THE EFFECT OF CASH HOLDINGS ON INCOME SMOOTHING

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Abstract
This paper uses panel data for companies listed in Tehran Stock Exchange (TSE) over the period from 2005 to 2010 to analyze the relationship between cash holdings and income smoothing. The results indicate that there is a significant positive relationship between cash holdings and income smoothing, but there was no significant relationship between positive changes in cash holdings and income smoothing.

Keywords: Cash holdings, Positive changes in cash holding, Income smoothing.

JEL: G30, M41.

1. Introduction
Cash holding policies have always been one of the most important financial policies in the process of managing companies. Therefore, different theoretical frameworks have been used in financial literature in order to explain cash holding policies. The agency pattern is one of the patterns which discuss the concept of cash holding policy from the agency theory perspective (Kuan et al., 2011). According to agency theory, the separation of ownership and control, different aims and information asymmetry between owners and managers probably cause managers to work in order to increase their personal interests (Dey, 2008). Since cash holding policies is controlled by managers, the cash held in companies, increases as the managers’ motivation for pursuing personal interests improves (Chen, 2008). Based on this viewpoint, Jensen (1986) States that the increase in cash holdings through reducing the need to gain new capitals by companies leads to the inability of the capital market to monitor the decisions made by managers. Moreover, higher free cash flow causes the resources under the managers’ control to increase which will lead to improvement of the managers’ motivation for using the sources to make investment in non-optimized projects.

Moreover, company’s management should act carefully, because manager’s behavior might not be only appropriate for management policies but also it may be contradicted with benefit procedures. In this case, one of the procedures which is highly welcome by companies is the phenomenon of applied income management through various techniques of earnings smoothing and the effects of its results on management benefits so that it reduces income relative fluctuations and also has a positive effect on users’ benefits such as stock price. Income smoothing phenomenon due to income smoothing objectives and its basis is fulfilled by different ways of natural and artificial smoothing. Natural smoothing means reducing
accounting income volatilities than economic profit which is affected by management activities to organize the economic events. And also artificial smoothing means reducing accounting income volatilities in different periods so that it has an even pace, and it is fulfilled through discretionary principles and methods of accounting.

In this research the relationship between cash holding and income smoothing of companies is investigated in order to help the users of financial information to have an accurate insight towards making sophisticated decisions. Furthermore, there are several important features of our analysis which, we believe, extend the literature on the empirical determinants of income smoothing activities. First, we use the cash holdings of companies into the analysis of income smoothing activities. Second, distinct from previous empirical studies, this study is to contribute to the debate by empirically examining the income smoothing activities from developing countries perspective.

2. Literature Review
2.1. Cash Holding
According to Opler et al. (1999), there are three theories on why companies hold high levels of cash. Trade-off theory, pecking order or financing hierarchy theory, and free cash flow theory are three theories which are considered as follow:

*Trade-off theory:* The trade-off theory of cash holdings states that the optimal liquidity level is a trade-off between the costs and the benefits of holding cash. The most obvious benefits of cash are that cash reduces the exposure to financial distress; cash does not disrupt investment policy when financial constraints are met, and cash lowers the costs of raising external funds or liquidating assets. The major cost incurred by holding cash on the other hand is the opportunity cost of the capital invested in liquid assets (Ferreira and Vilela, 2004).

*Financing hierarchy or Pecking Order Theory:* Myers and Majluf’s (1984) pecking order theory assumes that a firm’s capital structure is a direct consequence of its profitability, investment needs and payout policy, which depend on how expensive it is to access capital markets. According to the pecking order theory, cash becomes available to a firm when its profits exceed its investment needs. When cash is available abundantly and the firm is confident about the profitability of its investments, then excess cash is paid out in the form of dividends. In addition, Myers and Majluf (1984) consider that there is no optimal level of cash but cash has rather the role of a buffer between retained earnings and investment needs. The pecking order theory describes a financing hierarchy that minimizes the costs associated with external financing resulting from information asymmetries and signaling problems. In this hierarchy, internal financing has the highest priority, followed by low risk debt, leaving equity as a last resort (Myers and Majluf, 1984).

