

INVESTIGATION OF THE RELATIONSHIP BETWEEN PRODUCT PRICING POWER AND INDUSTRIAL STRUCTURE WITH PROFIT MANAGEMENT IN COMPANIES ADMITTED TO TEHRAN STOCK MARKET

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ABSTRACT

In present paper, the relationship between product pricing power and management structure with profit management of the companies admitted to Tehran stock market is studied. To test research hypotheses, statistical sample of the studied population is selected for a 7 year period based on financial information of the years 2007-13 of the stock market companies. After taking statistical sample and collecting data, tested variables are calculated and data analysis and hypotheses test is done via SPSS, Eviews and Minitab. Finally, results obtained from research hypothesis test reveal the direct and meaningful relationship between product pricing power and an inverse and meaningful relationship between industrial structure of companies and profit management. Moreover, results demonstrated that there is a meaningful and direct relationship between pricing powers in market resulted from industrial structure and profit management of companies.

Keywords: Product Pricing Power, Industrial Structure, Profit Management

INTRODUCTION

The simplest definition for price is that price is the monetary value of products and services. Therefore, pricing is the process of determining monetary value of products and services. Price has a vital role in production and service providing activities. Previously, companies assigned the responsibility of pricing to accounting departments and this unit determined the prices by taking production costs and a suitable level of profit. However, from marketing point of view, what is neglected is the value of product for customer. One of the most important and interesting activities of the management is deciding over determination of price of product and services. Pricing operation is more detailed than it appears at the beginning. All commercial units which supply product or service to society must determine the price of their products and services. Even non-profit institutions determine a price for their services. There are a lot of products and services whose price must be determined and decisions for pricing is not done in one step. To ensure that prices reflect the finalized costs, market status and activities of commercial competitors, it is necessary that prices be reconsidered and evaluated continuously. Some of the prices may remain unchanged for a long time while others change rapidly. Therefore, decisions regarding pricing is not a stagnant process and is a part of a continuous, dynamic and fundamental process (Shabahang, 2011).

Market structure which represents the organizational characteristic of the market covers a wide range of complete competition to complete exclusion. Product market competitiveness means that different companies compete seriously in producing and selling products and services and their products don't excel each other considerably. In other words, competitiveness means that a company failed to take production procedures to produce a product with higher quality or supply its product with a lower price compared to competitors and consequently, control the market (Ebrahimi, 2011).

Taking ultimate goals of the companies which is achieving highest profit into account, necessitates that managers update their long-term plans for increasing production and service providing (Yu *et al.*, 2006). Perez (2010) emphasized that companies achieve their ultimate goal when they consider increasing their production quantity a few percent higher than minimum and providing services with higher profit. One of the issues in management success in companies is to consider quantity and quality of production

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compared to competitors and taking over them (Acdego and Mc Key, 2012). Production quantity varies among industries. Therefore, taking product and market capacity into account with regard to products of competitors is one of the important factors in companies' survival (Coterie *et al.*, 2006). Van and Wang (2009), found out that changes in quantity of products in accordance with market production capacity is the result of applied and long term plans of managers and can be an effective factor for changes in productions of various industries. According to what stated above, in recent work, relationship between product pricing power in market, industrial structure and profit management in companies admitted to Tehran stock market will be studied and applied basics of the players of capital market including potential and actual investors will be presented. Moreover, it is attempted to answer the question that whether product pricing power in market and industrial structure can lead to managers' motivation for behaviors resulting in company's profit?

Obviously, the purpose of each research is to provide readers with obtained results so that it can lead to making appropriate and effective economic decisions. Hence, the present work is not exceptional. On the other hand, results of the work are considerable for companies' managers for more positive results.

