiency in the market and this made the companies with poor performance to withdraw the market. (Nahandi, 2013)

According to international expert organizations, developing countries such as Iran do not have a good level of transparency, the capital market is no exception, and it is necessary to take the necessary measures to improve information transparency (Aghaei, 2013). The ideal thought in the market is that neither the suppliers nor the demanders should allow their resources to commit crimes and spread corruption.

Information Quality

The accounting information quality can be defined as accuracy of financial reporting in operations and cash flows at for-profit corporation (Lee et al., 2010).

There are two general approaches for evaluating the financial reporting quality: user needs approach and the supporting investors and shareholders approach. In the user needs approach, the financial reporting quality is specified based on the usefulness of financial information (relevance and reliability). But in the supporting investors and shareholders approach, the financial reporting quality is mainly defined in terms of complete and fair disclosure to shareholders. In this regard, financial reporting quality is complete and transparent financial information that prevents misleading by creating ambiguity for users (Rahmani, 2002).

In most financial researches, the quality of accruals and more generally the earnings quality has been considered as a metric to measure financial reporting quality (Ismaili, 2006).

Managers are relatively free to recognize revenue and expense, some believe that accruals are the result of management's fearless actions in identifying, recording, and reporting events, and finally distorting financial statements. Many researchers believe that the earnings quality depends on the amount of cash and accrual components of earnings. financial statements Users are always in doubt to the reliability and usefulness of accruals; Because managers are able to use different accounting methods legally and within the accepted principles of accounting to change the company's earning and in line with their personal preferences, so identifying those accruals that affect the earning quality is difficult for investors and prevents them from accurately recognizing corporate earning quality. Therefore, their decisions based on poor-quality reported earnings may be slow.

Factors affecting information disclosure quality are (Rahmani, 2012):

Company Size: Big companies are more sensitive to political costs. Experimental findings confirm this claim. Big companies seek more and better information to reduce public criticism or government interference in their operations (Rafornier, 1995). Small companies, on the other hand, to feel that full disclosure of information could jeopardize their competitive position. Therefore, they disclose less and lower quality information.

Companies also improve their reporting practices and information disclosure quality over the time (Zheng 2013)

Audit Firm Size: Annual reports not only are audited, but also their content is influenced by auditors. Assuming such impact and the auditors' belief that their performance is judged by the quality of their annual reports, it big audit firms (which are less dependent on one or more of their clients) resist on more and better information in annual reports provided by their employers. In addition, audit firms are more likely to agree with the views of big audit firms. In contrast, small audit firms do not have the ability to influence their client disclosure procedures and try to meet the needs of clients in order to maintain them (Wallace et al., 2010).

Companies decide on the quality level of their financial reporting based on the cost-benefit of disclosing quality information. It may be thought that companies choose to provide the highest quality information possible, regardless of the cost of disclosing such information. But this is not the case, because disclosure of information imposes costs on the company, such as direct (non-proprietary) costs, legal and judicial costs, and proprietary costs, which are indirect costs of disclosure. According to these costs, companies choose an internal strategy for the level of quality of their financial reporting (Huang 2012)

Stock Returns

At the moment, the most important metric to evaluate the performance of institutions is the stock return. This metric alone contains information content for investors and is used to evaluate performance. Lack of this metric is an alarm and can disturb company's performance. This metric has a lot of information content, because evaluating the performance based on market value reflects investor information well. Returns are the driving force that motivates and rewards investors. Return refers to the total set of benefits that given to a share year on year (Ismaili et al., 2013).

Financial Leverage

Financial leverage reefers to the debt to total assets ratio. Financial leverage measures the overall debt of a company. These ratios reflect the company's ability to meet short-term and long-term commitments. These ratios are calculated by comparing fixed costs and earning (income statement) with linking debt to equity (balance sheet). Financial leverage ratios are important to lenders because they show that if the company's income cover fixed costs and interest or not, and if the company's assets are sufficient to repay the debts in the event of bankruptcy. If the loan and interest costs are excessive, the possibility of the company bankruptcy increases. The more predictable income and earnings, the more debt is acceptable (Leo, 2015)

Research Background

Darini (2014) studied the relationship between voluntary disclosure of financial information and assigning value of companies. This study aims to examine whether more disclosure of information by companies leads to greater valuation by investors. The data of 52 companies listed on the Tehran Stock Exchange during 2008 to 2012 have been used in this study. The results of the hypothesis testing show that more disclosure of information by companies leads to more valuation by investors.

