

Real Earnings Management in Organization and the Behavior of Cost Stickiness: Empirical Evidence from Iranian Companies

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Abstract

This study investigates on the association between real earnings management and the stickiness of selling, general and administrative (SG&A) costs. The cost stickiness phenomenon is a pattern of cost behavior which related to managerial deliberate resource commitment decisions. This paper speculates that, in a sales decline, firm with earning manipulate increased the degree of cost stickiness. This is because of manipulate non-discretionary costs leading to increasing the intensity of cost reduction. To estimate real earnings management consider three item including: sales manipulation, overproduction, and the abnormal reduction of discretionary expenditures. The data sample consists of 2,552 firm-year observations of Tehran Sock Exchange firms for the period 2003–2013. Based on paper's result, the three level of REM variable increased degree of cost stickiness. ROA, ROE, Leverage and EM consider as control variables. EM, like REM variables increase the degree of cost stickiness and Return on assets (ROA) show an anti-stickiness behavior.

Keywords: “Real Earnings Management”, “Costs Stickiness”, “ROA”, “ROE”, “Leverage”.

Introduction

Decision making is a sensitive, important and inseparable action in all financial activities. External and internal users for take their financial decision, needs correct, reliable and timely information. Among all of the financial information which is needed for decision making, the information related to profit and loss is very important. This type of information shows the liquidity of firm to achieve the fine goals in long, medium and short-time.

Evaluation and estimation method of cost and sales revenue, as parts of earning, is critical for all users, especially for those users are not involved in the preparing the information and financial statements. Because managers to achieve their desire profit, select intended accounting's evaluation methods, and put effect on cost and revenue.

To achieve a reliable analysis, users must have an understanding of costs behavior. This paper is focused on new models instead of traditional model. Based on traditional model, there is a symmetrical association between cost and volume increase and decrease. But Anderson et al. (2003) show a different behavior of cost. According to this model, apposite of traditional model, cost response to a decline in sales volume is smaller than the cost response to an increase in sales volume. Cost stickiness indicates that contrary to common beliefs selling, general and administrative (SG&A) costs do not follow the costs traditional model. Cost stickiness research showed that SG&A costs increase on average 0.55% per 1% increase in sales but decrease only 0.35% per 1% decrease sales (Anderson et al. 2003). So because of sticky costs, earnings¹ behave asymmetrically for operational reasons (Banker, Basu, et al. 2016). Fundamental analysis suggests that increases in the SG&A ratio represent decreases in efficiency and are indications that managers are not able to adequately control costs. Furthermore, this lack of control is a negative signal regarding future performance and firm value. Alternatively, decreases in the SG&A ratio are viewed as increases in efficiency and are a sign that managers are properly controlling costs. Therefore, this decrease is believed to be a positive signal regarding future performance and firm value (Johnson 2016). During the time many articles and research have proven the hypothesis of sticky behavior of selling, general and administrative cost. For example, (Anderson et al. 2003), (Subramaniam & Weidenmier 2003), (Banker & Chen 2006), (Calleja et al. 2006) and (Anderson et al. 2007).

The behavior of cost stickiness and the cause of that are directly connected to demand in market. When demand increases, managers increase committed resources to the extent necessary to accommodate additional sales. When volume falls, however, some committed resources will not be utilized unless managers make the deliberate decision to remove them. Because demand is stochastic, managers must evaluate the likelihood that a drop in demand is temporary when deciding whether to adjust committed resources downward. Stickiness of SG&A costs occurs if managers decide to retain unutilized resources rather than incur adjustment costs when volume declines (Anderson et al. 2003).

Manager's decision to maintain unutilized resources also because by personal considerations and result in form of agency costs. Agency costs are costs incurred by the firm because self-interested managers make decisions that maximize their personal utility but are not optimal from the perspective of firm's stockholders (Jensen & Meckling 1976).

(Kajiwara & Yasukata 2011) proposed a new theory about the cost stickiness behavior. They proposed deliberate decision and cost adjustment delay theory as main reason for the occurrence of cost stickiness. When managers predict the decrease in sales revenue for the short time, they try to maintain resources and bearing the costs of maintain (such as depreciation, amortization and maintenance costs). Therefore, to earn more earnings in the long time, manager try to protect their sources and bear the maintain cost of assets.

¹earnings = sales – costs

According to the cost adjustment delay theory, costs are stickiness because the rate of declining in sales revenue and cost cannot be the same. (Anderson et al. 2003) and (Hirai & Shiiba 2006) are examples of experimental research related to this topic. They found that the amount of cost stickiness in the short-time higher than medium and long-time and cost stickiness reduced in long-time and volatility of cost closer to volatility of sale revenue. In addition (Subramaniam & Weidenmier 2003) realize that cost stickiness seen in volatility and importance sales revenue decreases. But this phenomenon is not seen in significant decrease. These findings indicate this fact costs cannot be quickly reduced as sales revenue (rate of decrease in costs less than the rate of decrease in sales revenue).

Another variable required for earnings analysis (besides cost) is sales revenue. The way of report sales revenue is an interest subject for all users of financial statements. For external users, there is always being an afraid of manipulation sales revenue and related item by managers and show more earning and better situation of company. The decisions are taken by users base on this manipulation data could be cause of irreparable results and in this situation, the understanding of earnings management gets important. In accounting literature it is difficult to express definition of earnings management, because there is not a clear boundary between earnings management and financial fraud. Financial fraud typically has a substantial adverse valuation effect on companies. In order to interpret this valuation effect, it is helpful to understand the stylized sequence of information released to the market (Fich 2005).

Real Earnings Management (REM) by change in operating activities misleads the stakeholders. Although real earnings management has not been as widely studied as accrual based earnings management, Graham et al.'s (2005) finds that managers prefer real activities manipulation, by such means as reducing discretionary expenditures or capital investments, over accruals manipulation as a way to manage earnings. These real earnings management activities are significantly different than accrual-based ones as they have direct cash flows effects. Graham et al. (2005, p. 32) find

....strong evidence that managers take real economic actions to maintain accounting appearances. In particular, 80% of survey participants report that they would decrease discretionary spending on R&D, advertising, and maintenance to meet an earnings target. More than half (55.3%) state that they would delay starting a new project to meet an earnings target, even if such a delay entailed a small sacrifice in value. . . .

