"Evaluating the effect of accruals quality, investments anomaly and quality of risk on risk premium (return) of stock of listed companies in Tehran Stock Exchange"

AUTHORS	Seyed Kazem Ebrahimi Ali Bahrami Nasab Mehdi Karim

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SECTION 1. Macroeconomic processes and regional economies management

Seyed Kazem Ebrahimi (Iran), Ali Bahrami Nasab (Iran), Mehdi Karim (Iran)

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Abstract

Nowadays, reaching to economic goals in any society requires public participation, which is only the result of people participation. Investment in stock market is one of people participation methods. So, awareness from stock return and its affecting factors is one of anxieties of investors and owners of shares. In this research, authors evaluate the effective factors on stock return using Fama and French models. So, authors study the effect of some factors including accruals quality, anomalies of investments, size factor, market's risk premium factor, and book equity to market equity factor, on stock's risk premium which is representative of stock returns, in 70 listed companies in Tehran stock exchange from 20 March 2003 to 20 March 2014. Results showed that accruals quality and quality of risk have meaningful effect on risk premium, which is representative of stock returns. Results also show that investment anomaly has no meaningful effect on risk premium and, consequently, on stock returns.

Introduction

One of the key factors in investment deciding is specifying the effective factors in explaining the behavior of stock returns. For this reason, researchers in accounting field already are trying to find the effect of various factors on stock returns of companies to predict the future stock returns of companies using it.

In one of the most important studies carried out by Fama and French (1992), by summarizing the previous experimental findings, the relationship between beta variables, company size, book equity to market equity ratio, financial leverage, and dividend to stock price ratio with expected stock return were studied and it was concluded that systematic risk (beta) on his own cannot explain all differences in stock returns. And it was found that among evaluated variables, both "company size" and "book equity to market equity ratio", variables could better explain the difference in average stock returns.

Fama and French by proving that the above two variables are able to describe the completed regression, claimed that they could show the effect of them by forming two baskets named SMB and HML.

Nowadays, the "common stock return" is one of principal factors in deciding in exchange. Investors in capital market are searching for high yielding stocks, and also tend to decrease their investment risk, so it seems that one of the most basic methods for this is investment in a collection of securities (portfolio), because it is more efficient than investment in only one share. In fact, by increasing the number of shares in portfolio, and in condition of non-decreasing the stock return, the risk of whole collection decreases (the causes of decreasing risk are various economic, political and social situations which effect on investee companies). But it should be avoided to believe in ability to completely remove the risk.

It is obvious that there are several factors which effect on stock return and could be used by investors and other stakeholders in predicting stock return. But it should be noted that it is possible that using any of these factors simultaneously has no unique effect on stock return. In other words, it is possible that the effect of some of the above risk factors on stock return will be similar. So, there is no need to certainly use them simultaneously in prediction, because using one of them has the same result. Findings of this study may help investors in choosing a portfolio with highest earnings.

1. Literature

One of the factors covering information risk is accruals quality. A main part of information is about cash flows provided with profit, and cash flows calculates by profit minus accruals. In fact, accruals are defined as the items which postpone logging earnings and costs,

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Seyed Kazem Ebrahimi, Assistant Professor in Department of Accounting, Economics, Management and Administrative Sciences, Semnan University, Semnan, Iran.
Ali Bahrami Nasab, Accounting Teacher of Department of Accounting, Economics, Management and Administrative Sciences, Semnan University, Semnan, Iran.
Mehdi Karim, Accounting Student of Master Degree in Department of Accounting, Economics, Management and Administrative Sciences, Semnan University, Semnan, Iran.

or we can introduce it as a cash transformer to another time. Generally, accrual component of profit to its cash component may be specified with higher unreliability, because accruals are created by taking attention to judgments and estimates (from cash flows created in other periods), while the cash component of profit is more objective. By taking attention to previous studies on quality properties of profit, the accruals quality is found to be more suitable for specifying the information risk than cash flows. So, the accruals quality decreases the asymmetric information, which caused information risk (Rahmani and Fallah, 2010). Although accruals in time passing make changes or adjustments in identification of cash flows, and these adjusted items (profit) better evaluate company's operation, often accruals are based on assumptions and estimates, which (if wrong) should be corrected in accruals and future profit. For example, if net income from a claim was lower than primary estimate, the next recording also shows receipt of cash and corrects the estimate error.

Company's quality of earnings (in this study, the accruals quality is its representative) is effective on company's return, because awareness of low reported earnings of a company results in lack of interest in investors, and finally decreases its stock return.

The other effective factor on risk premium and, finally, on return, which is revealed in this study, is investment on fixed assets, which is calculated using changes in gross estate, machineries, and equipment in addition to inventory. The goal of this work is to evaluate the investment in long term properties (e.g., building, machinery, equipment, furniture and other types of estate) and, finally, to assess it on risk premium and stock return, which is one of the goals of this study (Lyandres Sun and Zhang, 2008).

