The Relationship between Product Market Competition and Income Smoothing in Listed Companies on Tehran Stock Exchange

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ABSTRACT

The purpose of the study is to examine the relationship between product market competition and income smoothing in listed companies on Tehran Stock Exchange. The results show that there is a significant and negative relationship between product market competition and income smoothing.

INTRODUCTION

Product market competition is one of the important issues in corporate governance of external organization. As governance problems can distort financial reports, the present study tests some aspects of financial reporting and due to the temptation of the managers’ motivation; it leads to economic performance distortion via reported incomes. The present study attempts to find a relationship between product market competition and income smoothing and by data analysis can extract the criteria by which they can decide about investment or non-investment in companies.

1- Statement of problem and study purpose:

One of the goals of accounting reporting is presenting useful information about financial performance of business unit for a wide range of users. Profit and loss statement is one of the basic financial statements fulfilling this goal. The product of profit and loss statement is net profit and it is one of the important financial information applied by investors and other users of financial statements. Based on the importance of reported profit regarding economic decisions and allocation of rare resources, earnings management and report earnings quality are the topic of most of accounting researches in three recent decades. One of the forms of earnings management is income smoothing. Income smoothing as a conscious measurement to reduce the periodical changes of reported or predicted earnings is defined via using accounting technique’s in the framework of general principles of accounting [1]. Income smoothing hypothesis proposes that earnings to reduce the fluctuations as considered normal for the company is manipulated consciously by management. According to the definition, in earnings measurement process, some defects as contrast of benefits with managers and shareholders need future estimations and predictions and we can use various accounting methods and these defects cause that there is a difference between reported income and actual income. In such conditions, earnings information content is reduced and good application of this element in decision making models is endangered. Previous experiences showed that motivation of managers for earnings smoothing is based on two main factors: 1- Internal factors dedicated to the features of company as board structure and shareholder composition, 2- External factors as product market competition and type of industry.

Product market competition is the condition in which there are many informed buyers and sellers as none of them can affect the price level as they are small part of total industry sale.

In the markets with high competition, the behavior of a specific company can hardly affect the behavior of entire market and to attract the attention of investors and other beneficiaries, increasing social credit and...
reduction of capital cost, the firms are more inclined to present high quality financial statements and their inclination to earnings manipulation is reduced [11]. The companies active in exclusive markets as they are mostly dependent upon government and use state budget, the managers of these firms are supervised by monitoring organizations and they should be responsive to the resources given to them. Thus, they behave as their performance is normal and they are more inclined to manipulate financial statements and income smoothing.

Theoretical framework and review of literature:

In some of studies, there are some evidences regarding the effects of product market competition on managers’ motivation regarding manipulation and income smoothing. Earnings management hypothesis was presented at first by income smoothing by Hepworth and later it was introduced by defines earnings management as intentional intervention of management in financial reporting process to achieve earnings expected level. In other words, based on the various goals of management, it is possible the earnings is increased or reduced or is smoothed.

Darrough & Stoughton [7] believe that in competitive industries, business units by presenting exact and high quality financial report prevent the potential competitors into the industry. Varkichia [12] indicates that existing competition in product market avoids the issuing of high quality financial reports and firms in competitive markets can report financial information with low content. Harris found that in industries with low competition, suitable disclosure of operation is rarely possible.

Kouhan proved that in the industries with low competition, high quality financial information reporting is less probable.

Karuna & subramanyam [9] believe that earnings management is common only in the companies with high competition. They state that competition pressure leads to some problems in companies. For example, delay or stopping the research and development costs and other activities leading to the increase of short-term profitability.

3-1 Local studies:

Heidari, Qafarloo in a study investigated the relationship between competitive structures of products and conditional conservatism and found that there was a positive and significant association between products competitive structures and conditional conservatism in financial reporting.

Setayesh and Jahromi [3] in a study evaluated the impact of competition in product market with capital structure and found that there was a negative and significant association between product market competition and capital structure.

Namazi and Ebrahimi [6] in a study investigated the relationship between competitive structure of product market and stock return. Generally, the results of their study showed a negative relation between Herfindal-Hirschman index and stock return and this relationship was no significant. There was a negative and significant relation between Lerner index and adjusted Lerner index and stock return.

Qorbani et al., [5] in a study investigated the relationship between product market competition and board composition and information disclosure quality and found that product market competition had not governance effect and the relationship between board composition and disclosure quality was not improved.

3-2 Foreign review of literature:

Laksmana and Yang [10] in a study investigated the relationship between product market competition and income smoothing with profitability introduction goal. They found that competitive firms are more inclined to income smoothing compared to exclusive companies.

