

Empirical review of costs stickiness by emphasis on motivations and management expectations

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ABSTRACT

The purpose of this research is to empirically review costs stickiness by emphasis on motivations and management expectations in quoted companies in Tehran stock exchange. In this research operational costs have been used to measure costs stickiness. Asset intensity is used as a variable to determine adjustment costs. Moreover, free cash flow and loss avoidance virtual variables have been used to measure managers' optimistic and pessimistic expectations. In this research, a number of ۱۲۳ companies quoted in Tehran stock exchange in ۲۰۰۳-۲۰۱۱ time period, have been reviewed, and pooled/plan data (by considering F-limear and Hasman tests) and Eviews software have been used to test research hypothesis. The findings indicate that operational costs in companies quoted in Tehran stock exchange are ۹۰٪ sticky in assurance level. Asset intensity, pessimistic management expectations, management motivations for loss avoidance, and free cash flow, have no effect on costs stickiness. But, optimistic management expectations would increase costs stickiness.

KEYWORDS

Costs stickiness, management expectations, management motivations, quoted companies in stock exchange.

۱. Introduction

The Selling, general, and administrative costs, have a significant relationship with operation level of business unit. Mean value of selling, general, and administrative costs ratio to total assets, is ۲۲٪, while development and research costs ratio to total assets is ۳٪ (Bankers et al., ۲۰۱۱). Considering the significance of selling, general, and administrative costs, professional practitioners prefer to control these costs. Perception of behaviours of selling, general, and administrative costs, motivates the researchers' attentions. The results of previous researches such as works of Chen et al. (۲۰۱۲) is an indicator of asymmetric behaviour of selling, general, and administrative costs; in

other words, increase in selling, general, and administrative costs in high demand periods, is more steep comparing to that in low demand periods. This phenomenon is called 'cost stickiness' (Balakrishnan & Soderstrom, ۲۰۰۹; Benker et al., ۲۰۱۰). One of the first hypothesis of management accounting indicates that cost adjustments have a proportional relationship with increase and decrease in activity level. But recently this issue has been argued by appearance of cost stickiness by Anderson et al. (۲۰۰۳). It means that level of increase in costs as a result of increase in activity level is more than level of decrease in costs as a result of the same decrease level in activity level (Namazi & Davani poor, ۲۰۱۰).

Previous researches have mainly expressed cost stickiness with economic factors such as asset intensity, and lack of assurance of future demand, and the effect of motivations and management expectations on cost behavior have been neglected. However, Anderson et al. (۲۰۰۳) thought that a part of asymmetry of selling, general, and administrative costs is a result of agency costs, but they found no empirical evidences for their assumption.

The main goal of this research is to study cost stickiness in Tehran stock exchange, and operational costs will be reviewed as a sample. To be more specific, the main purpose of this research is to answer these questions:

۱) are operational costs sticky?, ۲) if stickiness is available, how much is the intensity of cost stickiness?, ۳) if cost moderator factors are controlled, are operational costs still sticky?, and ۴) do management motivations and expectations affect the stickiness of operational costs?

۲. Research theories

In the field of literature of cost stickiness, and according to empire building and downsizing theories, we can make two below questions (Chen et al., ۲۰۱۲):

۱. asymmetry of operational costs has a positive relationship with agency issue resulted from management motivations, and after controlling factors which affect on adjustment of operational costs, this asymmetry still remains?

۲. Can we decrease the positive relationship between agency issue and asymmetry of operational costs through creation of a strong corporate governance?

Agency theory mentions the conflict of interests between shareholders and managers, which is known as agency issue;

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it means that managers direct the activities to a direction which benefits themselves not shareholders (Jensen & Meckling, ۱۹۷۶). A famous issue is management empire building which states that manager tends to grow the company more than optimized size, and also to maintain unused sources in order to increase their individual benefits such as dignity, power and position, and income (Masulis et al., ۲۰۰۷, and Hope & Thomas, ۲۰۰۸).

There are so many articles about agency theory which know managers' motivations a result of below factors (Datta et al., ۲۰۱۰):

۱. managers gain more financial and non-financial interests from managing big organizations.

