



## The Effect of Recognizing Managers' Behavioral Biases on Company Life Cycle Patterns; Using the Gray Analytic Hierarchy Process

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### ABSTRACT

The sustainable growth and development of the capital market has always been considered as one of the strategies of countries to create economic stability. However, the existence of behavioral biases in decision-making in the capital market has made this market less productive, especially in developing countries, and has posed problems, such as inefficiency of macro-level investment and the existence of micro-level financial constraints in a competitive market. Accordingly, the present study aims to investigate the effect of recognizing managers' behavioral biases on Company life cycle models through the gray analytic hierarchy process. The research methodology is hybrid. In the first step, meta-synthesis analysis with the participation of 18 academic experts is used to identify the components of managers' behavioral biases. Then, the identified indicators are examined through Delphi analysis and out of a total of 51 identified indicators, 26 indicators are finally approved. In Delphi analysis, the identified components are examined and it is found that recognizing the CEO's utilitarian behavioral biases can lead to an increase in the Company life cycle. Then, in the quantitative part, hypotheses are formulated according to the results of the qualitative part. In this regard, 101 companies have been investigated from 2012 to 2019 and the results show that the management of real and accrued profits has a negative and significant impact on Company life cycle.

**Keywords:** Behavioral Bias, Company life cycle, Gray Analytic Hierarchy Process.



## 1. Introduction

Analyzing the financial behavior of companies operating in the capital market is very important because it helps investors to have a more accurate assessment of the performance of investable companies. One of the theories proposed in the knowledge of organizational management is the theory of organic approach. According to this theory, companies go through different stages during their years of activity so that the characteristics of each stage are different from other stages. The Company life cycle is one of the concepts that has entered various areas related to the company in recent decades (Yaan, 2010). The main role of financial reporting is the effective transfer of financial information to outsiders in a reliable and timely manner, one of the main purposes of which is to provide the necessary information to evaluate the performance and profitability of the economic enterprise. A prerequisite for achieving this goal is to provide financial information in a way that makes it possible to evaluate past performance and is effective in measuring profitability and predicting the future activities of the enterprise. What can ensure the growing life of organizations is the existence of a powerful and efficient management system. Also, according to life cycle theory and from a financial and economic point of view, they have certain manifestations and behaviors. This means that the financial and economic characteristics of a company are affected by the stage of the life cycle in which the company is. Quality financial reporting can be affected by the management abilities of companies and their managers in different life cycles. This is due to differences in financial and economic characteristics of the company and different management capabilities (Bamer et al., 2012). The main purpose of this study is to investigate the effect of recognizing the behavioral biases of managers on the stages of the Company life cycle through the gray analytic hierarchy process.

### Theoretical foundations and research background

The various stages of a company's activity from the time of its establishment to the dissolution or bankruptcy of the company are called life cycle. Company life cycle theory states that companies, like components of a body, tend to grow and evolve in a

linear fashion due to the predictability of strategies, structures, and activities that are commensurate with the rise to decline of the company (Coerin and Cameron, 1983). Since about 1960, management and strategy researchers have incorporated the Company life cycle model (derived from biology) into financial and business research (Pal et al., 1995).

On the other hand, managers have the ability to choose different management strategies in the implementation of business plans, each of which will lead to the creation of different cash flows. Also, the efficiency of management requires the selection of optimal strategies that lead to the highest expected value for the company. However, in choosing the company's value-creating strategies in practice, managers sometimes, for various reasons (for example in response to short-term performance appraisal criteria), go for solutions that improve their short-term performance, instead of focusing on long-term goals and creating the most expected value by choosing the best solution. This becomes a complex and problematic issue when such a choice by managers leads to a reduction in the expected value of the company in the long run and has an adverse effect on the future performance of the company. In other words, managers who focus on short-term goals are expected to achieve fast and, of course, temporary results and returns in a short period of time, but their performance will not be satisfactory in the long run. In this way, they are involved in very short-sighted or very optimistic management (Miezik, 2010). Among these characteristics of managers are the level of optimistic, short-sighted behaviors, profit management discussion, authoritarian management behavior and agency behavior of managers, which can affect the emotional tendencies of investors in the market, which depends on different views of managers. In general, in relation to the effect of behavioral and ethical characteristics of managers on the emotional tendencies of investors, there is an argument that companies with managers with higher behavioral and ethical standards (ethics-oriented) that work for the interests of shareholders and society have transparency, and more accurate monitoring and planning. Also, these companies try to present a stable trend to the market and avoid creating tension in the market, so with greater transparency, less emotional trends in investors of this type of company are expected (Ma et al., 2018). In addition, there is an

argument that in companies with managers with opportunistic behaviors and lower standards of ethics, there is a lower level of transparency and a lower level of oversight, where not much attention is paid to ethical issues and there exists less stable conditions. Also, these managers do not care about the interests of shareholders, so it is expected that they will face more emotional tendencies in investors.

