A Study of Earnings Timing of Listed Firms in the Tehran Stock Exchange by panel data approach

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Abstract. Given the growing importance of earnings timing of stock exchange, the recognition of contributing factors can be helpful in improving it. Market timing is a criterion that can be studied with respect to decision-making on earnings timing. One of the contributing factors in timing earnings is earnings management. It can be considered a dimension of real and accrual based knowledge management. Hence, the purpose of the study is to examine earnings timing with respect to market expansionary period and firms’ discretionary accrual-based earnings management. To do this, Jones’s modified model was used to determine level of discretionary accruals. The population of the present study encompasses all non-financial listed companies in Iran’s stock exchanges, and research sample consisted of 111 firms. Given the fact that the period of the research was a five-year course starting 2008 through 2012, data were composed of 555 observations. In order to test hypotheses, a multivariate regression method based on panel data was used. The results of the test indicate that firms can make more profits during market expansion period, and they can manage earnings more effectively by achieving higher market valuation.

Keywords: Earnings management, Jones’s modified model, earnings timing, and business cycle (market expansion and recession period)

1. INTRODUCTION

As for the characteristics of developed countries, we can refer to efficient financial markets and institutions, which provide foundations for economic growth and development, as well as assuming an important role in country’s economy. Dynamic financial markets are viewed as one of fundamental and influential components in the economy of every country. Market dynamics requires transparent and reliable information in order to make appropriate decisions. A great deal of information used in financial markets is processed and reported by an accounting system. The information provided by accounting system is the basis for predicting future data. In order to make precise prediction of future data, we cannot just rely on accounting data, but instead we need to direct our attention to other factors such as country’s economic conditions (economic growth or expansion) as well.

Economic conditions can exert different effects on firms and their performance and influence the manner of accounting data. On the other hand, timely and reliable financial reports and financial information can be made available to foreign consumers accordingly. Users of financial statement invariably assess company’s performance and make their own decisions based on the statements. Under different economic circumstances, i.e. economic boom or recession, there is an important relationship between earnings manipulation by managers and the conditions. In general, providing unreliable and irrelevant information would result in inefficient allocation of capital, which in turn have a negative impact on securities market. Considering the periodic cycles of expansion and recession in equity market, earnings timing takes on growing importance in capital markets. According to capital market experts, one of the most important contributing factors in earnings timing is how to manage accruals (earnings management). Accrual accounting provides an opportunity for financial statements to offer a better image of company’s performance; however,
accruals require certain assumptions and estimates. The use of such options to manage accruals in order to achieve predetermined results of reporting is by definition called earnings management. Managers may employ an impetuous earnings management in an attempt to earn personal interest under different conditions as well as influencing capital market in several cases like the necessity for achieving target profit and so on. For example, Bartov and Mohanram (2004) maintained that during the period they were exercising large options to buy equity so as to inflate earnings, they ventured into earnings management. Given the subject of the present study, we deal with information in the foregoing area; thus, it is necessary to come up with some accounts of business cycles (market expansion and recession period) and earnings management. Accordingly, the study seeks to demonstrate whether firms can offer more earnings management during market expansionary period, and they are also able to do so by higher valuation.

2. RESEARCH BACKGROUND AND THEORETICAL FOUNDATIONS

2-1. Earnings management

One of the objectives of financial reporting is to provide information valuable to investors, creditors, and other current and potential users as to investment and credit-grant related decision-making and other decisions. In order to estimate firm’s power to make profit, predict future earnings and relevant risks as well as evaluating management performance, one of the criteria of the foregoing groups is company’s previous and current earnings. Earning itself consists of cash flows and accrual items and accruals of earnings are to a large extent controlled by management, which it has the power to manipulate accruals of earning and manage earnings, so to speak, in order to demonstrate a better picture of company’s performance and increase the potentiality to predict future earnings. In other words, executives attempt to create predictable and viable results by opting for permissible accounting methods, because most investors and managers hold that companies with appropriate profitability trend, whose profits do not undergo substantial changes, benefit more from valuation, predictability and comparability than similar companies. Conversely, given agency theory, managers can benefit from essential motivation to manipulate earnings so as to maximize their interest. Helen and Valen (1992) posit that earnings management takes place when executives make use of their personal judgments in financial reporting and manipulate structure of transactions so as to alter financial reporting. The goal was pursued either to mislead some of their earnings stakeholders as to company’s economic performance or to influence the results of contracts whose conclusion hinges upon acquisition of personal profit. The researchers documented two forms of earnings management; the firms involves the selection of good accounting methods in order to achieve the desired level, i.e. an accounting based earnings management; the second takes advantage of the extent of practical decisions in order to achieve the desired earnings, i.e. manipulation of real activities. The former, accounting-based earnings management, is fairly obvious during the year that change happens, in that audit is supposed to recognize it and expose it through notes. The latter is accomplished through operational decisions, which is probably difficult for an outsider to recognize. Discretionary accrual management is not feasible by changing central economic activities of a company, but instead it is accomplished through selection of accounting methods and accounting estimates. Meanwhile, manipulation of real activities can be applied via central activities of a company.

