



# Examination of The Effect Between Competition in Products Market and Cash Value in The Firms Listed in Tehran Stock Exchange

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**Abstract:** *The present study is aimed at investigating the effect of competition among product market and cash value of the firms listed in Tehran Stock Exchange. The study considered Herfindahl Index as the criterion of competition. The samples were 85 firms studied during a seven-year period from 2009 to 2016. Finally, EXCEL, EViews, multivariate regression, and fixed effects method were used to test the hypotheses. The hypotheses' testing results using panel data method, showed a negative and significant relationship between competition in the product market and cash value and a negative and significant relationship between free cash flow and competition in the product market and the firm's cash value. Moreover, there was a positive and significant relationship between diversification of product market with product market competition and firm cash value.*

**Keywords:** *Competition in product market, Cash, Free Cash Flow, Herfindahl Index*

## INTRODUCTION

Competition is one of the most pivotal and important concepts of the theory of economics, so the definition of this term should be very precise. In the theory of economics, the term competition is used as a specific structure and organization of the market. According to Adam Smith, competition is an activity and movement happening only in cases of "imbalance," i.e. the times supply and demand are disrupted. When there is an overhead supply, the suppliers compete against others to impose it; and vice versa, when supply declines, applicants compete to allocate the existing products to them. With the rise of the neoclassical economist, the competition was defined differently. They defined the competition as market equilibrium structure. They argue that if there are many sellers in a market and everyone is well aware of the prices others sell at, one can state that there is competition. According to classic economists, buyers and sellers are also priced in the competition, or their actions cannot influence prices. Moreover, in these markets, the mobility of resources and factors of production are so high, market participants are well aware, and the products of different companies are homogeneous. In other words, the base for competition in the capitalist system is emulation to achieve more in pursuit of economic benefits compared to others. It is clear that the base of competition here is to start the pursuit of personal interests by any person, which in fact forms the main slogan of classical and neoclassical economists (Renani, 2006). However, in Islam, competition, contrary to the capitalist system, means "a competition for earning money" within the framework of the moral and legal rules of Islam, which accepts such frameworks as the filter to remove the competition from the effects of it and to achieve the goals of the economic system Islam (Mirmoezi, 2008).

Market competitiveness eases the effectiveness and creation of effective sovereignty. This can be realized by increasing the efficiency of managers, transparency in decision-making, boosting the level of accountability of managers, reducing the risk of inaccurate investment decisions, and realizing the prices on the market. The degree of market competition, the rules and hurdles

to entry and exit, and the closed or openness of the economic system are among these (Beiner et al, 2008). The nature of competition in product markets influences corporate behavior in all these stages (Namazi et al, 2012). Competitive policies of the company's product market also influence the profits, free flow of cash, and the evaluation of investors from these cash flows (Lyandresy et al, 2011). Raith states that in case of competition and competitive pressures, the companies will work to dissuade competitors from entering the industry. The applied purpose of this study is to respond to the information needs of investors in the shares of companies, managers of companies and institutions, the stock market organization, stock brokers and securities brokers, students and researchers (Raith, 2003).

## **2. Theoretical fundamentals and literature**

Competition here is defined as the power of the corporate market. Market power is controlling a company over the price or the level of its production. In operational definition, market power means monopoly power, the monopoly of a company's multilateral or competitive (Pendey, 2004). In the financial, economic-financial literature, different definitions of market structure can be found. It is stated, in the strategic literature, that the preservation and survival of companies in today's competitive world will not leave them merely competitive advantage, and gain competitive advantage as the power of the corporate market (Hajipour et al, 2009). Competitive product market is that different companies compete in the production and sale of goods, and their products are not superior to the others, because if otherwise, the market tends to be monopolized by multilateralism (Khodamipour et al, 2013). Linch et al. studied the impact of corporate competitive power on corporate tax avoidance activities. Using an example from 1993 to 2012, using multiple indices to avoid tax payments, researchers concluded that the greater the power of the company in the product market, the greater the tax avoidance behavior of the firm will be (Linch et al, 2016).

