THE EFFECT OF REAL AND ARTIFICIAL EARNINGS MANAGEMENT ON THE VALUE RELEVANCE OF EARNINGS

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ABSTRACT
The goal of the present research is to study the effect of real and artificial earnings management on the value relevance of earnings in firms accepted in Tehran Stock Exchange. Therefore, 66 companies accepted in Tehran Stock Exchange for the financial period between the years 2007 and 2012, were selected. The companies under investigations belonged to 6 active industries in the Stock Exchange. In the present study we have used Jones (Dechow et al., 1995) adjusted model to measure artificial earnings management and based on the studies carried out by Roychowdhury (2006) we have used three models of: (1) usual level of discretionary expenses estimation (focusing on firm’s selling, general, and administrative expenses) model, (2) usual level of production costs estimation model, and (3) usual level of operational cash flows estimation model to measure real earnings management. To test the research hypotheses we have used a multi-variable regression model. The research results show that real and artificial earnings management has a negative effect on the value relevance of earnings. This means that by increasing real management and also artificial management of earnings, the value relevance of earnings decreases.

Keywords: Real Earnings Management, Artificial Earnings Management, the Value Relevance of Earnings

INTRODUCTION
The goal of accounting is to prepare financial information for the users to foster and improve the decision making process but the aim of accounting researches and studies is to assess the usefulness of these data for the investors and other users. The theoretical framework of the financial accounting standards board (FASB) shows that the goal of financial reporting is to supply useful information for decision making (statement 1) and the issue of usefulness in decision making is considered as the selection criterion for accounting (statement 2). These statements show the changes in the approach of FASB regarding the stewardship role of earnings into its usefulness in decision making. However, the existence of different accounting estimations and methods and most importantly the conflict of interest in the process of measuring earnings has affected the value relevance of earnings. The value relevance of earnings of accounting is one of the interesting issues in accounting researches which was first posed by Ball & Brown (1968) who did the first research about it and it has been noticed by plenty of researchers. Earnings management is the consequence of a degree of flexibility and implementing the ideas which can be seen in financial reporting of the managers. Managers may use their authority for opportunistic earnings management (Christy & Zimmerman, 1994), or confidential transfer of the data about the future performances of the company (Healy & Wallen, 1999). Most researchers have found that earnings management is done stimulated by deviating the users from financial statements or deviating from the results of a contract which depend on accounting profits (Burgestler & Imes, 2003). Managers can wait until the end of the year to achieve the intended earnings level and use discretionary accruals for the reported earnings management. But this strategy may be followed by the risk that the amount of earnings intended to be manipulated may exceed discretionary accruals, because the authority on accruals is limited through the generally accepted accounting principles (Barton & Simko, 2002). It is presupposed that economic incidents in a company limits the ability of managers to report the delayed earnings (accruals). Thus, it is possible that managers can not achieve the intended earnings at the end of the year.
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through discretionary accruals. Managers can reduce this risk through manipulating real operating activities during the year. Manipulating real activities is limited less. Another advantage is to alter real activities to manipulate earnings is that auditors and policy makers care about these behaviors less. However, manipulating real activities is not without any costs because there is the possibility that cash flows in future periods may be affected indirectly (negatively) by activities which are carried out to increase current earnings. In the present research, the effect of both earnings management – which we call artificial earnings management for accruals management and real earnings management for manipulating real operational activities- on the value relevance of earnings will be investigated.

The rest of the paper is organized as follows. section 2 presents theoretical framework and research literature. Section 3 presents research hypotheses. Section 4 discusses methodology. Section 5 describes sample selection procedures and descriptive statistics. Section 6 reports empirical results. And section 7 concludes this study.

Theoretical Framework and Research Literature

Earnings Management

Earnings management has absorbed a lot of attention for itself in academic researches. The primary literature in earnings management dealt with testing the effect of accounting alternatives on capital market. But the main focus was on the differentiation between the two rival hypotheses. The mechanical hypothesis which was common in accounting in 1960s stated that users of financial statements do not use information resources other than financial reports of the companies. The mechanical hypothesis predicts that the relationship between accounting earnings and stock price is solely mechanical. In other words, the investors may be deviated systematically through the choices and accounting methods. The rival for mechanical hypothesis is called efficient market hypothesis. The efficient market hypothesis, the paradigm dominant on financial accounting researches in 1970s, stated that market prices reflect all accessible information completely. There are 3 possible forms for market efficiency and usually the medium strong form of efficient market hypothesis is the most acceptable status which is considered to test efficient market hypothesis.

This form of efficient market hypothesis states that market can recognize the effect of arranging accounting changes. Thus, these changes can not deviate the market systematically. In other words, awareness about the information does not let the investors to get extra earnings because the prices have entailed the information previously (Wanda, 1987). Watts and Zimmerman (1978) devised their positive theory as an alternative for arrangement accounting changes. Positive theory poses motives other than those related to capital market for earnings management by the companies. To do so, positive theory does not reject the previous hypotheses but it focuses on internal contract motives of the company for utilizing the different accounting alternatives, instead. Accounting variables prepare a basis for the decisions related to resources appropriation, compensating management services and avoiding the violation of debt contract conditions. Thus, management can affect the results and outcomes of these decisions by choosing from among the estimations and accounting approaches. Therefore, positive theory is also called contractual theory.