2-2. Earnings management practices

In sum, ways of earnings management are as follows:

1- Selection of accounting policies makes a difference in timing of recognition, earnings, and costs in order to anticipate profit. For example, policies that advance the recognition of earnings and delay the recognition of costs can increase the profits reported.

2- The use of accounting policies/discretionary estimates;
Even after company founder selected accounting policies, there are still options on how to employ accounting principles. For instance, there are options on the estimation of service life, residual value, the life of intangible asset, bad rate of receivable accounts, etc.

3. Timing of accounting policies
Management has also the power to recognize events when and how they occur. When accounting events require disclosure of financial statements, e.g. in the case of defective assets, the power is given when they can be amortized.

4. Timing:
Timing of acquisition and purchase of assets can make a difference in accounting earnings. Management, however, can invest in, advertise and preserve costs of research; each is viewed as cost of the period during which they are incurred. It also can make decision on the timing of the sale of property, machinery and equipment in order to speed up or delay the recognition of gains or losses.

2-3. The concept of business cycle

There are many definitions of business cycles, but almost all of them have similar meanings. As a result, there have been fewer controversies regarding the issue. Dorenbush et al (1983), in their accounts, came up with the similar definitions of the regular ups and downs of boom and slump in economic activities revolving around economic grow path.

Lucas (2002) found business cycles repetitive deviations in real GDP with respect to a long-run process. Burns and Mitchell (1946) came up with a scientific definition of business cycle as follows: “business cycles are a type of regular fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar character (P.3)”.

In the definition, there are four points to be dealt with, which include:

A. The fluctuation occurred in major economic activities that have to do with not only home goods, but other variables also such as employment, price levels and financial market variable are important.

B. Business cycles do not simply encompass special economic sectors or a certain number of variables. Yet prosperity and recession are considered at the same time in many economic activities. The attribute is called co-movement.

C. the time including a business period can vary from one year to more than ten years. However, the point is that economy shows tendency toward contraction when recession begins, and this continues for one year or more.

D. recession and boom patterns continually recur, but they will not function as alternating periods. This means that the spread and duration of fluctuation are not invariably equal, so recession and prosperity sequence can be observed in economy over and over again.

Co-movement posits that the observed cyclic pattern can move in many economic sectors and macroeconomic variables more or less at the same time as fluctuations in products

This means that in a business cycle peaks and troughs stages are considered with respect to foregoing variable over a time. Co-movement analysis is proceeded with two viewpoints—
turning time and turning orientation. Given the time, variables can be leading, coincidental, and lagging. Leading variable are those whose movement can change in turning points before reference variable. Similarly, coincidental indicators and GDP move simultaneously, and lagging variables moves after reference variable. In terms of direction, they are divided into three groups— pro-cyclical, countercyclical or acyclical groups. If variable moves in the same direction as reference variable, it is called pro-cyclical variable; and if it moves in the opposite direction, it is called countercyclical variable; and finally, a variable that moves across time randomly and without a specific pattern is called acyclic. Another attribute generally considered by business cycle researchers is variation that measure the amplitude of volatility of a variable. According to the definition, variation is the extent to which variable tend to be volatile. High levels of variable variation, compared to reference variable, indicate the power and potentiality of series to generate a cycle. The two characteristics have nothing to do with the definition of business cycles, yet it is studied in terms of evaluation of causes of business cycles.

2-4. Characteristics of business cycles

As the definition of business cycles suggests, the most important characteristics of business cycles are made clear.

1. Volatility: it show to what extent a variable is unstable and actually the extent to which variable tends to be volatile.
2. Persistence: the feature works in such a way that economy shows a tendency toward contraction at recession time, and this continues for a year or more. Likewise, during prosperity, economy reveals its expansion functions which lasts for a while.
3- Comovement: this means that the observed cyclic pattern can move in many economic sectors and macroeconomic variables more or less at the same time as fluctuations in products (Tabibnia and Ghasemi, 2010).

Recognition of business cycle stages

Many efforts have been made to identify, evaluate, and realize stages of business cycles. In general, a business cycle consists of four stages; expansion, peak, recession or downturn and trough or bottom. The stages indicate the status of economy, which include (Akhavi and Ahmadi, 1992).