There are at least two reasons for executives' greater willingness to manage earnings through real activities than through accruals. First, accrual-based earnings management is more likely to draw auditor or regulatory scrutiny than real decisions, such as those related to product pricing, production, and expenditures on research and development or advertising. Second, relying on accrual manipulation alone is risky (Cohen et al. 2008).

The present paper provides new evidence on the relationship between real earnings management and cost stickiness and extends the prior literature in several important dimensions pertaining to empirical methodology, including improved analysis of costs behavior. This paper examines the relationship for Iranian publicly traded companies which are accepted in Tehran stock exchange. Previous studies have been mostly restricted to firms in the United States; but this paper, investigate on the behavior of costs in a different environment (including economic and legislation conditions).

2. Related literature

2.1. Real Earnings Management

Creditors, Shareholders and other Stakeholders use earnings and other accounting information to assess firm health, credibility, and viability (Ederington et al. 1987; Fischer & Verrecchia 1997; KHURANA et al. 2003; Ho & Rao 1993). However, previous empirical evidence suggests that managers tend to manage

earnings for their personal benefit (like earn rewards, raising stock value, attracting investors). Earnings management occurs when managers use discretion in financial reporting or transaction's structure to alter financial reports either to mislead some stakeholders about the underlying economic performance of the firm or to influence contractual outcomes that depend on reported accounting numbers (Healy, Wahlen 1999). Earnings thus become a less reliable measure of firm performance and reported earnings that are pertinent to investor pricing decisions can be of poor quality (Francis et al. 2005).

Bondholders tend to focus on a firm's ability to generate future cash flows to ensure the payment of periodic interest and the bond's principal. The quality of accounting information affects bondholders' estimates of future cash flows (Ge & Kim 2014). Thus Bondholders for achieve to their desire goals, needs to information that is lack of management manipulation. But managers for doing earnings management have their motivation. (Bharath et al. 2008) show that an important motivation for earnings manipulation is the desire to attract external financing at low cost. They also find that firms manipulating earnings are: (1) more likely to have boards of directors dominated by management; (2) more likely to have a Chief Executive Officer who simultaneously serves as Chairman of the Board; (3) more likely to have a Chief Executive Officer who is also the firm's founder, (4) less likely to have an audit committee; and (5) less likely to have an outside block holder. Managers to improve reported margins and manipulation earnings suggest price discounts to temporarily increase sales, overproduction to report lower cost of goods sold, and reduction of discretionary expenditures (Roychowdhury 2006).

Because of the nature of accruals item compare with cash item, faced with higher manipulation risk. Accrual policies of managers are related to income-reporting incentives of their bonus contracts, and changes in accounting procedures by managers are associated with adoption or modification of their bonus plan (Healy 1985).

Managers tradeoff between real activities manipulation and accrual-based earnings management methods based on their relative costs and that managers adjust the level of accrual-based earnings management according to the level of real activities manipulation realized (Zang 2012).

Real earning management considers sales manipulation, overproduction, and cutting discretionary expenses as the ways of managers help with through them manipulate earnings (Cohen et al. 2008; Roychowdhury 2006). R&D expenses is one of the discretionary expenses and previous research show that managers are more (less) likely to cut R&D when accounting flexibility is low (high), and that managers prefer the use of accrual to real earnings management given ample accounting flexibility (Wang & D'Souza 2006).

To accrual-based earnings management, managers can manage earnings through real economic actions. Real earnings management camouflages a firm's current-period unmanaged economic performance. To the extent that these actions deviate from optimal business operations, REM jeopardizes a firm's competitive advantage in the long run (Cohen & Zarowin 2010; Wang & D'Souza 2006; Zang 2012).

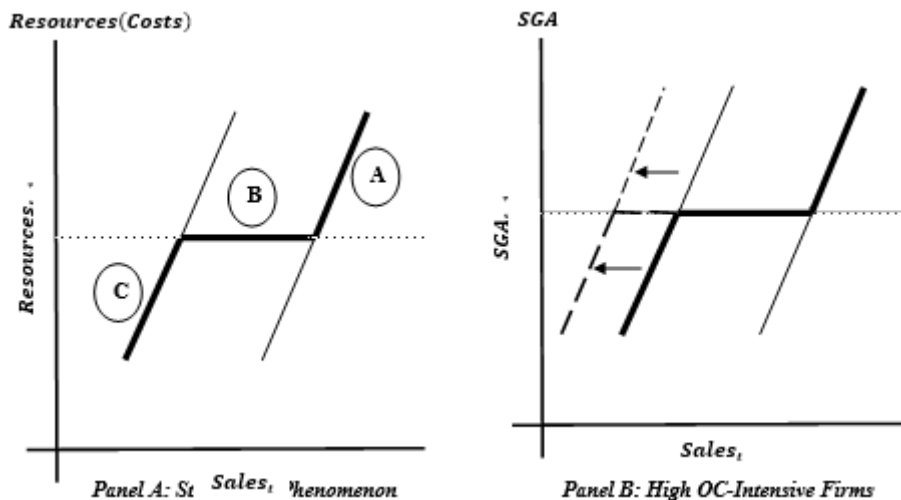
In addition, REM could have negative consequences at the level of future cash flows (Roychowdhury 2006). In particular, the survey evidence of (Graham et al. 2005) shows that managers are willing to burn real cash flows and make small or moderate sacrifices in economic value to meet earnings targets. (Kim & Sohn 2013) find that, after controlling for other risk factors, there is a significant negative association between REM and the level of future cashflows. The bond pricing model predicts that the bond value is positively associated with total firm market value (Merton, 1974), which is a function of discounted future cash flows (Brealey & Myers 2003).

