

# The Relationship between Product Market Power and Earnings Management in Tehran Stock Exchange

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## Abstract

**Background/Objectives:** Product market power is as a natural safety margin that certain companies use for smoothing fluctuations of companies. Financial analysts considered product market power as a crucial factor in assessing prospects of company. There is also empirical evidence that financial analysts' earnings forecasts are correct for companies that have a higher product market power. Increased competition increases risk of bankruptcy, thus creating powerful incentives for managers in order to keep their jobs more strict. As a result, competition can be compressed so that managers manipulate earnings more to overcome threat of bankruptcy. In contrast, companies with greater financial flexibility have stronger position in the product market, indicates that the pressure on managers about earnings manage, will be less applied. The main objective of this study was to test the relationship between product market powers with earning management. **Methods/Statistical Analysis:** The sample used in this study consisted of 111 firms listed in Tehran Stock Exchange during the years 1383 to 1392 and to test hypothesis, random effects models and generalized least squares estimation method is used. Results: Separate evaluation and analysis impact of product market pricing power on earnings management indicate that showed that although the market price of the product, can affect earnings management, but competition in industry, has good explanatory power. **Conclusion/Application:** The results indicate negative and significant relationship between research variables.

**Keywords:** Earnings Management, Industry Competition, Product Market Power, Tehran Stock Exchange

## 1. Introduction

Earning management occurs when managers exert their judgment in financial reporting and recording to change content of financial reporting and change view of stockholders about economic performance and impact accounting figures. Including what managers can apply their judgment on useful life of assets, long-term assets residual value, estimate for doubtful receivables; choosing an item from different methods of accounting, depreciation, investment, allocation of costs. In all these cases are part of accrual accounting in relation to their managers are authorized (discretionary accruals) and thus their actions led to earnings management evenly.

Including the explanation of this phenomenon, the bonus plan hypothesis, the hypothesis debt contract, political cost hypothesis, and are the representation theory.

Given the above issues, this study attempts to communicate between the product and the market pricing in the industry with a focus on earnings management for firms listed in Tehran Stock Exchange is detected. Pricing power confers a number of advantages on the firm. For example, firms with greater pricing power can better maintain their profit margins when they are subject to exogenous productivity shocks because of the uniqueness of their products and/or strong brand name. Greater product differentiation (or lower product substitutability) can lead to more inelastic demand curve

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for a firm's products, affording it the flexibility to pass on cost shocks to its customers. In Gaspar and Massa<sup>1</sup>, product market power acts as a natural hedge that firms employ to smooth out firm-specific fluctuations. They predict a negative correlation between market power and firm specific volatility. Gaspar and Massa<sup>1</sup> also provide a mathematical solution proving that the change in profit caused by a cost shock negatively impacts lower market power. It is important to note that financial analysts consider product market power a critical factor in their evaluation of a firm's prospects.

Base on discussions above, this study tries to test relationship between product market power and product market competition in the industry and earnings management of listed firms in Tehran Stock Exchange.

## 2. Theoretical Framework

Healy and Wahlen<sup>2</sup> point that earnings management occurs when managers use their own judgment in financial reporting and financial reporting of transactions to alter their work. This action is intended to mislead the benefit of owners of the firm or impact on economic performance of the contracts which are subject to the achievement of clear benefit to be done. Skinner and Sloan<sup>3</sup> showed that managers in order to avoid detection of their real value, manipulation earnings, since reporting lower than expected profit is greatly Punished by market.

Many empirical cases support and endorse this idea that competitive pressure is an important factor in management decisions. A number of studies have shown that a product market environment is effective on investment, financing, cash distribution, corporate governance, earnings forecasts by analysts and management decisions<sup>4-6</sup>. However impact of product market power over strategic decisions for firm reported earnings management, is an issue that has largely been ignored. Central topic in earnings management research is to identify which firms have the motivation to manipulate earnings. Most of the literature on earnings management, explore the issue that how much firms can manipulate earnings. Still we have little information how managers do earning manipulation.

There are a number of arguments that suggest a potential link between product market power and earnings management. Intra industry pricing power (which we interchangeably refer to as product market power) emanates from the firm's ability to extract abnormal rents (higher

prices) from its customers with little impact on demand, thus conferring a competitive pricing edge to the firm. The preceding argument does not require us to make the assumption of a perfectly inelastic demand curve for it to hold. Uniqueness and superiority of product lines or a strong brand name are the hallmarks of strong pricing power and competitive advantage. While industry-wide elasticity of demand is determined by the aggregate demand curve for the industry, intra industry product differentiation (among firms within the industry) can affect the price elasticity of demand faced by a specific firm, regardless of the industry structure in which it operates<sup>7</sup>.