### **Perceptual bias of the CEO**

The emergence of behavioral sciences in financial issues is a new approach to the study of financial markets. This approach addresses the issue that, contrary to standard financial discussions and theories, behavioral and cognitive tendencies can affect the price of financial assets. Despite many studies that have been done in this field, many people still do not have a correct understanding of the concept hidden in behavioral finance management (Etebarian Khorasgani and Ghoreishi Shahraki, 2015). In fact, the basis of behavioral finance is the correspondence between the feelings and the way managers make decisions. Behavioral finance raises questions, such as whether the CEO's perceptual errors can deepen agency costs' gap. Various studies on the types of perceptual errors and how these errors affect the financial decisions of investors in financial markets have been conducted and concluded that investors' decisions are affected by several perceptual errors or biases of the CEO (Kamali Ardakani and Rajabi Ghiri, 2015). Grohmann (2020) conducted a study entitled "financial literacy and financial behaviors: evidence for emerging markets in central Asian countries." In this study, stock market consultants, auditors, accountants and financial managers of companies operating in the capital markets of Central Asian countries have been used as the target population. The research tool was a questionnaire and the results showed that although the level of financial literacy is high in the markets of these countries, the level of inference and conceptual perception of financial issues is very low. This issue is well manifested in financial behaviors, behaviors that are mostly subject to emotional and collective decisions rather than futuristic decisions based on financial insights. Ulupinar (2019) investigated the effect of managerial stability on CEO behavioral biases. In this study, which was conducted between 1994 and 2006, three criteria of CEO tenure, managerial ownership and dual position of CEO were

used to measure managerial stability. Perceptual biases were also measured based on overconfidence and optimism. The results showed that all three criteria of managerial stability have a positive effect on the perceptual biases of the CEO and lead to more biased behaviors of the CEO when the position of management at the top of companies is stable.

Koga and Kato (2019) conducted a study entitled "perceptual biases with corporate growth expectations". This study was conducted in the period 1989 to 2015 on Japanese stock exchange companies and 1000 observations were reviewed by year-company. The results showed that optimistic and pessimistic bias is influenced by financial market conditions and specific characteristics of companies, including the past experiences of the company. The study also showed that bias affects companies' actual business decisions. Fixed investment and the cost of the R&D unit of companies increase and decrease in terms of optimism and pessimism, respectively. The above findings indicated that the perceptual biases of companies can be considered as an alternative mechanism along with traditional optimization mechanisms on how financial conditions and macroeconomics affect the investment behavior of companies. Ziu honug and Kie (2018) examined profit management at different stages of Company life cycle. They showed that the management of accruals and the management of real profits have the highest rates in companies that are in decline and the lowest rates in companies that are in growth. Negeo and Radhekishan (2017) examined the management of real profits in companies in the emerging, growing, and maturing stages. In this study, cash flow components have been used to separate life cycle stages. The results of this study showed that on average, companies in the maturity stage are more inclined to use real earnings management. Jenkinez et al. (2013) examined the effect of Company life cycle on the relevance of earning components. They hypothesized that business units would adopt different strategies at different stages of the life cycle. The results of their research showed the relevance of the value of profit components by emphasizing profitability in the final stages of the life cycle, rather than emphasizing growth in the early stages of the life cycle.

Shirzadi and Dolatyari (2019) examined the use of Dickinson cash flow model instead of using the age of the company in separating the stages of the Company

life cycle. Findings indicated that the stages of growth and maturity have a negative and significant relationship with the cost of capital, i.e. the cost of capital is lower in these stages. While the decline phase has a significant and positive relationship with the cost of capital, it means that the cost of capital is higher in this phase. But the emergence stage has nothing to do with the cost of capital. Asnaashari and Valizadeh Larijani (2015) investigated risky behavior during the Company life cycle and its effect on future financial performance using generalized method of moments. The results showed that companies in the emerging and declining stages take more risk in comparison to the maturity stage. In addition, the risky behavior of companies that are in the emerging and declining stages is associated with weaker financial performance compared to companies operating in the stages of growth and maturity in the next financial period. Baradaran Hassanzadeh and Ghasemi (2015) studied the effect of earnings management on stock liquidity with an emphasis on life cycle stages (Dickinson model). The results of this study showed that with increasing earnings management, the liquidity of the company's shares decreases, and also earnings management reduces the liquidity of companies' stocks in the emergence and growth stage. Asnaashari and Naderi Noor Eini (2017) examined profit management patterns in Company life cycle. The results showed that companies use the model of profit management through accruals in the stages of emergence and decline, while real activities play a dominant role in earnings management in the stages of growth and maturity. In addition, as the growth outlook of companies in the growth and maturity stages increases, so does the share of accruals in earnings management. Ousta and Gheitasi (2012) investigated the effect of Company life cycle on discretionary accruals. The results of a survey of 140 member companies of the research statistical sample showed that the use of discretionary accruals is different at different stages of the life cycle; So that the use of discretionary accruals in the growth stage is higher than the maturity and decline stages and the use of these items in the maturity stage is less than the decline stage.

