

## **Relationship between Matching Principle and Earnings Properties- The Case of Iran**

Bita Mashayekhi<sup>1</sup>, Farzaneh Jalali<sup>2</sup> and Vahid Menati<sup>3</sup>

*In this paper we investigate the impact of poor matching on earnings properties. This study is based on Dichev & Tong (2008) theory that states: poor matching creates noise in the economic relationship of revenues and expenses, and will be influential on properties of accounting earnings. This study utilizes data from the 3136 firm-year of the companies listed in Tehran Stock Exchange(TSE) during the years of 2002 to 2011. The results suggest that earnings volatility had significant changes during the given period and the fluctuation is attributable to the intrinsic factors (revenues volatility). Also, no significant change in correlation between revenues and expenses was suggested by statistical tests. In addition, earnings persistence and autocorrelation in earnings changes did not vary significantly during the 10 years.*

**Keywords:** Matching Principle, Earnings Persistence, Earnings Volatility, Autocorrelation in Earnings Changes

**Field of Research:** Accounting

### **1. Introduction**

Accounting earnings is a combination of variety elements and is resulted from a number of options in choosing accounting rules, procedures, and estimations. Better understanding of the elements and the way of they are calculated, and the way accounting standards impact on the earnings could lead to better decision making. Accounting earnings are calculated under two approaches; balance sheet (asset-liability) and income statement (revenue-expenses). In “revenue-expense” approach the stress is on income statement whereas in “asset-liability” approach tends to be based on balance sheet.

This study investigates the effects of poor matching on the accounting earnings properties in Iran and the way earnings properties may be affected by the changes in “matching”. The significance of this issue is that the identifying the impacts of observing or not observing of matching, as an imperative principle, can contribute to the procedures.

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Matching principle and the accounting earnings properties (e.g.; persistence of earnings, autocorrelation in earnings changes and earnings volatility) are controversial subjects in the field of accounting. Studies have shown that recognition of revenues and the related expenses in non- contemporaneous period makes a noise in earnings. This noise (the mismatching between revenues and expenses) increases earnings volatility and reduces earnings persistence; therefore, earnings quality will be affected. This study is based on the theory of Dichev & Tong (2008) about matching principle, the study which has never been examined in Iran's economic condition and still has subtle point regarding the field of "matching" and the consequences. According to the findings of their study, matching influences earnings properties such as: earnings persistence, earnings volatility, and autocorrelation in earnings changes. The results showed that there is a clear and economically substantial trend of declining contemporaneous correlation between revenues and expenses, and they also found that there is strong evidence of increased volatility of earnings with declining persistence of earnings.

Using data from 3136 firm-year of the companies listed in Tehran Stock Exchange (TSE) during the years of 2002 to 2011; this study besides examining the matching trend, aims to investigate on changes of earnings properties over the 10 years. Since this study is unprecedented in Iran, it is likely to bear novel points in this area. The findings of this study suggest that there is no significant change in the relationship between revenues and expenses (matching principle) over the research period and consequently, earnings persistence and autocorrelation in earnings did not change significantly too. Volatility analysis indicated that Earnings volatility has changed significantly during the period under review. The changes in earnings volatility can be attributed to volatility in revenue as an intrinsic factor.

The paper is organized as follow: Section 2 presents the theory and literature review of the study. Section 3 presents research hypothesis. Section 4 and 5 denoted to determine on methodology and data gathering of the study. Section 6 provides a discussion of the results and Section 7 is regarding to conclusions of the study.

### **2. Literature Review**

Earnings are calculated based on the two approaches; the first is balance sheet approach (asset-liability) and the second is the income statement approach (revenue-expense). According to the first approach, the focus is on the balance sheet and definitions of assets and liabilities, so the items reflected on the balance sheet are consistent with the definition of assets and liabilities otherwise they will be shown in the income statement. On the other hand, the income statement shows the items that are consistent with the definitions of revenues and expenses.

Since 1930s the accounting policy and stress has been put on the definition, measurement and recognition of earnings, and it has been obtained by matching the expenses with related revenues. Studies have shown that, the standards passed by FASB implied apparent inclination to balance sheet approach while the matching principle is achievable through income statement approach. The rise of "pro-forma" and "street"

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earnings has been considered as an evidence for poor matching and decline in information content of earnings.