Earnings management theory was first posed as earnings smoothening by Hepworth (1953) and was introduced by Gordon (1964) after him. The expression "earnings management" was altered for "earnings smoothening" for the first time by Mc Nichelson (1988). Therefore, earnings management was focused on preparing a summary of firm performances to enforce and reflect those results intended (Riyahi-e-Boloki, 2000).

Schipper (1989) defined the concept of earnings management as follows: "the intentional interference in financial reporting process to achieve the expected level of earnings". This means that regarding the different targets and goals of management, the earnings may increase or decrease or be smoothened. The aims and stimuli which result in earnings management are frequent regarding the accounting literature, some of which are as follows:

1) The receipt of managerial compensation. 2) Political cost reduction. 3) Firm value enhancement. 4) Capital absorption
The Manipulation of Discretionary Accruals and Earnings Management

A fundamental factor in earnings management test in companies is the estimation of authority factor and management's enforcement in earnings determination. Studying the literature based on earnings management shows the existence of different approaches with different features in estimating and measuring the authority of management in identifying the reported earnings. One of the most important approaches among them, based on using discretionary accruals, is used as an index for determining and discovering earnings management in business units. Healy (1985) Deangelo (1986), and Jones (1991) carried out studies about earnings management by utilizing accruals for discovering earnings management and posed models which were tested frequently in researches after them. Dechow et al., (1995) posed a model which was called “Jones's adjusted model” afterwards. This model was compared with models of Jones, Healy, and Deangelo and also the industry model. They found out that the adjusted model of Jones is more powerful in earnings management discovering in business units. Jones (1991) has recognized the difference between earnings and cash resulting from operations as accruals. In this approach, the dominant idea is that the current information of cash resulting from operations is a more objective criterion to assess the real economic performance of a business entity and thus it can be manipulated by management less. Jones presupposed in his model presented in 1991 for studying earnings management in business units that non-discretionary accruals are fixed during the pass of time. It should be noted that accruals can be divided into two parts of discretionary and non-discretionary elements. Although non-discretionary accruals are limited due to the regulations, organizations, and other external factors, discretionary accruals can be manipulated by the management. Thus, the discretionary element of accruals is considered as a proxy in order to discover earnings management in business units in accounting studies.

The Manipulation of Real Activities and Earnings Management

Roychowdhury (2006) considered real earnings management as departures from normal operational practices with the primary objective of meeting near-term earnings goal. That is unlike accruals' management which is the only output in accounting systems was affected without any direct cash flow consequences. In fact real earnings management sacrifices long-term cash flows to show the short-term (current) earnings are inflated which is known as a myopic behavior that decreases firm value in long-term.

Managers have two overall options to achieve the goals related to their earnings management. They should either manipulate discretionary accruals or make changes in operational decisions of the business entity. The previous researches (Gunny, 2005) categorized these operational decisions in 4 groups as follows: 1- the reduction of discretionary costs of research and development, 2- the reduction of discretionary costs of advertisement and sales, 3- the timing of selling fixed assets for earnings report, and 4- over production to reduce the cost of goods sold and increasing credit sales

We should consider that manipulating real activities is not the means of changing the arrangement of accounts.

In this method, managers change the time of doing operations, the type of resources appropriation, or the administration time for investing projects. Earnings management activities based on accruals does not accompany any direct outcome of cash flow (Cohen & Zarowin). Real earnings management affects a firm's cash flows directly. In this method, cash flows are sacrificed for accrual earnings and the most important loss related to it is that firm value will reduce due to the reduction of cash flows in future periods (Cohen & Zarowin, 2010).

The Difference between Accruals Management and Manipulating Real Activities

As stated earlier, earnings management is done in the two forms. The first form entails appropriate accounting methods to achieve desirable earnings levels (in other words, accruals management) and the second form uses timing or the amount of operational decisions in order to achieve desirable earnings (in other words, real activities are manipulated). The first form is usually discovered easily by the auditor in the year the change happens and the second form is discovered very difficultly by outsiders (Healy & Wallen, 1999).
The principle difference between accruals management and manipulating real activities is related to timing earnings management. In comparison to accruals management, any manipulation in real activities should occur in periods of the year. The manipulation of real activities occurs when the predictions of managers show that earnings will encounter a failure in realizing the intended goals and also when some other factors (tough accounting standards) limit accruals management. In this case they do some tasks which derive from the usual activities of the company. An advantage of changing real activities in earnings management is that auditors and legislators recognize such a behavior less. Thus, one of the other differences of these two forms of earnings management is that accruals management in the year of occurrence is known to some extent, but the manipulation of real activities can not be recognized easily (Yu, 2008). Real earnings management affects a firm's cash flows directly. In this method, cash flows are sacrificed for accrual earnings and its most important loss is the destroy of firm value due to the reduction of cash flows in future periods. Also accruals management is not without any costs. The discovery of accruals' manipulation can present the possibility of the need to have special investigations by the auditors. Also it is possible that it results in financial punishments by professional legal communities (such as Stock Exchange), the necessity of re-representation of earnings and studying the issue in legal courts (Roychowdhury, 2006).

The Value Relevance of Earnings
According to Hendericson and Brada's (1992) idea the data which can affect the recipient gorgeously are those which entail some information. They believed that information should be able to reduce the lack of assurance and give the recipient the message that its value is more than the cost of gaining data and on the other hand it should be potentially efficient on decisions made by the individuals.

