

The Effect of Managerial Overconfidence on Profit Smoothing Evidence from Tehran Stock Exchange

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Abstract

The purpose of this research is to review the effect of overconfidence on profit smoothing in three macro industries: vehicle and parts manufacturing, chemical products and medicinal materials and products in Tehran stock exchange. Time period of this research is 2006-2012 and a number of 56 companies (22 vehicle companies, 13 chemical companies, and 21 medicinal companies) were chosen as sample. Binary logit multi-variable regression models were used to analyze research data in mentioned industries in Eviews 6 software. In this research, profit smoothing is considered as dependent variable, managerial overconfidence as independent variable, and also some control variables effective on profit smoothing such as return on assets, financial leverage, and company size, have been used.

The findings indicate that managerial overconfidence has no effect on profit smoothing in the companies which are being reviewed. Moreover, in medicinal materials and products industry, the effect of company size on profit smoothing has been positive and significant, and the effect of return on assets on profit smoothing has been negative and significant.

Keywords: managerial overconfidence, profit smoothing, and quoted companies in stock exchange.

1. Introduction

Profit smoothing is defined as a conscious behavior which is done to decrease the periodical fluctuations of profit. Many researchers know Hepworth (1953) as the first introducer of "profit smoothing" behavior. Ronen & Sadan (1981) generally believe that investors prefer to invest in companies which have a fixed method for profitability, investors also believe that companies which report fluctuating profits, have more risks comparing with companies that report smooth profits. Therefore, managers perform profit smoothing, in order to show a stable profitability, and obtaining high yield in the framework of accounting accepted principles. Defond & Park (1997) and Joo (1991) believe that increasing the welfare of managers and stock holders and facilitating the predictability of profit are motives of profit smoothing.

Managers who are overconfident (optimistic) measure the future efficiency of company investments so high (Heaton, 2002, Malmendier & Tate, 2005). Malmendier & Tate (2005) define the overconfident managers as the managers who measure the future efficiency of their projects so high. Heaton (2002) uses the term optimistic for the managers who systematically measure the profitability resulting from performance of good companies very high, and profitability resulting from performance of weak companies very low. Previous researches indicate that managerial overconfidence is effective on investment, financing, and dividend policy (Malmendier & Tate, 2008; Cordeiro, 2009; Deshmukh et al., 2013; Malmendier et al., 2011; Hirshleifer et al., 2012).

Reviewing the effect of managerial overconfidence on company policies such as company course and company accounting policies, is an important issue; because, overconfidence can lead to decisions which can destroy the company value. For example; Roll (1986) believes that the reason that managers get involved in destructive merger & acquisition activities, is managerial overconfidence. To make disturbance in activities such as investing, financing and accounting policies, may be costly (Malmendier & Tate, 2005 and 2008; Ben-David et al., 2010). In other side, managerial overconfidence can make some benefits for the companies in some conditions. For example, risk accepting motivation by overconfident managers comparing to other managers, has a lower cost (Gervais et al., 2011; Campbell et al., 2011).

Since, overconfident managers measure the efficiency of company investments so high, we can expect that if they fail to achieve desired profit and efficiency, they would manipulate and smooth the company profit. So, the effect of managerial beliefs on profit smoothing, is significant but it has not yet been reviewed in Iran experimentally.

Therefore, by considering above mentioned issues in current research, the effect of managerial overconfidence on profit smoothing in different industries have been reviewed.

2. Theoretical basics and history of research

Kapland (1968) proposed three possible methods for recognition of profit smoothing behaviors, which include:

1. Direct research from managers through interview, observation, and questionnaire

2. Research from independent professional persons (such as AICPA members).
3. Testing after event information.

To test after events information, below models are used:

1. Traditional models: in these models, it is assumed that profit gets smoothed when profit volatility is decreasing according to an expected model (Badri, 1998).
2. Imhoff model: in this model, it is claimed that smooth profits can be a function of another independent variable (other than what was mentioned before). Imhoff (1981) used sales dependent variable as a substitute.
3. Eckel model: theoretical framework of Eckel model, defines smoother institute as a unit which apply several accounting variables in a way that their effects minimize profit volatility. (Eckel, 1981).

One of the goals of profit smoothing, is to increase the efficiency. The results of performed researches in this field indicate that, when companies report smooth profit, owners trust more in company. Gordon found out in his research that managers make the profits smooth and subsequently satisfy their stock holders, through using accounting principles. He also believes that, since companies divide more profits through smoothing in different levels of profits, so these companies' share prices are higher (Gordon, 1964).