Theoretical and Historical Background of Research

The purpose of investors is to maximize shares' expected return. Although in maximizing shares, they attempt to reduce the risk. However, return of investment process is a driver which makes motivation and is an award for investors. Return resulted from investment is important for investors, since all of the investment activities takes place in order to gain return. Return evaluation is the only logical way which can be used by investors to compare alternative investments. One of the ways of improving high return of companies' shares is high capacity of companies (Van and Wang, 2002). To better understanding the investment performance, measuring actual return (corresponding to past) is necessary. Industrial structure is a fundamental factor in integrating variables contributing to return and profitability and beside criterion of production capacity measurement can be an important factor in recognizing company's optimal performance (Begnoli and Watts, 2007). Optimal allocation of financial resources is one of the most significant actions taken in the field of investment and it can be claimed that results of optimal allocation of financial resources manifests in this step. One of the results of optimal allocation of investment is improvement of production capacity of the companies (Hellermlina and Peshbeg, 2012). Hurrybar and Gallence (2002) discovered that investors, whether in micro or institutional level, intend to allocate their limited financial resources optimally to various investment options. In a market where limited financial resources are allocated well to investment options, investors have a relative confidence about investment and market mechanisms move toward return as well. Therefore, important factor of attracting investment of industrial consolidated structure will accompany with high production capacity. Unfortunately, one of the main problems with which capital markets of the majority of countries with appearing economy faces, is the inappropriate industrial structure for production level. Currently, capital market of Iran experiences such situations. Solving such problem necessitates recognition of right opportunities using tools with higher accuracy such as profit management for prediction of variable necessary for decision making including actual return of equities. Oftentimes, failure of investors in capital market is because of their inability in prediction of the relevant variables. Hence, if using appropriate tools or models, we can predict variables necessary for decision making with higher accuracy, market moves toward efficiency (Namazi *et al.*, 2005).

On the other hand, a phenomenon entitled profit management is defined as the process of taking conscious steps in the limit of accepted principles of accounting in which proximity of reported profit to target one is done through manipulation (Molla and Karimi, 2007). As can be inferred from the definition of profit management, in order to achieve a certain goal which logically meets interests of a specific group, managers' report the profit in such a way that it contradicts with the public interest of users and leads to misunderstanding the financial bills, while financial bills have no problem with respect to being in the limit of accounting standards frameworks and auditors cannot cast doubt on financial bills (Stoley and Burton, 2004). In this context, Hilly and Whalen (1999) believe that profit management occurs when managers use their personal judgments in financial reporting to manipulate the reports for the sake of

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misleading investors about the actual performance of the company and also affecting the results of contracts which depend upon reported accounting statistics. Today, profit management is one of the challenging and attractive issues of the accounting researches since investors – as one of the important factors for decision making – pay a specific attention to the profit value. Research has shown that low oscillation of profit demonstrates its quality. Therefore, investors can invest with more confidence on companies having more stable profit trend. Consequently, profit management can be considered as a way for announcing companies' suitable financial status which is carried out through management interference in the process of determination of profit (Norawesh *et al.*, 2005).

In general, according to Dutta *et al.*, (2012) and Marcarian and Senatalo (2010), the relationship between competition in product market and management of companies' profits is unknown and indeterminate. Dutta *et al.*, (2012) in a research, investigated the role of industrial competitive structure in profit management. Their results illustrated the meaningful and strong relationship between product pricing power and the degree of profit management and competitiveness in industries. Furthermore, their findings reflect the fact that in industrial level, more competition of industries will be accompanied with more profit management. Carona *et al.*, using competitive factors such as product replacement, market size and costs of entering industry, studied the relationship between competition in product market and companies' profit management. Their results demonstrated that industrial factors have great contribution to companies' profit management. In other words, results of Carona *et al.*, represent the positive relationship between competition and profit management.

In Iran, like in international level, a few researches have been carried out such as the work of Rostami *et al.*, (2013). In their work, they studied the relationship between market competitive structure and profit sharing. Their results revealed that replicability of products and market sizes have a positive and meaningful relationship with profit sharing and no meaningful relationship was observed between other dimensions of competition and profit sharing. Basic hypothesis of research which was tested by competition score, demonstrated the positive but meaningless relationship from statistical point of view. Moreover, Khajavi *et al.*, (2013), studied the relationship between competition in product market and profit management of companies admitted to Tehran stock market. For this purpose, Herfindahl – Hirschman index, Learner and moderated Learner were used as the criteria of measuring competition in product market. Optional committing items are used as criteria for measuring profit management. Results of research reveal that in general, there is a meaningful relationship between Herfindahl – Hirschman, Learner and moderated learner indices and companies' profit management.