In the field of determining the earnings, “matching” refers to the recognition of expenses when the related revenues had been recognized too (Whittred, and Taylor). The main idea of this paper is to formalize a model for the relationships between matching and earnings properties. This idea is based on the DT (2008)’s framework. Poor matching is the amount of expense which has not been matched to the related revenue and it can be realized by tracing the clues of noise in the economic relationships between expenses and revenues. Also, poor matching can arise from several reasons including of inevitable business factors (e.g., fixed costs, poor tracing of the costs), managerial discretion (e.g., taking a Big Bath, opportunistic smoothing), and accounting rules (e.g., R&D is required to be expensed regardless of traceability).

To provide a better sense of matching concept, the definition of perfect matching should be presented first. Perfect matching is defined as ‘the situation where all relevant expenses are matched with the associated revenues’. In other words, perfect matched earnings are the same as economic earnings. It should be noted that Matching is essentially a time-series phenomenon with all the mismatching eventually are being resolved over time. Studies have shown that accounting standards have moved on to balance sheet approach and not income statement approach. Accounting standards have been away from the concept of matching principle and the standard setting has been concentrated on the “assets -liabilities” approach. Dichev & Tong (2008)

Based on the previous studies, it is expected that this movement will effective on the qualities of the accounting earnings. So in this study we investigate the effects that, matching of revenues to the expenses have on some of the characteristics of accounting earnings (e.g.; persistence of earnings, autocorrelation in earnings changes and earnings volatility).

Studies have shown that recognizing the revenues in a period other than the related expenses in generates a noise in earnings. This noise can increase earnings volatility and reduce earnings persistence; so as a result, the earnings quality will be affected.

Including of the accounting earnings properties which have been investigated in this study are:

**Earnings persistence:** this index measures the persistence of accounting earnings across a long period of time. Earnings persistence is defined as the extent to which current period earnings is predicted by the pervious earnings.

**Earnings volatility:** this index measures the changes in accounting earnings. Earnings volatility is opposite of the income smoothing which reduces earnings Variance.

Investigating the relationship between matching principle and accounting earnings properties is important for several reasons; initially, earnings is the one of the most important outputs of accounting system and the matching process can affect it. And the

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second, as the Standard-setting process, based on balance sheet approach, is growing; this approach can exacerbate the process of matching. Hence, studying the consequents of the matching on earnings properties will broaden the viewpoints of users from accounting earnings when they make economic decisions based on accounting earnings.

Matching is an aged issue in accounting and there are lots of discussions about it in accounting textbooks. Among them, the earliest is Paton and Littleton (1940) monograph. They refer to 'matching' as the 'fundamental obsession' in accounting issues. Matching has also been considered in the financial accounting books such as Revsine, Collins and Johnson (2005).

However, little research has been conducted in the past 10 to 20 years on matching. One reason lies within the efficient market hypothesis (EMH) framework; the paradigm that has work towards smearing the importance of accounting information in recent years. There are serious uncertainties regarding this function because many researches showed that in fact, accounting information plays an important role in evaluation of the companies and that the matching is the most important accounting principles. The second reason is that, the old standards considered the matching of more importance whether in practice or just concept, for example APB11 introduced matching as guiding principle for accounting for income taxes. However, in the last two decades, FASB has chosen the balance sheet approach rather than the income statement approach deeming that accounting earnings is obtained more precisely through asset-liability changes rather than revenue-expense definitions. The statement No.142 (accounting for goodwill and other intangible assets) and No. 144(accounting for impairment and disposal of long term Assets) are illustrious instances in this field.

Despite the above, few researchers have founded their studies on the area of matching. DT(2008) can be taken as a good instance; who have carried out comprehensive research on the relationship between revenues and expenses. A thousand companies from 1967 to 2003 (40 years) were investigated in their research and the results showed that the connection between current period's revenues and expenses has reduced over time while this figure for current period's revenues and the prior period's expenses has increased. These findings confirm a reduction in matching quality and that expenses are recognized in a period before or later than what they have occurred. They explained the change by attributing it to economic factors and that accounting standards and alterations in accounting methods have had an important effect on this relationship. In addition they have reported that, recognizing and matching revenues to expenses in non-contemporaneous manner has led to noise in earnings and the noise will aggravate earnings volatility and weakens earnings persistence; thereby, earnings quality will fall.