*Free cash flow theory:* Jensen (1986) suggests that managers have an incentive to cash reserve to increase the amount of assets under their control and to gain discretionary power over the firm investment decision. Having cash available to invest, the manager does not need to raise external funds and to provide capital markets detailed information about the firm’s investment projects. Hence, managers could under take investments that have a negative impact on shareholders wealth (Ferreira and Vilela, 2004).

2.2. Income smoothing
Chong (2006) suggests three main reasons about why managers smooth their earnings: first, to reach the benchmark level that has been established in the stock market, usually by analysts’ forecasts. Second, to meet their own performance target, and third to avoid violations of debt contracts. However, different definitions have provided for income smoothing, so that each researcher has offered a different definition according to the method

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used for income smoothing. Barnea et al. (1974) stated that income smoothing means lowering income fluctuation deliberately according to accounting principles so that it looks usual for companies. Beidleman (1973) states that income smoothing is an attempt exerted by management to reduce unusual changes in income, and it is defined by accounting principles. Both definitions emphasize income manipulation according to the past years, so that unusual return to be reduced and reported income to be the same with expected income.

On the other hand, various categories of income smoothing have been done. Albrecht and Richardson (1990) and Michelson et al. (1995) have divided income smoothing into two kinds of natural and artificial smoothing. Eckel (1981) also divides income smoothing into two kinds of natural and deliberate smoothing. Natural smoothing comes from a production process which creates smooth income, while deliberate smoothing is the result of artificial smoothing methods. In this study, the relationship between cash holdings and deliberate (or artificial) income smoothing is examined.

2. Previous Researches

García-Teruel et al. (2009) showed that firms with good accruals quality hold lower cash levels than firms with poor accruals quality. This finding suggests that the quality of accounting information may reduce the negative effects of information asymmetries and adverse selection costs, allowing firms to reduce their level of corporate cash holdings.

Sun et al. (2011) showed that poor earnings quality has a negative impact on the value of corporate cash holdings and a positive impact on the level of cash reserves. They found that the negative effect of poor earnings quality either neutralizes or more than offsets the positive effect of excess cash on firm value.

Al-Qaisi (2011) showed that income smoothing increases the abnormal returns and market values of the companies.

In Iran, Moradi (2008) showed that there is a negative significant relationship between financial leverage and income smoothing. Also, in companies that have a higher free cash flow, there is more negative significant relationship between financial leverage and income smoothing.

Fakhari and Taghavi (2010) examined the effect of the quality of financial reporting according to the quality of discretionary accruals on the amount of cash in Iranian companies. The evidence of analysis based on the combined cross-sectional data and time series data indicates that the quality of financial reporting has a negative and significant relationship with the cash and cash equivalents. The results also indicate that the growth opportunities variables, cash flow and cash assets have a positive effect on cash holding, and the variables of size, debt maturity and the opportunity cost have a negative relationship with cash holding.

Khajavi et al. (2011) examined the performance of traditional and new indicators of liquidity to forecasting companies’ income smoothing. The results of their research indicated that there is significant relationship between traditional liquidity indexes and size of companies with income smoothing, and that the most important effective item is the level of inventory in the examined companies.

3. Research Hypothesis

To consider the relationship between cash holding and income smoothing in companies listed in Tehran Stock Exchange, two hypotheses were developed and tested.

H1: There is a significant relationship between cash holdings and income smoothing.

H2: There is a significant relationship between positive changes in cash holding and income smoothing.
4. Research Method
This research is an applied one. It is based on the quasi-experimental research design and ex post facto approach (from past data). Ex post facto method is used when the researcher considers the subject after investigating the occurrence of events. Moreover, there is no possibility of manipulating the independent variables.

Population of this research consists of all companies listed in Stock Exchange in six year period from 2005 to 2010. In this research statistical sampling is not used. Companies studied are selected based on exclusion method and the following criteria:
1. They must have been listed in Tehran Stock Exchange by the end of March 2010.
2. In terms of comparability, their financial period must be closed by the end of March.
3. They must not have had any change and operation postponement in fiscal year during the years 2005 to 2010.
4. Financial statements and companies’ attached notes must exist completely in Stock Exchange site in mentioned period.
5. Financial statements and main company’s attached notes must exist separately from financial statements of integrated company’s attached notes in period studied.
6. Stock holders’ book value must not be negative during the period studied.
7. The selected companies must not be a part of investment companies.
8. The companies must be profitable.
9. The reviewed company must have had continuous activity and its shares must have traded during the period of study.