Specifically, the value relevance of net earnings reported can be described by the amount of changes in stock prices or by the unusual return amount regarding the time period through which the market becomes aware of the current period's net earnings (Scott, 2007).

Studying the quality and the value relevance of earnings helps users of financial statements to judge about assurance of the current earnings and predict the future ones. Some scholars have defined the value relevance of earnings as follows:

- Ball and Brown (1968) did the first research in the field and posed the term "the value relevance of earnings" to show the relationship between annual earnings and annual unusual return rate.
- The value relevance of earnings is one of the important aspects of earnings quality. This means that studying the correlation between earnings and stock return and the descriptiveness power of earnings is one of the criteria in measuring earnings quality and the value relevance of earnings is measured in 2 forms: a) we presuppose that the change in stock price is the reaction against earnings changes during a certain period. Thus, the return is related to earnings and the earnings response coefficient (ERC) is considered as a criterion of the value relevance of earnings (Beaver, 1989), b) Using the regression E/P and stock return (Jang and Kwon, 2002).
- Earnings entail information content when it has the capability of being approved by stock return (Warfield, 1995).
- The value relevance of earnings can be shown as the relationship between earnings and stock return. That means the value relevance of earnings can be achieved in the form of earnings usefulness in approving stock returns (Vafeas, 2000).
- Tees (2002) identified 3 types of decisions which affect the quality and the value relevance of earnings as follows:
  1) Decisions made by standard designers, 2) Management decisions about which of the acceptable accounting methods should be selected. 3) Judgments and estimations by the management to utilize those methods.

Artificial Earnings Management and the Value Relevance of Earnings
Hunt et al., (2000) carried out a research to study the relationship between earnings management and stock value. They found out that smoothening increase the value relevance of earnings and earnings-return relationship. Houge & Longhran (2000) considered accruals as a reverse criterion for earnings
quality and studied the relationship between earnings quality and stock return. The concluded that the
stocks of companies with high accruals (low earnings quality) has a low return. This means that there is a
reverse relationship between accruals and stock return or there is a direct relationship between earnings
quality and stock return.

Chen et al. (2004) studied whether earnings quality has information about the future return of stocks or
not? They focused on a criterion related to earnings quality called accounting accruals and stated clearly
that: "the market may deviate temporarily through concentration on the end line of income statements and
ignoring earnings quality". This paper presented 3 reasons for why accruals do predict stock return which
are as follows: earnings' smoothening, lower reactions to changes in business conditions, and having
prejudice (being biased) about the company. They measured accruals (earnings quality) in changes in
flowing capital accounts in balance sheet. Of course, this relationship with earnings quality is an indirect
relationship. Also there were some evidences collected that show there is a negative relationship between
accruals and future stock returns. Besides that, they found out that the non-discretionary accruals do not
predict future stock returns.

Chan et al. (2006) studied the relationship between accruals and future stock return. The results of their
research showed that in those companies which have low earnings quality, the stock return will reduce in
the period after earnings reporting. Tucker and Zarovin (2006) studied the earnings’ smoothening effect
on the value relevance of earnings. According to the results of their research, smoothening results in
increasing the value relevance of earnings and the smoothened earnings present some information about
earnings, cash flows, and future accruals. Zhao and Chen (2009) concluded in their research about
earnings quality and rules halting the ownership of companies that companies bound to the rules have less
unusual accruals in their financial reporting and thus they benefit from a high earnings quality and a lower
level of earnings management.

Real Earnings Management and the Value Relevance of Earnings
Mizik and Jacobson (2007) found out in their research that those companies which tend more for earnings
management through manipulation of real activities achieve lower future stock return than other
companies.

Huang et al., (2009) studied the potential effect of artificial smoothening and real smoothening on firm
value. The results of their research showed that firm value will reduce by increasing artificial
smoothening and it will increase by real smoothening. They claimed that companies can increase the
awareness presented by earnings of the company by real smoothening and reduce company' agency costs.

Research Hypotheses
In the present research, and based on the theoretical foundations posed and regarding the previous
researches in the field of the effects of discretionary accruals which has a role in measuring artificial
earnings management in business companies and also the effect of real earnings management on the value
relevance of earnings which posed the determinative relationship of the returns considering the earnings
of the companies and to answer the main research question and the achievement of the research
hypotheses, the following hypotheses were devised:

First main Hypothesis: Artificial earnings management affects the value relevance of earnings.
First minor Hypothesis: The increasing artificial earnings management affects the value relevance of
earnings.
Second minor Hypothesis: The decreasing artificial earnings management affects the value relevance of
earnings.
Second main Hypothesis: Real earnings management affects the value relevance of earnings.
First minor Hypothesis: Real earnings management affects the value relevance of earnings through
managing official, general, and sales costs (discretionary costs).
Second minor Hypothesis: Real earnings management affects the value relevance of earnings through
managing production costs.
Third minor Hypothesis: Real earnings management affects the value relevance of earnings through
managing the sales' levels (price discounts and easier on credit conditions).
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Fourth minor Hypothesis: Real earnings management affects the value relevance of earnings through managing discretionary costs, production costs, and operational cash flows.

Fifth minor Hypothesis: Real earnings management affects the value relevance of earnings through managing discretionary costs and production costs.