۲. interests which primary shareholders gain in small companies is more than benefits which managers gain.

۳. managers may consider the real life-time of company and avoid hard decision-making, and try to combine costly dependent companies.

Considering this literature, smaller companies can not focus exclusively on reviewing the selling, general, and administrative costs, however they may study constituent factors of these costs.

Chen et al. believe that when organizations and companies have slack resources, and their managers should make reaction in demand decrease periods, the motivations of their managers result to more asymmetry of operational costs. Therefore, by designing an empirical structure it is predicted that agency issue result to asymmetry of operational costs in optimized levels, and there is a positive relationship between agency issue and asymmetry of operational costs after controlling other economic variables.

The second subject in this research is the review of management expectation role on asymmetry of operational costs.

Considering what was told above and according to the results of previously performed researches, we are going to empirically review the cost stickiness by emphasis on management motivations, and expectations in quoted companies in Tehran stock exchange.

۳. Research history

In the following there are some previously performed researches:

Medeiros & Costa (۲۰۰۴) reviewed the stickiness of administrative, public, sale costs on ۱۹۸ Brazilian companies. The results of their research was an indicator of presence of a sticky behaviour for selling, general, and administrative costs.

Calleja (۲۰۰۶) tested the stickiness of operational costs by using data relating to ۴ countries: America, England, France, and Germany. The results of his research indicated that by increasing sales by ۱%, operational costs increase by ۹۷%, and by decreasing sales by ۱%, operational costs decrease by ۹۱%, and intensity of stickiness in France and Germany was more than intensity of stickiness in America and England.

Anderson & Lanen (۲۰۰۷) reached to some evidences that indicate intensity of cost stickiness is different among different industries and stickiness intensity is different for

some components of operational costs, such as marketing, development and income costs.

Balakrishnan & Gruca reviewed the difference of stickiness intensity among different departments of organization. The results of this research indicated that in central and main departments of company intensity of cost stickiness is more. Bencker et al. (۲۰۱۱) performed a research in the field of creating value in long term by the means of selling, general, and administrative costs. The results of this research indicated that in companies which have low administrative, public, and sale costs, they create value in future and stickiness of administrative, public, and sale costs can be one of effective factors in economic subjects. They also found out that when administrative, public, and sale costs result in less potential value creation, cost stickiness is less. Anyway, where selling, general and administrative costs have less value creation, agency issue is more effective.

Chen et al. (۲۰۱۲) by reviewing financial, administrative data related to ۱۰۰ year-company, available in standard & Poor's (S & P) branch in ۱۹۹۶-۲۰۰۰ time period, indicated that increasing selling, general and administrative costs, such as overhead costs in directing department of companies when sales (demand) increase, have more slope comparing to decrease in these costs when sales (demands) decrease. They also reviewed asymmetry behaviour of selling, general and administrative costs in optimized level, the results indicated that asymmetry in selling, general and administrative costs increases when economic factors are imposed. These results means that there is a positive relationship between agency theory and degree of asymmetry in selling, general and administrative costs. They also found out that when administration system of company is disordered, there is a positive relationship between agency issue and asymmetry in selling, general and administrative costs. It seems that the effect of powerful corporate governance on agency issue, moderates and decreases the asymmetry of selling, general and administrative costs.

Namazi & Davani poor (۲۰۱۰) came to this conclusion that for each ۱% increase in sales, selling, general and administrative costs would increase by ۶۰%, while for each ۱% decrease in sales, selling, general and administrative costs would decrease by ۴۱%. They also reviewed that how intensity of cost stickiness changes in different time periods and different companies. The results indicate that stickiness intensity is less in periods that in the previous period there had been decrease in income. Moreover, intensity of cost stickiness for companies that they have a bigger total assets to sales ratio, is more.

۴. Research population

The population of this research includes all the companies quoted in Tehran stock exchange and sample includes the companies which have below features:

۱. they have had activities in stock exchange in ۲۰۰۳-۲۰۱۱ time period, and they have presented their financial reports and other required information to stock exchange.