According to the listed criteria, 73 companies in the period 2005 to 2010 have been selected for this study. Moreover, in this study, regarding the data type, and methods of the present analysis, the "combined data" method has been used. In this study, in order to perform statistical tests, SPSS16 and Eviews5.1 have been used for data analysis.

5. Research models and variables
5.1. Research Models
To test the research hypotheses, the following regression models have been used. To test the first hypothesis of the research, and to examine the relationship between cash holding and income smoothing, model 1 has been estimated:

\[ IS_{it} = \alpha + \beta_1 (CH_{it}) + \beta_2 (LEV_{it}) + \beta_3 (SIZE_{it}) + \varepsilon_{it} \]  

(1)

The variables of the above model are defined as follows:
- \( IS_{it} \): income smoothing of company \( i \) in year \( t \),
- \( CH_{it} \): cash holding of company \( i \) in year \( t \),
- \( LEV_{it} \): financial leverage of company \( i \) in year \( t \),
- \( SIZE_{it} \): size of company \( i \) in year \( t \),
- \( \beta_1, \ldots, 3 \): coefficients of explanatory variables,
- \( \varepsilon_{it} \): is considered as error term.

To test the second hypothesis of the research, and to examine the relationship between positive changes of cash, and income smoothing, model 2 has been estimated:

\[ IS_{it} = \alpha + \beta_1 (\Delta TCH_{it}) + \beta_2 (\Delta PCH_{it}) + \beta_3 (LEV_{it}) + \beta_4 (SIZE_{it}) + \varepsilon_{it} \]  

(2)

The variables of the above model are defined as follows:
- \( \Delta TCH_{it} \): the total changes in cash holding of company \( i \) in year \( t \)
- \( \Delta PCH_{it} \): the positive changes of cash holding of company \( i \) in year \( t \)
ΔPCH\_it: Positive changes in cash holding of company \( i \) in year \( t \)
LEV\_it: financial leverage of company \( i \) in year \( t \)
SIZE\_it: size of company \( i \) in year \( t \)
\( \beta_{1, \ldots, 4} \): coefficients of explanatory variable
\( \varepsilon_{it} \): is considered as error term.

5.2. Dependent Variable
Dependent variable is the ratio of standard deviation of operating cash flows to the standard deviation of operational income. According to Das et al. (2008), standard deviation of operating cash flows and standard deviation of operational income have been calculated as rolling for a period of 5 years. In the other word, for every year, standard deviation has been calculated by using the information of the same year and four years before that.

5.3. Independent Variables
*Cash holding:* This variable defines as the sum of cash and cash equivalents including the ratio of short term investment to all assets after extract cash and cash equivalents.
*Total changes in cash holding:* it means current period cash holding extract from cash holding of the prior period.
*Positive changes in cash holding:* it means the increase ratio of current period cash holding to the prior period.

5.4. Control Variables
Control variables that have been used in this study include:
*Debt:* this is measured by the ratio of total debts to the book value of total assets.
*Company Size:* For calculation the company size variable, criteria such as the logarithm of total assets or sales are used. But due to inflationary conditions and irrelevant historical figures of assets, in this research, the natural logarithm of stock market value of company is used as a measure of company size.

6. Results of Hypotheses Testing
To test the research hypotheses, at first, validity or reliability of the independent, dependent and control variables of the study were evaluated. According to Unit root test such as Flips - Peron test, and Levin, Lin and Chu, for variables that P-Value amount is less than 0.05, they are in a valid level during the study. This means that mean and variance of the variables within the time and their covariance has been fixed among different years. Therefore, viewed companies haven’t had structural changes, and using these variables in the model doesn’t leads to artificial regression. The results of unit root test are presented in Table 1.