Andrgassan investigated the relationship between product market competition and mutual behavior and motivation. Generally, the results of their study showed a non-uniform relation between them. The strong motivations due to paying high performance with strong PMC lead to cheating behaviors and similar or weaker encouragements with weak PMC can lead to cheating behavior.

Tang & Lee [11] in a study investigated the relationship between product market competition, board structure and disclosure quality and found that product market competition has significant impact on disclosure quality and it improves the relationship between board structure and disclosure quality.

Dataa [8] in a study investigated the relationship between product market power and industry structure with earnings management of big companies. Generally, they found that there was a linear relationship between product market power and earnings management. The higher the competitive power (products pricing ability), the higher the earnings management.
Study hypotheses:
To investigate the relationship between product market competition and income smoothing and based on theoretical basics and review of literature, a main hypothesis and four subhypotheses are designed and tested as followings:
Main hypothesis: There is an association between product market competition and their income smoothing.
First subhypothesis: There is an association between product market competition market of active firms in pharmaceutical products and their income smoothing.
Second subhypothesis: There is an association between product market competition active in machinerys and equipment products industry and their income smoothing.
Third subhypothesis: There is an association between product market competition active in chemical products industry and their income smoothing.
Fourth subhypothesis: There is an association between product market competition active in automobile industry and parts manufacturing and their income smoothing.

2- Methodology and study design:
The main purpose of this study is evaluation of the relationship between product market competition and income smoothing in the companies listed on TSE. This study is correlation in terms of method and it is ex post facto. It is applied in terms of the type of studies. The study period is 6 years during 2007 to 2012 and the study population is the firms in four industries of pharmaceutical products, machinerys and equipment, chemical products, automobile and parts manufacturing listed in TSE. 87 firms are selected as sample by systematic elimination. Multi-variate linear regression model is used to evaluate study hypotheses. For initial data analysis and calculation of study variables, Excel software 2007 is applied and for final analysis, SPSS software, version 19 is used.

5- Measurement of study variables:
5-1 Dependent variable:
In this study, discretionary accruals are analyzed as income smoothing index. To calculate discretionary accruals, adjusted Jones model is used.
In this study, the sum of accruals is calculated via profit and loss as:

\[ TA_{i,t} = EARN_{i,t} - CFO_{i,t} \]  
(5-1)

Where
\[ Tai, t \] = Total accruals of company in in year t
\[ EARN_{i,t} \] = Operational profit of company i in year t
\[ CFO_{i,t} \] = Operating cash flow (cash flows from operating activities) of company i in year t

Then, the following model is fitted regarding accruals. To standardize the numbers and figures and easy calculation, two sides of equation are divided by assets of first period.

\[ \frac{TA_{i,t}}{A_{i,t}} = \alpha_0 + 1 + \beta_1 \left( \frac{\Delta REV_{i,t}}{A_{i,t}} \right) + \beta_2 \left( \frac{PPE_{i,t}}{A_{i,t}} \right) + \epsilon_{i,t} \]  
(5-2)

Where:
\[ \Delta REV_{i,t} \] = The changes in annual income (difference of current year income with the past year income) of company i in year t
\[ PPE_{i,t} \] = Properties, plant and machineries (fixed assets of each year after deducting depreciation) of company i in year t
\[ \beta_1, \beta_2 \] are model coefficients and \[ \epsilon_{i,t} \] error of company i in year t.

Then, coefficients of model (2) are used in model (3) to achieve non-discretionary accruals as followings:

\[ NDA_{i,t} = \alpha_0 + 1 + \beta_1 \left( \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t}} \right) + \beta_2 \left( \frac{PPE_{i,t}}{A_{i,t}} \right) \]  
(5-3)

\[ \Delta REV_{i,t} \] = The change in annual income (difference of income of current year with the past year)
\[ \Delta REC_{i,t} \] = The change in received account (difference of received accounts of the end of year with the beginning of the same year)
\[ PPE_{i,t} \] = Property and machineries (fixed assets of each year after deducting depreciation)
\[ \beta_1, \beta_2 \] are model coefficients.

By the difference of the sum of accruals and non-discretionary accruals, discretionary accruals are calculated as:
$DA_{i,t} = \alpha \left( \frac{TAD_{i,t+1}}{TA_{i,t+1}} \right) - NDA_{i,t}$  

(4-5)

To separate the companies to high and low income smoothing, a criterion as TZ is used and the separation of firms is as:

For each of the sample companies, the correlation between discretionary accruals changes and changes of net profit minus discretionary accruals is calculated.

$TZ = corr[\Delta DA, \Delta (NI - DA)]$  

(5-5)

If the correlation between two variables is to -1, income smoothing of company is high.
If the correlation between two variables is to 1, income smoothing of company is low.