۲. the end of their financial year is ۲۰th March.

۳. they are not investment and financial companies.

According to above mentioned standards, the population of this research includes ۱۲۳ companies. All information required for this research is collected from database of Tehran stock exchange, Rah Avarad Novin software, and stock exchange journals. It should be mentioned that because of the nature of research variables, the years ۲۰۰۳ and ۲۰۰۴ have been only used in measuring the variables.

۳. Research hypothesis

This research includes ۴ hypotheses:

The first hypothesis: operational costs in companies quoted in Tehran stock exchange are sticky.

The second hypothesis: cost moderator factors affect the degree stickiness of operational costs.

The third hypothesis: management expectations affect the degree of stickiness of operational costs.

The fourth hypothesis: management expectations affect the degree of stickiness of operational costs.

۴. Research method and data analysis

This research is a semi-empirical, after-event research in the field of accounting researches, which has been performed by using multi-variable regression model and econometric patterns. The research's hypothesis has been tested according to pooled/plan data. The technique in which time and cross-sectional data are combined, is being widely used by researchers. This method is used when it is impossible to review issues in time series or cross-sectional series, or when the number of data is not much. Merging time and cross-sectional data and necessity to use them, is mainly because of increasing the number of visits, increasing freedom degree, decreasing dissonance of variance and decreasing linearity between variables. Statistical analysis has been performed using Eviews ۶ software.

۵. Measurement patterns of research variables

۱. virtual variable of sales decrease in current year comparing to previous year: this variable is a virtual variable (planar) which its value is equal to ۱, if current year sales is decreased comparing to previous year, unless it is equal to ۰.

۲. assets intensity: the method of measuring this variable as a cost moderating factor is as below:

$$AsInt_{it} = TA_{it}/TS_{it}$$

$AsInt_{it}$ = intensity of assets i at the end of year t

TA_{it} = total assets of company i at the end of year t

TS_{it} = total sales income of company i at the end of year t

۳. virtual variable of sales increase in previous year comparing to two years ago: this research is a virtual variable that if sales of previous year comparing to two years ago, is increased its value equals to ۱, unless it is equal to ۰.

۴. optimism expectations: this research is a virtual variable if they have had increase in sales in previous year, its value equals to ۱, unless it is equal to ۰.

۵. pessimistic expectations: this research is a virtual variable if they have had decrease in sales in previous year, its value equals to ۱, unless it is equal to ۰.

۶. management motivation for avoiding loss: this research is a virtual variable if the ratio of net profit in current year to company's market in previous year, its value is between ۰ and ۱, unless it is equal to ۰.

۷. free cash flow: this variable is calculated as follow:

$$FCF_{it} = (CFO_{it} - Dividend_{it})/TA_{it}$$

FCF_{it} = free cash flow of company i at the end of year t

CFO_{it} = free cash flow resulting from operational activities of company i at the end of year t

$Dividend_{it}$ = total divided profit of company i at the end of year t

TA_{it} = total assets of company i at the end of year t

۸. General patterns of testing research hypothesis

For testing research hypothesis, below regression patterns are used in pooled/plan mode:

This model is used to test the first hypothesis:

$$\Delta LnC_{it} = \beta_0 + \beta_1 \Delta LnS_{it} + \beta_2 DEC_{it} \Delta LnS_{it} + \epsilon_{it}$$

This model is used to test the second hypothesis:

$$\Delta LnC_{it} = \beta_0 + \beta_1 \Delta LnS_{it} + \beta_2 DEC_{it} \Delta LnS_{it} + \beta_3 AsInt_{it} DEC_{it} \Delta LnS_{it} + \epsilon_{it}$$

In order to test the third hypothesis this model is used in two modes: optimistic expectations and pessimistic expectations:

$$\Delta LnC_{it} = \beta_0 + \beta_1 \Delta LnS_{it} + \beta_2 DEC_{it} \Delta LnS_{it} + \beta_3 OPT_{it} DEC_{it} \Delta LnS_{it} + \beta_4 PES_{it} DEC_{it} \Delta LnS_{it} + \theta_{it}$$