Izadinia et al. (2014) compared Fama–French Three-Factor Model with Carhart Four-Factor Model in explaining the stock returns of companies listed on the Tehran Stock Exchange. In fact, this research is based on a four-factor model: Fama, French, and Momentum models. The study focused on the explanatory power of this model in the Tehran securities market from 2009 to 2011. In this study, multivariate regression method has been used to analyze the data; The results show that application of multi-factor models is more appropriate than one-factor model of capital asset pricing. Also, the results indicate that Carhart Four-Factor Model has no superiority over the Fama–French Three-Factor Model, where out of the four variables of market risk, size factor, value factor and tend to maintain recent trends (momentum), only risk and size variables affect stock returns.

Sabai et al. (2016) in their study entitled "the relationship between accounting information quality and capital cost" examined the correlation between accounting information quality and stock returns in companies listed on the Tunisian Stock Exchange. According to hypotheses testing, there is a significant negative correlation between the capital cost and the accounting information quality. Also, capital cost is positively affected by debt, equity returns and volatility.

Basilico et al. (2016) in their study examined the earning quality, corporate governance and future returns in European companies. This study aims to investigate the managers' optimistic behavior in financial reporting codification and its effects on investors (brokerage theory) through the relationship between earnings quality, corporate governance and future stock returns (efficient market hypothesis). The results of this study show that when earnings management is reduced, low pricing of accruals is still present in European countries (those with the highest number of institutional variables shows more earn earnings). While low pricing does not occur in all industries. Finally, the quality of corporate governance is important and is associated with higher quality and higher future stock returns.

Proti et al. (2016) in a study examined the metrics of earning quality and excess return. In fact, this study examined the relative ability of eight public earning quality metrics to describe future excess return. They ranked the criteria based on the amount of return earned from the portfolio. Using a sample consisted of American companies between 1988 and 2007, the findings show that market-based metrics (Earnings Response Coefficient, value proposition) are associated with higher accounting returns. Moreover, the quality of accruals and abnormal accruals perform better than stability, predictability and smoothing. These results are not justified by the capital cost effects and pricing anomalies. Finally, results suggest that high abnormal accruals and high smoothing may not indicate higher or lower earnings quality.

Research Methods

This is a development-applied research. This study is also qualitative in term of data collection. the research method was post-event. Research period was between 2009 and 2013.

To conduct this research, companies listed on the Tehran Stock Exchange were considered as a statistical population and a statistical sample was extracted from these companies.

The sample consisted of all companies that meet all of the following requirements:

- The fiscal year will end as scheduled on March 20.
- Keep clear of financial companies (such as banks, insurance companies) and investment companies.
- Companies have been listed on the Tehran Stock Exchange before 2002 and have been traded continuously,
- Also, the monthly price of their shares should be specified from July 2002 to the end of June 2013
- Do not change the fiscal year during the period under review (2003-2013).
- Their financial information is available.

By observing the above requirements, 200 companies were selected as sample size. Because some variables are calculated on these changes, the beginning and end years of the time period are exclused from the research and the data are included for a total of 1275 years. Table (1) shows the number of companies by industry and the percentage of companies related to the industry.

Table 1: Percentage of Industries of Sample Companies

Industry	No. Company	Percentage
Mining	13	5.09%
Pharmaceutical Materials And Products	23	9.01%
Mass Production	3	1.1%
Publish, Print And Reproduce	8	3.13%
A Variety Of Food And Beverage Products	23	9.01%
Industrial Contracting	4	1.56%
Wood, Cardboard, Paper And Packaging	8	3.13%
Technical Services	5	1.96%
Car And Parts Manufacturing	24	9.41%
Electrical Devices	12	4.70%
Other Non-Metallic Mineral Products	32	12.54%
Basic Metals	19	7.45%
Rubber	11	4.31%
Equipment And Plant	16	6.27%
Metal Products	13	4.70%
Chemical Materials And Products	43	16.86%
Total	255	100%

Data Collection Method

The library method was used for data collection. Data collection has been using the initial information of companies; That is, the information and data required were collected using Rahavard Novin Software and referring to the Tehran Stock Exchange Organization and studying the basic financial statements of companies listed on the Tehran Stock Exchange during the years 2009-2013. in addition to studying the basic financial statements, information about the financial statements from the stock exchange information site has been used.

