Explaining the relationship between sticky of expenses with prediction error of profit in Tehran Stock Exchange

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ABSTRACT

One of the basic assumptions of management accounting illustrate that costs changes has a significance Relationship with increasing and decreasing in the level of activity, recently after being raised of sticky costs issue by Anderson and his colleagues this assumption was discussed. It means Increases in costs by increasing the more activity level of reduction in costs is exchange for the reduction in the level of activity. Anderson et al (2003) changed the expression of Cost behavior to sticky costs. The Subject profit forecast error is one of the issues that can affect investment decisions to hold or transfer of shares, because purchase of shares of the new company's stock is riskier process than other companies; Because of its lack of trading Background, historical information related to their is low. Accordingly, in prediction two fundamental goals follow: The first one obviously is the proper planning and second one is Familiarity and deployment of predictive techniques using predictive techniques for decision making and problem solving process. The aim of this study was to investigate the relationship between forecast error of earnings and sticky cost in Tehran Stock Exchange. To achieve this aim, a main hypothesis and sub-hypothesis has been proposed, and to test hypotheses data 108 firms listed companies in Tehran Stock Exchange using systematic sampling purposefully selected, and data of the period between 2007 to 2013 was used for statistical analysis. Finally, the results indicate that There is an inverse relationship between sticky costs and forecast error of earnings, and also between sticky cost of goods sold and sticky costs of sales.

1. Introduction

Cost management process involves planning, control and decision making. Managers can provide each of these three functions with timely access to information by the accounting system recognition of cost

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behavior is one of the most important aspects of benefit analysis for managers. Study of cost behavior is not only important for academic researchers but also for ones who directly participate in activities related to their professional activities. It should be noted that measuring changes in the costs only depends on the rate of change in the level of activity not on the direction changes. But some writers, such as neurons and Sudestrum [11] believe that costs have further increase by volume activity. This type of costs behavior by them became known "sticky costs ".

According to Anderson and others, costs are sticky when amount increases in costs associated with the increased volume, are bigger than the reduction in costs associated with the same decrease in volume. As well as any decrease in volume activity, the company with a sticky costs compared to companies without stick costs will have a bigger decrease in income. Findings by Chen et al. [6] show that costs behavior in models which is used in financial analysts to forecast earnings has a significant role. Considering the above mentioned subjects the present study tries to answer these questions that how much high amount of sticky cost and sticky earnings will reduce the accuracy of forecasts?

Dun Wiss [7] in a research on the behaviour cost and profit forecasts by financial analysts have examined the accuracy forecasts in earnings of general consensus analysts, actually he Shows that companies that with stickier cost behaviour, has less prediction profit of analysts. In other words, findings suggest that the high costs impact the priorities for analysis and apparently investors pay more attention to the value of the company have a sticky cost behaviour apparently investors pay more attention to the value of the company with a sticky cost behaviour.

Kamran Ahmad [1] also investigated the factors affecting by company's profit forecast error with the initial offering of shares in the stock market Dhaka (capital of Bangladesh). His sample consisted of 202 companies listed on the Dhaka Stock Exchange for the period 1990-2006. The variables examined in this study seemed to be effective in forecast error of profit: Net profit ratio to sales, financial leverage, time horizon prediction, shares owned by directors, shares offered to the public, Economic boom, credit of underwriting, audit credit and corporate life. Using multivariate regression analysis, the result shows that there was a positive relationship between the economic boom and earnings forecast errors. Other variables were not significant even at the 90 percent confidence level.

Banker and Chen [5] In their study as a profit prediction using a model based on cost variability and sticky cost, Considering the sticky properties of cost Designed and tested a model for predicting profits. Variability and sticky cost refers to the fact that with increases sales, cost of sales proportion increases too, but with declining sales, costs proportional to are not decreased with decrease in sales, but declined less. In this model sales as the primary driver of change in profits and variable costs are considered.