**Research methodology**

The present study is descriptive-applied in terms of its objective and based on this, the qualitative research

strategy is of field type. The methodology of this research is of hybrid type. In fact, the research approach of this study is inductive-deductive in terms of data collection because it examines phenomena about which there is no comprehensive theory in the capital market or is not agreed upon. In other words, a model is first designed through an inductive approach and then, this model is evaluated through a deductive approach. Since hybrid methods have different dimensions, in this research, the data conversion model has been used for the pluralism of qualitative and quantitative data. In fact, in descriptive designs based on meta-synthesis, a measurement tool is usually developed through qualitative research and the aim is that the results of the first (qualitative) method help the results and analyses of the second (quantitative) method.

**Content validity assessment**

**Content Validity Ratio (CVR)**

According to this method, by sending the questionnaire to 15 experts, the items of the research tool are calculated based on the three ranges specified in Table (1) and based on the following formula:

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

**Table 1: Minimum CVR values in Lawshe's one-way tests to examine suitability of content validity**

The minimum CVR value	N of evaluators
0.99	5
0.99	6
0.99	7
0.75	8
0.78	9
0.62	10
0.49	15
0.42	20
0.37	25
0.33	30
0.31	35
0.29	40

Where,  $n_e$  is the number of experts who answered the "necessary" option, N is the total number of experts participating in this narration. It is important to note that if the calculated value is greater than the table

value, the content validity of that item is accepted. The minimum CVR is presented in the table below:

Now, according to the given explanations, the CVR index (content validity of items with index) is used.

**Table 2: Evaluation of content validity of model components with index (CVR)**

Main components	Sub-components	Indices	CVR		
			Unnecessary	Somewhat	Necessary
CEO biases	Biased behaviors based on managers' judgments	Error of overconfidence	-	-	1
		Error of optimism	-	-	1
		Error of profit forecast	-	-	1
		Error caused by improvidence	-	-	1
		Retrospective error	-	-	1
	Biased behaviors based on economic behavior	Overinvestment	-	-	1
		Investment inefficiency	-	-	1
		Financing restrictions	-	-	1
		Preferences with time constraint error	-	-	1
		Overvaluation of future projects	-	-	1
		Recession of accounts received <sup>1</sup>	-	-	1
	Biased behaviors based on utilitarian motives	Real earnings management	-	-	1
		Accrued earnings management	-	-	1
		Opportunistic motives	-	1	-
		Tax avoidance	-	-	1
	Biased behaviors based on abnormal phenomena	Cost stickiness	-	1	1
		Dividend policies	-	-	1
		Conservatism	-	-	1
		Ignoring the investment time horizon	-	-	1
		Mental accounting	-	-	1

$$CVR = \frac{12 - \frac{15}{2}}{\frac{15}{2}} = 0/6 > 0/49$$

Given that the CVR value of the scale is greater than 0.49 (the validity value listed in the coefficient table), it should be noted that the content validity of this item is confirmed. Thus, this value is calculated for each questionnaire items and questions.

**Reliability of the quantitative section**

To check the reliability in the quantitative section, the factor loading is first considered. Factor loading is a numerical value that determines the intensity of the relationship between a latent variable and the corresponding observed variable during the path analysis process. The higher the factor loading of an index in relation to a given structure, the more that index plays a role in explaining that structure. Also, if the factor loading of an index is negative, it indicates its negative effect in explaining the relevant structure.

In other words, the question about that index is inversely designed. The relationship between the factor (latent variable) and the observed variable is indicated by the factor loading. The factor loading is a value between zero and one. If it is less than 0.3, a weak relationship is considered and ignored. A factor load of between 0.3 and 0.6 is acceptable, and if greater than 0.6, it is highly desirable (Klein, 1994). In order to evaluate the reliability, the construct reliability, composite reliability, and factor loading are used (Fornell and Larcker, 1981).