Subsequent to DT (2008), Donelson, Jennings & Mclinnis (2011), "DJM", tried to establish the element most influencing the link between the revenues and expenses and to highlight between accounting standards and economic factor, the one that has more effect on this relationship, later in their research. To serve their target; they opted 32645 company-years from 1967 to 2005. According to their results, among the items of expenditures; allocating the funds out proportionately to some particular large items, was the main culprit to bring about the poor matching (reduction in the contemporaneous

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relation between revenues and expenses). So in their sample they excluded large special items. They also realized that the impact of economic factors on a these items have been larger than the most of the new accounting standards.

Another study, in the field, is Sue (2005). In this study, the effect of the matching principle on income smoothing has been inspected. The article was conducted following Gibbins and Willet (1997), who argued that the income smoothing is performed to reduce the variance of accounting earnings in one particular period and to finally represent the short-term earnings closer to the long-term earnings. Their hypothesis was that matching of revenues with expenses is actually an accounting technique to level the earnings. Sue's study has shown that this assumption is true if the company is making profit, yet is not always true for the other conditions. It seems that accounting conservatism in recognizing losses, at the point of prediction is consistent with income smoothing.

Sue's study concluded that conservatism and matching are not kind of traditional rules to be applied optionally; rather they own rational pillars, to lead to a better prediction of future (Su, 2005).

Lane and Willett (1999) have also executed a research in this regard. The issue that has been addressed by them was that, proper matching promotes smoothing effect on earnings which is useful for better estimation of long term earnings. This study differs from other studies in the way of purpose, approach and empirical analysis. Sue (2005) used a technique called the theory of statistical activity cost. To develop the ideas, this technique relies on computer simulations for its empirical results. But, in our study the real financial data are collected to test hypothesis.

Whittred et al, (2000) pointed in their paper that matching refers to the recognition of the expenses when the corresponding revenues are recognized. Then they argued that this definition is imprecise for modeling statistical features, as it does not clarifies how the expenses can be reasonably traced to the revenues.

Research background reviewed some of the studies in regards to the field of matching the revenues with the expenses, yet Iran's business atmosphere is devoid of any related statistics. Thus, the unanswered question is concerning the upshots of performing or not performing of the matching on the earnings properties in Iran's firms.

### 3. Research Hypothesis

According to the details presented in the literature, DT (2008) and DJM (2011), concluded that there is an inverse relationship between matching and earnings volatility. In other words, the researchers found that by having the matching reduced over time, earnings volatility has increase. Thus, the first hypothesis is as follows:

***Hypothesis 1: Poor matching increases earnings volatility.***

In poor matching expenses are merely divided among different periods. Therefore, the time relationship between revenues and expenses will precede the underlying economic

correlation. In this regard, Sivakumar & Waymire (2003) have mentioned contemporaneous relationship between revenues and expenses as the criterion for the quality of matching. The earnings produced by poor matching are volatile because the mismatched or the unmatched expenses play the role of noises. In simple word, they have appeared irrelevantly to their related business event in the firm. Consequently, mismatched expenses literarily add an excessive layer to the fluctuations that are produced inevitably in any economic condition.

Studies of DT (2008) and DMJ (2011) show a linkage between matching of revenues and expenses with earnings persistence. In other words, the result of their research has shown that when the matching of revenues with expenses reduces over time, earnings persistence will be reduced as well. So, the second hypothesis forms as below:

***Hypothesis 2: Poor matching decreases earnings persistence***

To test this hypothesis, the contemporaneous relationship between revenues and expenses is used as an index for the quality of matching as well. Earnings persistence is the slope coefficient of current earnings divided by the lagged earnings in the regression model. According to DT (2008) and DMJ's studies (2011), there is a direct correlation between matching and earnings changes autocorrelation. They concluded that when matching between revenues and expenses lessens, a negative autocorrelation in earnings changes will occur. So the third hypothesis, based on the results from previous research, is presented as follows:

***Hypothesis 3: poor matching causes negative autocorrelation in earnings changes***

Poor matching makes noise on the economic relationship between revenues and expenses, and leads to negative autocorrelation in earnings changes. In previous studies (e.g.; DT (2008) and DMJ (2011)), it was stated that accounting is self-corrective and the mismatching of expenses will eventually be resolved and corrected over time. So the fourth hypothesis will be as follows:

***Hypothesis 4: mismatching errors resolve over long-term horizons***

In this study, it will be argued how the effects of poor matching fade out over time. Since, accounting enjoys a self-correcting system, as the time passes, mismatched items will disappear. Supposing that these types of errors can generally last up to one year, in a five-year span, errors of the second to the fourth period have totally been corrected and only those of the first and fifth period have been remained.