MATERIALS AND METHODS

Methodology

The present research is post-incidental and correlations. The information and theoretical foundations for this research are extracted from library studies and through using different papers and books. Also the data needed for testing the research hypotheses were extracted from different resources such as the site for Stock Exchanges, research management site, Development and Islamic studies and Rahacard-e-Novin software. They were processes after being transferred into EXCEL broadsheets. Also the software SPSS 16 has been used to test the research hypotheses.

Measure of Artificial Earnings Management

We have used Jones's (1995) adjusted model in the present research to measure artificial earnings management. First the sum of accruals in each company is calculated as follows:

\[ TA_{i,t} = \left( \Delta CA_{i,t} - \Delta CL_{i,t} + \Delta CASH_{i,t} + \Delta STDEBT_{i,t} - \Delta DEPN_{i,t} \right) \]

Where, \( TA_{i,t} \) the firm i’s total accruals in year t, \( \Delta CA_{i,t} \) the firm i’s changes in current assets between the years t and t-1, \( \Delta CL_{i,t} \) the firm i’s changes in current liabilities between the years t and t-1, \( \Delta CASH_{i,t} \) the firm i’s changes in cash between the years t and t-1, \( \Delta STDEBT_{i,t} \) the firm i’s changes in short-term liabilities between the years t and t-1, \( \Delta DEPN_{i,t} \) the firm i’s depreciation cost of tangible and intangible assets in year t.

Now, to measure earnings management which can be recognized by looking at discretionary accruals, a Jones's regression model for each year and in each industry will be estimated as follows:

\[ TA_{i,t} = K_{1,i,t}^{adj} / \text{Asset}_{i,t} + K_{2,i,t}^{adj} (\Delta Rev_{i,t} - \Delta AR_{i,t}) + K_{3,i,t}^{adj} PPE_{i,t} / \text{Asset}_{i,t} + \varepsilon_{i,t}^{adj} \]  

(1)

Where \( \Delta Rev_{i,t} \) the firm i’s changes in revenues during the years between t and t-1, \( \Delta AR_{i,t} \) the firm i’s changes in net receivables between the years t and t-1, \( PPE_{i,t} \) the firm i’s gross property plant and equipment in year t. These amounts are standardized based on total assets of the year t-1 in firm i.

Next, by using the coefficients gained from equation (1), the amount of non-discretionary (usual) items is calculated as follows:

\[ NA_{i,t}^{adj} = K_{1,i,t}^{adj} / \text{Asset}_{i,t} + K_{2,i,t}^{adj} (\Delta Rev_{i,t} - \Delta AR_{i,t}) / \text{Asset}_{i,t} + K_{3,i,t}^{adj} PPE_{i,t} / \text{Asset}_{i,t} \]

And finally, the amount of discretionary (unusual) items is calculated as follows:

\[ AA_{i,t}^{adj} = TA_{i,t} - NA_{i,t}^{adj} \]

The absolute amount gained for the equation above, will alter earnings management in the present research. That is \( DA_{i,t} = |AA_{i,t}^{adj}| \), where greater amounts show higher earnings management and vice versa.

Proxies for Abnormal Real Activities (Real Earnings Management)

To identify companies which tend towards real earnings management, we need 3 abnormal levels of production costs, discretionary expenditures, and CFO for every company in each year. Consistent with prior studies (e.g., Roychowdhury, 2006; Cohen et al., 2008; Cohen and Zarowin, 2010), we estimate the normal level of production costs using the following industry-year linear regression:

\[ \text{ProdCost}_{i,t} = K_{i} + K_{2} \times \text{Rev}_{i,t} + K_{3} \times \Delta \text{Rev}_{i,t} + K_{4} \times \Delta \text{Rev}_{i,t} + \varepsilon_{i,t} \]  

(2)

Where \( \text{ProdCost}_{i,t} \) is the firm i’s production costs in year t, calculated as ( \( \text{COGS}_{i,t} + \Delta \text{Inv}_{i,t} \) ), where \( \text{COGS}_{i,t} \) is firm i’s cost of goods sold in year t, and \( \Delta \text{Inv}_{i,t} \) is firm i’s change in inventories between year t-1 and year t, \( \text{Rev}_{i,t} \) the firm i’s revenues in year t, \( \Delta \text{Rev}_{i,t} \) the firm i’s change in revenues between year t-1 and year t and \( \varepsilon_{i,t} \) is the error term. These amounts are standardized based on total assets of the year t-1 in firm i.

The residuals from Eq. (1) represent abnormal production costs. We use the residuals as our first proxy for abnormal real activities (AbnProdCost). A higher value of AbnProdCost indicates more manipulation through increased overproduction, price discounts, or more lenient credit terms.
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To examine managerial manipulation of discretionary expenditures, we focus on firms selling, general, and administrative expenses following Roychowdhury (2006), we estimate the normal level of discretionary expenditures using the following industry-year linear regression:

\[
\text{DisExp}_{i,t} = K_1 + K_2 \times \text{Rev}_{i,t-1} + \epsilon_{i,t}
\]

Where \(\text{DisExp}_{i,t}\) is the firm’s discretionary expenditures in year \(t\), \(\text{Rev}_{i,t-1}\) is the firm’s revenues in year \(t-1\), and \(\epsilon_{i,t}\) is the error term. These amounts are standardized based on total assets of the year \(t-1\) in firm \(i\). The abnormal discretionary expenditures are computed as the difference between the actual values (\(\text{DisExp}_{i,t} / \text{Asset}_{i,t-1}\)) and the normal level predicted from Eq. (3).