**Table 3: Investigation of factor loadings**

Main components	Sub-components	Indices	Results	
			Factor loadings	Results
CEO biases	Biased behaviors based on managers' judgments	Error of overconfidence	0.77	Confirmed
		Error of optimism	0.72	Confirmed
		Error of profit forecast	0.69	Confirmed
		Error caused by improvidence	0.81	Confirmed
		Retrospective error	0.73	Confirmed
	Biased behaviors based on economic behavior	Overinvestment	0.77	Confirmed
		Investment inefficiency	0.70	Confirmed
		Financing restrictions	0.69	Confirmed
		Preferences with time constraint error	0.83	Confirmed
		Overvaluation of future projects	0.64	Confirmed
		Recession of accounts received <sup>2</sup>	0.66	Confirmed
	Biased behaviors based on utilitarian motives	Real earnings management	0.72	Confirmed
		Accrued earnings management	0.79	Confirmed
		Opportunistic motives	0.83	Confirmed
		Tax avoidance	0.71	Confirmed
	Biased behaviors based on abnormal phenomena	Cost stickiness	0.86	Confirmed
		Dividend policies	0.90	Confirmed
Conservatism		0.67	Confirmed	
Ignoring the investment time horizon		0.69	Confirmed	
Mental accounting		0.74	Confirmed	

**Composite reliability**

The condition for establishing the construct reliability is that the size of the composite reliability (CR) is greater than 0.7 and the average variance extracted (AVE) is greater than 0.5 (Fornell and Larcker, 1981). Of course, Mackenz et al. (1996) considered the value of 0.4 and above to be sufficient for AVE (quoted by Davari and Rezazadeh, 2013).

**Compilation of score checklists**

In order to determine this stage of the research tool, the sub-components and indices are determined by reviewing the articles and researches approved in the critical evaluation stage. For this purpose, a partial summary of the conducted researches, which had the indicators considered by the present research, is presented in the following section in order to finally determine the score checklist.

**Determining the checklist of CEO behavioral biases**

The school or view of behavioral finance that results from the combination of psychology and finance states that psychology plays a role in financial decision making. Because cognitive errors and deviations affect

investment theories, they also affect financial choices. Behavioral finance is the study of how individuals analyze and interpret information to make informed investment decisions.

**Defining CEOs' behavioral biases**

In behavioral finance, behavioral characteristics that influence individuals' decision-making process are studied. These characteristics are called "behavioral biases" (Royaei et al., 2016). According to the given explanations, the frequency of behavioral biases through the scoring method is examined so that the components that have obtained the highest frequency are used to prepare a checklist:

Table 4: Determining the main components of CEOs' behavioral bias

Main criteria	Judgmental biases	Preferential biases	Biases caused by results	Apocalyptic Behaviors	Economic behavior	Abnormal phenomena	Utilitarianism	Cognitive	Emotional
Stambaugh and Yuan (2017)	*	*	-	-	*	*	-	-	-
Lee et al. (2017)	-	-	-	-	*	-	*	-	-
Bruno and Zuo (2017)	*	-	-	-	-	-	-	*	-
Malmendier & Zheng (2015)	-	-	-	-	-	-	-	-	-
Herciu & Ogreaan (2014)	-	-	-	-	*	-	*	-	-
Gilles & Hsu (2011)	*	-	*	*	*	*	*	-	*
Malmendier et al. (2011)	-	*	-	-	-	-	-	-	*
Flynn Simone (2008)	-	-	-	-	*	-	-	-	-
Kahneman & Riepe (1998)	*	-	-	-	-	*	-	-	-
Gilles & Hsu (2011)	-	*	-	-	*	-	-	-	-
Darabi et al. (2016)	*	*	*	-	-	*	*	-	-
Fadaei Nezhad et al. (2015)	*	-	-	-	*	*	*	-	*
Seifollahi et al. (2015)	*	-	-	-	*	-	*	-	-
Talebniya and Takhtaei (2014)	*	-	*	-	-	*	-	*	-
Fallahpour and Abdollahi (2011)	*	-	-	*	-	-	-	-	-
Total	9	3	3	2	8	6	6	2	3
Note: As can be seen, only researches that were in the form of scientific articles and considered these criteria as criteria for managers' behavioral bias were examined.									

As can be seen, judgmental biases, economic behavior biases, abnormal phenomena biases (price and stock returns) and utilitarian biases were identified as the four main components of managers' behavioral biases due to their high frequency in surveys. Now, in order to determine the checklist of these components, the following table is presented:

## Analyses of results via Delphi

### The first round of Delphi

In order to determine the indices related to the research variables, the Delphi method is used. In this section, the panel members include 18 university professors. According to the main concept, the behavioral bias of managers is identified and a total of 56 indices are identified, of which 15 are related to the components

of managers' behavioral biases. A seven-point Likert scale was used to measure them. To perform the first round of Delphi at the end of the indices related to each component, a place was considered to add additional indices from the perspective of the respondents. After designing the first round questionnaires, they were distributed. The most important issue for access to respondents was their dispersion and separation from each other. Since most of the respondents were accounting and financial management specialists of the university, the questionnaires were delivered to them by making an appointment and going to their office.