The main purpose of this investigation was to evaluate the effectiveness of this model over other models in a profit prediction. Results showed that involving asymmetric behaviour of costs in anticipation cause increase in forecasting accuracy compared to other forecasting models. Lunkani & Fert [10] investigated the factors influencing the forecast error of profit in Thai stock market. 175 companies were selected during 1991-1996. They examined variables including firm size, firm age, and income dispersion coefficient. Applying cross-sectional multivariate regression results showed that there is a positive relation between variables such as firm size and earnings forecasts and forecast error of earnings, and other variables were not statistically significant.

2. The research hypotheses

According to the theoretical literature and research background, the following hypotheses were formulated.

Main hypotheses**:** There is a relation between sticky costs and forecast error benefits of accepted companies in Tehran Stock Exchange.

The first sub-hypothesis: There is a relation between sticky goods sold with forecast error of profit in listed companies of Tehran Stock Exchange.

The second sub-hypothesis: There is a relation between sticky costs sales with General and administrative error in predicting the earnings of listed companies in Tehran Stock Exchange.

3. Research Methodology

In this paper in order to test this hypothesis, correlation analysis will be used. The study population of this paper includes companies in Tehran Stock Exchange during the years 2007-2013 with number of 466 firms. With the following assumptions inevitably some of these companies have been excluded from the community.

      1 - Financial year to the end of March is each year

      2 - Company during the period from 2007 to 2013 does not have any fiscal years

      3 - Company by the end of fiscal 2006 was accepted in Tehran Stock Exchange

      4 - Company is not part of the Companies with financial intermediation

Systematically sampling was carried out by applying the above condition and 108 participants selected.

4. The data collection

Data needed to test this hypothesis were collected by reference to the audited financial statements of listed companies in Tehran Stock Exchange and Application of Rahvard Company. Tools used for data collection included observation, statistical tests, database, and SPSS and Excel application. Information related to theoretical foundations was collected from library with books, articles in Persian and Latin.

5. Research variables

For testing the main hypothesis, we use the following equation:

$$ABS\text{-}FE_{it} = \beta_0 + \beta_1 STICKY_{it} + \beta_2 MV_{it} + \beta_3 LOSS_{it} + \beta_4 DOWN_{it} + \beta_5 VSALE_{it} P_{it} + \beta_7 OPLEV_{it} + \beta_8 SEASON_{it} + E_{it,}.$$

$ABS\text{-}F\,E_{it} =$ forecast error of earnings
$STICKY_{it} =$ sticky
$MV =$ Market value of equity
$Loss =$ Actual loss

Down = Predicting losses
VSALE = The percentage change in sales
DISP = Standard deviation of earnings forecasts reported
OPLEV = ratio of Margin to sales
SEASON = Earnings change relative to the previous period

5.1 Dependent variable

E = The remaining component
Earnings forecast error
$$ABS - FE_{it} = \frac{|ac.E_{it} - acf_{it}|}{price_{i,t-1}}$$
Where:
$ac.E_{it}$: is Actual earnings per share of firm I in period t
acf_{it}: is Predicted earnings per share of firm I and period t
$price_{i,t-1}$ **:** is price per share of I in period t-1

5.2 Independent variable Adherence

$$STICKY_{i,t} = log\left(\frac{\Delta cost}{\Delta sale}\right)_{i,t} + log\left(\frac{\Delta cost}{\Delta sale}\right)_{i,t-1} - T \quad , \quad T \in \{t-3, \dots, t\}$$

Where "

T = Latest t period in which the first company faced with declining sales

STICKY = Adhesion cost of firm I in period t

Sticky costs consist both of goods sold and administrative expenses of bond selling.

$\Delta cost$ The changes of costs are calculated by Equation 3.

$\Delta cost_{it}$= (SALE$_{it}$ – EARNINGS$_{it}$)- (SALE$_{i,t-1}$- EARNINGS$_{i,t-1}$)

Where:

SALE: is sale of I compant in t period

EARNINGS: is operating profit of firm i in period t

$\Delta sale$: Changes in sale is calculated by equation 3-2

$\Delta sale_{it}$ = S$_{it}$ - S$_{i,t-1}$

S it = sale of current year

S it-1 = sale of last year

6. The results of the research findings Analysis and hypothesis testing

In this research multivariate linear regression model is used for data analysis and hypothesis testing and to study the significance role of F statistic model and to evaluate the significance role of the coef-

ficient of the independent variables, t-statistic used in each model. To evaluate and determine the homogeneity of experimental data with statistical distribution and to verify the independence of each error Kolmogorov – Smirnov test was applied.