Two below models are used to test the fourth hypothesis:

$$\Delta LnC_{it} = \beta_0 + \beta_1 Avoid_{it} + \beta_2 \Delta LnS_{it} + \beta_3 Avoid_{it} \Delta LnS_{it}$$

$$+ \beta_4 Avoid_{it} DEC_{it} \Delta LnS_{it} + \gamma_{it}$$

$$\Delta LnC_{it} = \beta_0 + \beta_1 FCF_{it-1} + \beta_2 \Delta LnS_{it}$$

$$+ \beta_3 FCF_{it-1} \Delta LnS_{it}$$

$$+ \beta_4 FCF_{it-1} DEC_{it} \Delta LnS_{it} + \delta_{it}$$

In which:

ΔLnC_{it} = change in logarithm of operational costs of company i in the year t comparing to year t-1

ΔLnS_{it} = change in sales logarithm of company i in the year t comparing to year t-1

DEC_{it} = virtual variable of decrease in sales in current year comparing to previous year in company i in year t

$AsInt_{it}$ = intensity of assets of company i at the end of year t

OPT_{it} = optimistic expectations of management of company i at the end of year t

PES_{it} = pessimistic expectations of management of company i at the end of year t

$Avoid_{it}$ = management motivation for avoiding loss in company i at the end of year t

FCF_{it-1} = free cash flow of company i at the end of year t-1

۹. Analysis of research data and findings

Descriptive statistics of research variables are presented in table ۱.

By comparing adjustment coefficient (result of dividing standard deviation to mean value) of primary variables we conclude that adjustment variable of operational costs logarithm, comparing to adjustment variable of sales logarithm has higher adjustment coefficient and dispersion,

and subsequently lower stability in research period. This issue indicates that companies being reviewed have been considerably different in adjustment of operational costs in research period, while mentioned companies are similar in sales adjustments. This is an indicator of stickiness of operational costs in research period.

The results of descriptive statistics related to average of optimistic and pessimistic variables of managers indicate that in research period, managers have had more optimistic expectations.

Tab. ۱ descriptive statistics of research variables in all companies

standards	Number	Mean	Medium	Maximum	Minimum	Standard deviation	Adjustment coefficient
Adjustment in logarithm of operational costs	۹۸۱	-۰,۰۰۷	۰,۰۰۰	۱,۰۰۰	-۱,۰۰۹	۱,۰۰۳	۰,۰۰۰
Adjustment in sales logarithm	۹۸۱	۰,۰۱۲	۰,۰۱۲	۰,۰۱۲	-۰,۰۱۲	۰,۰۰۳	۰,۰۰۰
Decrease in current sales comparing to previous year	۹۸۱	۰,۰۰۰	۰	۱	۰	۰,۰۰۳	۰,۰۰۰
Assets intensity	۹۸۱	۱,۰۰۰	۱,۰۰۰	۱,۰۰۰	۰,۰۰۰	۰,۰۰۰	۰,۰۰۰
Optimistic expectations	۹۸۱	۰,۰۰۰	۰	۱	۰	۰,۰۰۳	۰,۰۰۰
Pessimistic expectations	۹۸۱	۰,۰۰۰	۰	۱	۰	۰,۰۰۳	۰,۰۰۰
Motivation for loss avoidance	۹۸۱	۰,۰۰۰	۰	۱	۰	۰,۰۰۳	۰,۰۰۰
Free cash flow	۹۸۱	۰,۰۰۰	۰,۰۰۰	۰,۰۰۰	-۰,۰۰۰	۰,۰۰۰	۰,۰۰۰

۹-۱. The first hypothesis: operational costs in companies quoted in Tehran stock exchange are sticky.

Before testing research hypothesis, we selected a suitable pattern for regression model. First, by using F limier test, we selected pooled data model against accidental data model. The results of F limier test for the first hypothesis are shown in table ۲. Possibility value of F limier test shown in table ۲,

has been more than significant level of ۰%, so, using pooled data method is suitable for testing the first hypothesis.