**Table 5: Results of the first round of Delphi**

Research components	Indices	Measurement criteria		
		Mean	Contingency coefficient	Confirmed/Removed
<b>Biased behaviors based on managers' judgments</b>	Error of overconfidence	5.261	0.76	Confirmed
	Error of optimism	5.047	0.68	Confirmed
	Error of profit forecast	5.112	0.71	Confirmed
	Error caused by improvidence	5.104	0.7	Confirmed
	Retrospective error	3.784	0.34	Removed
<b>Biased behaviors based on economic behavior</b>	Overinvestment	5.051	0.69	Confirmed
	Investment inefficiency	5.118	0.71	Confirmed
	Financing restrictions	5.172	0.74	Confirmed
	Preferences with time constraint error	4.473	0.43	Removed
	Overvaluation of future projects	5.092	0.7	Confirmed
	Recession of accounts received	4.321	0.41	Removed
<b>Biased behaviors based on utilitarian motives</b>	Real earnings management	5.38	0.83	Confirmed
	Accrued earnings management	5.15	0.69	Confirmed
	Opportunistic motives	3.783	0.39	Removed
	Tax avoidance	4.02	0.28	Removed
<b>Biased behaviors based on abnormal phenomena</b>	Cost stickiness	3.089	0.29	Removed
	Dividend policies	5.021	0.69	Confirmed
	Conservatism	5.326	0.82	Confirmed
	Ignoring the investment time horizon	4.07	0.33	Removed
	Mental accounting	5.13	0.78	Confirmed

As can be seen in Table 5, in order to confirm/remove the indices related to the research variables, two criteria of mean and contingency coefficient have been used. Based on these two criteria, due to the fact that the Likert scale is 7-point, the indices that have scored less than 5 points in the mean are removed and the indices that have scored less than 0.5 points in the contingency coefficient are removed. In other words, the criteria for confirmation and elimination of sub-indices of research variables were the criteria of mean and contingency coefficient. According to the research of Digner and Weinch (2010), for critical evaluation of Delphi criteria based on the 7-point Likert scale, the means below 5 and the contingency coefficient of 0.5 are suitable criteria for index elimination.

### The second round of Delphi

At this stage, no variables were removed and based on the results, it was determined that in this Delphi round, the obtained mean scores were above 5 and the contingency coefficient of expression of the panel members was above 0.5, and all criteria were

approved. Therefore, it can be said that the research in the second Delphi round has reached a theoretical saturation point according to the obtained results.

Frequency of approved factors based on the Delphi method

The overview of the research in relation to the main factors and sub-factors of the research is presented in Table 7. As can be seen, the highest percentage of frequency related to conformity is one of the individual causal factors creating the research components. This drawing can be a good view of the research components from the perspective of researcher and panel members.

As can be seen, after the second round of Delphi, 26 indicators were confirmed in the form of 9 components, based on which the frequency percentage of each indicator was determined in the form of sub-components.



Table 6: Second round of Delphi

Research components	Indices	Measurement criteria		
		Mean	Contingency coefficient	Confirmed/Removed
Biased behaviors based on managers' judgments	Error of overconfidence	5.24	0.79	Confirmed
	Error of optimism	5.33	0.80	Confirmed
	Error of profit forecast	5.18	0.70	Confirmed
	Error caused by improvidence	5.17	0.72	Confirmed
Biased behaviors based on economic behavior	Overinvestment	5.32	0.69	Confirmed
	Investment inefficiency	5.21	0.64	Confirmed
	Financing restrictions	5.5	0.5	Confirmed
	Overvaluation of future projects	5.7	0.58	Confirmed
Biased behaviors based on utilitarian motives	Real earnings management	5.97	0.83	Confirmed
	Accrued earnings management	6	0.94	Confirmed
Biased behaviors based on abnormal phenomena	Dividend policies	5.1	0.62	Confirmed
	Conservatism	5.38	0.78	Confirmed
	Mental accounting	5.88	0.99	Confirmed
Management insight	Accuracy of profit forecasting	6.3	0.98	Confirmed
	Reduction of the risk of falls	5.79	0.88	Confirmed
	Timely disclosure of information	6.3	0.98	Confirmed
	Reduction of information asymmetry	5.79	0.88	Confirmed

Table 7: Frequency of research factors

Main component	Sub-components	N	Frequency
CEOs' behavioral biases	Biased behaviors based on managers' judgments	4	13.79%
	Biased behaviors based on economic behavior	4	13.79%
	Biased behaviors based on utilitarian motives	2	10.34%
	Biased behaviors based on abnormal phenomena	2	10.34%

### Gray Analytic Hierarchy Process

The analytic hierarchy process (AHP) is one of the most well-known and widely used multi-criteria decision-making methods that has the ability to measure the degree of consistency of preferences and to consider tangible and intangible criteria. Gray relation analysis (GRA) is just a multi-criteria decision making technique that has its own principles and rules and is not necessarily solved using gray numbers. In this study, due to the subjectivity and ambiguity of experts' judgments, the gray AHP has been used. In the following, the steps of the gray AHP are presented.