Fotini and Christos conducted a study called "Competitive Advantage and Profitability." They conducted this research before the financial crisis using panel data and financial factors. The population were Greek manufacturing companies, and the companies studied were chemical, pharmaceutical and plastic companies. The results showed that performance in smaller companies was higher than others (Fotini et al, 2015). Liu and Mauer conducted a paper entitled "Investigating the relationship between product market competition and cash value." They used the Harpindal Index to assess competition in the product market and the results showed a significant relationship between product market competition and cash value (Liu et al, 2011). Irvine and Pontiff studied the relationship between product market competition and cash flow from 2001 to 2008. The results showed that increasing competition leads to increased cash flow and stock returns (Irvine et al, 2009).

Beiner et al. studied the effect of product market competitiveness on remuneration of directors and cash value of the company. They reviewed 200 Swiss companies from 2002 to 2005 and concluded that the more competitive the market, the high the number of rewards of corporate executives. There was a negative relationship between the level of competition in the market and the company's cash value (Beiner et al, 2008). Baggs and Bettignies showed theoretical and empirical analysis that direct competition has a direct effect on managerial efforts. They measured the cost of the dealership by distinguishing between companies whose ownership and management were the same and large companies that were subject to ownership. In both scenarios, the results showed a significant and negative relationship between agency cost function of the interaction between the company's growth opportunities and the open cash flows of the defined and competitive market and Tobin Q index (Baggs et al, 2007). Fylypatvs (2002) studied the economic model of the relationship between product market competition and the profitability of different manufacturing industries in the US. He concluded a significant relationship between competition in the product market and the profitability of companies. Moreover, the results showed that competition in the product market differs in different industries.

Setayesh and Salehinja by using 78 companies, came to the conclusion that direct ownership of companies and the ratio of debt were inversely related to cash flow of the firms, but there was evidence of a significant relationship between institutional ownership, management ownership and ownership concentration that was not observed by companies' free cash flow (Setayesh et al, 2015). In a paper titled "Examining the relationship between product market competitiveness and the structure of the board of directors and the quality of disclosure"

presented in the journal Accounting Knowledge, Khodamipour and Bazraei stated the effect of product market competition on the disclosure quality of a company. In both aspects, the effects of the strategy and governance were examined. The required data for the research was from 105 companies listed in Tehran Stock Exchange from 2004 to 2011. They used a logistic regression model to test the hypotheses. The results of the effect of the strategy showed a negative and significant relationship between Herfindahl-Hirschman index and entry barriers with the disclosure quality, which shows a positive and significant relationship between competition and the quality of disclosure. Findings of the governance effect also showed that Herfindahl-Hirschman index and the barriers to entry index did not have a significant effect on the relationship between the independence of the board of directors and the disclosure quality (Khodamipour et al, 2013). Gorbani et al. examined the relationship between product market competition, board composition and information disclosure quality using information from 90 companies listed in Tehran Stock Exchange during the years 2003-2009. The results of their research based on Herfindahl-Hirschman index as the only competitive variable with the help logistic regression showed that competition in the product market has a strategic effect and a meaningful U-shape relationship with the quality of information disclosure. However, regarding the effect of governance, the results showed that the percentage of board members does not have a significant relationship with the quality of disclosure, and competition in the product market does not enhance and strengthen the relationship between these two variables (Gorbani et al, 2013). According to the abovementioned points, for the purpose of achieving the goal, the following hypotheses have been tested:

**Hypothesis 1:** There is a significant relationship between competition in product market and cash value of companies listed in Tehran Stock Exchange.

**Hypothesis 2:** Free cash flow has a significant effect on the relationship between competition in the product market and the cash value of companies listed in Tehran Stock Exchange

**Hypothesis 3:** Diversification of products of companies has a significant effect on the relationship between competition in the product market and the cash value of companies listed in Tehran Stock Exchange.