One of the important topics about capital market is awareness about the value of company's risk, specifically, systematic risk, which could play an important role in deciding, because it was believed that the stock return of companies is a function of systematic risk, and systematic risk explains the changes in return rate of a share to return share of whole market. Investors in capital market are trying to invest in situation which gives them maximum return, so they take attention to investment risk. It seems that there is a type of relationship between risk and return. The higher risk, the higher is the return. So, investor must note to this relationship, but it does not mean that accepting high risks always results in higher return. It is obvious that awareness of the relation between risk and return of accruals helps investors to decide more suitably in the future. Also in this study we used return diversity risk and accruals premium for return to evaluate the relationship between them (Ali and Ali, 1995).

2. History

Sloan (1996) in evaluating the relationship between accruals and stock return concluded that companies with high accruals have low stock return. It means that there is an inverse relationship between volumes of accruals with stock return. Shi et al. (2007) for justifying this relationship explained the irregular accruals by taking attention to the hypothesis of biased attitude toward earning. In their viewpoint, sometimes irregular accruals results in latency in considering the information related to levels of company's accruals for pricing stock, according to the hypothesis of biased attitude to earnings of irregular accruals made from investors' prejudice about reported earnings.

Potential relationship between external financing of irregular accrual, first studied by Richardson, Sboan and Soliman (2005) and the results showed that there is a negative relationship between financing activities of company and future stock return, and this negative relationship is made as a result of existence of irregular external financing. This relationship is true for every external financing activities.

Francis et al. (2005) evaluated the relationship between accruals quality and the cost of debt and shareholders' equity. They showed that the companies having suitable accruals quality have lower cost of capital. Chan et al. (2006) evaluated the relationship between accruals (difference between earnings and cash flows) with future stock return, and showed that in a company with high accruals in the next financial reporting period, the stock return will decrease. One interpretation of these findings is that the companies with low earning quality (companies with high accruals) will get drop in return in the period after earning reporting. Another interpretation is that investors become aware of low earning quality of companies and, then, adjust stock price suitable for it. They repeated the study on subject by separating components of accrual and also categorizing based on arbitrary and non-arbitrary figures and obtained similar results.

Also, in recent years, Demirer and Jategaonkar (2013) found a positive and meaningful relationship between diversity and efficiency. In other research, Maio and Philip (2013) found that micro-economic variables which are cause of risk and are based on pricing equity, could better explain the macro-economic variables. In other research, Jiang (2010) found that both level and changes in dispersion predict future stock return.

Ashiq et al. (1999) in their study understood that there is a negative relationship between accruals and current profit with next year's stock return, which is

stronger for larger companies. Also this relationship was weaker for smaller companies, so probably these companies have lower worry level for market investors. This study showed that there is no strong relationship between accruals and future return, which is dependent to company size or other criterion related to partnership of professional market investors. Lev and Nissim (2004) by evaluating the stability of accruals showed that the negative relationship between accruals and future stock return by taking the assumption of lacking of performance in market results in finding these relationships by individuals and using opportunities for arbitrage and gain benefit. They showed that these conflict existed in previous decade and did not decreased, but because of turnover and cost of information for using accruals, the speed of reaction made by individuals is not high.

Kan et al. (2010) evaluated the relationship between sums of accruals with future return. Their results show that discretionary accruals have positive relationship with future market return, but the forecasting power of sums of accruals with factors like return criterions, estimation methods, risk premium indexes and models used for separating accruals has a strong relationship.

Dastgir et al. (2012) evaluated the relationship between accruals and cash components of profit with stock return and dividend. Results of research showed that there is a direct and meaningful relationship between accruals and cash components of profit with stock return and dividend. Qaemi et al. (2008) in their research entitled "Quality of earnings and stock return" showed that there is a direct relationship between discretionary accruals and stock return, while there is an inverse relationship between non-discretionary accruals and stock return.

In continuation of study by Francis et al. (2005), the required evidences did not provide for proving that the accruals quality is an information risk factor. In continuation, they evaluated the effect of accruals quality on risk premium of investment portfolios using two-step sectional regression of Fama and Macbeth, to evaluate the related information risk. Using these tests, they did not find any evidence which indicates that accruals quality is a risk factor in information. Mouselli and Jaafar evaluated the effect of accruals quality on risk premium of companies listed in London exchange and related information risk. Their findings showed that companies with low quality accruals have higher efficiency than companies with high quality accruals.