Tab. ۲ selection of pooled data against accidental data in all companies

Model	$\Delta \ln C_{it} = \beta_0 + \beta_1 \Delta \ln S_{it} + \beta_2 DEC_{it} \Delta \ln S_{it} + \varepsilon_{it}$		
Test type	Test value	Freedom Degree	P-value
F limier	۰,۲۲	۱۲۲ & ۷۳۶	۱,۰۰۰

Because of selecting pooled data model against accidental data, we avoided performing Hausman test in order to selecting fixed effects pattern against accidental effects pattern.

Pooled regression model of effect of adjustment in sales logarithm on adjustment in logarithm of operational costs in research period, has been shown in table ۳.

The results presented in table ۳, indicate that the effect of adjustment in sales logarithm on adjustment in logarithm of operational costs has been positive but not significant (۰,۰۰۰). The results also indicate that the effect of adjustment in sales logarithm on decrease in current sales comparing to previous year on logarithm of operational costs has been negative (-۰,۰۰۰), and by considering possibility of t test, it is ۱۰% in assurance level. It shows that operational costs in companies quoted in Tehran stock exchange are ۱۰% sticky in assurance level.

The results related to F test indicate that it is not generally significant, but by considering Doorbin-Watson test, it has not autocorrelation problem.

Moreover, results related to adjusted coefficient of determination indicate that in total research period, only ۰,۰۰۰ of change in logarithm of operational costs are affected by research variables.

Since regression coefficient of change in sales logarithm in current sales decrease, comparing to previous year, the first hypothesis is approved in assurance level of ۱۰%.

Tab. ۳ the effect of sales logarithm on change in logarithm of operational costs

Variables	Tests	coefficients	t	P-value t
Constant		-۰,۱۰	-۱,۹۷	۰,۰۴۸۶
Change in sale logarithm		۰,۲۸	۱,۰۹	۰,۲۷۰۰
change in sales logarithm in current sales decrease, comparing to previous year		-۰,۸۴	-۱,۸۰	۰,۰۶۰۳
Determination coefficient	Adjusted coefficient of determination	P-value F	Durbin-Watson	
۰,۰۰۴	۰,۰۰۲	۰,۱۷۰۱	۱,۶۶	

۹-۲. The second hypothesis: cost moderator factors affect the amount of cost stickiness.

The results of F limier test for the second hypothesis are shown in table ۴. Possibility value of F limier test shown in table ۴, has been more than significant level of ۰%, so, using pooled data method is suitable for testing the second hypothesis

Tab. ۴ selection of pooled data against accidental data in all companies

Model	$\Delta \ln C_{it} = \beta_0 + \beta_1 \Delta \ln S_{it} + \beta_2 DEC_{it} \Delta \ln S_{it} + \beta_3 AsInt_{it} DEC_{it} \Delta \ln S_{it} + \epsilon_{it}$		
Test type	Test value	Freedom Degree	P-value
F limier	۰,۲۴۱	۱۲۲ & ۷۳۰	۱,۰۰۰۰

Pooled regression model of effect of cost moderator factors on amount of stickiness of operational costs, is shown in table ۵.

The results shown in table ۵ indicate that the effect of change in sale logarithm in current sale decrease comparing to previous year in asset intensity on change in logarithm of operational costs, is significant but according to possibility of t test, it is not significant. This indicates that assets intensity decrease the stickiness of operational costs, but this decrease is not significant.

Moreover, results related to adjusted coefficient of determination indicate that in total research period, only ۰,۰۰۴ of changes in operational costs are affected by research variables.

Since the effect of change in sales logarithm in current sale decrease, comparing to previous year, in assets intensity on change in logarithm of operational costs, is not significant, the second hypothesis is not approved.