2.2. Cost Stickiness

(Anderson et al. 2003) shown selling, general and administrative (SG&A) cost increase on average 0.55% per 1% increase in sales but decrease only 0.35% per 1% decrease in sales. They analyzed that sticky costs occur because managers deliberately adjust the resources committed to activities.

In another research (Anderson et al. 2005) find that costs are sticky for operations costs but not for the other cost categories. They also show that the degree of asymmetric cost behavior varies as a result of deliberate decision by managers that are associated with adjustment costs.

(Balakrishnan & Gruca 2008a) show operating costs for the hospital (sample data) as a whole are sticky. They also find that higher stickiness in costs pertaining to patient care relative to costs in other functions. Sticky cost research relies on the asymmetric relation between levels of sales and costs (Venieris et al. 2015). (Banker, R.D., Byrlov 2014) formed an integrated framework for the sticky cost phenomenon by incorporating all the recent theoretical developments. This theoretical framework is presented graphically in fig.1 (Panel A). When current sales ($Sales_t$) exceed available resource capacity, which is determined by resources carried over from the prior period ($Resources_{t-1}$), firms will add resources in a proportional way (Fig. 1 – Panel A – Scenario A). When current sales fall, firms weigh the costs of maintaining a slack of unutilized resources against the adjustment costs associated with disposing of these resources. At intermediate sales levels, unutilized capacity is positive but acceptably low and, thus, firms maintain the original resource levels (Fig. 1 – Panel A – Scenario C). (Banker, R.D., Byrlov 2014) argue that this slack of unutilized resources depends not only on concurrent sales but also on: (i) prior period resource levels, which affect the adjustment costs of the current period; (ii) expected future sales, which affect future adjustment costs; and (iii) agency and behavioral factors. Finally, in the case of current sales levels being far below minimum acceptable unutilized capacity, firms will cut resources to reduce the slack (Fig. 1 – Panel A – Scenario B). (Venieris et al. 2015).



(Xue & Hong 2016) To check whether the expense reduction indicates better operating efficiency or managers' dysfunctional short-sighted behavior, divide expenses into R&D, advertising, and other general expenses. The results show that the difference in the reduction in stickiness between the earnings-management and non-earnings-management sub-samples is much more significant in other general expenses than in R&D or advertising expenses.

(Cheng et al. 2016) Using a large sample of Chinese private firms show that SG&A costs are on average anti-sticky. They also find that firms with limited access to capital have lower contemporary capacity expansion associated with sales increase, as well as stronger cost anti-stickiness or weaker cost stickiness. The results of (Banker, Byzalov, et al. 2016) study were classified in 3 parts: First, cost behavior directly affects earnings properties such as asymmetric timeliness, persistence, and predictability. Second, because cost behavior affects the time-series properties of earnings, it has predictive value for future earnings. Third, if managers, analysts, and investors do not fully understand this predictive value, then this can lead to systematic earnings forecast errors and systematic abnormal returns.

3. Hypothesis development

Based on (Cohen et al. 2008; Roychowdhury 2006) studies, we consider three types of REM activities:

- (1) Sales manipulation,
- (2) Overproduction, and
- (3) Cutting discretionary expenses.

Sales manipulation refers to manager's attempts for increase sales revenue during the financial year by offering "limited-time" price discounts or more lenient credit terms. In addition, offering more lenient credit terms, such as a longer payment period, increases firm's risk and company will face to uncollectible accounts and lack of liquidity.

Overproduction means, manager's product goods more than they need to increase earnings and earn more profit. Inventory is one of the most important items in financial statements appear in income statement and balance sheet. The cost of goods sold (COGS) appears in the income statement and the cost of unsold goods appears as the inventory in the balance sheet. By overproduction, managers decrease the COGS in per unit. So overproduction allows to the managers, reports lower COGS and increase earnings in financial statement. Although managers, to achieve the desired goals, increase earnings but gain earnings are less sustainable and the excessive inventory may be obsolete so a great loss may occur in the future (not all industries).

Based on (Xue & Hong 2016) research, there is significantly more expense stickiness in non-earnings-management sub-sample than earnings-management sub-sample, which indicates that managers prefer to reduce more expenses under the pressure of reporting sound earnings.

Some of methods used in earnings management do not have a direct effect on cash flow, but included manipulate discretionary accruals. Also Managers can with manipulation in discretionary accruals achieve their desired profit margin. For example reduce advertising costs, as a high amount distribution and sale cost.

Earnings manipulation example by manipulation in discretionary accruals items is accelerate to sales plan, change in Sending goods plans, reduce in research and development costs (R&D), delays in identifying maintenance costs, reduce in advertising costs, selling, general and administrative costs, retraining and transport costs. Reducing such expenditures lead to decrease in cash outflows and have a positive effect on cash flows in the current period. For example, the abnormal reduction of advertising expenses can result in lower future sales revenues and therefore lower future cash flows; an abnormal reduction of employee training expenses can damage firms competitive in the long time.

Manipulation in selling, general and administrative costs (as considered costs in costs stickiness concept) can make not only changes in profit but also changes in sales revenue. Cost stickiness concept is violated the assumption of costs traditional. In the traditional model of cost behavior, costs have change according to the change in sale's volume. In cost stickiness model, the rate of costs decrease for 1% decrease in sales revenue less than the rate of cost increase for 1% increase in sales revenue (Anderson et al. 2003). So managers with manipulation in selling, general and administrative costs (as discretionary accruals item) to earnings management effected on cost stickiness.

In this paper with assuming companies manage their earning, review the effect of Real Earnings Management on cost stickiness. The main question of this study based on papers assumption is:

“How much real earning management changes the intensity of cost stickiness?”

In the main hypothesis, investigate on the relationship between cost stickiness and Real Earning Management. After prove hypothesis (H_1 or H_2), examine the effect of constituent items of REM on cost stickiness (Ab-CFO, Ab-Prod & Ab_Dexp).