Dastgir and Rastegar (2011) evaluated the relationship between quality of earning, size of accruals and stock return with accruals quality. They specified quality of

earning using Dechow and Dichev model. Results of their study showed that quality of earning has a direct relationship with accruals quality. Also they found that by increasing the accruals quality and increasing the size of accruals, the stock return increases.

Lee and Xiao (2011) in studying the investment in properties found that investing in these properties helps companies to decrease their risk or increase their performance. The logic of this reasoning is that a capital consumer company could benefit from cost saving by converting main part of capital to tangible assets. This advantage may become more highlighted in economic downturn, because in these intervals, having cost saving becomes more important for maintaining companies or decreasing negative effects on profitability. This subject is justifiable by taking attention to the fact that costing was carried out in previous, but now is used for making income, and there is no need to further use of cash and, on the other hand, the deprecation cost acts as a tax shield and prevents from consuming the cash.

Ogneva (2015) in a study evaluated the effect of accruals on return with and without payment shock. He used an asset pricing model for specifying the additional return based on quality of accruals. This pricing model is used with considering the non-shocked return of cash flow and standard of Dechow and Dichev. The stock with low quality of accruals in average experiences more negative oscillations. It means that the stock with lower quality of accruals experiences more negative cash flow shock. Therefore, the quality of accruals has a direct relationship with cash flow shock. By removing the return with shock of cash flow from achieved return, the return without shock of cash flow has inverse relationship with quality of accruals.

Chichernea et al. (2014) evaluated the relationship between systematic risk and accruals and investments. They found that the companies with lower accruals and lower investments have higher risks.

Drakos (2016) divided the portfolio return of investments in two smaller and larger groups and concluded that in short term and long term there is delayed effect between size and return of portfolios.

The delayed effect may also be considered as relationship between inflation and price of merchandise. Although it is logical to believe that increasing in raw material (like oil) price will result in increasing the price of final products, the inflation process always does not continue by this way, and based on the special conditions of the market, sometimes inflation goes forward or backward. So, we cannot easily conclude that today's inflation of raw material results in future inflation of final products price.

3. Hypotheses

1. There is a meaningful relationship between accruals quality and risk premium of companies listed in Tehran Stock Exchange.
2. There is a meaningful relationship between investments anomaly and risk premium of companies listed in Tehran Stock Exchange.
3. There is a meaningful relationship between quality of risk (investment diversity) and risk premium of companies listed in Tehran Stock Exchange.

4. Method

This is an experimental study in demonstrability research area of accounting and is based on real information of financial statements of companies, and also is from correlation type and based on data collection method is a descriptive research. Methodology of research is ex-post facto, but because it may have applications in using information, it is an applied research.

Two methods used in this study for data collecting including library research and field research. In library research, the information is obtained by referring to books and articles and various internal and external resources existing in libraries of universities, and Stock Exchange Organization, and Internet, and also by study and evaluation of existing thesis in the field of this study. In field research, the data collection is carried out by obtaining information of companies listed in Tehran Stock Exchange using various resources including informative CDs of Stock Exchange Organization and also "Rah Avard Novin" software.

5. Sample selection

1. For obtaining a homogeneous statistical sample in evaluation interval, the companies listed in exchange before 21 March 2009 were selected.
2. To increase the comparability, their financial period must end in March.
3. They should not change their activity type in evaluation time interval.
4. In evaluation time interval, the stock of company must be dealt and no more than 6 month stop in dealing on the stock happened.
5. The company should not be one of financial intermediating, leasing, banks or insurance types.
6. Because of using adjusted model of Jones and need in high amount of data, the small industries are removed from the sample.

Based on the prescribed criteria, 70 companies listed in Tehran Stock Exchange are selected and research on the sample is carried out from 20 March 2009 to 19 March 2014. All required data are extracted from Tehran Stock Exchange website and Rah Avard Novin software.

6. Research modeling

In this research, for determining the accruals quality (AQ), investment anomalies (I/A) and investments risk (RD), it was required to separately calculate for sample companies based on quality of every accrual, investment quality and risk measurement criterion. In the following, the measurement criterion of each of three above criterions will be described.

7. Accruals quality

In this research, the diagnostic criterion of companies' accruals quality is absolute value of numeric value of discretionary accruals (the ahigher (lower) was absolute value the weaker (better) is the company's accruals quality). For estimating the discretionary accruals, the corrected Jones model (Dechow et al., 1995) was used. However, by taking attention to the corrected Jones model, a sectional model used for maximizing the sample size and preventing from inherent bias of models based on accruals (DeFond and Subramanyam, 1998 and Peasnell et al., 2005). Results of Bartov et al. (2000) research showed that sectional model's performance in specifying the earning management is better than models based on accruals. In his study, Subramanyam (1996) also concluded that estimation of the same coefficients in the similar model is more precious, and it is because of more operational freedom in sectional model. In this research, by taking attention to the existing researches, for calculation the total current accruals, we focused on its voluntary components. So, the total current accruals for company i in year t is calculated as equation (1):

$$TCA_{it} = \left(\Delta CA_{it} - \Delta Cash_{it} \right) - \left(\Delta CL_{it} - \Delta STDebt_{it} \right), \quad (1)$$

where TCA_{it} = total current accruals of company i, in year t.