There is also empirical evidence in support of the view that financial analyst's earnings forecasts are more accurate<sup>5</sup> and exhibit less dispersion<sup>1</sup> for firms with greater product market power<sup>8</sup>. These findings are attributed to the price setting ability of such firms and firms' lower variability in demand, revenues and cash flows. A strong product position also endows the firm with superior staying power - in other words; the firm has greater flexibility when responding to unexpected changes in consumer product needs. Because of the ability to set prices, strong market power is associated with more stable cash flows and lower stock return volatility<sup>9</sup>. Pricing power gives these firms deeper pockets, allowing them to maintain their superior positions. The enhanced immunity of these firms against cash shortfalls increases their capability to face deteriorating economic conditions and result in lower likelihood of distress vis-a-vis firms with weak pricing power. Schmidt<sup>10</sup> contends that enhanced competition increases the threat of liquidation of the firm, thus providing strong incentives for managers to work harder to retain their jobs. Thus, intense competition may induce the managers to manipulate earnings more aggressively to ward off the threat of liquidation. In contrast, the higher financial flexibility of firms with strong product market positions suggests that the pressures on managers to engage in earnings management would be less pronounced<sup>7</sup>.

Datta and et al.<sup>7</sup> believe that there are two other important channels through which competitive pressure can influence the transparency of reported earnings - namely, (a) information disclosure channel, and (b) the disciplinary effect channel. The disclosure decision by the firm depends on the costs and benefits of revealing underlying information about the firm's prospects. A number of theoretical models predict that firms in industries

characterized by intense competitive will opt to report less useful information<sup>11,12</sup>. Verrecchia<sup>12</sup> proposes that due to the adverse impact from disclosure, firms in industries characterized by intense product market competition prefer less informative disclosure policies to reduce predatory threats from rivals show that limiting the information flow allows insiders to sidestep the competition, while Verrecchia and Weber<sup>12</sup> find empirically that disclosure of proprietary information is less in competitive industries in support of the view that product market competition and disclosure are negatively related.

Recent empirical evidence supports the idea that product market competition provides incentives for managers to be more closely aligned with shareholders' interests<sup>13</sup>. Guadalupe and Pérez-Gonzalez<sup>14</sup> show the greater the intensity of product market competition, the less the private benefits of managerial control. Allen and Gale<sup>15</sup> conclude that competition between firms is a more effective disciplinary mechanism than either internal governance mechanisms or external monitoring mechanisms such as the market for corporate control. Other studies argue that competitive pressure may aggravate the moral hazard problem<sup>16</sup>, increase managerial shirking and raise the likelihood of misreporting of accounting information. Thus, both the information disclosure effect and the external disciplinary effect of competition provide conflicting views on how competition will impact managerial behavior.

### 3. Literature Review

Gaspar and Massa<sup>1</sup> in their study indicate that product market power acts as a natural hedge that firms employ to smooth out firm-specific fluctuations. They predict a negative correlation between market power and firm specific volatility. Gaspar and Massa<sup>1</sup> also provide a mathematical solution proving that the change in profit caused by a cost shock negatively impacts lower market power. Karuna<sup>17</sup> shows that firms in more competitive industries monitor their CEOs more closely than in less competitive industries which exacerbate the career concern problem.

Fosu<sup>18</sup> review capital structure and product market power on firm's performance. Results indicate that there is direct and significant relationship between capital structure and firm's performance, but product market powers don't have any effect on firm's performance. Beiner et al.<sup>19</sup> in a study entitled "Product market competition,

management incentives and valuation of the firm", found relationship between product market competition and the firm's performance. Thus, with increasing competition in the product market, firm's performance also reduced. In addition, they found nonlinear relationship between the intensity of competition in product markets and sustainable management incentives. That is to say they do it because of the paucity of empirical literature on the impact of competition on managerial incentives.

Studies have also documented other benefits of strong market power, such as the greater informativeness of stock prices<sup>9</sup> and higher stock liquidity because investors channel more capital when they are better informed<sup>20</sup>. The greater informativeness of stock prices combined with higher liquidity implies that the earnings of firms with stronger market position exhibit more stability, hence, a lesser need to manipulate earnings.