Earning management usually occur when managers wants increase profit so they are attempting to decreaseselling, general and administrative costs. This reduction in costs leads to company change in the intensity of cost stickiness. Previous research shows that income smoothing behavior (as a form of earnings manipulation), significantly mitigates the degree of cost stickiness (Hartlieb & Loy 2016).

All above discussion leads paper to the following competing alternative hypotheses against the null hypothesis of no relation between REM and the cost stickiness. The main hypothesis of the research is defining as follows:

H₁: There is a positive relation between the cost stickiness and the level of REM.

The main hypotheses included the following composition:

H₁₁: There is a positive relation between the cost stickiness and the sales manipulation,

H₁₂: There is a positive relation between the cost stickiness and the overproduction, and

H₁₃: There is a positive relation between the cost stickiness and the cutting discretionary expenses.

In contrast, the null hypothesis (H_0) is defining as follows:

H₀: There is a no relation between the cost stickiness and the level of REM.

For more review, the paper chooses four alternative hypotheses:

H_a: There is a signification effect of EM (based on Jones model) on the relation between the cost stickiness and the REM.

H_b: There is a signification effect of ROA on the relation between the cost stickiness and the REM.

H_c: There is a signification effect of ROE on the relation between the cost stickiness and the REM.

H_d: There is a signification effect of Leverage on the relation between the cost stickiness and the REM.

4. Data & methods

4.1. Cost stickiness

Consistent with the prior research about cost stickiness, this paper specify the following empirical model to estimate the sticky behavior of SG&A costs (Anderson et al. 2003).

$$\begin{aligned} \text{Log}[SGA_{i,t}/SGA_{i,t-1}] \\ = \beta_0 + \beta_1 \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] + \beta_2 \text{Decrease\_Dummy} \\ \times \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Where *SGA* and *revenue* respectively are total selling, general and administrative costs and sales revenue of firm *i* in period *t* and *Decrease_Dummy* is a dummy variable.

The log specifications accommodate economic interpretation of the estimated coefficients. Because the value of *Decrease_Dummy* is 0 when revenue increases, the coefficient β_1 measures the percentage increase in SG&A costs with a 1% increase in sales revenue. Because value of *Decrease_Dummy* is 1

when revenue decreases, the sum of the coefficients, $\beta_1 + \beta_2$ measures the percentage increase in SG&A costs with 1% decrease in sales revenue. If SG&A costs are sticky, the variation of SG&A costs with revenue increases should be greater than the variation for revenue decreases (Anderson et al. 2003).

4.2. REM proxies

(Roychowdhury 2006) develops empirical models to estimate the normal levels of real business activities, as reflected in cash flow from operations, production costs, and discretionary expenditures. The author uses the residuals from these models as proxies for REM. Consistent with several recent studies (Cohen et al. 2008; Cohen & Zarowin 2010; Hong & Andersen 2011), this paper uses these models to construct REM measures. Model (2) used to estimate the normal level of cash flow from operations:

$$CFO_{i,t}/Assets_{i,t-1} = \beta_0 1/Assets_{i,t-1} + \beta_1 Sales_{i,t}/Assets_{i,t-1} + \beta_2 \Delta Sales_{i,t}/Assets_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

Where t is a year indicator, CFO is cash flow from operations, $Assets$ is total assets, $Sales$ is net sales, and $\Delta sales$ is the change in sales compared with the sales amount in the previous year.

Model (3) used to estimate the normal level of production costs:

$$\begin{aligned} Prod_{i,t}/Assets_{i,t-1} &= \beta_0 1/Assets_{i,t-1} + \beta_1 Sales_{i,t}/Assets_{i,t-1} + \beta_2 \Delta Sales_{i,t}/Assets_{i,t-1} \\ &+ \beta_3 \Delta Sales_{i,t-1}/Assets_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

In this model $Prod$ is sum of the COGS and change in inventory.

The normal level of discretionary expenses estimate using model (4):

$$DisExp_{i,t}/Assets_{i,t-1} = \beta_0 1/Assets_{i,t-1} + \beta_1 Sales_{i,t-1}/Assets_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

In model (4) $disexp$ is the discretionary expenses measure by the sum of advertising, R&D, and selling, general, and administrative expenses.

After estimate REM models, multiply the residuals from models (1) and (3) by -1, such that higher values indicate a higher probability of making real decisions to increase earnings (Cohen & Zarowin 2010; Zang 2012). In model (2) do not multiply residuals by -1 since higher production costs are indicative of overproduction to reduce the COGS. To capture the effects of earnings management through all these three activities in a comprehensive measure, construct an overall REM proxy (realem) by summing Ab_CFO , Ab_Prod , and Ab_Dexp (Ge & Kim 2014).

4.3. Control variables

Paper considers a modified version of Jones model in the empirical analysis. In this model nondiscretionary accruals are estimated during the event period as:

$$NDA_{i,t} = \beta_0 + \beta_1 1/Assets_{t-1} + \beta_2 (\Delta REV - \Delta REC) + \beta_3 PPE_t \quad (5)$$

Were ΔREV and ΔREC respectively are revenues in year t less revenues in year $t-1$ and net receivables in year t less net receivables in year $t-1$, PPE is gross property plant and equipment in year t . It should be noted all three variables must scaled by total assets at $t-1$.

Consistent with previous studies of earning management(Healy 1985; Dechow et al. 1995), total accruals (TA), are computed as:

$$TA_t = (\Delta CA_t - \Delta CL_t - \Delta Cash_t - \Delta STD_t - \Delta Dep_t) / A_{t-1} \quad (6)$$

Were ΔCA and ΔCL respectively are change in current assets and current liabilities. $\Delta Cash$ is change in cash and cash equivalents. ΔSTD is change in debt includes current liabilities. Dep is depreciation and amortization expense and finally A is total assets(Dechow et al. 1995).