### 3. Methods

The population was all companies listed in Tehran Stock Exchange during the period of 2009-2016 (7 year-period) with the following conditions:

1. Listed in Tehran Stock Exchange by March 21 2009 with the fiscal year ending in March 21
2. Companies should not change their fiscal year during the study period.
3. The company should have continuous activity during the research period with shares traded.
4. They should offer the financial information needed to complete this study in full from 2010 to 2016.
5. They should not be of investment companies.

Data collection was done in two steps. In the first stage, the library method was used to formulate the theoretical foundations; and in the second, the data needed to calculate the research variables were extracted from the new database. If the data in this database were incomplete, we referred to the archives in the Stock Exchange Library and the website of the Research, Development and Islamic Studies Organization of the Stock Exchange (<http://rdis.ir>). Linear regression and correlation tests (individually and combination) were used for validation of outputs. The study was correlation and regression type. EViews software was used in this study for hypothesis testing and analysis of data. The study used data panel method. According to this method, Levine's and Lane Chu statistics were used to examine the reliability of independent and dependent variables.

### 4. Evaluation of the variables

The following model was proposed to test the first hypothesis:

$$\text{Value corporate of cash}_{it} = \delta_0 + \delta_1 \text{Product market competition}_{it} + \delta_2 \text{Size}_{it} + \delta_3 \text{Lev}_{it} + \delta_4 \text{Age}_{it} + \varepsilon_{it}$$

The following model is proposed to test the second hypothesis:

$$\begin{aligned} \text{Value of corporate}_{it} &= \delta_0 + \delta_1 \text{Product market competition}_{it} + \delta_2 \text{Free cash flow}_{it} + \delta_3 (\text{Free cash flow}_{it} \\ &* \text{Product market competition}_{it}) + \delta_4 \text{Size}_{it} + \delta_5 \text{Lev}_{it} + \delta_6 \text{Age}_{it} + \varepsilon_{it} \end{aligned}$$

The following model is proposed to test the third hypothesis:

$$\begin{aligned} \text{Value of corporate}_{it} &= \delta_0 + \delta_1 \text{Product market competition}_{it} + \delta_2 \text{Product diversification}_{it} \\ &+ \delta_3 (\text{Product diversification} * \text{Product market competition}_{it} + \delta_4 \text{Size}_{it} + \delta_5 \text{Lev}_{it} + \delta_6 \text{Age}_{it} \\ &+ \varepsilon_{it} \end{aligned}$$

#### 4.1. Dependent variable: cash value

(Cash + short-term investments) / book value of total assets

#### 4.2. Independent variables

Herfindahl-Hirschman Index (HHI) was used to measure market competition in the product market. This index is derived from the sum of the second-tier market share of all active enterprises in the industry:

$$HHI = \sum_{i=1}^k S_i^2$$

K is the number of enterprises active in the market.

S is the market share.

$$S_i = \frac{x_j}{\sum_{i=1}^n x_j}$$

"X" is company sale and "I" is the kind of industry.

HHI measures the degree of industry concentration. In this index, the higher the calculated index, the greater the concentration and the lower the competition in the industry and vice versa Setayesh et al, 2011):

$FCF_{it} = (INC_{it} - TAX_{it} - INT_{it} - PSDIV_{it} - CSDIV_{it} / TA_{i,t-1})$

INC<sub>it</sub>: Operating income before depreciation of firm i in year t

TAX<sub>it</sub>: Total company tax payable in year t

INT<sub>it</sub>: Interest payable by firm i in year t

PSDIV<sub>it</sub>: Profit of preferred shareholders payable by firm i in year t

CSDIV<sub>it</sub>: Profit of ordinary shareholders payable by firm i in year t

TA<sub>i,t-1</sub>: Total assets of the previous year

In order to classify companies into free cash flow surplus, first, the free cash flow of sample companies is obtained according to the above formula, and then the median is obtained from the free cash flow, and the companies that are higher than the average are classified as the ones with free cash flow surplus.