RESULTS AND DISCUSSION

Method used in this work is correlative and from descriptive type. The method of reasoning is comparative – deductive. In this research, according to data type and methods of statistical analysis, the method of data panel is used since for investigation of the relationship between product pricing power in market, industrial structure and profit management, predicted and estimated variables are studied from two different viewpoints. On one hand, these variables are tested among various companies and on the other hand, in the period of 2007-13.

Research Hypotheses

1. There is a meaningful relationship between product pricing power and profit management.
2. There is a meaningful relationship between companies' industrial structure and profit management.
3. There is a meaningful relationship between product pricing power in market resulting from industrial structure and profit management.

Population and Sample

Statistical population of this work includes all companies admitted to Tehran stock market. However since the volume of this population is high and also due to some inhomogeneity and lack of information for all of these companies, a sample was selected from this population. In present work, to select the statistical sample, screening method was used by taking the following specifications for the companies:

1. They must remain in the list of companies admitted to Tehran stock market and their financial information must be accessible.

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2. In intended period, their shares must be actively sold in market.
3. To increase comparability of the companies, their financial year must end up in March, 20 and they have no change in their financial year.
4. Must not be financial mediating companies (investment, holding, leasing, banks and insurance) due to their different performance.

By considering the above presumptions, statistical sample includes 104 companies which were picked from companies of the population in the period of 2007-13.

Since in this work, we intend to find a meaningful relationship between two groups of information in the population; that is product pricing power and industrial structure with profit management of the companies, this research is a correlative one and the method of research is of causal nature. On the other hand, present work is an after event one. It means that it is done based on analysis of previous data (financial bills) of companies. Since this work can cover a wide range of financial information users, it is applied. Moreover, in present paper, to test the research hypotheses, correlation test and multiple linear regressions are used.

Research Variables

In this work, profit management is the dependent variable and variables of product pricing power, industrial structure and product pricing power resulting from industrial structure are independent ones and growth rate, investment opportunities, shares price fluctuations and financial leverage are control variables.

Statistical Models of Testing Research Hypotheses

To test the first through third hypotheses, models 10-12 are used as follows:

$$AbsDiscAccruals_{i,t} = \alpha_0 + \beta_1 MarketPower_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Market - to - book_{i,t} + \beta_4 Volatility_{i,t} + \beta_5 Size_{i,t} + \beta_6 Leverage_{i,t} + \varepsilon_{i,t} \quad (10)$$

$$AbsDiscAccruals_{i,t} = \alpha_0 + \beta_1 Industry - Level Competition_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Market - to - book_{i,t} + \beta_4 Volatility_{i,t} + \beta_5 Size_{i,t} + \beta_6 Leverage_{i,t} + \varepsilon_{i,t} \quad (11)$$

$$AbsDiscAccruals_{i,t} = \alpha_0 + \beta_1 MPIL_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Market - to - book_{i,t} + \beta_4 Volatility_{i,t} + \beta_5 Size_{i,t} + \beta_6 Leverage_{i,t} + \varepsilon_{i,t} \quad (12)$$

Inferential Statistics

1. Correlation Test for Research Variables

Before inferential statistical tests, for each of the research hypotheses, to find the correlation between variables, Pearson correlation test is used whose results are as follows:

Table 1: Results of Pearson correlation test

Leverag e	Size	Volatilit y	Marke t/ book	Growt h	MPI L	Industr y	Market Power	
0.069	0.662	0.118	.219	0.034	0.278	0.150	0.143	Pearson
0.063	0.000	0.000	0.000	0.362	0.000	0.000	0.000	correlation test
								Meaningfulness
								level
								Correlation
								type
								Correlation
								level

According to the table, except two variables of growth and leverage, other variable have meaningful relationship with profit management. Therefore, it can be expected that results of regression test confirm the above table.

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Test of Linear Regression Model Assumptions

Test of Dependent Variable Distribution Normality

Normality of the residuals of the regression model is one of the assumptions of the regression which shows the validity of the regression tests. Therefore, normality of the dependent variable leads to normality of the model residuals. In this work, this issue is tested via statistic of Kolmogorov – Smirnov test whose results are summarized in table 2.