To model CFO, empirical studies (e.g., Roychowdhury, 2006; Cohen et al., 2008; Cohen and Zarowin, 2010) generally follow Dechow et al., (1998) theoretical analysis and express the normal levels of CFO as a linear function of sales and change in sales. Consistent with these studies, we estimate the following cross-sectional regression for each industry group and year:

\[
\text{CFO}_{i,t} = K_1 + K_2 \times \text{Rev}_{i,t} + K_3 \times \Delta \text{Rev}_{i,t} + \epsilon_{i,t}
\]

Where \(\text{CFO}_{i,t}\) is the firm’s operating cash flows in year \(t\), \(\text{Rev}_{i,t}\) is the firm’s revenues in year \(t\), \(\Delta \text{Rev}_{i,t}\) is the firm’s change in revenues between year \(t-1\) and year \(t\), and \(\epsilon_{i,t}\) is the error term. These amounts are standardized based on total assets of the year \(t-1\) in firm \(i\). We then estimate firm-specific abnormal CFO as the residual from the above Eq. (4).

We also compute two comprehensive metrics of abnormal real activities by aggregating these individual measures in order to capture the overall level of real activities manipulation. To compute our first comprehensive measure (ProdCost&DisExp), we add up only AbnProdCost and AbnDisExp, because the CFO-based measure is ambiguous. For the second one (ProdCost&DisExp&CFO), we aggregate all three individual measures (i.e., AbnProdCost, AbnDisExp and AbnCFO) into one measure. As is true for the individual measures, the higher the values of the comprehensive metrics, the more likely that the firm is engaging in real activities manipulation.

Measure of the Value Relevance of Earnings

The main qualitative characteristics related to the value relevance were relevance and reliability. Francis and Shipper (2005) defined accounting value relevance as the ability of the earnings to identify market returns.

In this research and according to the researches carried out by Warfield et al., (1995), Vafeas (2000), Firth et al., (2007), Sanchez-Ballesta and Garcia-Meca (2007), Chang (2008), Chang and Sun (2009), and Dimitropoulos and Asteriou (2010) we have used earnings reaction coefficient (ERC) (the relationship between earnings and return) as the measurement criterion for the value relevance of earnings.

To estimate value relevance of accounting earnings we have used the following regression model:

\[
\text{RET}_{i,t} = \alpha_0 + \alpha_1 \times \text{EPS}_{i,t} / \text{P}_{i,t-1} + \epsilon_{i,t}
\]

Where \(\text{EPS}_{i,t}\) the firm’s earnings per share in year \(t\), \(\text{P}_{i,t-1}\) the firm’s stock price in the beginning of the year \(t\), \(\text{RET}_{i,t}\) annual stock return of firm \(i\) in the year \(t\).

Research Design and Models Needed for Testing the Hypotheses

To study the effect of earnings management on the value relevance of the earnings we have used the overall regression of the ordinary least squares of the integrative data using the random effects method and specifically we have used the overall framework of the pattern presented by Firth et al., (2007).

In the present research, we have used the following regression models to test the hypotheses:

Testing First Main Hypothesis Model

\[
\text{R}_d = \alpha_0 + \alpha_1 \times \text{EPS/P}_{t-1} + \alpha_2 \times \text{AEM} + \alpha_3 \times \text{EPS/P}_{t-1} \times \text{AEM} + \alpha_4 \times \text{EPS/P}_{t-1} \times \text{Lev} + \alpha_5 \times \text{EPS/P}_{t-1} \times \text{Size} + \alpha_6 \times \text{Lev} + \alpha_7 \times \text{Size}
\]

To adjust the first model (the effect of artificial earnings management on the value relevance of earnings) by using the adjusted model of Jones’s, the amounts of discretionary accruals (AEM) were calculated through which the management acts to artificially manage the earnings. Then the sample companies were divided into two groups of increasing earnings management (AEM+) and decreasing earnings management (AEM−) (regarding the amount of discretionary accruals). According to the adjusted model of Jones, earnings management is recognizable by considering the absolute amount of discretionary
accruals such that the higher value of discretionary accruals will result in a higher earnings management in the company and based on the research hypotheses, in order to achieve increasing and decreasing earnings management, companies with positive discretionary accruals were isolated from companies with negative discretionary accruals. Our total sample included 66 companies with 369 observations. The portfolio of increasing earnings management included 34 companies with 205 observations and the portfolio of decreasing earnings management included 32 companies with 191 observations.

Our analysis is performed on all firm-years with non-missing data required to compute the proxies for abnormal real activities and other variables defined in table 1.

**Testing Second Main Hypothesis Model**

\[
R_{it} = \alpha_0 + \alpha_1 \frac{\text{EPS/P}_{t-1}}{} + \alpha_2 * \text{REM} + \alpha_3 \frac{\text{EPS/P}_{t-1}}{} * \text{REM} + \alpha_4 \frac{\text{EPS/P}_{t-1}}{} * \text{Lev} + \alpha_5 \frac{\text{EPS/P}_{t-1}}{} * \text{Size} + \alpha_6 \frac{\text{Lev}}{} + \alpha_7 * \text{Size}
\]

To adjust the second model (the effect of real earnings management on the value relevance of earnings) first we used the estimation models for the unusual levels of the real activities described above. Then, 5 criteria of real earnings management were calculated and by putting each of them in the second model, we have studied the type of their relationship with the value relevance of earnings.