ΔCA_{it} = changes in *current assets* of company i, in year t.

$\Delta Cash_{it}$ = change in cash of company i, in year t.

ΔCL_{it} = change in current liabilities of company i, in year t.

$\Delta STDebt_{it}$ = change in received financial facilities of company i, in year t.

For calculating the discretionary accruals in certain observation of company year, first coefficients are obtained using equation (2) using ordinary least squared method for all companies in year t (for homogenization, the variables are divided on sum of assets):

$$\frac{TCA_{it}}{TA_{it-1}} = \alpha_1 \left(\frac{1}{TA_{it-1}} \right) + \alpha_2 \left(\frac{REV_{it}}{TA_{it-1}} \right) + \varepsilon_{it}, \quad (2)$$

where TA_{it-1} = total assets of company i in year (t-1).
ΔREV_{it} = change in operational income of company i, in year t.
ε_{it} = remainder of equation equal to discretionary accruals of company i, in year t.

After estimating coefficients, non-discretionary accruals are calculated using equation (3) as follows:

$$NDAC_{it} = \alpha_1 \left(\frac{1}{TA_{it-1}} \right) + \alpha_2 \left(\frac{REV_{it} - AR_{it}}{TA_{it-1}} \right), \quad (3)$$

where $NDAC_{it}$ = non-discretionary accruals of company i in year t.

$$\left| DAC_{it} \right| = \left| \frac{TCA_{it}}{TA_{it-1}} - NDAC_{it} \right|, \quad (4)$$

where $\left| DAC_{it} \right|$ = discretionary accruals of company i in year t.

8. Investment anomalies

In this research, in accordance with researches of Lyandres et al. (2008) and Wu (2010), we measured the diagnosis criterion for investment anomalies using equation (5), which, in accordance with accruals quality, evaluates its effect on risk premium. In this model, long term investment is represented by machinery, assets and equipment. The long-term investments are investments used in several financial periods of company including investment in buildings, machinery and furniture.

Also the inventory is as representative of real short-time investment used in ordinary operation cycle of company, including investment in raw materials, under production merchandise and supplies.

$$\frac{I}{A_t} = \frac{(\Delta PPE\_Gross_t + Inventories_t)}{TA_{t-1}}, \quad (5)$$

where $\frac{I}{A_t}$ = quality of investment anomaly of company i in year t.
ΔPPE_Gross_t = gross of estate, machinery and equipment.
$\Delta Inventories_t$ = changes in inventory of company i in year t.
ΔTA_{t-1} = sum of asset of company i in year t.

9. Stock risk

The criterion of measuring the next variable which made a fundamental for us in monthly portfolio making, and using it and two prescribed variables we will make portfolio for companies' stock, in accordance with equation (6). We used

monthly information from Stock Exchange and monthly variance of stock return of companies for measuring it, according to like studies of Jiang (2010), and Stivers and Sun (2010).

$$RD_t = \sqrt{\frac{1}{n-1} \sum_{i=1}^{n} \left(R_{i \cdot t} - R_{M \cdot t} \right)^2}, \quad (6)$$

where RD_t = criterion of measuring risk of company i in year t.
n = the number of stock of company i in year t.
i = stock return of company i in year t.
R_M = weighted average of market return in year t.
R_M is the monthly return of market in year t, which is calculated from the following equation:

$$R_{M \cdot t} = \frac{I_t - I_{t-1}}{I_{t-1}},$$

where I_t = total price index in end of period t.
$R_{i \cdot t}$ = equal to monthly stock return of companies, which is calculated by the following formula:

$$R_{i \cdot t} = \frac{D_{i \cdot t} + P_{i \cdot t} \left(1 + X_{i \cdot t} + C_{i \cdot t} \right) - (P_{i \cdot t-1} + M_{i \cdot t} X_{i \cdot t})}{P_{i \cdot t-1} + M_{i \cdot t} X_{i \cdot t}},$$

where $D_{i \cdot t}$ = dividend of every share i in the end of period t.
$P_{i \cdot t}$ = price of stock i in the end of period t.
$X_{i \cdot t}$ = capital increase percent from receivables and cash stock i in the end of period t.
$C_{i \cdot t}$ = capital increase percent from reserve stock i in the end of period t.
$M_{i \cdot t}$ = nominal amount paid by investor for capital increase from receivables and cash for share i.