Booth et al. (1996), concluded that smoothing companies, have a higher expected efficiency from unexpected profit, comparing to other companies.

The theoretical model of this research is illustrated in below fig:

Managerial overconfidence => profit smoothing

Ronen & Saden (1981) concluded that in different industries, companies perform profit smoothing in different grades. Ashari et al. (1994) in a broad research tried to determine effective factors on profit smoothing, and they concluded that, profitability and industry type variables are effective on profit smoothing.

Zahra et al. (2005) express that voluntary actions of managers such as profit manipulating, can lead to concealing the real value of assets and financial status of company, and it has negative effects for stock holders, employees, society, managers' reputations and job security.

Atick (2009) in a research reviewed the recognition of profit smoothing behaviours in Turkish companies, and he used founder method to smooth profit. The results indicate that profit smoothing is one of the motives of accounting changes, and economical features of financial period have caused the changes in accounting, and Turkish companies intend to report their net profit as 0.

Parbonetti (2009) in a research reviewed the risk motive of companies' CEOs and profit smoothing. This research mentions the effect of managers' rewards on profit smoothing. Therefore, chief executive officers that their rewards are highly affected by company performance have a lower motivation for risk. In another side, stock holders intend to accept chief executive officers who have positive NPV for the projects, while risk aversion managers despite having positive NPV, and prevent to accept risky projects. So, by decreasing the risk motivation in managers, their welfare increases. Deshmakh et al. (2013) concluded that since overconfident managers believe that foreign investments are costly, they divide lower cash if they need more investments in the future. They also concluded that in companies which have lower growth opportunity and lower cash, this negative relationship is much more intense.

Bavman (2013) concluded that managerial overconfidence has a positive effect on profit smoothing.

Badri (1999) in a research for recognition of effective factors on profit smoothing, indicated that company size, profitability, industry type, ownership type, company type, are not determined as effective factors on profit smoothing.

Shoorvarzi & Pahlavan (2010) in a research reviewed the effect of company size on profit smoothing in 353 quoted companies in Tehran stock exchange in 2002-2006 time period. Firstly, they classified sample companies to smoother and non-smoother companies by using Eckel index, and finally, they used logistic model to test the research assumptions. The results indicated that there is a positive relationship between company size and profit smoothing.

Khajavi et al. (2011) reviewed 74 companies in 1999-2009 time periods, and concluded that there is a positive relationship between traditional indexes of liquidity and company size, and profit smoothing, and products of quoted companies in stock exchange, is the most significant element in this field.

3. Research assumptions

1. There is a direct relationship between managerial overconfidence and profit smoothing in vehicles and parts industry.
2. There is a direct relationship between managerial overconfidence and profit smoothing in chemical products industry.
3. There is a direct relationship between managerial overconfidence and profit smoothing in medicinal materials and products industry.

4. Research variables

The variables of this research in order to test the assumptions are divided into 3 groups: dependent variables, independent variables, and control variables.

4.1. Independent variables

Independent variables which are used in this research include:

Managerial overconfidence (MO) index is the independent variable of this research, that over investment (over-invest) in assets is used to measure it by following Malmendier and Tate (2005 and 2008):

Over investment in assets is calculated from residuals of growth regression model of assets on sales growth according to year-industry and according to below model:

$$SG_{it} = \beta_0 + \beta_1 * AG_{it} + \varepsilon_{it}$$

In which:

SG_{it} = sales growth at the end of financial period t for company i;

AG_{it} = assets growth at the end of financial period t for company i;

ε_{it} = regression residuals at the end of financial period for company i, that positive amount of these residuals is an indicator of over investment in assets (**managerial overconfidence**) and its negative amount is an indicator of lower investment in assets (**managerial lower confidence**).

The method to calculate sales growth and assets growth is as follow:

$$SG_{it} = (S_{it} - S_{it-1})/S_{it-1}$$

$$AG_{it} = (TA_{it} - TA_{it-1})/TA_{it-1}$$

In which:

S_{it} = sales amount at the end of financial period t for company i;

S_{it-1} = sales amount at the end of financial period t-1 for company i;

TA_{it} = the amount of total assets at the end of financial period t for company i;

TA_{it-1} = the amount of total assets at the end of financial period t-1 for company i.