Recovery

In this stage of the business, producers rise more than prices and real gross domestic production (GDP) approach the limit of its long-run process.

Expansion

It is a stage of business, in that sale along with the profit of producers reaches its zenith in the end and stops here, while unemployment reaches its nadir and inflation often arises as an economic problem.

Recession

It is a stage of business during which drop in output proceeds and profit of production activities decline; in addition to this, the growth of real GDP follow a declining trend, as unemployment In this stage of the business, producers rise more than prices and real gross domestic production (GDP) approach the limit of its long-run process. It is a stage of business, in that sale along with the profit of producers reaches its zenith in the end and stops here, while unemployment reaches
its nadir and inflation often arises as an economic problem. Production and sale and continue a declining trend. As a result, the stage is called a declining stage. Follows a growing trend. At this point, long-held investments become limited along with production and sale and continue a declining trend. As a result, the stage is called a declining stage.

Crisis

In this stage of business, real GDP, level of sales and business remain at the lowest rate and unemployment stays at its highest point. This has been agreed on that setting up a cycle require a specific duration, i.e. it must be persistent and viable. This means that a full business course lasting at least one year and every fluctuation less than the period are recognized as random fluctuation. On the other hand, expansion and recession stages of the cycle are preferred to be in a row.

Since market has a look at future and already manifest indicators of recession event (e.g. rise in interest rate), and expansion (e.g. expansionary fiscal policy), decline of equity market is considered a consequence of business cycle typically preceding the outbreak of economic impacts. Sadly enough, thorough recognition of the beginning and end of decline mechanism points are after all arbitrary. Because of this, we have no operational definition of progress and decline of stock market at work, which causes business cycle to fall. As a result of the limitation, we tap into previous studies on business cycle.

Association of business cycles with earnings management

Presence of various economic conditions, i.e. economic recession and boom, is one of the contributing factors in level of earnings management. Researchers like Lin and Shih (2003) and Qinglu conducted studies on the link between the factor and earnings management in Europe. The works indicate that earnings management has significant relationship to business cycles as companies mostly employ earnings management in the course of recession. However, considering certain features of firms, Qinglu came to the conclusion that in small firms, growing firms, and cyclic firms there is a relationship between earnings management and positive business cycles, while in larger firms, non-growing and acyclic firms the relation is negative.

Lin and Shih (2003) reviewed the relationship between earnings management and macroeconomic condition, stressing that earnings management as phenomena generally hinge on the conditions of macroeconomic environment, as the amplitude and dimension of earnings management receive no treatment. In the study, Lin and Shih employed Jones’ modified model of time series in order to estimate discretionary commitment, and their sample include the period from 1989 to 1996, which was difficult to treat due to the limitation.

Banerji and Hiris (2001) indicated that the classic criterion of business cycle and growth cycle as well as growth rate cycle rely on an understanding of active macro economy active variables in the economy of open market. The research provides a framework for analysis and estimation of the behavior of business cycles concerning economic activities and inflation. The framework also is developed in support of foreign business and important sectors of domestic economy. In the work, business cycle and growth rate cycle were introduced as economic determinants.

Kroling (2001) analyzed the business cycles of the Unites States, growth-focused regime of the US, Japan, and Europe economy. He demonstrated that the long-run develop is a foundation for a change in the pattern of business cycle in the case of America. As for Japan, a sudden economic development event during the mid-1970 as well as a long-run economic regression in 1990 are discussed. In the case of Europe, a universal event in 1970 on a par with the pattern of business cycle was approached.
Qinglu (2005), in a study on which the present research is built, deals with business cycles, accounting behavior and earnings management in the US companies. Particularly, it is assumed in the research that the importance of earnings management are influenced by certain features of firms within a macro economy environment. Qinglu indicated that earnings management is a function of GDP growth convergence. That is, earnings management decline the same as real GDP growth up to a certain point, followed by an increase in real GDP growth. However, the relationship between directions of the earnings management of real GDP growth depends on firm-specific characteristics. The result indicated that earnings management mounts during the periods that economic growth is either very weak or very strong. Furthermore, small firms and firm with low profitability and acyclic firms are less interested in the use of earnings management during the economic periods involving very strong economic growth and vice versa.

3. RESEARCH HYPOTHESES

1- There is a significant relationship between firm expansion and earnings management.
2- There is a significant relationship between higher value firms and earnings management during market expansionary period.

4. RESEARCH METHODOLOGY

Population of the study

It consists of all listed companies in Tehran Stock Exchange, except investment companies, financial intermediaries and banks listed in the stock exchange from the beginning of 2008 through 2012.