## **4. The Methodology and Model**

### **4.1 Investigating Contemporaneous Relation between Revenues and Expenses**

Investigating contemporaneous relation between revenues and expenses is done through the following regression equation:

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$$\text{Revenues} = \alpha + \beta_1 * \text{Expenses}_{t-1} + \beta_2 * \text{Expenses} + \beta_3 * \text{Expenses}_{t+1}$$

Where Revenues denotes net revenues deflated by the period's average assets, Earnings denotes earnings before extraordinary items deflated by average assets, Expenses is the difference between the Revenues and the Earnings,  $\text{Expenses}_{t-1}$  is the difference between the  $\text{Revenues}_{t-1}$  and the  $\text{Earnings}_{t-1}$  and  $\text{Expenses}_{t+1}$  denotes the difference between the  $\text{Revenues}_{t+1}$  and the  $\text{Earnings}_{t+1}$ .

If mismatching exists, the strong correlation between current revenues and noncurrent expenses ( $\text{Expenses}_{t-1}$  or  $\text{Expenses}_{t+1}$ ) will occur.

This model will be run for each year (cross-sectional) and in this way the coefficients will be computed. Coefficients test will be conducted through two tail t-test. To investigate the question that: *"Has the matching changed over time?"*

In order to better highlight the impacts of the changes, we divided the research period into two horizons; the part time framework which is from 2002 to 2006 and the part time framework which is from 2007 to 2011. Then through the method of means t-test, differences between matching proxy of two time period will be examined.

### 4.2 Investigating Earnings Volatility over Time

Earnings volatility will be calculated for 3 years and then this factor will be compared with two other proxies. Those proxies are volatility of revenues and expenses (as a proxy for intrinsic factors) and correlation between current revenues and current expenses (as a proxy for poor matching). Similar to previous studies, we will compare the means of that proxy in two time horizons. If earnings volatility proxies are different in two horizons, then it can be conclude that earnings volatility is caused by these factors. Earnings volatility and proxies will be computed as follow:

$$\begin{aligned} \text{Vol (Earning):} & \text{Standard deviation (Earnings}_{t-2,t+2}) \\ \text{Vol (Revenues):} & \text{Standard deviation (Revenues}_{t-2,t+2}) \\ \text{Vol (Expenses):} & \text{Standard deviation (Expenses}_{t-2,t+2}) \end{aligned}$$

To investigate the accounting self-correcting, we will examine similar test through two-year analysis. That is by adding two years data and then a similar test will be conducted.

### 4.3 Earnings Persistence and Autocorrelation in Earnings Changes Over Time

In this section we investigate earnings persistence and negative autocorrelation in earnings changes trends over the research period. For this purpose, earnings persistence will be calculated according to Friedman and et al (1982) model. In this model earnings  $t$  will be regressed on earnings  $t+1$  to show how much current earnings can be explained the following earnings. So the  $\beta$  coefficient will be evaluated. If  $\beta$  is close to one then it indicates a high persistence and the  $\beta$  close to zero indicates low persistence of earnings. Model is as follow:

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$$\text{Earnings}_{t+1} = a + \beta * \text{Earnings}_t + \varepsilon_{it}$$

Where  $\text{Earnings}_t$  denotes earnings before extraordinary items for year  $t$  deflated by average assets for year  $t$ ,  $\text{Earnings}_{t+1}$  denotes earnings before extraordinary items for year  $t+1$  deflated by average assets for year  $t+1$ ,  $\beta$  as proxy for earnings persistence,  $a$  denotes model intercept and  $\varepsilon_{it}$  denotes the noise.

To examine changes in earnings persistence, data are divided into two groups and then the differences between the two periods will be examined. Also, this test will be performed for a long period of two years and its results will be compared with changes in negative autocorrelation in earnings changes.