**Table 1: Variable Definition**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definitions</th>
</tr>
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<tbody>
<tr>
<td>REM(\text{AbnProdCost})</td>
<td>Abnormal production cost measured as deviation from the predicted values from the corresponding industry-year regression model(A) in year t</td>
</tr>
<tr>
<td>REM(\text{AbnDisExp})</td>
<td>Abnormal discretionary expenditures measured as deviation from the predicted values from the corresponding industry-year regression model(B) in year t</td>
</tr>
<tr>
<td>REM(\text{AbnCFO})</td>
<td>Abnormal CFO is measured as deviation from the predicted values from the corresponding industry-year regression model(B) in year t</td>
</tr>
<tr>
<td>REM(\text{ProdCost&amp;DisExp})</td>
<td>The sum of AbnProdCost, AbnDisExp; higher values indicate more real activities manipulation</td>
</tr>
<tr>
<td>REM(\text{ProdCost&amp;DisExp&amp;CFO})</td>
<td>The sum of AbnProdCost, AbnDisExp, and AbnCFO; higher values indicate more real activities manipulation</td>
</tr>
<tr>
<td>AEM(\text{DisAccr})</td>
<td>Artificial earnings management or Discretionary current accruals measured as deviations from the predicted values from the corresponding industry-year regression model(1) in year t</td>
</tr>
<tr>
<td>Ret</td>
<td>The annually compounded stock return for fiscal year t</td>
</tr>
<tr>
<td>\text{EPS/P}_{t-1}</td>
<td>The earnings per share for fiscal year t scaled by stock price at the beginning of fiscal year t</td>
</tr>
<tr>
<td>Leverage</td>
<td>The ratio of long-term debt to total assets at the beginning of fiscal year t</td>
</tr>
<tr>
<td>Firm size</td>
<td>The natural log of total assets of firm i at the beginning of year t</td>
</tr>
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</table>

**Statistical Sample and Descriptive Statistics**

**Statistical Population and Sample**

The statistical population for the present research involves 6 industries from among firms accepted in Tehran Stock Exchange including cement, medicine, chemistry, machinery, principal metals, and automobiles. Due to the broadness of the statistical population and certain difficulties resulting from that and also some disharmony among the members of the society regarding the data needed for our research, the following conditions were devised for the statistical sample prepared and the research sample was selected by systematic deletion method.
The statistical population of the present research involves all companies which were among the firms accepted in Tehran Stock Exchange at least from the beginning of the year 1391 (21 March 2007) until the year 2012 and concurrently benefit from the 4 characteristics mentioned below:
a) Due to the different nature and categorization of items in financial statements of the investing companies and financial intermediaries compared to the manufacturing companies, investment companies, insurance companies, banks, and financing entities were not studied in the present research.
B) Regarding the need to calculate the research variables and doing tests on the hypotheses about each company, the data needed for every company should be accessible.
C) To observe the capability of comparability, the fiscal year for the companies should end at the end of Esfand (21st. March).
D) Companies selected should not have stopped their transactions during the research years for more than 4 months. Our final sample entailed 396 observations considering the limitations above.

The Descriptive Statistics
Table 2 shows the descriptive statistics for the variables of the present research. Based on the data in this table, among research variables, the variable of real earnings management through manipulating production costs has had the highest criterion deviation (REM "AbnProdCost") in which the 2 integrative criteria of Abn2 and Abn3 have had a similar criterion deviation and this shows that there is a more tendency towards earnings management through production costs’ manipulation.
Table3 presents the Pearson's correlation coefficient among the five measures of real earnings management, artificial earnings management, and the value relevance of earnings. AbnProdCost, AbnDisExp, and AbnCFO are positively associated with each other. And the correlation between AbnProdCost and Abn3, 2 is very high (0.89, 0.99). AbnProdCost and AEM are significantly positively associated with EPS/P.

Table 2: Descriptive statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Full sample</th>
<th>AEM firm-years</th>
<th>AEM firm-years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>Sdev</td>
</tr>
<tr>
<td>Ret</td>
<td>396</td>
<td>0.35</td>
<td>0.7741</td>
</tr>
<tr>
<td>EPSPt-1</td>
<td>396</td>
<td>0.20</td>
<td>0.1976</td>
</tr>
<tr>
<td>AEM</td>
<td>396</td>
<td>0.00</td>
<td>0.09</td>
</tr>
<tr>
<td>Lev</td>
<td>396</td>
<td>2.06</td>
<td>4.4369</td>
</tr>
<tr>
<td>Size</td>
<td>396</td>
<td>11.91</td>
<td>0.5611</td>
</tr>
<tr>
<td>REM(AbnProdCost)</td>
<td>396</td>
<td>1.61</td>
<td>2.4534</td>
</tr>
<tr>
<td>REM(ABnDiExp)</td>
<td>396</td>
<td>0.02</td>
<td>0.0303</td>
</tr>
<tr>
<td>REM(ABnCFO)</td>
<td>396</td>
<td>0.12</td>
<td>0.1661</td>
</tr>
<tr>
<td>REM(ABn3)</td>
<td>396</td>
<td>1.64</td>
<td>2.475</td>
</tr>
<tr>
<td>REM(ABn2)</td>
<td>396</td>
<td>1.61</td>
<td>2.46</td>
</tr>
</tbody>
</table>

See Table1 for variable definition.
Empirical Results (Research Models’ Adjustment)