Sample

Given the limitation imposed on the study population, 111 companies were left and selected as sample.

1. Study companies were required to stay as a member of Tehran Stock Exchange by the end of the research.
2. Study companies are not within the purview of banks, financial institutions and investment companies, holding companies, leasing and financial intermediary.
3. Companies whose information on the study variable are not available to the study are excluded from the population.

Definition of research variables and how to consider them in the models

Earnings management (EM): it is used as dependent variable in the models. Given discretionary accruals and on the basis of Jones’s modified model (Decho et al, 1995), parameters were estimated by regression.

How to measure discretionary accruals DAadj:

1. Calculation of total accruals
   \[ \frac{TAt}{At_{t+1}} = \frac{(OIt - FOt)}{At_{t+1}} \]

2. Industry average parameter estimates (\( \alpha_3 \), \( \alpha_2 \), \( \alpha_1 \))
   \[ \alpha_3 \left( \frac{PPET}{At_{t_1}} \right) + \alpha_2 \left( \frac{\Delta REVt}{At_{t+1}} \right) + \alpha_1 \left( \frac{TAt}{At_{t+1}} \right) = \alpha_1 \left( \frac{1}{At_{t+1}} \right) \]

3. Estimating nondiscretionary accruals
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\[
\frac{NDA_t}{A_{t-1}} = \alpha_1 \left( \frac{1}{A_{t-1}} \right) + \alpha_2 \left[ \frac{(\Delta \text{REV}_t - \Delta \text{REC}_t)}{A_{t-1}} \right] + \alpha_3 \left( \frac{\text{PPE}_t}{A_{t-1}} \right)
\]

Non-discretionary accruals are estimated by putting company’s industry average parameters (equation 2) in equation 3.

(4) Estimating discretionary accruals

\[
\text{DAadj}_t = \frac{TAt_{t-1}}{A_{t-1}} - \frac{NDA_t}{A_{t-1}}
\]

Discretionary accruals equal the sum of accrual item estimated in equation (1) minus nondiscretionary accruals obtained in equation (3).

**Dependent variable**

Market valuation (HPB): it is price-to-book, ending closing price-to-book of net assets per share ratio

**Auxiliary variables**

Firm size: Natural logarithm of total assets  
Operating performance (ROA): Net income-total assets ratio  
Financial leverage (Lev): it is considered as a financial indicators which is total liabilities-to-total assets ratio

**Dummy variable (dummy)**

Bull market: it is considered as a dummy variable, while market in year t is booming it is 1, otherwise 0.

**How to select stock expansion and recession condition**

According to Maleknejad and Aghaee (2009), conditions of recession and expansion are selected as follows

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>-0.152459799</td>
</tr>
<tr>
<td>2009</td>
<td>0.384288123</td>
</tr>
<tr>
<td>2010</td>
<td>0.461825779</td>
</tr>
<tr>
<td>2011</td>
<td>0.100779901</td>
</tr>
<tr>
<td>2012</td>
<td>0.319006791</td>
</tr>
</tbody>
</table>

The above table is the maximum average return of total stock market index which is linked to 2010 and the minimum return to 2008. Given the trend of total index, 2010 is expansion period (the maximum increase in prices) and 2008 is recession period (the highest decrease in prices).

**5. ANALYSIS OF FIRST HYPOTHESIS**

Hypothesis 1: there is a significant relationship between firm expansion and earnings management.

\[
\text{EM}_{it} = \alpha_i + \alpha_1 \text{MARKET}_{it} + \alpha_2 \text{SIZE}_{it} + \alpha_3 \text{ROA}_{it} + \alpha_4 \text{LEV}_{it} + \epsilon_{it}
\]
Table 2. Analysis of the first hypothesis.

<table>
<thead>
<tr>
<th>Estimation period:</th>
<th>Cross-section fixed (dummy variables)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted coefficient of determination</td>
<td>0.660748</td>
</tr>
<tr>
<td>\textit{F statistic}</td>
<td>10.80927</td>
</tr>
<tr>
<td>Probability</td>
<td>0</td>
</tr>
<tr>
<td>Durbin-Watson statistic</td>
<td>2.035105</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>coefficient</th>
<th>SD</th>
<th>t statistic</th>
<th>probability</th>
<th>Confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>-3.40772</td>
<td>0.543736</td>
<td>-1.26722</td>
<td>0.095</td>
<td>nonsense</td>
</tr>
<tr>
<td>ROA</td>
<td>0.694244</td>
<td>0.027209</td>
<td>25.51476</td>
<td>0</td>
<td>99%</td>
</tr>
<tr>
<td>MARKET</td>
<td>0.382401</td>
<td>0.143431</td>
<td>2.666105</td>
<td>0.008</td>
<td>99%</td>
</tr>
<tr>
<td>LEV</td>
<td>8.728105</td>
<td>1.620649</td>
<td>5.385561</td>
<td>0</td>
<td>99%</td>
</tr>
<tr>
<td>C</td>
<td>20.42143</td>
<td>2.755864</td>
<td>7.410173</td>
<td>0.0817</td>
<td>nonsense</td>
</tr>
</tbody>
</table>