### Gray analytic hierarchy process

In order to calculate the weight of the research criteria, the gray AHP is used. For this purpose, after forming a pairwise comparison matrix of the problem, the opinions of experts were collected. In the next step, the degree of incompatibility of each pairwise comparison matrix was determined. If the incompatibility of the

pairwise comparison questionnaires is standard (less than 0.1), the next step can be started; otherwise, the pairwise comparison questionnaires will be returned to the experts for review. Table 8 shows the results obtained from the calculations of the gray AHP.

As can be seen, the incompatibility rate of all components is under 0.1.

Since the Q index represents the most important law in rough analysis, i.e. the most important feature for adjustment or improvement, it was determined that Q is related to biased behaviors based on abnormal phenomena (V4). But since according to the guideline, inverse rough is the highest criterion of the center index, then the lowest component, i.e. biased behaviors based on utilitarian motives of managers (V3) is considered as the most important factor in the recognition of biased behaviors that increases the effectiveness of investment efficiency by upgrading investment competitiveness capabilities and reduces financial constraints by raising the level of reliability

capabilities. Also in the second place of the importance of recognizing the biases of the CEO is the component of biased behaviors based on the judgment of managers (V1).

**Table 8: Results of the Gray AHP**

Research components	Weight of criteria		Indices	Weight of criteria		Weight of criteria	
	Lower limit	Upper limit		Lower limit	Upper limit	Lower limit	Upper limit
Biased behaviors based on managers' judgments	0.73	0.86	Error of overconfidence	0.331	0.382	0.277	0.382
			Error of optimism	0.209	0.302	0.192	0.302
			Error of profit forecast	0.340	0.418	0.298	0.418
			Error caused by improvidence	0.161	0.280	0.144	0.280
Biased behaviors based on economic behavior	0.61	0.70	Overinvestment	0.139	0.289	0.110	0.290
			Investment inefficiency	0.479	0.619	0.414	0.619
			Financing restrictions	0.349	0.622	0.305	0.622
			Overvaluation of future projects	0.718	0.935	0.679	0.935
Biased behaviors based on utilitarian motives	0.76	0.92	Real earnings management	0.288	0.489	0.240	0.490
			Accrued earnings management	0.321	0.536	0.296	0.576
Biased behaviors based on abnormal phenomena	0.51	0.68	Dividend policies	0.551	0.884	0.522	0.884
			Conservatism	0.453	0.668	0.404	0.668
			Mental accounting	0.156	0.229	0.119	0.224

**Table 9: Analysis of indices using Gray AHP**

Recognizing CEO bias	Code	$S_i^U$	$S_i^L$	$R_i^U$	$R_i^L$	$Q_i^U$	$Q_i^L$
Biased behaviors based on managers' judgments	V1	1.238292	1.938726	0.302929	0.693872	0.403002	0.563572
Biased behaviors based on economic behavior	V2	1.64873	2.54837	0.390290	0.754832	0.584726	0.817262
Biased behaviors based on utilitarian motives	V3	0.637762	1.009187	0.139892	0.320901	0.192001	0.283761
Biased behaviors based on abnormal phenomena	V4	1.938262	2.893826	0.473626	0.972662	0.535271	0.928881
Indices				$S^*$	$S^-$	$R^*$	$R^-$
Values of indices				0.609918	2.990298	0.44837	1

**Measuring research variables**

**Dependent variable**

**Company life cycle stages**

CLC\_DUM<sub>i,t</sub> = Company life cycle stages, which is a dummy variable, is 1 for the first hypothesis if the company is in the growth stage, otherwise it will be equal to zero. For the second hypothesis, if the company is in the maturity stage, it is put equal to one, otherwise it will be equal to zero. For the third hypothesis, if the company is in the decline phase, it is put equal to one, otherwise it will be equal to zero.

Antoni and Ramesh (1992) used four variables of sales revenue growth, capital expenditure, dividend ratio and firm age to separate companies into life cycle stages. Pursuant to Article 6 of the Special Conditions

for the Admission of Joint Stock Companies to the Stock Exchange, joint stock companies must have at least three years of experience in the relevant industry and be active in the subject. Also, according to this law, joint stock companies must be profitable in three consecutive financial periods leading to the acceptance. Therefore, in this study, due to the inactivity of the transaction (purchase and sale) or other non-listed emerging companies in the Tehran Stock Exchange, the life cycle is defined as three stages of growth, maturity and decline and the emergence stage is omitted.

**Independent research variable**

Biased behaviors based on managers' utilitarian motives

In this study, according to Delphi analysis, the two variables of real earnings management and accrued earnings management are used separately.