<table>
<thead>
<tr>
<th>Research variables</th>
<th>Flips -Peron test</th>
<th>Levin, Lin and Chu test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistics</td>
<td>P-Value</td>
</tr>
<tr>
<td>IS_it</td>
<td>214.804</td>
<td>0.000</td>
</tr>
<tr>
<td>CH_it</td>
<td>257.162</td>
<td>0.000</td>
</tr>
<tr>
<td>ΔTCH_it</td>
<td>463.596</td>
<td>0.000</td>
</tr>
<tr>
<td>ΔPCH_it</td>
<td>304.409</td>
<td>0.000</td>
</tr>
<tr>
<td>LEV_it</td>
<td>206.426</td>
<td>0.000</td>
</tr>
<tr>
<td>SIZE_it</td>
<td>238.326</td>
<td>0.000</td>
</tr>
</tbody>
</table>
In Table 2, the overall model has been investigated. Coefficient of determination ($R^2$) is a measure that explains the strength of relationship between independent and dependent variables. The value of this coefficient is actually representing that how many percent of the variability explained by the independent and control variables.

**Table 2: results from general investigation of models**

<table>
<thead>
<tr>
<th>General Statistics</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R^2$</td>
<td>0.5003</td>
<td>0.4779</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.3884</td>
<td>0.3680</td>
</tr>
<tr>
<td>$F$</td>
<td>4.4687</td>
<td>4.3482</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>Durbin - Watson</td>
<td>1.6360</td>
<td>1.6247</td>
</tr>
</tbody>
</table>

According to Table (2) the $R^2$ for the model 1 and model 2 is respectively 0.5003 and 0.4779. It means that $50.03\%$ of variability for the model 1 and $47.79\%$ for the model 2 is explained by independent and control variables. Moreover, the number of Durbin - Watson model is 1.6360. Also, the statistic of Durbin - Watson is used for investigating the affirmative error in the regression model. In other words, if the remaining of regression model shows a significant systematic pattern, the error will be affirmative. With simplicity, this coefficient is a reflection for this fact that some variables which belong to the real model have been interrupted, and they must be pulled out and reenters the model as an accurate explanatory variable.

To detect the affirmative error using Durbin - Watson statistic we should work as follows: if the related statistic is larger than the upper limit of Durbin- Watson, the constant correlation would not exist. The results from auto coefficient of error statement using Durbin - Watson statistic regarding lower bound (dL), and upper bound (dU) Durbin- Watson statistic for a case that the number of the sample is 79, the number of dependent and control variables is 3, and, confidence level is 99% are respectively 1.372 and 1.546 and the statistic obtained is located in the range of, $d_u < d_0 < 4 - d_u$ indicates a lack of auto correlation between errors of model.

Moreover, the statistic $F$ is used for a meaningful test of the overall multiple regression models. The rule of decision making is as follows: If the value of mathematical $F$ at a specific level is more than the value of critical $F$, then the overall significant regression in that level of significance would be accepted. With a brief take to the probability of statistic of $F$ in the second Table you will find that in all models of regression it is less than the critical value of 0.05, this indicates that all regression models are significant in all hypothesis of the research.

After examining the reliability of research variables, the confidence of lack of constant correlation and also the overall regression model were estimated to be significant, independent variables and control coefficients were calculated in table. T-statistics is used to significance test model coefficients. So that, if P-Value of the independent and control variables coefficient is smaller than 0.05, the coefficient would be significant in the model. As you see in Table 3, the significant level of t-statistics and independent variable coefficient indicate that there is a positive and significant relationship between cash holding and income smoothing. In other words, with increasing the current period cash holding, the motivation of income smoothing will increase. Thus, the first research hypothesis is accepted at 95% confidence level. However, the significance of t-statistics related to the control variables indicates that there is no significant relationship between debt ratio and income smoothing.
but company size has a significant and negative relationship with income smoothing. In other words, with the increase in company size, motivation in income smoothing is reduced.

Table 3: The results of testing H1

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>S.E</th>
<th>t-Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH_i</td>
<td>5.7803</td>
<td>2.0273</td>
<td>2.8513</td>
<td>0.0046</td>
</tr>
<tr>
<td>LEV_i</td>
<td>1.8436</td>
<td>0.9689</td>
<td>1.9037</td>
<td>0.0579</td>
</tr>
<tr>
<td>SIZE_i</td>
<td>-0.5990</td>
<td>0.2496</td>
<td>-2.3993</td>
<td>0.0169</td>
</tr>
<tr>
<td>Constant</td>
<td>7.8575</td>
<td>3.2302</td>
<td>2.4325</td>
<td>0.0155</td>
</tr>
</tbody>
</table>

As seen in Table 4, the significant level of t-statistics and independent variable coefficients indicate that there is no significant relationship between changes in cash holding and income smoothing. Thus, the second research hypothesis is not accepted. However, the significance of t-statistics related to the control variables indicates that there is no significant relationship between debt ratio and income smoothing, but company size has a significant and negative relationship with income smoothing. In other words, with the increase in company size, motivation in income smoothing is reduced.