### 4.4 Changes in Autocorrelation in Earnings Changes

Autocorrelation in earnings changes is cross-correlation between current earnings changes and past earnings changes is as follow:

$$\text{Correlation} (\text{Earnings change}_{t-1, t}, \text{Earnings change}_{t, t+1})$$

## 5. Data

Research data was collected from audited financial statements. For this purpose, data from the “Rahavard-e-Novin” software and Tehran Stock Exchange (TSE) websites has been collected. The collected data was analyzed by Excel, SPSS19 and Eviews7. Requirements related to data collection is as follows:

- Financial information required to be available
- Financial to be available for at least 3 years.

This study utilizes data from the 3136 firm-year of the companies listed in TSE during the years 2002 to 2011. This sample size and the opted period of study is considered to be perfect as they are highly related to the recent data and contain most of the available data for the listed companies in TSE. In some cases, because of the hypothesis limitation, the number of samples has been minimized.

## 6. Result Analysis

### 6.1 Descriptive Statistics

Descriptive statistics for variables such as mean, median and standard deviation are shown in Table 1.



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**Table1: Descriptive statistics**

Variable	Observation	Mean	Median	Standard Deviation
Earnings	3,163	0.138	0.100	0.431
Revenues	3,163	0.826	0.750	0.833
Expenses	3,163	0.688	0.630	0.707
Vol(Earnings)	3,163	0.149	0.050	3.531
Vol(Revenue)	3,163	0.304	0.100	6.052
Vol (Expenses)	3,163	0.213	0.080	2.614
Corr(Revenue, Expenses)	3,163	0.733	0.970	0.500
Two-year Earnings	951	0.153	0.120	0.238
Two-year Revenues	951	0.885	0.820	0.722
Two year Expenses	951	0.731	0.680	0.674
Vol(Two-year Earnings)	951	0.085	0.060	0.102
Vol(Two-year Revenue)	951	0.216	0.150	0.356
Vol(Two-year Expenses)	951	0.172	0.100	0.314
Persistence in Earnings	3,136	0.758	0.765	0.464
Autocorrelation in Earnings change	3,136	-0.179	-0.196	0.187
Persistence in two-year Earnings	951	0.419	0.483	0.378
Autocorrelation in two year Earnings change	951	0.589	0.599	0.049

Where Earnings is the earnings announced before extraordinary items deflated by the average assets. Revenues are the net revenues deflated by the average assets. Expenses are the difference between Revenues and Earnings. Vol (Earnings) is earnings volatility, which is calculated by taking the standard deviation of the deflated earnings for the most recent three years. Vol (Revenues) is revenues volatility, which is calculated by taking the standard deviation of the deflated revenues for the most recent three years. Vol (Expenses) is expenses volatility, which is calculated by taking the standard deviation of the deflated expenses for the most recent three years. Corr (Revenues, Expenses) is the correlation between revenues and expenses, which is calculated as the correlation between the deflated revenues and the deflated expenses for the most recent three years. Two-year earnings are calculated as the average of deflated earnings for the current and previous periods. Two-year revenues and expenses are calculated analogously. Vol (two-year Earnings) is volatility in two-year earnings, which is calculated by taking the standard deviation of two-year earnings for the most recent three non-overlapping two-year periods. Vol (two-year Revenues) and Vol (two-year Expenses) are calculated analogously. Corr (two-year Revenues, two-year Expenses) is calculated analogously for the most recent three non-overlapping two-year periods. For each sample year, persistence in earnings is the slope coefficients from the regression of current deflated earnings on the previous period earnings on a cross-section basis. Autocorrelation in earnings change is the cross-sectional correlation between current earnings change and past earnings change.

6.2 Hypothesis Test

**Hypothesis 1:** Poor matching increases earnings volatility

For testing this hypothesis according DT (2008)'s framework the following model was applied:

$$\text{Revenues}_t = \alpha + \beta_1 * \text{Expenses}_{t-1} + \beta_2 * \text{Expenses}_t + \beta_3 * \text{Expenses}_{t+1}$$

The Results are shown in Table 2:

**Table 2: Regression of Revenues on previous, current and future Expenses**

Model:  $\text{Revenues}_t = \alpha + \beta_1 * \text{Expenses}_{t-1} + \beta_2 * \text{Expenses}_t + \beta_3 * \text{Expenses}_{t+1}$