### Accrued earnings management

Opportunistic use of accruals is actually measured to increase current income by bulking accruals over time. (Di Meoa et al, 2017). Givoly and Hayn (2000) argued that conservatism would lead to large volumes of negative accruals. Accordingly, following the research of Garcia Lara et al. (2009), it can be inferred that more aggressive companies that are more persistent in using accruals to increase their current income, offer less negative accruals. Therefore, in order to measure this variable from the dummy variable for opportunistic use of accruals to increase current income, it is calculated based on the average total income of accruals over the past three years. In fact, accruals are calculated from the difference between operating profit and operating cash flow divided by the average of total assets. The residual coefficient of accruals' regression indicates the opportunistic use of accruals to increase current income. In this study, the accruals are first calculated through Dechow and Dichev (2002) model in order to measure this variable. The model is as follows:

$$\Delta WC_{it} = \beta_0 + \beta_1 CFO_{it-1} + \beta_2 CFO_{it} + \beta_3 CFO_{it+1} + \varepsilon_{it}$$

Where,

$\Delta WC_{it}$ : Change in working capital of company i at time t

$CFO_{it-1}$ : Operating cash flow of company i at time t-1

$CFO_{it}$ : Operating cash flow of Company i at time t

$CFO_{it+1}$ : Operating cash flow of company i at time t+1

$\varepsilon_{it}$ : Regression residual or symbol of quality of accruals

Based on the explanations given, higher regression residual indicates the opportunistic motives of managers to increase current income from accruals.

### Real earnings management

In this study, according to the researches of Roychowdhury (2006), Cohen et al. (2008), and Cohen and Zarowin (2010), the three criteria of abnormal operating cash flow, abnormal production costs, and abnormal discretionary costs are used to measure the real earnings management. These three criteria are

calculated using the residual values obtained from the estimates of the following models, respectively:

$$\frac{CFO_{it}}{A_{it-1}} = a_1 \left( \frac{1}{A_{it-1}} \right) + a_2 \left( \frac{Sales_{it}}{A_{it-1}} \right) + a_3 \left( \frac{\Delta Sales_{it}}{A_{it-1}} \right) + \varepsilon_{it}$$

$$\frac{PROD_{it}}{A_{it-1}} = a_1 \left( \frac{1}{A_{it-1}} \right) + a_2 \left( \frac{Sales_{it}}{A_{it-1}} \right) + a_3 \left( \frac{\Delta Sales_{it}}{A_{it-1}} \right) + a_4 \left( \frac{\Delta Sales_{it-1}}{A_{it-1}} \right) +$$

$$\frac{DISCE_{it}}{A_{it-1}} = a_1 \left( \frac{1}{A_{it-1}} \right) + a_2 \left( \frac{Sales_{it-1}}{A_{it-1}} \right) + \varepsilon_{it}$$

Where,

$CFO_{it}$ : Operating cash flow of company i at time t

$Sales_{it}$ : Sales of company i at time t

$A_{it-1}$ : Total assets at the beginning of the period of company i at time t

$PROD_{it}$ : Production costs (total cost of goods sold and changes in inventory) of company i at time t

$DISCE_{it}$ : Discretionary costs (advertising, public, administrative and sales costs) of company i at time t

$\varepsilon_{it}$ : The residual term of the model that indicates the abnormal level of the estimated variable in each model.

Since the application of each of the above criteria alone may cause an error in measuring the real earnings management variable, similar to previous research, the above three criteria (abnormal operating cash flow, abnormal production costs, and abnormal discretionary costs) are combined in a hybrid index. For this purpose, after calculating these criteria, the standardized values of each of the mentioned criteria are added together to obtain the combined index of real earnings management (REM) for each company. The use of this combined criterion reduces the skewness resulting from the separate application of each of the real earnings management criteria and provides a more accurate criterion for testing (Sohn, 2016).

### Control variables

CEO Tenure: The CEO tenure increases over time (Shen, 2003). At the beginning of their tenure, CEOs need to develop their managerial skills to meet their new job needs. After that, they are likely to get rid of their opportunistic motivations. Also, Frederickson et al. (1998) stated that if CEOs' tenure is less than a year, they seek to meet the needs of their professional

areas, and then, they may begin to seek power and gain a position for themselves. Accordingly, following the research of Di Meoa et al. (2017) and Bebchak et al. (2009), 0 and 1 are used to measure this variable. So that if the CEO tenure is 3 years or more, it is given 1, otherwise, it is given 0.

**Board Size (BSIZE):** This variable is defined as the number of people on the board of directors of companies (Gampirs et al., 2003; Dianati and Malek Mahmoudi, 2013; Di Meoa et al., 2017).

**Board Independence (BIND):** In this study, like the study of Khodadadi et al. (2016) and Bibchak et al. (2009), the ratio of non-executive members of the board to the total members of the board is used to measure this variable.

**Company Size (Size):** To measure company size, as in the research of Rego and Wilson (2012) and Higgins et al. (2015), the logarithm of the net annual sales of the company has been used.