Stock return is calculated in accordance with prescribed formula and using "Rah Avard Novin" software which exists in Stock Exchange Organization's library, and transferred to the current study.

10. The method of building portfolio for variables

Now, by determining the accruals quality, investments quality, and risk measurement criteria for year t in end of every year, the sample companies categorized to 5 groups based on accruals quality, investments quality and calculated risk quality. The group (1) contains companies with highest accruals quality, investment and calculated risk, and group (2) contains companies with lowest quality of calculated items.

Finally, for 3 variables, with their calculation method previously scribed, portfolio is created and specified as follows:

The accruals quality (AQ) factor in this study equals to the difference between monthly weighted average of return between two groups (1 and 2) and highest accruals quality (lowest absolute numerical value of discretionary accruals) and two groups (4 and 5) with lowest accruals quality (highest absolute numerical value of discretionary accruals).

On the other hand, specifying the investments quality (I/A) and risk (RD) also first requires the categorizing of sample companies to 5 groups based on investments quality and calculated risk in accordance with equations (5) and (6) for every company. For this, in the end of financial year of sample companies, they are categorized to 5 groups based on value of investments quality and risk. The group (1) is for companies with highest quality and group (5) is for companies with lowest quality. After categorizing companies based on investments quality and risk, these two variables will be calculated like accruals quality in the order following:

The investments quality and risk factor are equal to difference between the monthly weighted average between two groups with highest investments and risk quality (1 and 2) with two groups with lowest investment and risk quality (4 and 5).

In the following, for calculating two other variables of Fama and French (1993) model including company size factor (SMB_t) and rate of company's book equity to stock market equity factor (HML_t), the companies are categorized as follows:

In the end of each financial year, all sample companies on that year are sorted based on market equity, and separated from the mean point to two portfolios of big size companies (B) and portfolio of small size companies (S); in such a way that every portfolio contains about 50% of companies. In the next step, the companies in every portfolio are rated based on ratio of book equity to stock market equity, and categorized in three groups, which includes: top 30% (H), average 40% (M) and low 30% (L). So all of companies are included in six portfolios as follows:

Table 1. Portfolios

Ratio of book equity to market equity / Market equity	H	M	L
S	S/H	S/M	S/L
B	B/H	B/M	B/L

where SMB_t = company size factor, which is calculated using the following equation (7):

$$SMB_t = \frac{S/L + S/M + S/H}{3} - \frac{B/L + B/M + B/H}{\tau}, \quad (7)$$

where SMB_t = company's book equity to stock market equity factor in year t, which is calculated using the following equation (8):

$$HML_t = \frac{S/H + B/H}{2} - \frac{S/L + B/L}{2}. \quad (8)$$

It is worth noting that categorizing companies in portfolios for all of the variables was based on financial year, but calculating the return's weighted average of these portfolios was monthly and carried out using monthly return of companies.

The next variable in regression equation of market's risk premium factor was the β factor introduced by CAPM model. This factor is measured using $(R_M - R_F)$ and the regression formula presented by Fama and French, named market factor and showed using MKT abbreviation.

In this study, the interest rates on government bonds are used as risk free return rate (R_F). During 20 March 2009 – 19 March 2014 interval, this rate was calculated as follows:

Table 2. Interest rates on government bonds

Year	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Rate (i)	15.5	16	18	19.5	20

From the fact that profit of these bonds payment is seasonal, so the real interest rate is higher than nominal interest rate. The real interest is calculated from equation (9) as follows:

$$R_F = \left(\left(1 + (\frac{i}{4}) \right)^4 - 1 \right). \quad (9)$$

Also because of monthly calculation of portfolios' return, and the fact that risk free return rate is yearly, so the calculated rate in equation (9) is divided by 12.

11. Dependent variable

The dependent variable in this study is stock risk premium of sampled companies ($R_{j,t} - R_{F,t}$), which are obtained from weighted average stock return of companies ($R_{j,t}$) minus risk free return ($R_{F,t}$). The weighted average stock return of companies is calculated using the following equation (10):

$$R_j = \sum_{j=1}^{n} W_j X_j, \quad (10)$$

where X_j is stock return and W_j is weight of share j in portfolio which is calculated using the following equation (11):

$$W_j = \frac{P_j}{\sum_{j=1}^{n} P_j}, \qquad (11)$$

where P_j = total market equity of released stock and available in stock exchange for company i.