After calculating nondiscretionary accruals and total accruals, then discretionary accruals are estimated by subtracting the predicted level of nondiscretionary accruals (NDAP) from total accruals (standardized by legged total assets):

$$DAP_{i,t} = TA_t - NDA_t \quad (7)$$

Leverage ratio indicates how much of the assets are provide by creating debt. This ratio is calculated as follows(Aivazian et al. 2005):

$$Leverage = LongTermDebt / TotalAssets_{t-1} \quad (8)$$

The return on assets ratio (ROA),measures as gross income produced (after tax) by total assets during a period by comparing gross income to the average total assets(Kumar & Ravi 2007; Saeed 2014).

$$ROA = NetIncome / TotalAssets \quad (9)$$

The return on equity ratio (ROE) measures the ability of a firm to generate profits from its shareholders investments in the company(Saeed 2014).

$$ROE = NetIncome / ShareholderEquity \quad (10)$$

4.4. Model for estimating the Relationship between Costs Stickiness and real Earnings

Using cost stickiness model, estimate the following models to examine the relationship between cost stickiness and real earning management:

$$\begin{aligned} \text{Log}[SGA_{i,t}/SGA_{i,t-1}] = & \beta_0 \\ & + \beta_1 \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] \\ & + \beta_2 \text{DecreaseDummy} * \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] \\ & + \beta_3 \text{DecreaseDummy} * \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] * REM \\ & + \beta_4 \text{DecreaseDummy} * \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] * REM * EM \\ & + \beta_5 \text{DecreaseDummy} * \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] * REM * ROA \end{aligned} \quad (11)$$

$$\begin{aligned}
 & +\beta_6 DecreaseDummy * \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] * REM * ROE \\
 & +\beta_7 DecreaseDummy * \text{Log}[Revenue_{i,t}/Revenue_{i,t-1}] * REM * Lev \\
 & +\varepsilon_{i,t}
 \end{aligned}$$

All variables are defined in the appendix A.

In model (11), the dependent variable is the SGA. The test variables are four REM proxies (*Ab_CFO*, *Ab_Prod*, *Ab_Dexp*, and *realem*). Hypothesis (H₁) implies that the coefficients of REM variables are negative. With a negative coefficient of REM variable, the intensity of cost stickiness will increase and decrease the coefficient of β_2 ($\beta_1 + \beta_2 < \beta_1$). It should be noted if REM coefficients are positive, with a positive coefficient of REM variable, the intensity of cost stickiness will decrease and increase the coefficient of β_2 ($\beta_1 + \beta_2 > \beta_1$).

The null hypothesis implies no relationship between REM and the cost stickiness. In the following attempting to reject the null hypothesis and show with earning management, the intensity of cost stickiness will change.

The papers proxy for accrual-based earnings management (EM) is the abnormal accruals from the modified Jones model, as described by (Cohen et al. 2008).

In Stock Exchange Market, managers avoid reporting earnings decreases and losses (Burgstahler & Dichev 1997), so with Earning Management show more profit.

As a result, manager interested in boosting current-period earning, so they could choose to cut investment in R&D, particularly if the realization of the benefit associated with the forfeited R&D project impacts the firm in a future period rather than the current period. But it should be noted, when sales fall managers cut operating costs less aggressively if the firms operate in more competitive product markets (Li & Zheng 2016).

SG&A is included in the analysis because portions of this expense are similarly subject to managerial discretion (Gunny 2010). So we expect the relationship between cost stickiness and Real Earning Management is a positive relationship, because according to the description, with increasing the Real Earnings Management lead firm to increase the intensity of cost stickiness.

Among the control variables, the nature of earnings management is similar to Real Earning management. We expect earnings management have a positive effect on the relationship between cost stickiness and Real Earning Management and increase the intensity of the cost stickiness.

A higher leverage ratio implies a higher default risk. If the risk is increased due to the company's performance, the potential investors tend to invest on companies, will be reducing. The reduction of investment can cause of many problems for companies. So managers to absorb the investor, attempted to do earning management and show a better position of company. So we predict the coefficient of Lev is negative and have a positive effect on the relationship between cost stickiness and Real Earning Management and increase the intensity of their relationship.

A high rate of ROE indicates the willingness of companies to invest in internal and external resources. Therefore, managers for raise funds and attract investors towards company, for use the finance in their intended investment, attempted to Real Earning Management. So we expect ROE have a positive effect on the relationship between cost stickiness and Real Earning Management and increase the intensity of their relationship.

The rate of ROA showed the willingness of company to invest in assets. With purchases asset, in addition to spending a large amount of company's funds, it increased the company expenditure, such as depreciation, amortization and maintenance costs. With increase in expenses, we predict that the coefficient of ROA is positive and have a negative effect on the relationship between cost stickiness and Real Earning Management.

5. Sample selection and descriptive statistics

Database of paper obtained from Tehran Stock Exchange (2003-2013). to achieving a better result, after obtaining the desired data from audited financial statements, established three conditions:

- 1) The chosen companies must active in the Tehran Stock Exchange from the beginning to the end of the period of study. These conditions made data available in during the period of the study.
- 2) Companies must have no change in their activities in the period of research or not faced with the change of financial year. Because of these two item, prevent the unreasonable changes in the amount of revenue, and since income is one of the main variables, it can have a significant effect on results.
- 3) Companies must not show negative sale in financial statement. The existence of negative sales, will impact on cost stickiness model so this kind of companies removed from the population.

Table 1 presents the descriptive statistics of variables. The mean values of the REM variables are not large, it changes from 0.000 to -0.045. The max and min value of REM respectively is 1.774 and -3.439, this is show REM data is very close each other. The mean percentage of SG&A is 67% and it is show SG&A costs cover more than half of sales revenue and it should be noted regardless of cost of goods as an impressive amount. The reason of increase in SGA costs compared with sales revenue, due to the special conditions in Tehran stock exchange in recent years. Also these conditions reduce TEDIX², TEPIX³ and TEDPIX⁴ ratio.