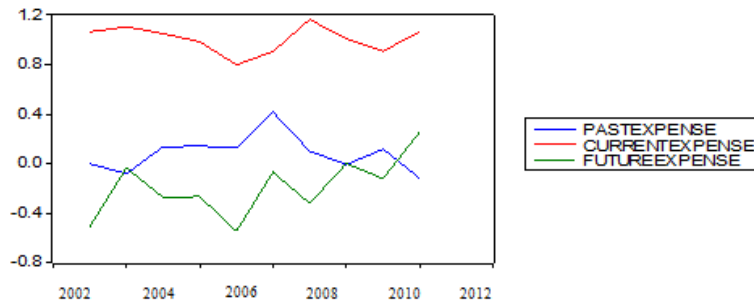
year	N	Coefficient on past expenses ( $\beta_1$ )	Coefficient on current expenses ( $\beta_2$ )	Coefficient on future expenses ( $\beta_3$ )
2002	253	0.001	1.065	-0.508
2003	339	0.081	1.105	-0.034
2004	358	0.136	1.050	-0.270
2005	393	0.143	0.986	-0.265
2006	404	0.131	0.798	-0.544
2007	379	0.417	0.905	-0.069
2008	357	0.101	1.166	-0.319
2009	351	-0.006	1.008	0.002
2010	239	0.118	0.910	-0.121
2011	49	-0.117	1.066	0.258
mean 2002 to 2006		0.066	1.001	-0.324
mean 2007 to 2011		0.103	1.011	-0.050
Difference		0.037	0.010	0.275
P-value on Diff.		0.100	0.898	0.132

Revenues<sub>t</sub> is net revenues deflated by average assets for the current period. Expenses<sub>t</sub> is the difference between Revenues and Earnings for the current period. Expenses<sub>t-1</sub> is the difference between Revenues and Earnings for the previous period. Expenses<sub>t+1</sub> is the difference between Revenues and Earnings for the next period. The regression is run on a cross-sectional basis in each year. The slope coefficients on the past, current and future expenses are reported in the table. P-value on the difference is obtained from a two-tail t-test.

According to DT (2008), Results showed a significant decrease in  $\beta_2$  over time. Unlike their findings, in this study, this difference is not significant. DT (2008) showed that Coefficient on past expenses ( $\beta_1$ ) and Coefficient on future expenses ( $\beta_3$ ) has increased significantly but we did not see a significant increase.

Figure 1 show changes in the Coefficient on past expenses ( $\beta_1$ ), Coefficient on the current expenses ( $\beta_2$ ) and Coefficient on the future expenses ( $\beta_3$ ) over 10 years:

Figure 1: Coefficients for past, current and future Expenses



The overall results indicate that there is no significant change in matching properties over research period.

Now we investigating earnings volatility over the three years and it will be compared with intrinsic factors (revenues and expenses volatility) and the poor matching proxy (the correlation between revenues and expenses volatility). The results are shown in table 3:

Table 3: Volatility over time for the one-year sample

year	N	Vol(Revenues)	Vol(Earnings)	Vol(Expenses)	Corr(Revenues, Expenses)
2002	271	0.170	0.080	0.150	0.760
2003	332	0.180	0.070	0.160	0.750
2004	351	0.160	0.060	0.150	0.710
2005	388	0.160	0.070	0.140	0.720
2006	395	0.190	0.070	0.180	0.700
2007	396	0.180	0.110	0.150	0.700
2008	349	0.190	0.090	0.150	0.740
2009	339	0.350	0.110	0.300	0.740
2010	242	0.230	0.130	0.120	0.820
2011	49	0.230	0.150	0.200	0.710
mean 2002 to 2006		0.170	0.070	0.160	0.730
mean 2007 to 2011		0.230	0.120	0.200	0.740
Difference		0.060	0.050	0.040	0.010
P-value on Diff.		0.085	0.002	0.143	0.576

As presented by table 3, volatility in the revenues and the earnings were significantly different over 10 years. That indicates that earnings volatility is caused by intrinsic factors rather than the factors due to the changes in matching properties. DT (2008) reported that earnings volatility is caused by the changes in correlation between revenues and expenses (as proxy of matching) and earnings volatility is isolated from intrinsic factors, so our findings are not consistent with DT (2008) results.