Table 2: Results of the test of dependent variable normality

Results	Level of (Sig) significance	K-) statistic (S)	N	Variable
Abnormal distribution	0/000	4/501	728	Optional committing items
Normal distribution	0/954	0/514	728	Involuntary committing items

Normality of the dependent variable is the necessary condition for regression models. Therefore, it is necessary to normalize this variable before testing hypotheses. In this research, to normalize the data, Johnson transfer function is used, and data analysis is performed by means of Minitab 16. Results of K-S test after normalization of data are shown in the second row of the above table.

Investigation of the Colinearity among Research Variables

Colinearity means a linear relationship between explanatory and independent variable. One of the ways for finding the colinearity relationship is the investigation of the correlation between independent variables. If the correlation between them is not strong, colinearity doesn't occur. In this study, investigation of the colinearity of the independent variables is done via Pearson correlation test. Results of the correlation test are shown in table 3.

Table 3: Results of Pearson correlation test

	Market Power	Industry	MPIL	Growth	Market/book	Volatility	Size
Industrial competition level (P – Value)	-0/092 (0/013)	1					
Power resulted from competition	-0/027 (0/467)	-0/031 (0/400)	1				
Growth rate (P – Value)	0/023 (0/544)	0/121 (0/001)	-0/085 (0/022)	1			
Investment opportunities (P – Value)	0/010 (0/785)	0/181 (0/000)	0/025 (0/504)	0/087 (0/019)	1		
Share price fluctuations (P – Value)	0/029 (0/442)	0/079 (0/033)	0/242 (0/000)	-0/011 (0/770)	0/075 (0/043)	1	
Company size (P – Value)	0/123 (0/001)	0/409 (0/000)	0/001 (0/981)	0/141 (0/000)	0/357 (0/000)	0/239 (0/000)	1
Financial leverage (P – Value)	-0/253 (0/000)	-0/187 (0/000)	0/060 (0/106)	-0/010 (0/796)	0/056 (0/129)	0/061 (0/102)	0/068 (0/066)

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As can be seen in the above table, product pricing power, industrial competition level and power resulted from competition level variables are directly correlated and this correlation among variables is strong. Therefore, due to the colinearity among variables, simultaneous entrance of variables in model is not practical and testing must be done in separate models. For other variables, due to absence of a strong correlation, it can be said that colinearity problem doesn't exist among them and their simultaneous entrance will make no problem in the model.

Test of Research Variables

Chao and Hausmann Test

To determine the model type, whether panel or pooled, and also for determination of the test type, including the method of constant or random effects, Chao and Hausmann tests are used, respectively as illustrated in table 5.

According to results of Chao test and its p-values for three hypotheses, H_0 is rejected with 95% certainty and this means that we can use data panel method. Moreover, according to results of Hausmann test and its p-values which is less than 0.05 for all three hypotheses, H_0 of the test is rejected with 95% certainty and H_1 is approved. Therefore, it is necessary to estimate the model with the method of constant effects.

Table 4: Results of Chao and Hausmann tests

P-Value	DF	Value	Statistic	N	Test	Hypothesis
0/0000	(618*103)	2/8237	F	728	Chao	First
0/0314	6	6/3852	χ^2	728	Hausmann	
0/0325	(618*103)	2/9116	F	728	Chao	Second
0/0155	6	8/3205	χ^2	728	Hausmann	
0/0000	(618*103)	3/7896	F	728	Chao	Third
0/0174	6	5/4006	χ^2	728	Hausmann	

Test of Regression Statistical Assumptions

To evaluate the validity of the model and assessment of the classic regression assumptions, it is necessary to perform tests regarding normality of the residuals, variance similarity, residuals independence and model explanation error proofing. Results of the above tests are summarized in table 5.

Table 5: Results of tests corresponding to model statistical assumptions

Ramsey		Durbin-Watson		Breusch-Pagan		Jarque-Bera		Hypothesis
P-Value	F	D		P-Value	F	P-Value	χ^2	
0/6130	5/8449	2/25		0/2541	3/3757	0/2194	1/2136	First
0/4738	2/6162	2/23		0/0458	1/0505	0/2279	1/2389	Second
0/0695	2/6676	2/23		0/0000	3/7894	0/5942	1/6131	Third

According to results of Chao and Hausmann tests and also the results of the classic regression statistical assumptions, model of research hypotheses is estimated using data panel method or in the form of constant effects.