The average Return on Assets (ROA) is 0.132 suggesting that for every rial company invested in assets during in the year, produced 13.2% of net income. The average of Return on Equity (ROE) is 0.354, and it is show for each Rial company invested in shareholder's equity, earned 35.4%. In this situation ruling in Tehran Stock Exchange, investments on stock exchange earned a higher return than investment in assets. This increasing returns on investment in the capital market caused by inflation conditions ruling in Iranian market⁵. Also using ROE variable which is located in range of 6.663 and -5.569, show the paper used both profitable and unprofitable companies in Tehran Stock Exchange. The mean value of leverage (Lev) is 0.083 and it is represents the amount of long-term debt to finance assets in company. This value indicates that in Tehran Stock Exchange, company further earned their capital through direct investments or attracts foreign investment, such as selling stocks, bonds or other Islamic bonds⁶. The reason for this companies choice probably because of inflation ratio, devaluations and decrease in purchasing power in long term.

Table 1

Sample selection and descriptive statistics

Panel A-Sample selection

Sample	Observations	Observations
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²Tehran divided Index

³Tehran Price Index

⁴Tehran Exchange Price Index

⁵In this paper the purpose of inflation is the conditions ruled in capital market of Iran from 2005 to 2012. According to inflation conditions in the period of study, Because of unreasonable increases in the prices of assets, increased the willingness of companies to invest in the capital market, as a result of investment in the assets leads to depression compared with investments in the capital market.

⁶Like Sukuk or Conventional Bonds

	Deleted	Remaining
Initial sample: firm-year observations with valid data on Tehran Stock Exchange, 2003–2013	-	5995
Exclude financial firms	1375	4620
Exclude observations where SG&A expenses are greater than sales revenue and observations for firms that have no positive sales revenues and SG&A costs	2068	2552

Descriptive Statistics

Variable	N	Mean	SD	Median	Min	Max
Panel A: REM variables						
CFO	2552	-0.045	0.167	0.023	-1.705	0.11
Prod	2552	0.000	0.251	-0.005	-2.646	2.02
Dexp	2552	-0.008	0.034	0.002	-0.987	0.01
Δ	2552	-0.053	0.293	-0.029	-3.439	1.77
Panel B: Costs Stickiness variables						
SG&A as a percentage of sales revenue	2552	0.064	0.289	0.064	-2.607	3.00
SG&A, general and administrative (SG&A) costs	2552	0.063	0.193	0.060	-1.496	1.74
SG&A costs as a percentage of sales revenue	2552	0.067	0.300	0.061	0.000	148.0
Panel C: Firm-specific variables						
Return on Assets Ratio (ROA)	2552	-0.000	-0.009	0.222	-1.859	2.73
Return on Equity Ratio (ROE)	2552	0.083	0.053	0.095	0.000	1.04
Return on Assets Ratio (ROA)	2552	0.132	0.108	0.155	-0.629	2.06
Return on Equity Ratio (ROE)	2552	0.354	0.302	0.661	-5.569	6.66
Appendix A for variable definitions.						

In table 2 provide the Pearson Correlations of variables. Among the REM's variables, Ab-Prod is negatively correlated with Ab-Dexp and Ab-CFO. Ab-Dexp is positively correlated with Ab-CFO, Ab-Dexp and Ab-CFO are negative correlated with log(SGA) in other side Ab-Prod have a positive relation with log(SGA). EM variable, have a negative correlations with log (SGA), and other control variables Including ROA, ROE and LEV show a similar behavior and have positive correlation with log(SGA).

Table 2
Pearson correlations of variables

	Log SGA	Log Sales	Ab- CFO	Ab- Prod	Ab- Dexp	REM	EM	ROA	ROE	Lev
Log SGA	1									
Log Sales	0.278	1								
Ab-CFO	-0.063	-0.088	1							
Ab-Prod	0.135	0.270	-0.086	1						
Ab-Dexp	-0.151	-0.032	0.099	-0.003	1					
REM	0.062	0.177	0.510	0.804	0.171	1				
EM	-0.028	0.048	-0.092	0.039	-0.021	-0.021	1			
ROA	0.121	0.164	-0.205	0.103	-0.039	-0.033	0.037	1		
ROE	0.046	0.079	-0.141	0.023	-0.020	-0.062	-0.021	0.435	1	
Lev	0.023	0.018	0.008	0.020	-0.023	0.019	-0.015	-0.019	-0.029	1

^Acorrelation that are significant at the 5% level or less are in bold-faced.

^Bsee Appendix A for variable definitions

6. Results

This paper estimate model (11) using the ordinary least squares procedure. For all regressions, correct the standard errors for heteroskedasticity and firm-level clustering and report the corresponding *p*-values.

Table 3 reports the results of model (11). In column (1) we present the results of the existence of cost stickiness in the Tehran Stock Exchange. Columns (2) to (4) present the results when an individual REM proxy, Ab_CFO, Ab_Prod, or Ab_Dexp, respectively, is in the model; column (5) is result when the comprehensive measure real EM, serves as the REM proxy. Based on results, the paper finds significant positive associations between cost stickiness and real em (increased the intensity of relationship).

Table 3
The effect of Costs Stickiness on REM.

variable		(1)	(2)	(3)	(4)	(5)
Log(Sales)	B1	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
		0.19	0.19	0.19	0.20	0.19
decrease-dummy*Log(Sales)	B2	(0.19)	(0.26)	(0.04)	(0.07)	(0.01)
		-0.04	-0.03	-0.07	-0.05	-0.08
b-CFO			(0.00)			
			-0.70			
b-Prod				(0.03)		
				-0.19		
b-Dexp	B3				(0.00)	
					-2.54	
EM						(0.00)
						-0.23
M	B4		(0.00)	(0.02)	(0.00)	(0.00)
			-0.21	-0.19	-1.96	-0.18
OA	B5		(0.00)	(0.00)	(0.01)	(0.00)
			2.89	1.04	7.70	1.01
OE	B6		(0.39)	(0.78)	(0.60)	(0.91)
			-0.17	0.02	0.81	-0.00
EV	B7		(0.16)	(0.81)	(0.87)	(0.64)
			3.88	-0.35	-2.06	-0.51
bservations			2552	2552	2552	2552
djusted R^2			0.03	0.04	0.03	0.03
values are in parentheses; the results are firm-level cluster adjusted;						
Appendix A for variable definitions						