Tab. ۵ the effect of cost moderator factors on the amount of stickiness of operational costs

Variables	Tests	coefficients	t	P-value t
Constant		-۰,۱۳	-۱,۶۱	۰,۱۰۷۱
Change in sale logarithm		۰,۲۸	۰,۸۷	۰,۳۸۳۶
change in sales logarithm in current sales decrease, comparing to previous year		-۰,۲۰	-۰,۲۰	۰,۸۰۲۷
Change in current sale logarithm comparing to previous year in assets intensity		۰,۲۷	۱,۰۹	۰,۱۱۲۲
Determination coefficient	Adjusted coefficient of determination	P-value F	Durbin-Watson	
۰,۰۰۷	۰,۰۰۴	۰,۱۰۸۴	۱,۶۶	

۹-۳. The third hypothesis: management expectations affect the amount of stickiness of operational costs.

This hypothesis has been reviewed in two modes of optimistic expectations and pessimistic expectations.

The results of F limier test for testing the third hypothesis in optimistic expectation mode, are shown in table ۶.

Possibility value of F limier test shown in table ۶, has been more than significant level of ۰%, so, using pooled data method is suitable for testing the third hypothesis in mode of optimistic expectations.

Tab. ۶ selection of pooled data against accidental data in all companies

Mod el	$\Delta \ln C_{it} = \beta_0 + \beta_1 \Delta \ln S_{it} + \beta_2 DEC_{it} \Delta \ln S_{it} + \beta_3 PES_{it} DEC_{it} \Delta \ln S_{it} + \theta_{it}$		
Test type	Test value	Freedom Degree	P-value
F limier	۰,۲۲۲	۱۲۲ & ۷۳۰	۱,۰۰۰۰

Pooled regression model of the effect of management optimistic expectations on the amount of stickiness of operational costs, is shown in table ۷.

The results of table ۷ indicate that the effect of change in sale logarithm in current sale decrease comparing to previous year in optimistic expectations on change in logarithm of operational costs, is negative and according to possibility of t test, it is significant (۰,۰۴۴۰). it indicates that management optimistic expectations, would increase the stickines of operational costs.

Moreover, the results related to adjusted coefficient of determination indicate that in research period, research variables only affect ۰,۰۰۷ of changes in operational costs.

By considering that the effect of change in sales logarithm in decrease in current year sales decrease, comparing to previous year in optimistic expectations on change in logarithm of operational costs is significant, the third

hypothesis of research in optimistic expectations is approved.

Tab. ۷ the effect of management optimistic expectations on the amount of stickiness of operational costs

Variables	Tests	coefficients	t	P-value t
Constant		۰,۸۱	۱,۲۳	۰,۲۱۹۴
Change in sale logarithm		۰,۲۹	۱,۱۲	۰,۲۶۲۸
change in sales logarithm in current sales decrease, comparing to previous year		-۱,۴۳	-۲,۱۶	۰,۰۳۰۹
Change in current sale logarithm comparing to previous year in optimistic expectations		-۰,۱۰	-۲,۰۲	۰,۰۴۴۰
Determination coefficient	Adjusted coefficient of determination	P-value F	Durbin-Watson	
۰,۰۰۶	۰,۰۰۲	۰,۱۶۸۱	۱,۶۶	

The results of F limier test for testing the third hypothesis in pessimistic expectations mode, are shown in table ۸. Possibility value of F limier test shown in table ۸, has been more than significant level of ۰%, so, using pooled data method is suitable for testing the third hypothesis in mode of pessimistic expectations.

Tab. ۸ selection of pooled data against accidental data in all companies

Model	$\Delta Ln C_{it} = \beta_0 + \beta_1 \Delta Ln S_{it} + \beta_2 DEC_{it} \Delta Ln S_{it} + \beta_3 PES_{it} DEC_{it} \Delta Ln S_{it} + \theta_{it}$		
Test type	Test value	Freedom Degree	P-value
F limier	۰,۲۲۲	۱۲۲ & ۷۳۰	۱,۰۰۰

pooled regression model of the efect of management pessimistic expectations on the amount of stickiness of operational costs are presented in table ۹.

The results of table ۹ indicate that the effect of change in sales logarithm in current year sales decrease, comparing to previous year in pessimistic expectations on change in logarithm of operational costs, is positive (۰,۸۱), but not significant. It indicates that management pessimistic expectations would decrease the stickiness of operational costs, but the effect is not significant.