1.2. Research models. For testing hypotheses of study, three regression models described below were used. This regression model introduced by Fama and French in 1993 to which we added three variables for testing research hypotheses, including accruals, investments anomalies and risk. All of its variables were previously described, and in this stage only the principal models are introduced as follows:

$$R_{j,t} - R_{F,t} = c_j + b_j\left(MKT_t\right) + s_j\left(SMB_t\right) + $$
$$+ h_j\left(HML_t\right) + a_j\left(AQ_t\right) + _{j,t}, \qquad (12)$$

$$R_{j,t} - R_{F,t} = c_j + b_j\left(MKT_t\right) + s_j\left(SMB_t\right) + $$
$$+ h_j\left(HML_t\right) + i_j\left(I/A_t\right) + _{j,t}, \qquad (13)$$

$$R_{j,t} - R_{F,t} = c_j + b_j\left(MKT_t\right) + s_j\left(SMB_t\right) + $$
$$+ h_j\left(HML_t\right) + r_j\left(RD_t\right) + _{j,t}, \qquad (14)$$

where $R_{j,t} - R_{F,t}$ = Risk premium of samples companies, which is calculated as weighted average stock return minus risk free stock return.
MKT_t = market's risk premium.
SMB_t = company size factor.
HML_t = book equity factor.
AQ_t = accruals quality factor.
I/A_t = investment anomaly factor.
RD_t = risk quality factor (return diversity).

1.3. Findings. *1.3.1. Descriptive statistics.* Table 3 shows the results of descriptive statistics of research variables.

Table 3. Results of descriptive statistics of research variables

Variable	Variance	Average	Mean	Maximum	Minimum
Book equity to market equity rate	4.374311	-0.520050	0.091042	6.787685	-13.122610
Market's risk premium	0.369670	-0.136543	-0.028740	0.286773	-1.627215
Accruals quality (A)	17.217030	13.441510	7.735767	78.143980	0.366873
Company size (S)	0.644506	0.441189	0.596741	1.474086	-2.031330
Stock's risk premium	6.018739	5.566673	3.951572	29.791090	0.009304
Risk quality	28.324730	9.342192	5.026051	119.768400	-46.474240
Investments quality	17.263150	-0.259441	2.499581	34.519600	-62.053380

By taking attention to the presented results and the above descriptive statistics, which have difference between mean and average, it must be said that this difference is because of difference and oscillation in monthly return of available companies in portfolio, and is a justified matter, and was seen in previous studies.

1.3.2. Inferential statistics. In this research, for testing hypotheses it is required to do diagnostic F-Limer tests and, then, if required, the Hausman test, to specify the type of pattern estimation method. Results are showed in Table 4.

F-test shows H_0 hypothesis which uses consolidated data against H_1 hypothesis, which uses panel data. By taking attention to the obtained significance level from Table 4, the result of test shows that

using consolidated data for hypotheses is more suitable. So, there is no need to use Hausman test, and after presenting autocorrelation between variables, we will estimate the models and test hypotheses.

Table 4. Results of F-Limer test (similarity of intersecting intercept)

Zero hypothesis (H_0)	Test Model	Statistic	P-Value	Result
All of sections are equal	Hypothesis 1 model	0.984967	0.474200	Zero theorem accepted
	Hypothesis 2 model	1.203045	0.313300	Zero theorem accepted
	Hypothesis 3 model	1.329440	0.241000	Zero theorem accepted

In Table 5, the alignment between variables explained and this problem was analyzed:

Table 5. Alignment between variables

Variables	Stock's risk premium (Y)	Book equity to market equity ratio (H)	Market's risk premium (M)	Company size (S)	Accruals quality (A)	Investments quality (I)	Risk (R)
Stock's risk premium (Y)	1	0.3083	0.223873	0.5513	0.469	-0.05145	0.5760
Book equity to market equity ratio (H)		1	0.1784	0.1519	0.1763	-0.15035	-0.0796
Market's risk premium (M)			1	0.0662	0.5561	-0.160367	0.0859
Company size (S)				1	0.4244	-0.1049	0.3199
Accruals quality (A)					1	-0.2757	0.5711

Table 5 (cont.). Alignment between variables

Variables	Stock's risk premium (Y)	Book equity to market equity ratio (H)	Market's risk premium (M)	Company size (S)	Accruals quality (A)	Investments quality (I)	Risk (R)
Investments quality (I)						1	0.0589
Risk (R)							1

It could be seen in the above table that there is no alignment between independent and dependent variables, and also in between independent variables, each variable is not aligned with the next variable, and their alignment is lower than the 70%, which is a value for diagnosing alignment, and has a suitable distribution between variables.

1.3.3. Results of testing hypothesis 1. There is a meaningful relationship between accruals quality and risk premium of companies listed in Tehran Stock Exchange.