This paper presents the results of estimating model (11) for the pooled sample in table 3. Our estimate based on hausman test results was performed as fix or random effects testing. For checking cost stickiness in our model, we must attend to coefficients of β_1 and β_2 . The value of decdummy is 0 when revenue increases. The coefficient β_1 measures the percentage increase in SG&A costs with a 1% increase in sales revenue. Because the value of decdummy is 1 when revenue decreases, the sum of the coefficients, $\beta_1 + \beta_2$ measures the percentage increase in SG&A costs with a 1% decrease in sales revenue. If SG&A costs are sticky, the variation of SG&A costs with revenue increases should be greater than the variation for revenue decreases. Thus, the empirical hypothesis for stickiness, conditional on $\beta_1 > 0$ and $\beta_2 < 0$. (Anderson et al. 2003)

In table 3 the coefficient of β_1 is a positive value and its show that our first condition for proving cost stickiness is established. In Column (1) The estimate value of β_1 is 19% (t-statistic=9.79) shows that the SG&A cost increased 19% per 1% increase in sales revenues. The estimate value of $\beta_2=-4\%$ (t-statistic=-1.29) provides strong support for the sticky cost. With sum value of $\beta_1 + \beta_2=15\%$ shows that SG&A costs decreased only 0.15% per decrease in sales revenue. So we see according to the results, the sales, general & administrative costs in the Tehran Stock Exchange have sticky nature and show a similar behavior like cist stickiness.

By considering cost stickiness behaves in Tehran Stock Exchange, we study the relationship between cost stickiness and real earning management.

The coefficient of Abs-CFO, Abs-Prod and Abs- Deep are statistically significant and negative. These results suggest that, in general, managers with manipulation in cash flow from operations, Discretionary spending and overproduction increase the intensity of cost stickiness ($\beta_1 + \beta_2 + \beta_3 < \beta_1$).

In column(2) we can see the relationship between cost stickiness and Ab-CFO. In this model, the SG&A cost increased 19% per 1% increase in sales revenues ($\beta_1=0.19$) and 16% decrease in SG&A cost with a 1% decrease in sales revenue ($19\%-3\% < 16\%$).By entering the coefficient of Ab-CFO (β_3) to our model, the intensity of cost stickiness increased from 16% decrease in SG&A cost to 92% decrease in SG&A cost ($19\%-3\%-70\%=92\%$).

The other variables of REM, Ab-Prodin column (3) show the same behavior. In this model the SG&A cost increased 19% per 1% increase in sales revenues (like β_1 in Ab-CFO model in column 2) and 12% decrease SG&A cost with a 1% decrease in sales revenue ($19\%-7\% < 12\%$).In Ab-Prod model compare to Ab-CFO model β_2 Increased 4%. After entering the coefficient of Ab-Prod (β_3) to our model, the intensity of cost stickiness increased from 12% decrease in SG&A cost to 7% increase in SG&A cost ($19\%-7\%-19\%=-7\%$). This means that 7% increasing SG&A costs with a 1% decrease in sales revenue.

The last variable of REM variables is Ab- Dexp shows in column (4). This variable shows a similar behavior, like two other variables of REM. The considerable thing about this variable is the greatly intensity change in cost stickiness relationship With Ab-Dexp as a proxy of REM in this model.

In column (5) Ab-CFO, Ab-Prod and Ab-Dexp variables considered as an index of REM variable and then we test the relationship between cost stickiness and REM. In this model the coefficient of β_1 is 19% and it means with a 1% increase in sales revenue with increase 19% in SG&A costs. The coefficient of β_2 is 8% and show that with 11% decrease in SG&A costs with a 1% decrease in sales revenue ($19\%-8\%=11\%$).After entering the coefficient of remvariable, which is the coefficient of β_3 , this variable behavior like the Ab-Dexp in model 4. In this model 12% increase in SG&A costs with a 1% decrease in sales revenue ($19\%-8\%-23\%=-12\%$).

To study control variables effect on the relationship between real earning management and cost stickiness, we focus on EM, ROA, ROE and Lev variables. As we can see the coefficients of EM is negative and statistically significant. Negative coefficient of the control variables EM shows us that with entrance this control variable to our model increases the intensity cost stickiness. ROE and lev control variable showed the same behavior, like EM control variable. As shown, ROA control variable showed opposite behavior with three other control variables (EM, ROE & LEV).

A summary of intensity of control variables on the relationship between cost stickiness and real management showed in table 4.

Table 4
Change in intensity on relationship between Costs Stickiness and REM.

	Ab_CFO,	Ab_Prod	Ab_Dexp	REM
EM	Increase	Increase	Increase	Increase
ROA	Decrease	Decrease	Decrease	Decrease
ROE	Increase	Decrease	Decrease	Increase
LEV	Decrease	Increase	Increase	Increase

Given that previous research with subject cost stickiness or real earning management pays little attention to the economic consequences the effect of REM on cost stickiness, this study investigates the impact of REM on cost stickiness. Using a sample of Companies listed on the Tehran Stock Exchange during 2001–2012. Our study contributes to the REM literature. Current research on the consequences of REM focuses on subsequent firm performance, stock market returns, or the cost of equity capital (Cohen & Zarowin 2010).

To our knowledge, we are one of few, if not the first, to examine the economic consequences of REM on cost stickiness. In this paper, we show that the real earning management affected on the results of cost stickiness.

All three of variables that we were considered as REM proxy, is statistically significant but negative.