Moreover, the results related to adjusted coefficient of determination indicate that in research period, research variables have only affected ۰,۰۰۲ of companies' operational costs.

By considering that the effect of change in sales logarithm in current year sales decrease, comparing to previous year in

pessimistic expectations on change in logarithm of operational costs is not significant, the third hypothesis is not approved in pessimistic expectations mode.

Tab. ۹ the effect of management pessimistic expectations on the amount of stickiness of operational costs

Variables	Tests	coefficients	t	P-value t
Constant		-۰,۱۰	-۲,۰۲	۰,۰۴۴۰
Change in sale logarithm		۰,۲۹	۱,۱۲	۰,۲۶۲۸
change in sales logarithm in current sales decrease, comparing to previous year		-۰,۶۲	-۱,۲۷	۰,۲۰۲۹
Change in current sale logarithm comparing to previous year in pessimistic expectations		۰,۸۱	۱,۲۳	۰,۲۱۹۴
Determination coefficient	Adjusted coefficient of determination	P-value F	Durbin-Watson	
۰,۰۰۶	۰,۰۰۲	۰,۱۶۸۱	۱,۶۶	

۹-۴. The fourth hypothesis: management motivations has no effect on the amount of stickiness of operation costs.

This hypothesis has been reviewed in two modes: management motivations for avoiding loss, and management motivations for free cash flow.

The results of F limier test for testing the fourth hypothesis in the mode of management motivations for avoiding loss, are shown in table ۱۰. The amount of F limier possibility shown in table ۱۰, is more than significant level of ۰%, so, it is suitable to use pooled data method to test the fourth hypothesis in the mode of management motivations for avoiding loss.

Tab. ۱۰ selection of pooled data against accidental data in all companies

Model	$\Delta Ln C_{it} = \beta_0 + \beta_1 Avoid_{it} + \beta_2 \Delta Ln S_{it} + \beta_3 Avoid_{it} \Delta Ln S_{it} + \beta_4 Avoid_{it} DEC_{it} \Delta Ln S_{it} + \gamma_{it}$		
Test type	Test value	Freedom Degree	P-value
F limier	۰,۲۰۹	۱۲۲ & ۷۳۰	۱,۰۰۰

Pooled regression model of the effect of management motivations for avoiding loss, on the amount of stickiness of operational costs, is shown in table ۱۱. Results presented in table ۱۱, indicate that change in sales logarithm in current year sales decrease in management motivations for avoiding loss on change in logarithm of operational costs, is positive (۰,۰۹) but not significant. It indicates that management

motivations for avoiding loss has no effect on stickiness of these costs.

Moreover, results related to adjusted coefficient of determination indicate that in research period, research variables have only affected ۰,۰۰۱ of changes in operational costs of companies. Since the effect of change in sales logarithm in current year sales decrease, comparing to previous year in management motivations for avoiding loss on change in logarithm of operational costs, the fourth hypothesis is not approved in the mode of management motivations for avoiding loss.

Ta. ۱۱ the effect of management motivation for avoiding loss on the amount of stickiness of operational costs

Variables	Tests	coefficients	t	P-value t
Constant		-۰,۰۶	-۰,۸۸	۰,۳۷۸۰
Management motivation for avoiding loss		-۰,۰۹	-۰,۴۸	۰,۶۲۸۳
Change in sale logarithm		۰,۰۳	۰,۱۳	۰,۸۹۴۴
Change in sales logarithm in management motivation for avoiding loss		-۰,۰۳	-۰,۰۶	۰,۹۰۴۰
Change in current sale logarithm comparing to previous year in management motivation ofr avoiding loss		۰,۰۹	۱,۱	۰,۰۹۱۱
Determination coefficient	Adjusted coefficient of determination	P-value F	Durbin-Watson	
۰,۰۰۳	۰,۰۰۱	۰,۹۳۶۰	۱,۶۶	

The results of F limier test for testing the fourth hypothesis in the mode of free cash flow is shown in table ۱۲. The amount of F limier possibility shown in table ۱۲, is more than significant level of ۰%, so, it is suitable to use pooled data method to test the fourth hypothesis in the mode of management motivations for free cash flow.