Final Test of Linear Regression

After determination of the pooled or panel model and test method, as well as tests for linear regression model assumptions, final model of linear regression for each of the research hypotheses must be estimated whose results are represented in tables 6-8.

Table 6: Results of first hypothesis using constant effects method

Relationship	P-Value	Statistic	Coefficient	Variable
Positive	0/0000	5/6978	0/1002	Constant component
Positive	0/0321	1/9315	0/0492	Product pricing power in market
Negative	0/0002	-1/7625	-0/0153	Growth rate
Negative	0/0054	-1/7931	-0/0189	Investment opportunities
None	0/1186	3/5630	0/0073	Share price fluctuations
Positive	0/0000	1/6521	0/0887	Company size
None	0/0669	1/7106	0/0299	Financial leverage
	0/7390			Model determination factor
	16/0542			statistic <i>F</i>
	(0/0000)			(<i>P</i> –Value)

Analysis of the Results of the First Hypothesis

In investigation of the meaningfulness of the model, since the probability of the statistic *F* is less than 0.05, meaningfulness of the model is approved with 95% certainty. The determination factor illustrates 73.9% of the optional committing items are explained via variables entered the model. In investigation of the meaningfulness of the coefficients, according to results presented in table 7, since the probability of the statistic *t* for the variable of product pricing power is less than 0.05, the presence of a meaningful relationship between product pricing power and profit management is approved with 95% certainty. Hence, the first hypothesis of the research is approved and it can be said with 95% certainty that there is a positive and meaningful relationship between product pricing power and profit management. That is, companies having more power in pricing products in market, have more tendencies toward applying profit management.

Table 7: Results of second hypothesis test using constant effects method

Relationship	P-Value	Statistic	Coefficient	Variable
Positive	0/0000	8/9489	0/1884	Constant component
Negative	0/0425	-1/2458	-0/0606	Product pricing power in market
Negative	0/0013	-1/2269	-0/0137	Growth rate
Negative	0/0073	-1/6936	-0/0177	Investment opportunities
None	0/1587	1/4110	0/0067	Share price fluctuations
Positive	0/0000	1/8555	0/0863	Company size
None	0/7209	0/3574	0/0038	Financial leverage
	0/7165			Model determination factor
	14/3345			statistic <i>F</i>
	(0/0000)			(<i>P</i> –Value)

Analysis of the Results of the Second Hypothesis

In investigation of the meaningfulness of the model, since the probability of the statistic *F* is less than 0.05, meaningfulness of the model is approved with 95% certainty. The determination factor illustrates 71.65% of the industrial competition level is explained via variables entered the model. In investigation of the meaningfulness of the coefficients, according to results presented in table 8, since the probability of the statistic *t* for the variable of industrial competition level is less than 0.05, a negative and meaningful relationship between companies' industrial structure and profit management is approved with 95% certainty. Hence, the second hypothesis of the research is approved and it can be said with 95% certainty that there is a negative and meaningful relationship between companies' industrial structure and profit

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management. That is, companies having less competition for pricing products in market, have fewer tendencies for applying profit management.

Table 8: Results of third hypothesis test using constant effects method

Relationship	P-Value	Statistic	Coefficient	Variable
Positive	0/0000	5/0481	0/1017	Constant component
Positive	0/0000	1/6228	0/1482	Product pricing power in market
Negative	0/0011	-1/2793	-0/0145	Growth rate
Negative	0/0139	-1/4680	-0/0173	Investment opportunities
None	0/8184	-0/2297	-0/0012	Share price fluctuations
Positive	0/0000	1/2443	0/0898	Company size
None	0/4422	0/7689	0/0089	Financial leverage
0/7264				Model determination factor
15/0540				Statistic <i>F</i>
(0/0000)				(<i>P</i> – Value)