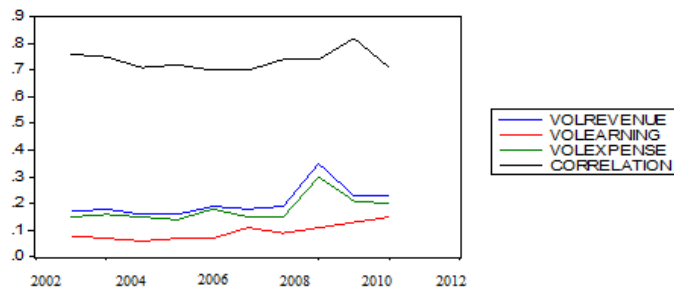
The results also indicate that correlation between revenues and expenses have not changed significantly over the period under review.

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Givoly and Hayn (2000) reported earnings volatility in their study but the volatility was attributed to conservatism in accounting. Conservatism can be regarded as poor matching, thus our findings are similar to their findings.

Figure 2 shows earnings volatility, revenues volatility, expenses volatility and correlation between revenues and expenses over 10 years. As clearly shown, Earnings volatility and revenues volatility are approximately parallel.

**Figure 2: Volatility of Revenue, Earnings, Expenses and correlation between Revenue and Expenses over time**



### ***Hypothesis 2: Poor matching decreases earnings persistence***

Earnings persistence will be calculated according to the model of Friedman and et al (1982).

Persistence in earnings is the slope coefficients from the regression of current deflated earnings on the previous period earnings on a cross-section basis. The results are listed in Table 4.

According DT's reports (2008), it is expected that earnings persistence decreases over time. Our results is consistent with DT (2008)'s findings. Although, our results showed that there is declining trend in earnings persistence, but the difference is not statistically significant. So the evidence does not support second hypothesis.

### ***Hypothesis 3: Poor matching causes negative autocorrelation in earnings changes.***

Autocorrelation in earnings change is the cross-sectional correlation between current earnings change and past earnings change. Similar to previous hypothesis, the results are listed in the table 4 and the time horizon's mean, will be compared with each other:

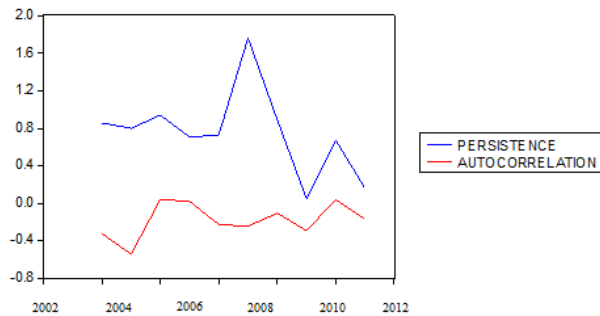
**Table 4: Persistence and autocorrelation over time for the one-year sample**

year	N	Persistence in earnings	Autocorrelation in earnings change
2002	272	0.858	-0.324
2003	363	0.800	-0.541
2004	371	0.942	0.043
2005	366	0.708	0.021
2006	400	0.730	-0.225
2007	400	1.764	-0.244
2008	392	0.891	-0.103
2009	372	0.051	-0.290
2010	396	0.678	0.039
2011	248	0.161	-0.168
mean 2002 to 2006		0.807	-0.205
mean 2007 to 2011		0.709	-0.153
Difference		-0.098	0.052
P-value on Diff.		0.759	0.684

The results suggest that (as shown in the table 4) there is no significant change in autocorrelation in earnings changes over 10 years and figure 3 displays it clearly.

Figure 3 shows earnings Persistence changes and Autocorrelation in earnings changes over 10 years.

**Figure 3: persistence and autocorrelation in earnings changes**



**Hypothesis 4: mismatching errors resolve over longer horizons**

The results are shown in table 5:

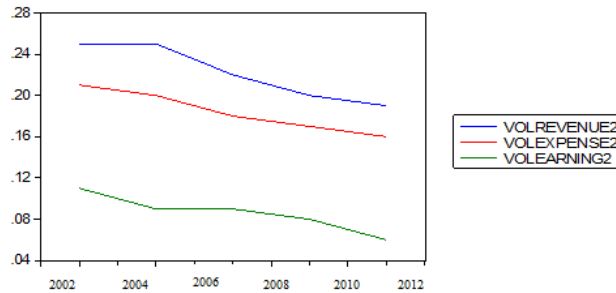
**Table 5: Volatility over time for the two-year sample**