5-2 Independent variable:
The independent variable is product market competition. Based on theoretical and financial basics of competition in product market, it is calculated by herfindal-hirschman index and it is one of the important indicators in this regard. This index applies the information of all enterprises in industry and to achieve this index applies the sum of square of the share of sizes (production, sale, labor force and etc) of all enterprises in industry or market. This criterion is calculated by the sum of squares of market share of all firms (share of enterprise divided by total market) in market.

$HHI = -\sum \left( \frac{SALES_i}{\sum SALES_i} \right)^2$  

(5-6)

The important point in this model is as there is no negative in the main index by which industries concentration is evaluated by it and this index is ranging 0, 1. The strong competition among the companies of an industry makes this index to zero and number 1 indicates exclusive state. In this model, to have a direct understanding of model output, HHI bigger indicates more competition in industries. The main index sign is inversed by multiplication by (-1).

5-3 Control variable:
In this study, to measure profitability of company, operational profit margin (OP) of firm is used. As the sum of accruals is obtained by the difference between operating cash flow and operating profit and loss. Thus, to control it on income smoothing, operating profit and loss is used as control variable. Operating profit margin is obtained by dividing operating profit by sale.

$op = \frac{op}{sell_{i,t}}$  

(5-7)

OP= Operating profit, Sell= Sale of company in year ith

6-Data analysis:
6-1 Descriptive statistics:
To investigate the initial data analysis, descriptive statistics of studied variables are calculated and are shown in Table 1.

<table>
<thead>
<tr>
<th>Profitability</th>
<th>Product market competition</th>
<th>Descriptive statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profitability</td>
<td>Product market competition</td>
<td>Income smoothing</td>
</tr>
<tr>
<td>522</td>
<td>522</td>
<td>522</td>
</tr>
<tr>
<td>-0.003</td>
<td>0.67</td>
<td>-0.004</td>
</tr>
<tr>
<td>0.000</td>
<td>0.18</td>
<td>0.000</td>
</tr>
<tr>
<td>0.13</td>
<td>4.39</td>
<td>0.030</td>
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<tr>
<td>-156.03</td>
<td>132.53</td>
<td>210.4</td>
</tr>
<tr>
<td>0.000</td>
<td>0.601</td>
<td>0.000</td>
</tr>
</tbody>
</table>

6-2 The results of main hypothesis test:
The main hypothesis states: Product market competition has significant and positive impact on profit smoothing.
Significance level of HHI independent variable is less than 5% and its Beta is 0.19 and it shows the significant and positive impact on income smoothing.
6-3 The results of first sub-hypothesis test:
The first subhypothesis states: The product market competition has not significant impact on income smoothing.
Significance level of HHI independent variable is bigger than 5% and it shows the significant and positive impact on income smoothing.

6-4 The results of second sub-hypothesis test:
The second subhypothesis states: The product market competition has significant and positive impact on income smoothing.

Table 2: Coefficients table Coefficients*, main hypothesis test with dependent variable of income smoothing based on TZ.

<table>
<thead>
<tr>
<th>Significance level</th>
<th>t</th>
<th>Standardized coefficient</th>
<th>Non-standard coefficient</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Standard</td>
<td>Beta standard</td>
<td>Standard error</td>
</tr>
<tr>
<td>.000</td>
<td>-36.891</td>
<td>0.03</td>
<td>-1.16</td>
<td>Constant</td>
</tr>
<tr>
<td>0.002</td>
<td>2.873</td>
<td>-0.19</td>
<td>1.41</td>
<td>2.64</td>
</tr>
<tr>
<td>0.666</td>
<td>-0.432</td>
<td>-0.024</td>
<td>0.005</td>
<td>-0.002</td>
</tr>
<tr>
<td>0.009</td>
<td>-2.816</td>
<td>-0.265</td>
<td>7.54</td>
<td>-19.7</td>
</tr>
</tbody>
</table>

Table 3: Coefficients table Coefficients*, first sub hypothesis test with dependent variable of income smoothing based on TZ.

<table>
<thead>
<tr>
<th>Significance level</th>
<th>t</th>
<th>Standardized coefficient</th>
<th>Non-standard coefficient</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Standard</td>
<td>Beta standard</td>
<td>Standard error</td>
</tr>
<tr>
<td>.010</td>
<td>2.624</td>
<td>.017</td>
<td>.045</td>
<td>Constant</td>
</tr>
<tr>
<td>.072</td>
<td>0.424</td>
<td>.034</td>
<td>5.329</td>
<td>2.261</td>
</tr>
<tr>
<td>.025</td>
<td>2.537</td>
<td>.066</td>
<td>7.20</td>
<td>.386</td>
</tr>
</tbody>
</table>

Table 4: Coefficients table Coefficients*, second sub hypothesis test with dependent variable of income smoothing based on TZ.