The results related to the adjustment of the first model are shown in table 4. As it has been shown in table 4, we can reason that artificial earnings management – accruals’ management- (AEM) has a negative relationship (-2.518) with the value relevance of earnings in a company. This has a high significant level (%5 error) in the present research. We can claim that by increasing earnings management, the value relevance of earnings decreases. Also the decreasing earnings management (AEM) has a negative (-5.837) and significant (%1 error) relationship with the value relevance of earnings. That is, when AEM gets increased, the value relevance of earnings will be decreased. This means that capital market reacts negatively towards AEM. But increasing earnings management (AEM+) has a positive (2.526) and significant (%5 error) with the value relevance of earnings. That is, when AEM+ get increased, the value relevance of earnings will be decreased. This means that capital market reacts positively towards AEM+.

As it has been shown in table 5, we can reason that the real earnings management has a negative and meaningful relationship with the value relevance of earnings through the manipulation of production costs in the significant level of 0.01 which shows that the manipulation of production costs in order to manage earnings really will result in decreasing the value relevance of earnings. Also, real earnings management through manipulation of discretionary costs including selling, general, And administrative expenses has a negative relationship (-1.564) with the value relevance of earnings, but this reverse relationship does not have a high significant (%10). Regarding the manipulation of discretionary costs in order to manage earnings really and the value relevance of earnings is not meaningful, we can not claim that increasing earnings management through manipulation of selling, general, And administrative expenses will result in decreasing the value relevance of earnings. Furthermore, the results related to studying the real earnings management through the manipulation of the normal level of operational cash flows by boosting sales volumes temporarily through increased price discounts or more lenient credit terms and its effect on the value relevance of earnings in a company shows that there is a positive relationship (2.843) and it is significant (%1 error) and this meaningful relationship shows that increasing real earnings management...
through the manipulation of operational cash flows will result in increasing the value relevance of earnings.

The results of first comprehensive measure (aggregating of ProdCost&DisExp&CFO) show that there is a negative (-4.063) and significant (%1 error) relationship. This means that by increasing real earnings management resulting from this proxy REM(Anb3), the value relevance of earnings decreases. Also the results of second comprehensive measure (aggregating of ProdCost&DisExp) show that there is a negative and significant relationship on the value relevance of earnings.

Table 4: The value relevance of earnings and artificial earnings

<table>
<thead>
<tr>
<th>Management Variables</th>
<th>AEM</th>
<th>AEM+</th>
<th>AEM-</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>0.544</td>
<td>3.556</td>
<td>2.104</td>
</tr>
<tr>
<td></td>
<td>(0.548)</td>
<td>(2.273)**</td>
<td>(1.757)</td>
</tr>
<tr>
<td>EPS/Pt-1</td>
<td>8.54</td>
<td>-3.637</td>
<td>4.871</td>
</tr>
<tr>
<td></td>
<td>(2.619)***</td>
<td>(-0.743)</td>
<td>(1.139)</td>
</tr>
<tr>
<td>AEM</td>
<td>1.721</td>
<td>-1.113</td>
<td>2.595</td>
</tr>
<tr>
<td></td>
<td>(3.159)***</td>
<td>(-1.143)</td>
<td>(3.902)***</td>
</tr>
<tr>
<td>EPS/Pt-1*AEM</td>
<td>-5.065</td>
<td>9.486</td>
<td>-14.222</td>
</tr>
<tr>
<td></td>
<td>(-2.518)**</td>
<td>(2.526)**</td>
<td>(-5.837)***</td>
</tr>
<tr>
<td>EPS/Pt-1*Lev</td>
<td>-0.066</td>
<td>0.012</td>
<td>-0.095</td>
</tr>
<tr>
<td></td>
<td>(-1.829)*</td>
<td>(0.242)</td>
<td>(-2.148)**</td>
</tr>
<tr>
<td>EPS/Pt-1*Size</td>
<td>-0.476</td>
<td>0.379</td>
<td>-0.058</td>
</tr>
<tr>
<td></td>
<td>(-1.754)*</td>
<td>(0.955)</td>
<td>(-0.161)</td>
</tr>
<tr>
<td>Lev</td>
<td>0.022</td>
<td>0.023</td>
<td>0.004</td>
</tr>
<tr>
<td></td>
<td>(2.132)**</td>
<td>(1.488)</td>
<td>(0.334)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.07</td>
<td>-0.297</td>
<td>-0.21</td>
</tr>
<tr>
<td></td>
<td>(-0.835)</td>
<td>(-2.290)**</td>
<td>(-2.057)**</td>
</tr>
<tr>
<td>R-square</td>
<td>0.354</td>
<td>0.224</td>
<td>0.619</td>
</tr>
<tr>
<td>D-W</td>
<td>1.751</td>
<td>1.732</td>
<td>1.95</td>
</tr>
<tr>
<td>F P-Value</td>
<td>31.867 0.00</td>
<td>9.432 0.00</td>
<td>45.063 0.00</td>
</tr>
<tr>
<td>Sample size</td>
<td>396</td>
<td>396</td>
<td>396</td>
</tr>
</tbody>
</table>

Notes: ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels.
According to the theoretical foundations by increasing earnings management, the value relevance of earnings decreases and fortunately from among the 3 related hypotheses to artificial earnings management, 2 hypotheses through which one considers artificial earnings management on the whole and another considers artificial earnings management as diminishing approve and reinforce these theoretical fundamentals. This means that when a manager does earnings management by using his authority to choose accounting approaches, the reported earnings do not accord with the real earnings. Thus, by increasing earnings management the amount of reflecting earnings’ information in stock price decreases, too which is the same as the reduction in the value relevance of earnings.