Table 4: The results of testing H2

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>S.E</th>
<th>t-Statistic</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ΔTCH_it</td>
<td>1.8344</td>
<td>2.9410</td>
<td>0.6237</td>
<td>0.5332</td>
</tr>
<tr>
<td>ΔPCH_it</td>
<td>2.6570</td>
<td>6.0494</td>
<td>0.4392</td>
<td>0.6608</td>
</tr>
<tr>
<td>LEV_i</td>
<td>0.7998</td>
<td>0.9261</td>
<td>0.8636</td>
<td>0.3883</td>
</tr>
<tr>
<td>SIZE_it</td>
<td>-0.7017</td>
<td>0.2413</td>
<td>-2.9085</td>
<td>0.0039</td>
</tr>
<tr>
<td>Constant</td>
<td>101423</td>
<td>3.0797</td>
<td>3.2933</td>
<td>0.0011</td>
</tr>
</tbody>
</table>

7. Discussion
The result of first research’s hypothesis indicated that there is a significant and direct relationship between cash holding and income smoothing, that is, with the increase in cash, income smoothing will increase. To justify this equation, it is said; since managers’ strategy towards circulating assets is conservative (Khajavi et al., 2011) therefore, in this kind of strategy, managers are interested in maintaining cash more than needed level, since when the lack of it occurs, they will have to finance. Since the rate of financing in Iran is more than the rate of expenditure of maintaining cash, hence, if they do not maintain cash, they have to finance with a higher rate than cost of opportunity. This action can increase the debt ratio of companies, and then increases the credit and financial risks in the company. On the other hand, according to Schwetzler and Reimund (2004), constant surplus of cash holding prevents managers from operational improving in trade unit, and this shows the low efficiency of managers in applying sources available to achieve income. Thus, the managers make income smoothing in order to show a sophisticated performance and to justify high company’s cash holding.

The results from second hypothesis of the research indicated that there is no significant relationship between positive changes in cash to past year and income smoothing. In other words, annually changes in cash by itself don’t have significant effect on income smoothing, and it can’t influence management motivation. Also, among control variables, company size has a significant and negative relationship with income smoothing in studied
companies. This means that, with increase in company size, the tendency to income smoothing will decrease. Also, financial leverage has no significant relationship with income smoothing. Probably, lack of confirming financial leverage considered as an important factor to income smoothing of companies which is measured by overall debt ratio to book value of overall assets. Probably, it is because of the way of loan payments and bank credits which is a conferment for getting assurance rather than analyzing financial statements of applicant company.

8. Suggestions
Since shareholders generally have a high tendency to the number of income and consider incomes with no fluctuation or less fluctuation as high quality incomes, shareholders are highly recommended to pay more attention to the issue of companies’ cash holding in their investment decision making as one of the factors of current asset not just to the number of income. Since regarding obtained results which states that the managers that maintain higher cash probably have stronger motivation for smoothing. So, this is the managers that to achieve their goals, maintain cash as well as manipulating income. Cash holding for management has some advantages such as: decreasing the probability of financial crisis, it makes a safe stock for encountering with unexpected losses, and reducing the costs of collecting financial resources and income smoothing is a strong factor for management to show his sophisticated performance towards shareholders. Thus, shareholders must consider the relationship between cash holding and income smoothing in their own investment decisions.

Furthermore, regarding the results from the research, it is recommended to the banks and other credit institutes to apply the relationship between dependent and independent variables of the research. It means that, for evaluating the performance of companies (factors which are based on accounting income) the banks must consider the cash which has been maintained by them, since companies may not present a proper quality report due to income smoothing. It is important to say that higher cash holding usually is welcome by financial and credit institutes. On the other hand, this cash holding for pay loans to companies may be tempting. Since this stagnant cash holding is an obstacle for companies’ investment in projects with high returns, so, the company will be prevented from development and growth, and it could be an alarm for financial and credit institutes to return their asset.
References