<table>
<thead>
<tr>
<th>Significance level</th>
<th>t</th>
<th>Standardized coefficient</th>
<th>Non-standard coefficient</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Standard</td>
<td>Beta standard</td>
<td>Standard error</td>
</tr>
<tr>
<td>.204</td>
<td>1.282</td>
<td>.014</td>
<td>.018</td>
<td>Constant</td>
</tr>
<tr>
<td>.0411</td>
<td>5.391</td>
<td>.222</td>
<td>7.11</td>
<td>2.78</td>
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<tr>
<td>.0411</td>
<td>-1.389</td>
<td>-.234</td>
<td>.034</td>
<td>-.068</td>
</tr>
<tr>
<td>.023</td>
<td>-4.443</td>
<td>-.203</td>
<td>52.50</td>
<td>23.28</td>
</tr>
</tbody>
</table>

Significance level HHI is less than 5% and its Beta is 0.222 and it shows that product market competition has positive and significant impact on income smoothing. In other words, product market competition has significant and positive impact on income smoothing of active firms in machineries and equipment industry.

6-5 The test of third subhypothesis:
The third subhypothesis states that product market competition has positive and significant impact on income smoothing
Significance level HHI is less than 5% and its Beta is 0.270 and it shows positive and significant impact. In other words, product market competition has significant and positive impact on income smoothing of active firms in machineries and equipment industry.

Table 5: Coefficients table Coefficients*, third sub hypothesis test with dependent variable of income smoothing based on TZ.

<table>
<thead>
<tr>
<th>Significance level</th>
<th>Non-standard coefficient</th>
<th>Standardized coefficient</th>
<th>Non-standard coefficient</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta standard</td>
<td>Standard</td>
<td>Beta standard</td>
<td>Standard error</td>
</tr>
<tr>
<td>.000</td>
<td>-15.672</td>
<td>.063</td>
<td>-.983</td>
<td>Constant</td>
</tr>
<tr>
<td>.000</td>
<td>2.547</td>
<td>.270</td>
<td>2.424</td>
<td>3.74</td>
</tr>
<tr>
<td>.044</td>
<td>-2.640</td>
<td>-.170</td>
<td>.082</td>
<td>-.13</td>
</tr>
<tr>
<td>.018</td>
<td>-2.404</td>
<td>-.428</td>
<td>9.477</td>
<td>22.78</td>
</tr>
</tbody>
</table>

The third subhypothesis states that product market competition has positive and significant impact on income smoothing
Significance level HHI is less than 5% and its Beta is 0.270 and it shows positive and significant impact. In other words, product market competition has significant and positive impact on income smoothing of active firms in machineries and equipment industry.

6-6 The test of fourth subhypothesis:
The fourth subhypothesis states that product market competition has not significant impact on income smoothing.
Significance level of HHI is above 5% and it shows the lack of significant impact on income smoothing. In other words, product market competition has not significant impact on income smoothing of active firms in automobile and parts manufacturing industry.
Table 6: Coefficients table Coefficients*, fourth sub hypothesis test with dependent variable of income smoothing based on TZ.

<table>
<thead>
<tr>
<th>Significance level</th>
<th>Non-standard coefficient</th>
<th>Standardized coefficient</th>
<th>Standard error</th>
<th>B</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000</td>
<td>-14.03</td>
<td>0.087</td>
<td>1.22</td>
<td></td>
<td></td>
</tr>
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<td>.0439</td>
<td>-3.00</td>
<td>-1.26</td>
<td>46.58</td>
<td>-12.13</td>
<td>HHI</td>
</tr>
<tr>
<td>.024</td>
<td>2.25</td>
<td>.00</td>
<td>391.27</td>
<td>100.90</td>
<td>op*HHI</td>
</tr>
</tbody>
</table>

1- Discussion and Conclusion:

The results of study showed that by increasing product market competition, income smoothing of firms is reduced. One of the reasons is as Herfindahl-Hirschmanindex (HHI) of firms is divided into high and low competition based on the share of their sale of total industry sale (Based on theoretical basics). Thus, the firms with a large portion of their sale are high competitive (based on review of literature) and to develop the future activities and achieving high share of market, the firms need investors’ attraction. Thus, they increase their reporting quality and are less inclined to income smoothing but the firms with a small portion of their sale are low competitive or exclusive. Such companies are mostly considered in society and based on some reasons (e.g. political motivations) are more inclined to income smoothing to avoid the changes of expectation of shareholders from one year to another one as the company can repeat the profit of the previous years in future years and they are more inclined to income smoothing.

REFERENCE