Research Hypothesis

There is a significant relationship between the accounting information quality and return forecasting.

Operationalizing Definitions of Research Variables

Financial Reporting Quality

The quality of working capital accruals is considered as a substitute for financial reporting quality of. The accruals quality was calculated by the Dijau and Dijo model (2002).

Return Forecasting: In this study, Fama and French models were used to measure this variable.

Fama–French Three-Factor Model

Fama and French finally presented the three-factor model, the size and book-to-market ratio based on their findings in 1992, using the CAPM model and previous studies.

They designed a multivariate regression to examine the factors affecting portfolio performance (Fama and French, 1993). Fama and French presented the following equation using the CAPM model

$$E(R_i) - R_f = b_i\left(E(R_M) - R_f\right) + s_i \times E(SMB) + h_i \times E(HML) \quad (1)$$

Where, $E(R_i)-R_f$ is excess return to risk-free rate. This excess return is related to three factors. The first factor is market risk, which is the same beta factor provided by CAPM. This factor is measured through (R_M-R_F) and market factor is shown with MKT in the equation presented by Fama and French.

The second factor is the difference between the stock portfolio rate of return of small companies and the stock portfolio of large companies, which is called the size factor and is represented by SMB.

$$SMB=\frac{(S/L+S/M+S/H)}{3}-\frac{(B/L+B/M+B/H)}{3} \quad (2)$$

S / L: Corporates that are small in size and have a low book-to market ratio.
S / M: Corporates that are small in size and have a moderate book-to market ratio.
S / H: Corporates that are small in size and have a high book-to market ratio.
L / B: Corporates that are big in size and have a low book-to market ratio.
B / M: Corporates that are big in size and have a moderate book-to market ratio.
B / H: Corporates that are big in size and have a high book-to market ratio.

The third factor is the difference between the average stock portfolio rate of return at companies with high book- market ratio and the stock portfolio of companies with low book-market ratio, commonly referred to as the value factor and denoted by HML.

$$HML=\frac{(S/H+B/H)}{2}-\frac{(S/L+B/L)}{2} \quad (3)$$

Finally, Fama and French presented the regression equation in 1993 to stock returns forecasting in their three-factor model as follows:

$$R_i-R_f=a_i+b_i\times MKT+s_i\times SMB+h_i\times HML+\varepsilon_t \quad (4)$$

In this equation, ai is the average abnormal stock return i, which is assumed to be zero in the hypothesis of the capital asset pricing model.

h_i, s_i , b_i indicates the market factors, size and portfolio value i, respectively.

ε_i is the expected return of portfolio, with a mean of zero

Paying attention to the above-mentioned issues and model number (4), Fama and French stock return forecasting is examined; The results can be seen in the form of the following regression model.

$$0.0065\ HML_{it}-\ 0.11\ SMB_{it}\ +\ 0.23\ MKT_{it}-2.31\ -R_i\ -R_f=$$
(-12.07) (-2.303) (8.11) (-1.74)

This estimation model involves in the final model in the form of a variable.