Tab. ۱۲ selection of pooled date against accidental data in all companies

Model	$\Delta Ln C_{it} = \beta_0 + \beta_1 FCF_{it-1} + \beta_2 \Delta Ln S_{it} + \beta_3 FCF_{it-1} \Delta Ln S_{it} + \beta_4 FCF_{it-1} DEC_{it} \Delta Ln S_{it} + \delta_{it}$		
Test type	Test value	Freedom Degree	P-value
F limier	۰,۲۰۸	۱۲۲ & ۷۳۰	۱,۰۰۰۰

Pooled regression model of the effect of free cash flow on stickiness of operational costs, is shown in table ۱۲. Results presented in table ۱۲, indicate that change in sales logarithm in current year sales decrease, comparing to previous year in free cash flow on change in logarithm of operational costs, is positive (۲,۴۷) but not significant. It indicates that free cash flow has no significant effect on stickiness of these costs.

Moreover, results related to adjusted coefficient of determination indicate that in research period, research variables have only affected ۰,۰۰۲ of changes in operational costs of companies.

Since the effect of change in sales logarithm in current year sales decrease, comparing to previous year in free cash flow on change in logarithm of operational costs, the fourth hypothesis is not approved in the mode of free cash flow.

Tab. ۱۳ the effect of free cash flow on the amount of stickiness of operational costs

Variables	Tests	coefficients	t	P-value t
Constant		-۰,۰۷	-۱,۲۰	۰,۲۱۳۴
Free cash flow		۰,۲۰	۰,۳۶	۰,۷۱۷۲
Change in sale logarithm		۰,۰۱	۰,۰۶	۰,۹۰۲۸
Change in sales logarithm in free cash flow		-۰,۰۴	-۰,۲۸	۰,۷۷۹۶
Change in current sale logarithm comparing to previous year in free cash flow		۲,۴۷	۰,۹۷	۰,۳۳۲۰
Determination coefficient	Adjusted coefficient of determination	P-value F	Durbin-Watson	
۰,۰۰۳	۰,۰۰۲	۰,۶۶۴۲	۱,۶۷	

۱۰. Discussion and conclusion

The purpose of this reseach is to empirically review cost stickiness by emphasis on management motivations and expectations in companies quoted in Tehran stock exchange. A number of ۱۲۳ companies quoted in Tehran stock

exchange in ۲۰۰۳-۲۰۱۱ time period, were reviewed in this research and for testing the research hypothesis, we used pooled data.

In this regard, by testing hypothesis ۱ to ۴, the findings indicate that:

۱. operational costs in companies quoted in Tehran stock exchange are sticky in assurance level of ۹۰٪.

۲. assets intensity would decrease the stickiness of operational costs, but this decrease is not significant.

۳. management optimistic expectations would increase the stickiness of operational costs.

۴. management pessimistic expectations would decrease the stickiness of operational costs, but this decrease is not significant.

۵. management motivations for avoiding loss has no effect on stickiness of operational costs.

۶. free cash flow has no significant effect on stickiness of operational costs.

The results of this research in relation to lack of effect of assets intensity on cost stickiness in research period, is not compatible with researches of Chen et al, and Namazi & Davani poor.

۱۱. Recommendations resulting from research findings

۱. by considering the stickiness of operational costs in assurance level of ۹۰٪, we recommend stakeholders to perform required actions against current interests (using assets for paying operational costs) in order to prevent long-term interests being sacrificed.

۲. by considering the positive effect of management optimistic expectations on stickiness of operational costs, we recommend the stakeholders of companies quoted in Tehran stock exchange to notice inappropriate effect of management optimistic expectations in changes in operational costs, in order to prevent cost stickiness phenomenon.

۱۲. Suggestions for future researches

۱. repetition of this research by using time pause and reviewing the effect of increasing pauses on improvement of model anticipation.

۲. reviewing the effect of cultural factors on cost stickiness.

۳. reviewing the research subject in different industries.

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