Table 6. Relationship between accruals quality and stock's risk premium

Variable	Significance level	T-statistics	Standard error	β factor
Intercept	0.122100	1.57017	0.661504	1.038673
Book equity to market equity ratio (H)	0.024200	2.318448	0.096462	0.223643
Market's risk premium (M)	0.230000	-1.213847	1.382468	-1.678104
Company size (S)	0.000000	6.847866	0.727007	4.978445
Accruals quality (A)	0.000000	5.081437	0.032484	0.165066
(F) statistics	0.00000	Significance level (*p*-value)		39.93361
Adjusted coefficient of determination (Adj-R^2)	1.806847	Durbin–Watson statistic		72.52%

In this hypothesis, we focused on the relationship between accruals quality and stock's risk premium of companies listed in stock exchange. By taking attention to Table 6 and variable factor, A = 0.165066, which explains the accruals quality, and is estimated using Fama and French model, it has significance factor equal to zero in 5% error level. So, from the above tables it could be concluded that accruals quality has a positive and meaningful effect on risk premium of companies listed in stock exchange. From the other result of hypothesis 1 which is explained in the above results, it could be concluded that by taking attention to

F-statistics (39.93) and zero significance level, the model considered for hypothesis 1 estimation has suitable significance. Also the adjusted coefficient of determination is about 73%, which explains that 73% of changes in dependent variable is justifiable by independent variables. Also the value of Durbin-Watson statistics is obtained by 1.80 which explains that there is no level one autocorrelation between remain does of pattern.

1.3.4. Results of testing hypothesis 2. There is a meaningful relationship between investments anomaly and risk premium of companies listed in Tehran Stock Exchange.

Table 7. Relationship between investments anomaly and stock's risk premium

Variable	Significance level	T-statistics	Standard error	β factor
Intercept	0.000000	4.849848	0.634759	3.078483
Book equity to market equity ratio (H)	0.035900	2.151035	0.116754	0.251143
Market's risk premium (M)	0.069900	1.848429	1.372172	2.536363
Company size (S)	0.000000	8.649429	0.778834	6.736471
Accruals quality (A)	0.365800	0.911837	0.029324	0.026739
(F) statistics	0.00000	Significance level (*p*-value)		23.33484
Adjusted coefficient of determination (Adj-R^2)	1.807839	Durbin–Watson statistic		60.23%

In this hypothesis, we focused on relationship between investments anomaly and stock's risk premium for companies listed in stock exchange. By taking attention to Table 7 and changing factor I = 0.026739, which explains the investment anomaly and is estimated using Fama and French model, the significance coefficient is 0.365800 in 5% error level. So, from data of the Table above, it can be concluded that the quality of investments

anomaly does not have a meaningful effect on risk premium of companies listed in stock exchange. So, we cannot propose this variable as a factor in justifying the risk premium of companies listed in stock exchange. On the other hand, from the results of model 2 and the results showed above, it can be concluded that by taking attention to F-statistics (23.33) and zero significance level, the model proposed for estimating the hypothesis 2 has

suitable significance, and the causes of this significance are other variables, which are from the principal variables of Fama and French model, the variables which have a close relationship with dependent variable, or stock's risk premium. Also adjusted coefficient of determination which is about 61% explains that 61% of changes in dependent variable is justifiable with independent variables, except investments and risk premium variables, which have no meaningful relationship with dependent variable. Also the value of Durbin-Watson statistics is obtained by 1.80 which explains the fact that there is no first order autocorrelation between remainders of pattern.

1.3.5. Results of testing hypothesis 3. There is a meaningful relationship between quality of risk (investment diversity) and risk premium of companies listed in Tehran Stock Exchange.

Table 8. Relation between investment anomaly and Stock's risk premium

Variable	Significance level	T-statistics	Standard error	β factor
Intercept	0.000000	5.470565	0.509993	2.789949
Book equity to market equity ratio (H)	0.001200	3.405807	0.093871	0.319706
Market's risk premium (M)	0.108200	1.632891	1.092496	1.783928
Company size (S)	0.000000	8.233014	0.659100	5.426379
Accruals quality (A)	0.000000	5.679481	0.014936	0.084831
(F) statistics	0.000000	Significance level (*p*-value)		44.208260
Adjusted coefficient of determination (Adj-R^2)	1.981766	Durbin–Watson statistic		74.55%

In this hypothesis, we focused on relationship between risk quality and stock's risk premium of companies listed in stock exchange. By taking attention to Table 8 and variable coefficient R = 0.084831, which explains the risk quality and is calculated using Fama and French model, the significance coefficient was zero in 5% error level. So, from the information of the Table above, it can be concluded that risk quality has a positive and meaningful effect on risk premium of companies listed in stock exchange. The other result of third model and results described above concludes that by taking attention to F-statistics (44.20) and significance level of zero, the model used in estimating the third hypothesis, has suitable significance. Also adjusted coefficient of determination is about 75%, which explains that 57% of changes in dependent variable is justifiable using independent variables. In addition, the Durbin-Watson statistics is obtained as 1.98 which explains that there is no first order autocorrelation between remainders of pattern.