Accounting Information Quality

Financial reporting quality index is based on the Ditchoff and Dicho model (DD) and Francis. This measure is based on the approach proposed by Ditchoff and Dicho (2002) and Francis (2005). According to this approach, earning quality first is determined by accruals quality, as accounting earning can be represented as the sum of operating cash flows and accruals. There is an assumption that accounting accruals forecast future operating cash flows, and reflect current cash flows or return of past cash flows. Measurement error in determining accruals can potentially distort the ability of accruals to predict future cash flows or to reflect past and present cash flows. The main idea of Ditchoff and Dicho (2002) was to

determine the extent of this measurement error in the design and estimation of accruals and cash flows. The variance of this measurement error can be considered as an inverse measure of earning quality. According to Francis et al. (2005) and McNicholas (2002), the calculated size for earning quality can be improved by controlling two important determinants of accruals: sales revenue growth and the tangible fixed assets (property, plant and equipment). forgave. Therefore, Equation (5) is used to measure financial reporting quality:

$$TAC_{it} = \alpha_0 + \alpha_1 CFO_{it-1} + \alpha_2 CFO_{it} + \alpha_3 CFO_{it+1} + \alpha_4 \Delta REV_{it} + \alpha_5 PPE_{it} + \varepsilon_{it} \quad (5)$$

TAC is Total accruals, CFO cash flows, AREV recent revenue change, PPE Gross amount of property, plant and equipment. Total current accrual is obtained from Equation ((2).

$$TAC_{it} = \Delta AC_{it} - \Delta LC_{it} - \Delta ACSH_{it} + \Delta STDEBT_{it} \quad (6)$$

AAC changes in working capital, ALC changes in corporate liabilities, AACSH changes in cash balance, ASTDEBT change in corporate short-term financial facilities

Cash flows are obtained from Equation (7).

$$TAC_{it} = \Delta AC_{it} - \Delta LC_{it} - \Delta ACSH_{it} + \Delta STDEBT_{it} \quad (7)$$

NIBE is Profit after net financial items, TAC Total accruals, DEPN is Depreciation Expenses.

According to Equation (5), if the accruals quality is high, then accruals can reflect a major change in current, past and future cash flows, and as a result the firm-specific balance (ε_i) in Equation (5) is the basis for the quality of the interest earned. Forms in this research. Specifically, the profit quality index is defined as the standard deviation from the company's residuals. The higher the standard deviations of the residuals, the lower the accruals and the lower the quality of the return.

According to the aforementioned explanation and model number (5), the financial reporting quality of examined, the results are shown in the following regression model:

$$TAC_{it} = \underset{(18.20)}{280673} - \underset{(-31.19)}{0.744 CFO_{it-1}} + \underset{(0.67)}{0.011 CFO_{it}} - \underset{(-1.67)}{0.021 CFO_{it+1}} - \underset{(-12.34)}{6120 PPE_{it}} - \underset{(-8.39)}{36486 \Delta REV_{it}}$$

To calculate financial reporting quality, accruals quality index has been used. Error values in estimating pattern number (5) provide an index for calculating the poor quality financial reporting. Obviously, by multiplying the positive values of the errors by -1, it can be used as an index to calculate financial reporting quality.

Research Regression Model

$$R_{it} = \beta_0 + \beta_1 EQ_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \quad (8)$$

Where,

R Stock return forecasting

EQ is Financial Reporting Quality

Size is Natural logarithm of book value of total asset

LEV is the ratio of total liabilities to total corporate assets

Data Analysis Method

Excel and Eviews8 software were performed for calculations and statistical analysis. In order to test the research hypotheses, regression and correlation analysis are used. The significance of the models was measured using coefficient of determination (R), correlation coefficient and t-statistic.

Results

Descriptive Statistics

A summary of the characteristics of the variables used in this study is summarized in Table (2).

Table 2: Summary of Descriptive Statistics of Research Variables

	EQ	R	LEV_TRM	SIZE_TRM
Mean	-3.498646	-1.493960	1.758958	11.83464
Median	-2.876089	-0.645000	1.508698	12.77116
Maximum	-0.017151	1.68000	7.399167	17.86500
Minimum	-9.993803	-123.1400	0.354579	4.870006
Standard deviance	2.464179	4.713358	1.083337	3.243176
Skewness	-0.853147	-16.32127	2.808765	-0.893081
Kurtosis	2.874691	3.717279	13.13391	2.780682
Total	-4460.773	-1903.305	2242.671	15089.17
Observance	1275	1275	1275	1275

Source: Research Findings

Data is winsorized at the 1% level; i.e, data over 99% and less than 1% are deleted and replaced by data at 1% and 99%. The effect of outlier data has been controlled to some extent.