Two Years	N	Vol(two-year Expenses)	Vol(two-year Revenues)	Vol (two-year Earnings)
2002-2003	122	0.250	0.210	0.110
2004-2005	160	0.250	0.200	0.090
2006-2007	184	0.220	0.180	0.090
2008-2009	185	0.200	0.170	0.080
2010-2011	136	0.190	0.160	0.060
mean 2002 to 2006		0.240	0.197	0.097
mean 2007 to 2011		0.195	0.165	0.070
Difference		-0.045	-0.032	-0.027
P-value on Diff.		0.101	0.077	0.044

As seen in the table5, there is a significant decline in volatility of earnings and volatility of revenues. So the earnings volatility can be attributed to volatility of revenues. Therefore, volatility of earnings can be attributed to intrinsic factors rather than matching properties.

Figure 4 shows earnings volatility (two–years), revenues volatility (two–years) and expenses volatility (two–years) changes over time under review. Earnings volatility and revenues volatility are approximately parallel.

**Figure 4: Two-year earnings, revenues and expenses volatility**



For investigating the time effects on earnings Persistence and Autocorrelation in earnings change, as it has shown in the table 6, two-year data has been utilized:

**Table 6: Persistence and autocorrelation over time for the two-year sample**

<b>Two Years</b>	<b>N</b>	<b>Persistence in two-year earnings</b>	<b>Autocorrelation in two-year earnings change</b>
2002-2003	122	0.001	0.644
2004-2005	160	0.823	0.599
2006-2007	184	0.731	0.510
2008-2009	185	0.055	0.604
2010-2011	136	0.483	0.589
mean 2002 to 2006		0.518	0.588
mean 2007 to 2011		0.352	0.592
Difference		-0.166	0.008
P-value on Diff.		0.953	0.972

The evidence (as shown in table 6) suggests that there is no significant changes in earnings Persistence and Autocorrelation in earnings change over 10 years so the findings don't support our expectations.

## **7. Summary and Conclusions**

The main purpose of this study was to highlight matching principle as one of the important principle in recognizing accounting earnings. Poor matching affects all properties of earnings (such as: persistence, volatility, reversibility and etc.), and perfect matching is required for presenting useful financial information. The theory used in this paper is based on Dichev & Tang (2008) study that argues how poor matching makes a noise on the relationship between revenues and expenses. They have reported that, poor matching increases earnings volatility and reduces earnings persistence. Additionally they stated that poor matching increases negative autocorrelation in earnings changes. Our study utilizes data from Iranian company which listed in Tehran Stock Exchange (TSE). According to our investigation, there was a meaningful correlation among earnings volatility revenues volatility that proved the inherency of the factors. On the other hand, we didn't find any relationship between earnings volatility with correlation between revenues and expenses. As a result we couldn't attribute earnings volatility to matching properties and this is not consistent with DT (2008)'s findings. In order to investigate earnings persistence and autocorrelation in earnings changes trend, we utilized one-year and two-year samples but the evidence doesn't support our expectation in both approaches.

As it is evident from the paper, this is only the significant difference of the ten-year period of the earnings volatility and the revenues volatility, which can be explainable (As the proxy for intrinsic factors).

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Evidence suggests that the Changes in accounting standards or setting new ones for Iranian companies from 2002 to 2011 haven't had significant effects on matching properties. As matching properties haven't had significant changes over 10 years, as results other properties of earnings (such as: earnings persistence, autocorrelation in earnings changes) haven't had significant changes too. These results are not consistent with DT (2008)'s findings.

The main limitation of this study is the lack of available data. If more data (because of increase in research period.) have been available, then the findings would be affected. Research on the matching principle in Iran and other countries, in comparison with other field of study, is less popular, while many of the properties of earnings or other accounting variables, are affected by matching principle.

We suggest that researcher focus on issuing new accounting standards and investigate matching properties about it. That is the researcher who investigates the effect of new standards on matching. As describe earlier, the main finding of this study is the changes in earnings volatility over 10 years and this volatility is attributed to revenues volatility. So investigating other factors including accounting or intrinsic factors, can lead to development our knowledge about matching.

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