**Diversification of products of the company:** Rumelt divided business activities in terms of the amount and type of diversification into different classes. The two main criteria for classification are Specialty Rate (SRR). SRR was the ratio of income from the largest business to the company's total revenues in a given year. According to this classification, Rumelt categorized companies into three categories in terms of diversification of the products (Rumelt, 1974):

- Single product businesses (single business)  $SR \geq 0.95$
- Companies with moderate diversification  $0.95 \geq SR \geq 0.7$
- Very diverse companies  $SR < 0.7$

**Firm size:** Natural logarithm of book value of company assets

**Financial leverage:** Dividing total debt into total assets

**Company age:** The number of years of company activity since its establishment

## 5. Results

### 5.1. Descriptive Statistics

The most important central index is the mean, which represents the equilibrium point and the distribution center, and is a good indicator of the centrality of the data. For instance, the mean value of the company's cash value is 0.046, showing that most data related to this variable are centered on this point. Median is another central tendency index that shows the state of the population. As is seen in Table 1, the median value of the company's cash value is 0.044, showing that half of the data is less than this value and the other half more than this value. In general, indices of dispersion are a standard deviation for determining the amount of dispersion of data with each other or their rate of distribution over the mean, of which

standard deviation is the most important parameter. The value of this parameter for the company's cash value is equal to 0.009 for diversification in product market and the competition in the product market is equal to 0.250 and 0.118, showing that among the variables of research, the company's age and cash value of the company have the highest and the least amount of dispersion, respectively. Moreover, it is necessary to explain that to avoid the effect of distracting data on the results of the research; all of the data of pertinent variables have been eliminated at the level of one percent.

**Table (1): Descriptive statistics**

variable	Mean	Median	Max.	Min.	SD
Company cash value	0.046	0.044	0.063	0.033	0.009
Variation in product market	0.428	0.328	1.000	0.021	0.250
PD * PMC	0.202	0.136	0.862	0.007	0.199
Business unit size	13.712/	13.742	13.866	0.215	0.581
Competition in product market	0.392	0.343	0.629	0.037	0.118
Age of the company	13.468/	13.000	16.000	8.000	1.736
Financial Leverage	0.706	0.716	0.769	0.262	0.078
Free cash flow	0.340	0.000	1.000	0.000	0.474
FCF_PMC	0.126	0.000	0.428	0.000	0.181

## 5.2. Chow test

In data panel, Chow test was used to determine the model estimation using the pool or panel data method. This test is calculated in the form of the F statistic. Since the significance level in this table is less than 0.05, the hypothesis is that the existence of hypothetical data in favor of panel data is rejected. According to Chow test statistic and error level, for models (1), (2) and (3), it is needed to use Hausman's test to select between a panel data model with fixed effects or panel data with random effects.

**Table 2: Chow test results**

The statistics	Error level	Accepted method	The statistics
Model Number (1)	3.702	0.000	Fixed effects
Model Number (2)	4.645	0.000	Fixed effects
Model Number (3)	3.615	0.000	Fixed effects

## 5.3. Hausman's test

After it was determined that the data was panel, Hausman's test was used to estimate the method of fixed effects against the random effects method. If the significance of the test is less than 0.05, the fixed effects method and if the significance of the test is greater than 0.05, the random effects method will be used. Here, as the significance of fixed effects pattern was less than 0.05, constant effects test was used.