#### 3.1 Research Hypothesis

Due to some reasons outlined earlier, this research hypotheses are:

Hypothesis: there is significant relationship between product market power and earning management.

#### 3.2 Research Methodology

The purpose of this research is applied research because its results can be used in decision making of managers and investors. Also, the deduction of the research hypotheses is a research of cross - correlation because in order to discover relationships between variables, regression and correlation techniques will be used for reasoning. Also, since we will reach the conclusion by testing data, our research will be in positive group theory.

#### 3.3 Research Sample

The population of this study is all listed firms in Tehran Stock Exchange from 1383 until 1392 for a period of 10 years. It should be noted that the choice of listed firms in Tehran Stock Exchange as such firms selected with accessible information.

In this study, the sample is selected through the systematic elimination of the population. The sample consists of all firms that meet the following criteria to be included in the target population:

- The financial period to ends 12/29 every year, so the data together combined and may be used.
- Financial terms have not changed during the study period; the results of financial performance are comparable.
- Not being among firms active in the field of financial activities, such as investment firms, banks, insurance firms, and financial institutions. Because these institutions differ in terms of the nature of the activities and their main income are from investments and related activities of other firms, therefore, are different in nature from other firms, so in our research will be deleted.
- The data for variables is available during the study period from 1382 till 1391.
- During the financial year do not have more than six months of trading halt. Since the halt in trading caused the inability to estimate the market value, it fails to create insecurity variables needed.

### 3.4 Research Variables and Model

Research variables and model are as followings:

$$(1) \text{ Abs Disc Accruals}_{it} = \beta_0 + \beta_1 \text{ Market Power}_{it} + \beta_2 \text{ Growth}_{it} + \beta_3 \text{ Market to Book}_{it} + \beta_4 \text{ Volatility}_{it} + \beta_5 \text{ Size}_{it} + \beta_6 \text{ Leverage}_{it} + \varepsilon$$

Absolute discretionary accruals scaled by lagged assets (Abs Disc Accruals), and product market pricing power (Market Power) in a multivariate setting, growth rate in assets (Growth), market-to-book ratio (Market-to-book) and volatility of sales (Volatility), firm size (Size), and Leverage.

$$\frac{TA_{it}}{A_{it-1}} = \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \left( \frac{\Delta REV_{it}}{A_{it-1}} - \frac{\Delta AR_{it}}{A_{it-1}} \right) + \alpha_3 \frac{PPE_{it}}{A_{it-1}} + \alpha_4 \frac{Netincome_{it-1}}{A_{it-1}} + \varepsilon_{it}$$

Where i indexes firms, t indexes time,  $TA_{it}$  equals Net minus cash flow from operations,  $DREV_{it}$  is the changes in sales,  $DAR_{it}$  is the change in Receivables and PPE is the total property, plant, and equipment

$$DA_{it} = \varepsilon_{it} = \frac{TA_{it}}{A_{it-1}} - \left( \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \left( \frac{\Delta REV_{it}}{A_{it-1}} - \frac{\Delta AR_{it}}{A_{it-1}} \right) + \alpha_3 \frac{PPE_{it}}{A_{it-1}} + \alpha_4 \frac{Netincome_{it-1}}{A_{it-1}} \right)$$

$$PCM = LI = (\text{Sales} - \text{COGS} - \text{SG\&A}) / \text{Sales}$$

Where Sales is variable SALE, cost of goods sold, COGS, is variable COGS, and sales, general and administrative expenses, SG and A, is variable XSGA. This measure excludes depreciation, interest, special items and taxes. We use operating income before depreciation to

calculate price–cost margin when there is missing data for the above items. Although the price–cost margin has been used to capture a firm’s product market power, this measure does not, however, isolate the firm-specific factors that influence product market pricing power from industry-wide factors. This metric can fluctuate due to industry-specific attributes that are unrelated to a firm’s market pricing power. Given that we are interested in examining the link between earnings manipulation and a firm’s product market power within an industry, we use an industry-adjusted Lerner Index to capture firm-specific product market power. To do so, we compute the value-weighted industry-adjusted Lerner Index (Market Power), which is the difference between the firm’s price–cost margin and the sales-weighted price–cost margin of the all firms within an industry and is described by the following equation<sup>7</sup>.

$$\text{Market power} = LI_i - \sum_{i=1}^N \omega_i LI_i$$

Where  $LI_i$  is Lerner Index for firm i,  $\omega_i$  is the proportion of sales of firm i to total industry sales, N is all firms of industry.