Conclusion and suggestions

Previously, many researches are carried out on the subject of risk factors affecting on stock return, and in each of them some of the factors affecting on return were proposed. In the current study, the effect of three factors on the risk premium of stock evaluated, which is a representative of stock return and used by the model which was first introduced by Fama and French (2008), and proposed as three hypotheses, and in the following we will describe the findings.

The first hypothesis is focused on the effect of accruals on risk premium. In this hypothesis, the accruals quality are estimated using adjusted Jones model, and its indirect effect is measured using portfolio making and Fama and French model, which measure the indirect effect of these factors on dependent variable or risk premium. The accruals may effect earning quality because of their customizability. It was expected that the increase in accruals results in increase in earnings quality, and, consequently, will be followed by reaction of market, which finally results in changes in risk premium and stock return. And, finally, our results were in accordance with Chan et al. (2006), Francis et al. (2005), and Kim and Qi (2009), which in these researches like our research, the focus was on the significant effect between accruals quality and stock's risk premium or stock return, and found a meaningful relationship between these factors; but these studies were in conflict with findings of Core et al. (2008), Mouselli and Jafar (2009), who show that there is no relationship between accruals quality and return.

By taking attention to this research, it can be said that the current investors of stock exchange should take attention that changes in quality of accruals may contain important and secret news about the future state of company, and, therefore, it must be noted in decision making. Also using these factors as complement with other effective variables including quality of risk – the effect of which on risk premium will be explained below may be effective; because the existence of complementary relationship between them prepares investors and other stakeholders to make better and more comprehensive prediction from stock market by putting together the related information. Considering only one factor of previous researches for predicting stock return cannot give helpful and complete information to stakeholders.

The second hypothesis is focused on the effect of anomalies in investments, which are calculated using the model of Wu et al. (2010) or Lyandres et al. (2008), and its effect on risk premium and stock return indirectly measured as a variable using Fama and French model and it was observed that it cannot be used as an effecting factor on risk premium. The results of this study were opposite to findings of Lyandres et al. (2008) which found a meaningful effect between investments anomaly and stock return. In this return, we found no meaningful relationship between investments anomaly and stock return which, finally, resulted in effect to stock return.

Also, in third hypothesis, we evaluated the relationship between risk quality (which is a representative of systematic risk) and risk premium (which is a representative of stock return) and, based on the results, concluded that risk quality and, consequently, systematic risk can be an effecting factor on risk premium and stock return, and we can say it is an effecting factor on stock return. This study is similar to Chichernea et al. (2014) and Bollerslev et al. (2013) measured who the effect of systematic risk on stock return, which also found a meaningful relationship between stock return.

Also, the hypothesis says that stock return of companies is a function of risk, and risk explains the changes of return rate of a share proved partially, and, based on testing hypothesis, we reached to results close to this hypothesis.

Limitations

1. The first and most important limitation of researches based on inferential statistics is about extending results to other conditions and intervals. It is possible that the relationships which proved in this research do not exist in other intervals or conditions, or the type of relationships may be different. So, in extending the results of this research, the required caution should be used.
2. The limitation of stopping the trading symbol of some companies during the research interval was a fundamental limitation of this research, which effects on precision and results of research.
3. Ability of individual in processing the input information for capital market is different. So, there is a probability of having different conclusions of different investors in facing with similar information from capital market, in other

words, there is different decision making by investors in processing those information.
4. Effects of differences in accounting methods for measuring and reporting financial events may effect on results of research, where no adjustments for this are carried out because of lack of access to information.
5. There are some other factors in this research including macro-economic and political factors, which may be out of access for researcher and may have effects on results of research. But the effect of these factors was not considered in this research.
6. In this research, there was no adjustment for annual adjustments and condition paragraphs of accountant report.

Suggestions

1. For predicting the future performance of oscillations of a variable, by taking attention to all aspects of all existing information, take special attention to common fundamental explaining factors of that special variable, to have no requirement for collecting large set of data.
2. It is suggested for investors and analysts to evaluate the financial statements by analytical perspective and beside it take attention to other information, especially to macro-economic and stock market factors.
3. In addition, by taking attention to the transience of variables which explain the market variations unfold in comparing the results of research, it is suggested to use roll and period models.
4. Repeating this research for companies with similar size, growth rate, ownership and risk for reaching to more suitable models.
5. Simulating the suitable prediction models in various time intervals with different economic conditions and evaluating the effect of economic environment on prediction power of variable during the time.
6. Doing the same research for all companies and also in industry level using quarterly financial reports.
7. Evaluating the relationship between the above explanatory variables and stock return by separating the smoothing/non-smoothing profit companies.
8. Modeling the non-linear relationship between the above explanatory variables and stock return in machine learning models field.

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