**Table 3: Hausman Test Results**

Model reviewed	The statistics	Error level	Accepted method
Model Number (1)	344.304	0.000	Fixed effects
Model Number (2)	0.785	0.762	Random effects
Model Number (3)	336.275	0.000	Fixed effects

## 5.4. Hypothesis testing

**Hypothesis 1:** this examines the relationship between product market competition and cash value of a company. Given the models of the first hypothesis in Table 4, the level of error in the competition in the product market is 0.004 and its coefficient is -0.008, which showed a significant negative relationship between product market competition and the company's cash value. Hence, this hypothesis is confirmed at a confidence level of 0.95. Among the control variables, age of the company has a positive and significant relationship with the company cash value and the financial leverage variable, which has a negative and significant relation with the company's cash value. Other variables do not have a significant relationship with the company cash value.

Given the results shown in Table 4, F statistics (5.697) and its error level (0.000), one can state that in general the research model has high significance. Moreover, given the adjusted coefficient of determination obtained for the model, which is 44%, one can claim that independent and control variables of the study explain more than 44% of the changes of the dependent variable. Furthermore, according to Durbin-Watson statistic that is 1.787, one can claim that there is no first-degree auto-correlation among the model's residuals.

**Table 4: Model regression results (1)**

Variable	Variable coefficient	T statistic	Error level
Intercept	0.129	15.269	0.000
Competition in product market	-0.008	-2.826	0.004
Age of the company	0.003	11.383	0.000
Financial Leverage	-0.182	-22.302	0.000
Business size	0.0002	0.459	0.645
The coefficient of determination	0.542		
Adjusted coefficient of determination	0.447		
Durbin-Watson statistics	1.787		
F statistics	5.697		
The probability of the F statistics	0.000		

**Hypothesis 2:** this hypothesis examines the effect of free cash flow on the relationship between product market competition and cash value of the company. According to the models of the first hypothesis in Table 5, the error level of free cash flow and competition in the product market is 0.000 and its coefficient is -0.124, which shows the negative and significant effect of free cash flow on the relationship between competition in the product market and the cash value of the company. Thus, this hypothesis is confirmed at a confidence level of 0.95. From among the control variables, firm age and financial leverage have a negative and significant relation with the company's cash value and other variables have no significant relation with the company's cash value.

Given the results shown in Table 5, F statistics (79.233) and its error level (0.000), one can state that in general the research model has high significance. Moreover, given the adjusted coefficient of determination obtained for the model, which is 45%, one can claim that independent and control variables of the study explain more than 45% of the changes of the dependent variable. Furthermore, according to Durbin-Watson statistic that is 2.265, one can claim that there is no first-degree auto-correlation among the model's residuals.

**Table 5: Regression results of model (2)**

Variable	Variable coefficient	T statistic	Error level
Intercept	0.117	19.116	0.000
Competition in product market	0.024	9.812	0.000
Free cash flow	0.035	15.399	0.000
FCF_ PMC	-0.124	-18.654	0.000
Age of the company	-0.003	-13.969	0.000
Financial Leverage	-0.038	-10.389	0.000
Business unit size	-0.00005	-0.162	0.871
The coefficient of determination	0.460		
Adjusted coefficient of determination	0.454		
Durbin-Watson statistics	2.265		
F statistics	79.233		
The probability of the F statistics	0.000		

**Hypothesis 3:** this hypothesis studies the effect of product market diversification on the relationship between product market competition and cash value of a company. According to the models of the first

hypothesis in Table 6, the error level of free cash flow and competition in the product market is 0.030 and its coefficient is 0.013, which shows the negative and significant effect of diversification in the product market on the relationship between competition in the product market and the cash value of the company. Thus, this hypothesis is confirmed at a confidence level of 0.95. From among the control variables, firm age has a negative and significant relation with the company's cash value and financial leverage and other variables have no significant relation with the company's cash value.

Given the results shown in Table 6, F statistics (5.987) and its error level (0.000), one can state that in general the research model has high significance. Moreover, given the adjusted coefficient of determination obtained for the model, which is 46%, one can claim that independent and control variables of the study explain more than 46% of the changes of the dependent variable. Furthermore, according to Durbin-Watson statistic that is 1.897, one can claim that there is no first-degree auto-correlation among the model's residuals.