Analysis of the Results of the Third Hypothesis

In investigation of the meaningfulness of the model, since the probability of the statistic *F* is less than 0.05, meaningfulness of the model is approved with 95% certainty. The determination factor illustrates 72.64% of the optional committing items is explained via variables entered the model. In investigation of the meaningfulness of the coefficients, according to results presented in table 8, since the probability of the statistic *t* for the variable of product pricing power resulted from industrial structure is less than 0.05, a positive and meaningful relationship between product pricing power resulted from industrial structure and profit management is approved with 95% certainty. Hence, the third hypothesis of the research is approved and it can be said with 95% certainty that there is a positive and meaningful relationship between product pricing powers resulted from industrial structure and profit management. That is, companies having more pricing power resulted from industrial structure, have more tendency toward applying profit management. It must be noted that control variables of growth rate and investment opportunities have negative and company size have positive and meaningful effect on profit management of companies. That is; companies having high growth rate and better investment opportunities, apply less profit management and in contrary, bigger companies have more tendencies toward profit management.

Discussion

According to the first research hypothesis, there is a meaningful relationship between product pricing power and profit management. In investigation of the meaningfulness of the overall model, since the value of statistic *F* is less than 0.05, meaningfulness of the model is approved with 95% certainty. Moreover, determination factor reveals that 73.9% of the optional committing items are explained via variables entered the model. In investigation of meaningfulness of the coefficients according to presented results of tables 4-7, since the probability of the statistic *t* for the coefficient of product pricing power in market is less than 0.05, therefore, the meaningful relationship between product pricing power and profit management is approved with 95% certainty. Hence, first hypothesis is approved and it can be said with 95% certainty that there is a meaningful relationship between product pricing power and profit management in companies so that by increase in power of product pricing by one, profit management of the company increases by 0.0492. Therefore, according to analyses regarding the first hypothesis, it can be concluded that there is a direct and meaningful relationship between product pricing power in market and companies' profit management. In the work of Dutta *et al.*, (2013), to investigate the market production capacity, industrial structure and profit management of the company, they showed that there is a meaningful relationship between product pricing power and profit management and this is in agreement with present paper.

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According to the second research hypothesis, there is a meaningful relationship between companies' industrial structure and profit management. In investigation of the meaningfulness of the overall model, since the value of statistic F is less than 0.05, meaningfulness of the model is approved with 95% certainty. Moreover, determination factor reveals that 71.65% of the industrial competition level is explained via variables entered the model. In investigation of meaningfulness of the coefficients according to presented results of table 4-10, since the probability of the statistic t for the coefficient of industrial competition level is less than 0.05, therefore, the meaningful relationship between companies' industrial structure and profit management is approved with 95% certainty. Hence, second hypothesis is approved and it can be said with 95% certainty that there is a meaningful relationship between companies' industrial structure and profit management in companies. Negative determination factor illustrates the inverse relationship between companies' industrial structure and profit management, so that with increase in power of product pricing by one, profit management of the company increases by - 0.0606. Therefore, according to analyses regarding the second hypothesis, it can be concluded that there is an indirect and meaningful relationship between companies' industrial structure and companies' profit management.

Dutta *et al.*, (2013), studied the industrial structure and profit management of the companies and they found out that there is a meaningful relationship between industrial structure and profit management and this is in agreement with present paper.

According to the third research hypothesis, there is a meaningful relationship between product pricing power resulted from industrial structure and profit management. In investigation of the meaningfulness of the overall model, since the value of statistic F is less than 0.05, meaningfulness of the model is approved with 95% certainty. Moreover, determination factor reveals that 72.64% of the optional committing items are explained via variables entered the model. In investigation of meaningfulness of the coefficients according to presented results of tables 4-13, since the probability of the statistic t for the coefficient of product pricing power in market is less than 0.05, therefore, the meaningful relationship between product pricing power resulted from industrial structure and profit management is approved with 95% certainty. Hence, third hypothesis is approved and it can be said with 95% certainty that there is a meaningful relationship between product pricing power resulted from industrial structure and profit management in companies so that by increase in power of product pricing by one, profit management of the company increases by 0.1482. Therefore, according to analyses regarding the third hypothesis, it can be concluded that there is a direct and meaningful relationship between product pricing power resulted from industrial structure and companies' profit management.

In the work of Dutta *et al.*, (2013), it was discovered that there is a meaningful relationship between product pricing power resulted from industrial structure and profit management and this is in agreement with present work.

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