7. The results of the first sub-hypothesis

There is a relation between sticky costs of goods sold with the profit forecast error listed companies in Tehran Stock Exchange.

Table 1: Correlation coefficient, coefficient of determination and camera test - Watson and Bonding Analysis of variance between the cost of goods sold with the profit forecast error

Model	The correlation coefficient	coefficient of determination	Adjusted coefficient of determination	Standard error of estimate	Camera test - Watson	F-statistic	Significant level
1	/285[a]	/081	/069	3/02723	1/751	6/621	/000[a]

Table 2: Regression coefficients for the independent variables and adjusted

Abbreviation	Not Standardized coefficients		Standardized coefficients	T-statistics	Significant level	Collinearity Statistics	
	B	Standard error of the coefficient B column	Beta			Tolerances	Variance inflation factor
(Constant)	-3/581	2/388		-1/500	/134		
COGSSTICKY	-/504	/249	-/083	-2/023	/044	/918	1/089
MV	-/279	/205	-/057	-1/364	/173	/888	1/126
Loss	2/190	/559	/204	3/917	/000	/567	1/762
DOWN	/221	/712	/016	/311	/756	/596	1/678
VSALE	/000	/000	/093	2/303	/022	/948	1/054
DISP	-/001	/000	-/056	-1/401	/162	/953	1/049
OPLEV	-/002	/002	-/042	-1/061	/289	/979	1/021
SEASON	672/	265/	104/	2/536	011/	911/	1/097

$$ABS\text{-}FE_{it} = -3.581 + -.504.COGS\text{-}STICKY_{it} + 2.190.LOSS_{it} + 0.672.SEASON_{it} + E_{it}$$

8. The second sub-hypothesis results

There is a relation between sticky cost of sales and general and administrative error in predicted profits of the listed companies in Tehran Stock Exchange.

Table 3: Correlation coefficient, coefficient of determination and camera test - Watson adhesion variance analysis between cost of sales, general and administrative with profit forecast error

Model	The correlation coefficient	coefficient of determination	Adjusted coefficient of determination	Standard error of estimate	Camera test - Watson	F-statistic	Significant level
1	/307[a]	/094	/083	3/02891	1/772	8/052	/000[a]

Table 4: Regression coefficients for the independent variables and adjusted

model	Abbreviation	Not Standardized coefficients		Standardized coefficients	T-statistics	Significant level	Collinearity Statistics	
		B	Standard error of the coefficient B column	Beta		Significant level	Tolerances	Variance inflation factor
1	(Constant)	-4/372	2/258		-1/937	/053		
	SGASTICKY	-/741	/210	-/136	-3/530	/000	/985	1/015
	MV	-/258	/196	-/053	-1/318	/188	/919	1/088
	Loss	2/221	/558	/205	3/977	/000	/550	1/817
	DOWN	/332	/703	/024	/472	/637	/577	1/734
	VSALE	/001	/000	/081	2/067	/039	/948	1/055
	DISP	/000	/000	-/046	-1/170	/242	/963	1/038
	OPLEV	-/001	/002	-/027	-/697	/486	/996	1/004
	SEASON	/607	/259	/093	2/343	/019	/929	1/077

$$ABS\text{-}FE_{it} = 4.372 \quad .741 SGA\text{-}STICKY_{it} + 2.221 LOSS_{it} + .001 VSALE_{it} + .607 SEASON_{it} + E_{it,}$$

9. The result of main hypothesis

There is a relation between sticky costs with error profit forecasts at companies in Tehran Stock Exchange.