4.2. Dependent variable

Smoothing index as the dependent variable of research is calculated through using Eckel index (1981). Eckel index is created according to profit volatility and sales, and it is as follow:

$$\text{Profit smoothing} = \frac{CV_{\Delta i}}{CV_{\Delta s}}$$

$$SI_{it} = CV_{\Delta it}/CV_{\Delta sit}$$

In which:

SI_{it} = profit smoothing index at the end of financial period t for company i;

$CV_{\Delta it}$ = coefficient of changes for fluctuation in profit time series at the end of financial period t for company i;

$CV_{\Delta sit}$ = coefficient of changes for fluctuation in sales time series at the end of financial period t for company i;

Whenever, Eckel index is less than 1, there is profit smoothing, unless profit smoothing has not taken place. In this research, companies that their smoothing index is less, higher, or equal to 1, are placed in smoother and non-smoother groups respectively. In smoother companies Eckel index is considered to be 1 and in non-smoother companies, Eckel index is considered to be 0.

4.3. Control variables

Control variables of this research as other effective factors in profit smoothing include:

- Return on assets (ROA) which is calculated through dividing operational profit to total assets of company at the end of year.
- Leverage (LEV) which is calculated through dividing operational profit to total assets of company at the end of year.
- Natural logarithm of stock market value as a representative of company size.

5. Research population and statistical sample

Statistical population of this research includes all quoted companies in Tehran stock exchange in three industries: vehicle and parts manufacturing industry, chemical products industry, and medicinal products industry in 2006-2012 time period. Through screening method, we only selected the companies which have all below qualifications:

- They have been quoted in Tehran stock exchange up to the end of November 2001, and their financial year is ended in November.
- They should not change their financial year in mentioned period.
- They have totally provided the required financial information for this research in 2006-2012 time periods.
- Company is not financial intermediation company.

It should be mentioned that information related to the years 2002 to 2005 were only used in calculation of

research variables such as profit smoothing index and managerial overconfidence index.

According to above mentioned qualifications, a number of 56 companies were chosen and reviewed as sample (22 vehicle companies, 13 chemical companies, and 21 medicinal companies).

6. Research and data collection method

In the respect that this research is trying to determine the relationship between managerial overconfidence and profit smoothing, it is a correlation research. Since determining the relationship between managerial overconfidence and profit smoothing can be used by a large group of those who use companies' financial information, it is an applied research. To implement this research, after event method is used. After event method is used when manipulating the independent variables is impossible. In this research, data and variables collected from sample companies have been obtained through referring to financial statements, explanatory notes, weekly and monthly reports of Tehran stock exchange, and by using RahAvard Novin and Tadbir Pardaz softwares.

7. Data analysis and assumption testing method

To determine the relationship between managerial overconfidence and profit smoothing in vehicle and parts, chemical products and medicinal products industries, logit binary regression analysis is used in the form of 3 regression model as below, because research dependent variable (profit smoothing index) is virtual (planar):

$$SI_{it} = \beta_0 + \beta_1 MO_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \varepsilon_{it}$$

In which:

SI_{it} = profit smoothing of company i at the end of financial year t in each of industries being reviewed.

MO_{it} = managerial overconfidence of company i at the end of financial year t in each of industries being reviewed.

ROA_{it} = return on assets of company i at the end of financial year t in each of industries being reviewed.

LEV_{it} = financial leverage of company i at the end of financial year t in each of industries being reviewed.

$SIZE_{it}$ = size of company i at the end of financial year t in each of industries being reviewed.

In logit binary models, Mac Fadd determination coefficient test and likelihood ratio test are used in order to determine the significance of total regression model (Shirin Bakhsh & Hassan Khoonsari, 2005, 116-119). It should be mentioned that Mac Fadd determination coefficient in logit binary regression model is equal to determination coefficient in normal regression. Logistic regression model and normal regression are similar, the only difference is that the method to estimate the coefficients is different. In logistic regression model, instead of minimizing the quadrature of errors (which is done in normal regression), the possibility of happening of an event is maximized. The most important feature of logistic regression model is that, it does not require to make assumptions that covariance matrices are normal or similar (Mahdavi et al., 2011).

In all statistical techniques, Eviews and Excel softwares are used.

8. Analysis of research data

8.1. Reviewing descriptive statistics of research variables

Descriptive statistics of research variables are shown in table 1. By comparing the coefficient of changes (obtained through dividing standard deviation on mean value) of dependent and independent variables of this research in all industries, we conclude that managerial overconfidence variable has much more coefficient of changes comparing to profit smoothing. It means that; relatively, stability of profit smoothing is more than managerial overconfidence. So, we can conclude that profit smoothing in companies being reviewed, despite many relative changes in managerial overconfidence, has had more stability, and therefore, managerial overconfidence should have little effect on profit smoothing of companies in mentioned industries. Among control variables, return on assets has had the highest level of dispersion and subsequently the lowest level of stability, in the other hand, company size variable has had the lowest level of dispersion in mentioned industries. Other results of descriptive statistics indicate that, in 7 years period of this research, the highest level of profit smoothing has been in vehicle and parts industry; so that 125 year-company in this industry have performed profit smoothing. The highest level of return on assets has been in medicinal products and materials industry (23%). Moreover, the highest level of financial leverage has been in vehicle and parts industry. It should be mentioned that managerial overconfidence in chemical products industry has had the lowest level of changes and dispersion coefficient.