- Model Estimation, Study of The Effect of Financial Reporting Quality On Stock Return Forecasting in Stock Companies

To estimate the model, we first use the Chow and Hausman test to determine the appropriate estimation method for this model. In the calculations performed by Eviews8, the test results are shown to investigate the fixed and random effects.

Table 3 - Results Related to The Probability Effects Test

Test	Statistic	Possibility
F Statistic	1.121040	0.1182
Chi-Square	3.758398	0.1956

Source: Research Findings

The P - value of Chow's statistics is equal to 0. 11 and as a result the integrated data estimation method is accepted. Therefore, the data examined in these companies are pool type.

Table 4: Results Related to Model Estimation

Variable	Abbreviation	Coefficient	t-statistic	Prob.
Financial Reporting Quality	EQ	0.051443	5.850416	0.0000
Financial Leverage	LEV_TRM	-0.067141	-2.486718	0.0131
Size	SIZE_TRM	-0.016283	-3.213495	0.0014
Intercept	C	-1.239338	-14.96247	0.0000
Coefficient of determination	R_Squared	0.402255	-	-
F statistic	F_Statistic	3.660393	-	0.0000

Source: Research Findings

The results show a positive and significant relationship between financial reporting quality and stock return forecasting. with increasing of reporting quality, the company's stock return forecasting increases. According to research hypothesis, significant relationship between reporting quality and stock return forecasting is confirmed.

The results show that there is a negative and statistically significant relationship between financial leverage (debt ratio) with the stock returns forecasting. higher debt ratio in companies, the probability of stock returns forecasting in companies is lower.

The results show a negative and significant relationship between company size and stock return forecast, i.e. the larger the company size, the probability of stock returns forecasting is lower.

The coefficient of determination R2 is 0.40 and indicates that the independent variables explain 40% of the dependent variable. The significance level of F statistic is 0.000, which indicates the overall validity of the model at a confidence level of 99%.

To control the variance heterogeneity problem when using panel data, the generalized least squares method in the context of seemingly unrelated spatial regressions has been used, so there is no autocorrelation and variance heterogeneity problem in the model under study.

Conclusion

This study aims to investigate the significant relationship between the accounting information quality and return forecasting in companies listed on the Tehran Stock Exchange. Fama–French Three-Factor Model (1993) was used for stock forecasting, like many studies, the accrual quality metric was used to measure accounting information quality. In addition, the statistical population of this study consisted of companies listed on the Tehran Stock Exchange. 250 companies were selected as a statistical sample in the period between 2009 and 2013 (a total of 1275 years of the company) and the data were collected and analyzed. The results of accounting information quality have a positive and significant relationship with stock returns forecasting. There is a significant relationship between accounting information quality and return forecasting in companies listed on the Tehran Stock Exchange. The results also show that there is a positive and significant relationship between the financial reporting quality of returns forecasting.

According to the results, there is a significant positive relationship between accounting information quality and return forecasting in companies listed on the Tehran Stock Exchange. Therefore, it can be expected that the return forecasting will increase as the accounting information quality increases. According to the financial results, increasing financial reporting quality leads to increased investor awareness about operating information. According to the efficient market hypothesis, this information is expected to be reflected in the stock price, then, the possibility of fluctuations forecasting in the unconventional stock returns will increase.

Based on the research findings, the managers and officials of the Tehran Stock Exchange and Securities Organization are recommended to take practical solutions to reduce the problems of agency, profit management and improve future returns forecasting and have more control over the auditing quality.

- Investors in the stock market are recommended to pay serious attention to the accounting quality metrics (audit firm size, the auditor's expertise in the industry and the continuity of the auditor's selection) when buying shares of different companies because one of the effective factors in is presenting reporting financial to market and independent auditor.

In conclusion, accounting quality reduces information asymmetry between different stakeholder groups, it is suggested that the relationship between audit quality and borrowing costs be examined. It is also suggested to examine the effect of accounting quality and borrowing rate. Also, it is better to conduct other studies on the effect of accounting quality using other metrics such as auditor's independence and comments.

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