Table 5: Correlation coefficient, coefficient of determination and camera test - Watson variance analysis between adherence costs with profit forecast error

Model	The correlation coefficient	coefficient of determination	Adjusted coefficient of determination	Standard error of estimate	Camera test - Watson	F-statistic	Significant level
1	/287[a]	/082	/070	3/10413	1/729	6/546	//000[a]

Table 6: Regression coefficients for the independent variables and adjusted

model	Abbreviation	Not Standardized coefficients		Standardized coefficients	T-statistics	Significant level Significant level	Collinearity Statistics	
		B	Standard error of the coefficient B column	Beta			Tolerances	Variance inflation factor
1	(Constant)	-5/507	2/448		-2/250	/025		
	STICKY	-/233	/121	-/079	-1/916	/046	/919	1/089
	MV	-/170	/210	-/034	-/810	/419	/905	1/105
	Loss	2/344	/580	/217	4/039	/000	/547	1/829
	DOWN	/210	/711	/015	/295	/768	/578	1/729
	VSALE	/000	/000	/080	1/954	/051	/937	1/068
	DISP	/000	/000	-/030	-/748	/455	/951	1/052
	OPLEV	-/001	/002	-/029	-/717	/473	/996	1/004
	SEASON	/679	/276	/102	2/462	/014	/916	1/092

$$\text{ABS-FE}_{it} = -5.507 - .233\ \text{STICKY} + 2.344\ \text{LOSS}_{it} + .679\text{SEASON}_{it} + E_{it,}$$

10. Discussion and conclusions

According to this test, analyses were performed through regression and correlation and we conclude that there is a coefficient of correlation between the independent variables market capitalization of the listed companies, and also there is a relation between adherence costs and profit forecast error listed companies in Tehran Stock Exchange. According to the results there is also an inverse relation between Bonding costs and the forecast error benefits of listed companies in Tehran Stock Exchange, it means that with Increasing sticky costs the profit forecast error also decreases and vice versa.

As well as results of this hypothesis is similar with the results of the study by Chen and bunker in 2006, because the results of this study showed that Involving asymmetric behaviour of expenditures in

anticipation of profits cause increasing in profits forecast accuracy compared to other models in Forecast earnings.

References

[1] Ahmed, K., Tanweer, H., Waves, K., *Reliability of Management Eaings focasts in IPO prospectuses*: Evidence from an Emerging Market, 2007, P.*1-20.*

[2] Anderson M. C, Banker R, Huang R, Janakiraman S., *Cost Behavior and Fundamental Analysis of SG&A Costs*, Journal of Accounting, Auditing & Finance, 2007, 22(1), P.*1- 28.*

[3] Anderson, M., Banker, R., Janakiraman, S., *Are selling, general administrative costs 'sticky?'* Journal of Accol, and unting Research, 2003, 41, P. *47–63.*

[4] Balakrishnan, R., Sivaramakrishnan, K., Gruca, T.S., *Cost stickiness and core competency: A note. Contemporary Accounting Research*, 2008, 25(4), P. *993–1006.*

[5] Banker R, Chen L., *Predicting Earnings Using a Model Based on Cost Variability and Cost Stickiness*, The Accounting Review, 2006, 81(2), P. *285-307.*

[6] Chen, C. X., Lu H., Sougiannis, T., M*anagerial empire building, corporate governance, and the asymmetrical behavior of selling, general, and administrative costs*. Working paper, University of Illinois at Urbana–Champaign, 2006, P.*1-10.*

[7] Weiss, D., *Cost Behavior and Analysts Earnings Forecasts*. The accounting review American Accounting Association, 2010, 85, P. *1441–1471.*

[8] Firth, M., IPO *profit forecasts and their role in signalling firm value and explaining post-listing returns*, Applied Financial Economics, 1998, P.*29-39.*

[9] Firth, M., Liau-Tan, C.K., *Signalling models and the valuation of new issues*: An examination of IPOs in Singapore, Pacific- Basin Finance Journal, 2008, 27, P. *511-526.*

[10] Ravi, L., Firth, M., *The accuracy of IPO earnings forecasts in Thailand and their relationships with stock market valuation*, Journal of Accounting and Business Research, 2005, 35, P.*269-286.*

[11] Noreen E, N., *The Accuracy of Proportional Cost Models: Evidence from Hospital Service Departments*, Review of Accounting Studies, 1995, 2, P.*89-114.*

[12] Wenjuan, X., *A New Measure of Analyst Earnings Forecast Dis-persion*, Working Paper, University of New Hampshire,2008, P.*35-41.*