This modified Lerner Index measure captures purely the intra-industry market power of a firm, therefore purging the effects of industry-wide factors common to all firms in a specific industry. Further, this adjustment addresses the fact that different industries have structurally different profit margins due to factors unrelated to intra-industry differences in market power of the firms.

### 3.5 Research Finding Analysis

Descriptive statistics of variables: to determine familiarity with the data, the descriptive statistics of variables, including mean, median (central criteria), standard deviation, maximum and minimum (measures of dispersion), has placed in Table 1.

In this study, a statistical model is used to estimate panel data. When panel data are used to estimate prior to doing practically everything, Chow test for the detection and the estimation method is needed. If the test is based on use of pool data, pool data estimation method is performed and if the result indicates tabloid data, Hausman model will be used for detection and test of the fixed or random effects. First of all, we need to estimate coefficients of earnings management calculation model. Results of this test using

**Table 1.** Descriptive statistic

variables	number	average	mean	Standard deviation	max	min
Earning Management	873	0.146	0.105	0.155	1.303	0.0002
Product market power	1110	-0.016	-0.003	0.306	1.344	-4.194
Firm growth	989	0.211	0.154	0.352	3.552	-0.744
Market value to book value	949	2.554	1.758	2.652	25.707	0.087
Sale stability	835	552933.7	79177.06	2938494	43408616	8.013
Size	1110	6.352	5.639	0.636	8.52	3.537
Financial Leverage	932	0.607	0.665	0.171	0.977	0.031

**Table 2.** Coefficient estimation by adjusted Jones Model

variables	coefficient	Standard deviation	T statistic	Significance level
constant	0.49	0.167	0.891	00.373
$1/A_{it-1}$	12232.15	18112.2	0.675	0499
$(\Delta REV_{it}/A_{it-1}) - (\Delta AR_{it}/A_{it-1})$	-0.274	0.286	-0.956	0.339
$PPE_{it}/A_{it-1}$	0.01	0.04	0.268	0.788
$Netincome_{it-1}/A_{it-1}$	-0.181	0.088	-2.055	0.04
F statistic	8.147		R <sup>2</sup> : 0.033	
F probability	0.000		AD R <sup>2</sup> : 0.031	
Significance level: 0.000		Housman Significance level:0.998		

a. First research hypothesis test using first model

**Table 3.** Result is gathered in the following table

variables	coefficient	Standard deviation	T statistic	Significance level
constant	0.239	0.075	3.171	0.001
Product market power	-0.027	0.021	-1.281	0.2
Market value to book value	0.159	0.016	9.662	0.000
Sale stability	$-3.02 \times 10^{-9}$	$2.35 \times 10^{-9}$	-1.282	0.2
Size	-0.022	0.012	-1.806	0.071
Financial Leverage	-0.011	0.035	-0.311	0.755
F statistic	17.572		R <sup>2</sup> : 0.122	
F probability	0.000		AD R <sup>2</sup> : 0.115	
Significance level: 0.000		Durbin-Watson: 1.684		
		Housman Significance level:0.771		

random effects models and generalized least squares estimation method is depicted in the following table.

Since level of product market power varies significantly, more than 0.05 and the t-statistic is smaller than 1.96, its impact on discretionary accruals is not significant. Thus, the first hypothesis about the effect of product market power on discretionary accruals and earnings management will not be accepted.

## 4. Conclusion

Separate evaluation and analysis impact of product market pricing power on earnings management indicate that showed that although the market price of the product, can affect earnings management, but competition in industry, has good explanatory power. This means that greater competition in industry will be reduce level of discretionary accruals and earnings management in companies in the industry.

In order to explain probable causes of negative relationship between products market competition and earning management two arguments will be very useful: Diamond and Verrecchia<sup>12</sup> established that increase in disclosure reduces information asymmetry and thus lead to lower capital cost. They stated that if number of companies competing for limited funds in the industry increase transparency of information also will increase. Hoberg and Phillips<sup>8</sup> also suggested need to reduce information asymmetry in order to obtain financing at favorable rates as a reason to expose more competitive environment. This result can be inconsistent with the findings of Datta et al.<sup>7</sup> and consistent with results of Karuna<sup>17</sup>.

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