Table 1. Descriptive statistics of research variables

Industry	variables standards	Profit smoothing (SI) index	Managerial overconfidence (MO) nce	Return on assets (ROA)	Financial leverage (LEV)	Company size (size)
Vehicle industry	Number	154	154	154	154	154
	Average	0.81	0.01	0.10	0.68	26.67
	Mean	1	-0.74	0.10	0.71	26.14
	Maximum	1	14.24	0.35	0.93	31.02
	Minimum	0	-2.64	-0.12	0.09	24.03
	Standard deviation	0.39	2.30	0.07	0.17	1.79
	Coefficient of changes	0.48	230	0.70	0.25	0.07
Chemical products	Number	91	91	91	91	91
	Average	0.80	0.03	0.21	0.58	26.84
	Mean	1	-0.48	0.18	0.63	26.80
	Maximum	1	9.69	0.61	0.89	30.65
	Minimum	0	-2.28	-0.01	0.16	23.39
	Standard deviation	0.40	1.84	0.14	0.19	1.79
	Coefficient of changes	0.50	61.33	0.67	0.33	0.07
Medicinal products and materials	Number	147	147	147	147	147
	Average	0.77	0.01	0.23	0.64	26.85
	Mean	1	-0.14	0.22	0.65	26.89
	Maximum	1	6.88	0.53	0.89	29.24
	Minimum	0	-1.13	0.02	0.17	24.67
	Standard deviation	0.42	1.14	0.10	0.15	0.98
	Coefficient of changes	0.55	114	0.43	0.23	0.04

8.2. Testing the first assumption

To test this assumption, logit binary regression model has been used; because, dependent variable of this research (profit smoothing index) is virtual variable (planar).

Regression model of the effect of managerial overconfidence on profit smoothing in vehicle and parts industry, has been shown in table 2. The results shown in table 2 indicate that the effect of managerial overconfidence on profit smoothing in vehicle and parts industry, is positive (0.0005) but by considering the possibility of Z test, it is not significant (0.9926). it indicates that managerial overconfidence has no effect on profit smoothing of quoted companies in stock exchange in vehicle and parts industry.

By considering Mac Fadd determination coefficient, only 0.020 of profit smoothing changes in vehicle and parts industry, has been affected by managerial overconfidence and control variables.

Results relating to possibility test of likelihood ratio (0.5564) indicate that regression model is not generally significant.

By considering this fact that managerial overconfidence has no effect on profit smoothing in vehicle and parts industry, the first assumption of research is not approved.

Table 2. Regression model of the effect of managerial overconfidence on profit smoothing in vehicle and parts industry

Dependent variable: profit smoothing	Fixed amount	Managerial overconfidence	Return on assets	Financial leverage	Company size
Regression coefficient	-0.35	0.0005	0.98	-0.79	0.06
Amount of Z test	-0.19	0.0009	0.61	-1.09	0.93
Amount of possibility	0.8493	0.9926	0.5423	0.2716	0.3498
Likelihood ratio test	Amount of LR test			Amount of possibility	
	3.01			0.5564	
Mac Fadd determination coefficient	0.020				

8.3. Testing the second assumption

To test this assumption again logit binary regression model has been used; because, dependent variable of this research (profit smoothing index) is virtual variable (planar).

Regression model of the effect of managerial overconfidence on profit smoothing in chemical products industry, has been shown in table 3. The results shown in table 3 indicate that the effect of managerial overconfidence on profit smoothing in chemical products industry, is positive (0.14) but by considering the possibility of Z test, it is not significant (0.2819). It indicates that managerial overconfidence has no effect on profit smoothing of quoted companies in stock exchange in chemical products industry.

By considering Mac Fadd determination coefficient, only 0.091 of profit smoothing changes in chemical products industry, has been affected by managerial overconfidence and control variables.

Results relating to possibility test of likelihood ratio (0.0836) indicate that regression model is not generally significant.

By considering this fact that managerial overconfidence has no effect on profit smoothing in chemical products industry, the second assumption of research is not approved.