From among the 5 related hypotheses to real earnings management, 3 hypotheses through which one approves the theoretical fundamentals is the real earnings management through production costs management and the two others are the integrative indexes of real earnings management which shows that when a manager tries earning management by implementing changes in real activities of the company or changes the operational decisions of the company he reports earnings which do not accord with real earnings. Thus, by increasing real earnings management the amount of reflecting earnings’ information in stock price decreases, too which is the same as the reduction in the value relevance of earnings.

The positive relationship between artificial earnings management increases the earnings and the value relevance of earnings and also the positive relationship between real earnings management through CFO management shows that market is generally deceived by the artificial earnings additive management and real management is deceived by manipulating CFO. This means that when an artificial earnings additive

<table>
<thead>
<tr>
<th>Variables</th>
<th>REM(AbnProdCost)</th>
<th>REM(AbnDisEx)</th>
<th>REM(AbnCF)</th>
<th>REM(Abn3)</th>
<th>REM(Abn2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>-0.403</td>
<td>-0.374</td>
<td>0.572</td>
<td>-0.396</td>
<td>-0.403</td>
</tr>
<tr>
<td>REM</td>
<td>0.039</td>
<td>1.36</td>
<td>-1.351</td>
<td>0.039</td>
<td>0.039</td>
</tr>
<tr>
<td>EPS/Pt-1*REM</td>
<td>(-4.177)**</td>
<td>(-1.564)</td>
<td>(2.843)***</td>
<td>(-4.063)**</td>
<td>(-4.129)**</td>
</tr>
<tr>
<td>EPS/Pt-1*Lev</td>
<td>(-3.808)***</td>
<td>(-3.100)***</td>
<td>(-2.987)***</td>
<td>(-3.760)***</td>
<td>(-3.792)***</td>
</tr>
<tr>
<td>EPS/Pt-1*Size</td>
<td>(-3.251)***</td>
<td>(-2.783)***</td>
<td>(-1.600)*</td>
<td>(-3.229)***</td>
<td>(-3.240)***</td>
</tr>
<tr>
<td>Lev</td>
<td>0.034</td>
<td>0.03</td>
<td>0.028</td>
<td>0.033</td>
<td>0.034</td>
</tr>
<tr>
<td>Size</td>
<td>0.012</td>
<td>0.015</td>
<td>-0.052</td>
<td>0.012</td>
<td>0.012</td>
</tr>
<tr>
<td>R-square</td>
<td>1.771</td>
<td>1.756</td>
<td>1.784</td>
<td>1.771</td>
<td>1.771</td>
</tr>
<tr>
<td>F Value</td>
<td>33.751 0.00</td>
<td>30.274 0.00</td>
<td>31.65 0.00</td>
<td>33.51 0.00</td>
<td>33.65 0.00</td>
</tr>
<tr>
<td>Sample size</td>
<td>396</td>
<td>396</td>
<td>396</td>
<td>396</td>
<td>396</td>
</tr>
</tbody>
</table>

Notes: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels.
management or a real CFO management occurs, the market can not differentiate the real earnings from
the managed earnings and managers mostly tend to use this type of earnings management.
On the whole, in economic environments which lack reliability there would be a lot of ups and downs as a
result of the activities and it is difficult to predict their future performances. This is exactly what risk
refers to. Having high risk increases the expected return of the stocks and there is a reverse relationship
between the expected return and stock price. Therefore, in companies where there is ambiguity in
economic environment, the manager reduces it through smoothening and earnings management which
decreases with ambiguity reduction and increases the stocks' prices. Thus, generally since earnings
management causes the reduction of fluctuations and the smoothened earnings have a high predictability,
the risk will reduce and the stock price will increase.

Conclusion
In the present research, a comprehensive analysis of the effect of earnings management on the value
relevance of earnings in financial reports of firms accepted in Tehran Stock Exchange between the years
2006 and 2011 was carried out. The artificial earnings management was calculated by using Jones's
adjusted model.
Also the real earnings management was calculated by using 3 estimation models in unusual levels of
manipulating the real activities of Roychowdhury (2006), Cohen et al., (2008), and Cohen and Zarovin
(2010) and the value relevance of earnings was gained by using the return earnings equation which is
called earnings identification coefficient. The research hypotheses' testing results showed that except for
the relationship between earnings management resulting from manipulating discretionary costs related to
real earnings management there is not much effects on the value relevance of earnings. The effects of
other types of earnings management such as real and artificial on the value relevance of earnings have a
high level of meaningfulness.
The main conclusion of the present research as that artificial earnings management decreases the value
relevance of earnings. Of course, this has an exceptional case when the increasing earnings management
acts reversely. That is, by utilizing artificial earnings management of increasing type, the value relevance
of earnings increases. Regarding the real earnings management, the result is almost the same. This means
that real earnings management decreases the value relevance of earnings. The exception present about
real earnings management also exists in the relationship between real earnings management through
manipulating operational cash flows which increases the value relevance of earnings. The controlling
variables used, firm size and financial leverage, both result in decreasing the value relevance of earnings.

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Research Article