**Table 6: Regression results of model (3)**

Variable	Variable coefficient	T statistic	Error level
Intercept	0.152	15.540	0.000
Competition in product market	-0.036	-5.202	0.000
Diversification in product market	0.006	1.348	0.178
PD_PMC	0.013	2.175	0.030
Age of the company	0.002	7.562	0.000
Financial Leverage	-0.176	-21.569	0.000
Business unit size	-0.0005	-0.861	0.861
The coefficient of determination	0.560		
Adjusted coefficient of determination	0.467		
Durbin-Watson statistics	1.897		
F statistics	5.987		
The probability of the F statistics	0.000		

### Discussion and conclusion

To study these issues, two main hypotheses were developed and for data estimation of the hypotheses, panel data and data of Tehran Stock Exchange companies were used during the years 2009-2016. The results of the first hypothesis showed a negative and significant relationship between competition in the product market and the company's cash value. Since the significance level of competition in the product market (independent variable) was less than 5%, it was stated that competition in the product market has a negative and significant effect on the cash value. This means that for one unit of increase in competition in the product market, the value of the cash reduces to -0.008 unit. As competition in the product market increases the strategic value of cash reserves, when market competition is intense and at times risky, the business unit loses its product market and reduces its cash resources. The results of this study were consistent with the results of studies conducted by Liu and Mauer (Liu et al, 2011) and contrary to the findings of Beiner et al. (Beiner et al, 2008).

The results of testing the second hypothesis showed a negative and significant relationship between free cash flow and the relationship between competition in the product market and the company's cash value. As the significant level of competition in the product market of companies with a free cash flow (independent variable) was less than 5%, one could state that competition in the product market has a negative and significant effect on cash value in companies with free cash flow. This means that for a single unit increase in the competition in the product market of companies with free cash flow, -0.124 unit values of cash decreases. Furthermore, considering the negative effect of product market competition on cash value in companies with free cash flow, one can state that companies with high free cash flow have the ability to generate cash resources (given the high potential). Accordingly, this competition in the product market is not so effective. The results of this study were consistent with the results of research by Bags and Bettignies (bags et al, 2007) and contrary to the findings of Irvine and Pontiff (Irvine et al, 2009).

The results of the third hypothesis showed a positive and significant relationship between product market diversification and the relationship between product market competition and company cash value. Since the level of significance of competition in the product market and diversification of the product market (independent variable) was less than 5%, it can be stated that competition in the product market has a positive and significant relationship with the cash value of companies with diversification in the product market. That means that for a single unit increase in competition in the product market of companies with diversification in the product market, 0.013 units of cash value will increase. Furthermore, considering the positive effect of product market competition on cash value in companies with diversification in the product market, one can state that by moving the market toward the issue of privatization in companies with high competitive power, the effects of market competition on products are more severe than other companies. In the same vein, the companies' state of being active or inactive strongly depends on the competitive structure of the industry. The results of this study were consistent with the results of Yildirim and Philippatos (Yildirim et al, 1974).

### Applied suggestions

As the liquidity of companies is a very important factor in their valuation in the capital market, the investors and creditors are suggested considering the corporate nature of the matter as well. It is suggested that investors and capital market participants, while deciding, pay attention to the degree of competition in the industries in which the companies are involved as it seems that competition is an effective factor in the companies' efficiency. Providing the necessary infrastructure to create a competitive environment in the product market through the characteristics of the industry can be determined by the governing bodies of economic policy and legislative institutions as an idea to motivate and incite managers to boost growth and prosperity, economic industries and ultimately help improve the country's economic situation. The results showed that cash is a valuable factor for companies in a competitive environment. Thus, in evaluation of the companies' activities, the users of financial statements are recommended to pay attention to cash given the type of competitive nature of the product market.

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