Table 3. Regression model of the effect of managerial overconfidence on profit smoothing in chemical products industry

Dependent variable: profit smoothing	Fixed amount	Managerial overconfidence	Return on assets	Financial leverage	Company size
Regression coefficient	-2.86	0.14	2.03	-0.07	0.13
Amount of Z test	-0.84	1.07	1.06	-0.05	1.12
Amount of possibility	0.4033	0.2819	0.2882	0.9602	0.2642
Likelihood ratio test	Amount of LR test			Amount of possibility	
	8.23			0.0836	
Mac Fadd determination coefficient	0.091				

8.4. Testing the third assumption

To test this assumption again logit binary regression model has been used; because, dependent variable of this research (profit smoothing index) is virtual variable (planar).

Regression model of the effect of managerial overconfidence on profit smoothing in medicinal products and materials industry, has been shown in table 4. The results shown in table 4 indicate that the effect of managerial overconfidence on profit smoothing in medicinal products and materials industry, is positive (0.06) but by considering the possibility of Z test, it is not significant (0.6342). It indicates that managerial overconfidence has no effect on profit smoothing of quoted companies in stock exchange in medicinal products and materials industry.

Other results indicate that in medicinal products and materials industry, the effect of company size on profit smoothing is positive and significant, and the effect of return on assets on profit smoothing is negative and significant. It indicates that, bigger and more valuable companies in medicinal products and materials industry, have had a higher level of profit smoothing. While, profitable companies in this industry, have had a lower profit smoothing.

By considering Mac Fadd determination coefficient, only 0.054 of profit smoothing changes in medicinal products and materials industry, has been affected by managerial overconfidence and control variables and specially company size.

Results relating to possibility test of likelihood ratio (0.0000) indicate that regression model is not generally significant.

By considering this fact that managerial overconfidence has no effect on profit smoothing in medicinal products

and materials industry, the third assumption of research is not approved.

Table 4. Regression model of the effect of managerial overconfidence on profit smoothing in medicinal products and materials industry

Dependent variable: profit smoothing	Fixed amount	Managerial overconfidence	Return on assets	Financial leverage	Company size
Regression coefficient	-14.19	0.06	-4.71	-0.86	0.62
Amount of Z test	-3.08	0.48	-2.92	-0.71	3.82
Amount of possibility	0.0021	0.6342	0.0035	0.4754	0.0001
Likelihood ratio test	Amount of LR test			Amount of possibility	
			24.84	0.0000	
Mac Fadd determination coefficient	0.156				

9. Conclusion and recommendations

The purpose of this research is to review the effect of overconfidence on profit smoothing in three macro industries: vehicle and parts manufacturing, chemical products and medicinal materials and products in Tehran stock exchange. Time period of this research is 2006-2012 and a number of 56 companies (22 vehicle companies, 13 chemical companies, and 21 medicinal companies) were chosen as sample. Binary logit multi-variable regression models were used to analyze research data in mentioned industries.

The results indicate that, managerial overconfidence has no effect on profit smoothing on quoted companies in stock exchange, in above mentioned industries, and in fact; profit smoothing is independent from managerial overconfidence.

Other results indicate that in medicinal products and materials industry, the effect of company size on profit smoothing is positive, and the effect of return on assets on profit smoothing is negative.

The results of this research that say managerial overconfidence has no effect on profit smoothing in mentioned industries, are different from the results of previous research performed by Bavman (2013).

The results of this research that say company size has a positive effect on profit smoothing in medicinal products and materials industry, is similar to the results of previous research performed by Shoorvarzi & Pahlavan (2010). By considering the results of this research, we recommend:

1. Since managerial overconfidence has no effect on profit smoothing in mentioned industries, it seems that overconfident managers do not use manipulating profit as a shield. Therefore, it is recommended that those who use financial information of companies should not be worry about this issue that managerial overconfidence might be hidden by Iranian managers through manipulating profit.
2. Since, there is a positive relationship between company size and profit smoothing in companies of medicinal products and materials, it is recommended that those who use financial information of companies and especially main stock holders of this industry, pay attention to this issue.

10. Recommendations for future researches

1. Reviewing and testing the relationship between managerial overconfidence and profit smoothing for loss-making companies, comparing to profit-making companies in future researches.
2. Repeating this research by using time pauses and reviewing the effect of increasing the pauses on improvement of model anticipation.
3. By considering relatively high fluctuations in economic, cultural and political factors of Iran, we recommend that non-linear regression design should be used for determination of relationship between managerial overconfidence and profit smoothing in future researches.

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