Given the significance economic situation—market expansionary period, which is the main variable of the model, we can claim that there is a significant relationship between economic situation variable – market expansionary period—and earnings management. Conversely, coefficient mark of the variable is positive in the model. Therefore, the relationship between the two variables is positive, i.e. earnings management gains momentum during expansionary period, so the first hypothesis is confirmed with respect to the results of the model.

9. Analysis of the second hypothesis

The second hypothesis: in market expansionary period, there is a significant relationship between higher valuation and earnings management. The hypothesis came to the fore in order to examine the impact of higher valuation and earnings management during market expansionary period and is being tested using the following model:

\[
EM_{it} = \alpha_i + \alpha_2 MARKET_{it} + \alpha_2 HPB_{it} + \alpha_3 MARKET \ast HPB_{it} + \alpha_4 LEV_{it} + \alpha_5 ROA_{it} + \alpha_6 SIZE_{it} + \epsilon_{it}
\]

Table 3. Analysis of the second hypothesis.

<table>
<thead>
<tr>
<th>Estimation period: 2088-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section fixed (dummy variables)</td>
</tr>
<tr>
<td>\textit{F statistic}</td>
</tr>
<tr>
<td>Probability</td>
</tr>
<tr>
<td>Durbin-Watson statistic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Explanatory variable</th>
<th>coefficient</th>
<th>SD</th>
<th>t statistic</th>
<th>probability</th>
<th>Confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARKET</td>
<td>1.308242</td>
<td>0.732404</td>
<td>2.786231</td>
<td>0.0348</td>
<td>95%</td>
</tr>
<tr>
<td>HPB</td>
<td>0.234572</td>
<td>0.119964</td>
<td>1.955351</td>
<td>0.0412</td>
<td>95%</td>
</tr>
<tr>
<td>MARKET*HPB</td>
<td>0.378999</td>
<td>0.131421</td>
<td>2.883859</td>
<td>0.0041</td>
<td>99%</td>
</tr>
<tr>
<td>LEV</td>
<td>7.865037</td>
<td>5.346431</td>
<td>1.471082</td>
<td>0.142</td>
<td>nonsense</td>
</tr>
<tr>
<td>SIZE</td>
<td>-2.72555</td>
<td>3.07108</td>
<td>-0.88749</td>
<td>0.3753</td>
<td>nonsense</td>
</tr>
<tr>
<td>ROA</td>
<td>0.591779</td>
<td>0.111191</td>
<td>5.322177</td>
<td>0</td>
<td>99%</td>
</tr>
<tr>
<td>C</td>
<td>16.76007</td>
<td>20.8141</td>
<td>0.805227</td>
<td>0.4212</td>
<td>nonsense</td>
</tr>
</tbody>
</table>
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Thus, given the significance the interaction of market valuation in the market valuation of expansionary period (Market*HPB), which is the main variable of the model, we can argue that there is a significant relationship between market valuation in expansion condition and further earnings. On the contrary, in the course of expansion in companies with higher valuations, the odds of more earnings goes up, then the second hypothesis is confirmed with reference to the results of the model.

Results of hypotheses test

Hypothesis 1: the relationship between market expansionary period and more earnings management were tested. The result of the research indicate a positive relationship between market expansionary period and more earnings management. The potential reason can be drawn from the fact that supply share is less than demand during market expansionary period and participants in market have high expectations for company’s future profits, while supply is more than demand and participants of market have lower expectation for future profits during recession. The results are in line with those of Johnson (1999), Churdia and Kumar (2002), and Antonium et al (2002).

For the second hypothesis: the relationship between companies with higher valuation and more earnings management during market expansionary period was tested.

The results indicated a positive relationship between companies with higher valuation and more earnings management. The potential reason for this is high expectations of mark participants for company’s future profits during market expansionary period and uncertainty about company valuation and asymmetry of little information. As a whole, in this very period of market, firms with higher valuation can generate more earnings management. The results are consistent with those of Lio and Vasalu (2000), Quinglo (2005), Liari and Robert (2005).

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