Operating cash flow is one of the most important factors in the financial statements, because this number represents the power of financial liquidity of the company. And finally represents the entity's activity summary, which leads to an incoming or outgoing cash. Usually, managers of companies accepted in Tehran Stock Exchange willing to show operating cash flow more than real value. Manager does it through register contracts earlier than occurrence, registered fake and fictitious financial events and registered false financial events. Management operating cash flow can be accomplished through management of sales revenue (increase) and managing costs (decrease). In both cases, the operating cash flow management effect on two factors of costs stickiness (sales revenue and sales, general and administrative costs). Therefore, with operating cash flow management on the one hand, for every 1% increase in sales revenue, increased with further intensity while the cost is increased by the same previous rate. And on the other hand, with 1% decreased in cost, decrease with further intensity while the sales revenue increased by the same previous rate.

Another method of earnings management that we use as a variable in our model is inventory management. Production cost management can be done through different methods. Like late registration financial events, misrepresentation of assets and changes in accounting methods to increase profits. Managers to increase the profitability attempting to manipulate the COGS or they willing to overproduction to show a better position in assets. With overproduction, decreases each unit of COGS, and through this policy increases profit from sales revenue (sales revenue-COGS=Gross profit). Warehouse and maintenance of additional products cause to increased costs for maintenance and other costs associated with. So manager's with production cost management increase the intensity of cost stickiness, because for every 1% increase in sales revenue, increased with further intensity.

Regarding the nature of discretionary expenses comparatively to other items, they have more ability to manipulate. According to what demanded managers wants (in this case increase profitability) Through

changes in accounting estimates, can manage in discretionary expenses and show the profitability of the company better than thereally. Thus, by reducing discretionary expenses and increase profitability, with 1% decrease in sales revenue, cost decreased with further intensity while the revenue is decreased by the same previous rate.

According to the results, managers with manipulate in operating cash flow, production and discretionary expenses increase the β_1 value and increase the β_1 value and for prove to cost stickiness this rules should be established:

$B_1 > 0$ and

$B_1 + \beta_2 < \beta_1$

The sum of three variables Ab-CFO, Ab-Prod and Ab-Dexp, is considered as an evaluation index of REM variable. As previously showed, all three variables showed similar results the results of three variables constituent REM, showed similar results, so we can see that the variable REM is also shown the same behavior.

So, According to the description and obtained results of research model, H_0 is rejected and H_1 proved. Approved hypotheses of our article, as follows:

H₁: There is a positive relation between the cost stickiness and rem.

Other results of our study were as follows (relation between the cost stickiness and the level of REM):

H_{1a}: There is a positive relation between the cost stickiness and abnormal cash flow from operations.

H_{1b}: There is a positive relation between the cost stickiness and abnormal production cost.

H_{1c}: There is a positive relation between the cost stickiness and abnormal discretionary expenses.

The results show that among the control variables, EM variable show a similar effect on the model (like the effect of the level of REM on cost stickiness). It is for this reason that the nature of earnings management based on Jones model (EM) like real the real earnings management (REM). Thus the EM control variable increases the intensity of cost stickiness. So "H_a" proved and that as follows:

H_a: There is a signification effect of EM (based on Jones model) on the relation between the cost stickiness and the REM.

Among the profitable control variables was selected, only ROA is significant. The results of this variable are interesting because this variable, unlike the previous results show a decrease intensity of cost stickiness. Thus "H_b" is confirmed as follows:

H_b: There is a signification effect of ROA on the relation between the cost stickiness and the REM.

But as we can see in the results (table 3), we don't find any signification evidence for prove the two of our hypothesis (H_c & H_d). So this hypothesis will be rejected.

H_c: There is no signification effect of ROE on the relation between the cost stickiness and the REM.

H_d: There is no signification effect of Leverage on the relation between the cost stickiness and the REM.

7. Discussion and conclusion

Previous cost behavior literature studies publicly traded firms and document that costs are sticky (Anderson et al. 2003; Anderson et al. 2005; Calleja et al. 2006).

Given that previous research pays little attention to the economic consequences of REM on cost stickiness, this study investigates the impact of REM on cost stickiness. Using sample of firms during 2003-2013. We find that sales manipulation, overproduction, and the abnormal reduction of discretionary expenditures increase the intensity of cost stickiness. Also we have seen a similar behavior of main

variables of REM on cost stickiness. Overall, our findings suggest that REM will increase significantly the cost stickiness.

Also we show among the control variables, EM had a signification impact on the relationship between REM and cost stickiness and increases the intensity of relationship between the main variables. The other control variable, ROE, show a different behavior.

Our study contributes to the cost stickiness literature. Current research of cost stickiness focuses on costs stickiness in different countries or prediction models using cost stickiness (Homburg & Nasev 2009; Balakrishnan & Gruca 2008b; De Medeiros & Costa 2004; Banker & Chen 2006). To our knowledge, we are one of few, if not the first, to examine the relationship between REM and cost sickness. Our results indicate that with Real Earning Management, has changed cost behavior in response.

Our findings will be of interest to shareholders and board members as well. Our results suggest that REM can be costly to firms and thus to shareholders. Therefore, our evidence alerts shareholders and board members to be concerned about REM.

We leave the study of how REM is related to the cost of private debt for future research.

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Appendix A

Variable definitions.

Cost Stickiness Variables	
SG&A	Selling, general and administrative costs
Revenue	Sales revenue
Decdummy	A Dummy variable and decdummy is 0 when sales increases and is 1 when sales decreases.
REM Variables	
Ab_CFO	Abnormal cash flow from operations, measured as the product of Negative one and the residuals from model (1).
Ab_Prod	Abnormal production cost, measured as the residuals from model (2).
Ab_Dexp	Abnormal discretionary expenses, measured as the product of negative One and residuals from model (3).
REM	Sum of Ab_CFO, Ab_prod and ab_Dexp.

Control Variables	
EM	Abnormal accruals from modified Jones model, as described by(Cohen et al. 2008).
ROA	Return on assets ratio measured as product of the profit margin divided by total asset turnover.
ROE	Return on equityratio measured as net income divided by shareholder's equity.
Lev	Leverage ratio measured as long term debt divided by total assets.

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