**Institutional Ownership (INST):** is the total number of shares owned by banks and insurance companies, investment companies, pension funds, finance companies and investment funds, and government organizations and institutions divided by the total number of shares issued by the company (Sohn, 2016).

**Financial Leverage (LEV):** The ratio of total liabilities to total assets.

**Cash Flow Ratio:** The ratio of operating cash to total assets of the company.

**Market Share:** In order to measure this variable, based on the research of Leventis et al. (2011), the ratio of sales of each company to the average industrial sales in which the company operates is used. Therefore, this high ratio indicates a larger share of the company in the market.

## Research hypotheses

According to the obtained results, the following hypotheses are presented:

**Main Hypothesis:** Biased behaviors based on utilitarian motives of managers have a significant effect on the life cycle stages of the company.

**Sub-hypothesis 1:** Accrued earnings management has a significant effect on the growth stage of the company.

**Sub-hypothesis 2:** Real earnings management has a significant effect on the growth stage of the company.

**Sub-hypothesis 3:** Accrued earnings management has a significant effect on the maturity stage of the company.

**Sub-hypothesis 4:** Real earnings management has a significant effect on the maturity stage of the company.

**Sub-hypothesis 5:** Accrued earnings management has a significant effect on the decline stage of the company.

**Sub-hypothesis 6:** Real earnings management has a significant effect on the decline stage of the company.

## Research model development

The first and second sub-hypotheses' test models

$$\begin{aligned} \text{CLC1}_{it} = & \delta_0 + \delta_1 \text{AEM}_{it} + \delta_2 \text{REM}_{it} + \delta_3 \text{CEO tenure}_{it} \\ & + \delta_4 \text{BSIZE}_{it} + \delta_5 \text{BIND}_{it} \\ & + \delta_6 \text{Size}_{it} + \delta_7 \text{INST}_{it} + \delta_8 \text{Lev}_{it} \\ & + \delta_9 \text{Cash Flow}_{it} \\ & + \delta_{10} \text{Market Share}_{it} + \varepsilon_{it} \end{aligned}$$

The third and fourth sub-hypotheses' test models

$$\begin{aligned} \text{CLC2}_{it} = & \delta_0 + \delta_1 \text{AEM}_{it} + \delta_2 \text{REM}_{it} + \delta_3 \text{CEO tenure}_{it} \\ & + \delta_4 \text{BSIZE}_{it} + \delta_5 \text{BIND}_{it} \\ & + \delta_6 \text{Size}_{it} + \delta_7 \text{INST}_{it} + \delta_8 \text{Lev}_{it} \\ & + \delta_9 \text{Cash Flow}_{it} \\ & + \delta_{10} \text{Market Share}_{it} + \varepsilon_{it} \end{aligned}$$

The fifth and sixth sub-hypotheses' test models

$$\begin{aligned} \text{CLC2}_{it} = & \delta_0 + \delta_1 \text{AEM}_{it} + \delta_2 \text{REM}_{it} + \delta_3 \text{CEO tenure}_{it} \\ & + \delta_4 \text{BSIZE}_{it} + \delta_5 \text{BIND}_{it} \\ & + \delta_6 \text{Size}_{it} + \delta_7 \text{INST}_{it} + \delta_8 \text{Lev}_{it} \\ & + \delta_9 \text{Cash Flow}_{it} \\ & + \delta_{10} \text{Market Share}_{it} + \varepsilon_{it} \end{aligned}$$

Where,

$\text{CLC1}_{it}$ : is the growth stage of the company from company life cycle stages

$\text{CLC2}_{it}$ : is the maturity stage of the company from company life cycle stages

$\text{CLC3}_{it}$ : is the decline stage of the company from company life cycle stages

$\text{AEM}_{it}$ : is accrued earnings management as the first component of utilitarian bias of company  $i$  at time  $t$

$\text{REM}_{it}$ : is real earnings management as the second component of utilitarian bias of company  $i$  at time  $t$

$\text{CEO tenure}_{it}$ : is the CEO tenure of company  $i$  at time  $t$

$\text{BSIZE}_{it}$ : is the board size of company  $i$  at time  $t$

$\text{Size}_{it}$ : is the size of company  $i$  at time  $t$

$INST_{it}$ : is the institutional ownership of company  $i$  at time  $t$

$Lev_{it}$ : is the financial leverage of company  $i$  at time  $t$

$Cash\ Flow_{it}$ : is the ratio of operating cash flow to total assets of company  $i$  at time  $t$

$Market\ Share_{it}$ : is the market share of company  $i$  at time  $t$

analysis, it is necessary to be familiar with descriptive statistics related to variables. Descriptive statistics of tested variables, which include some central indicators and dispersion, are presented for a sample consisting of 808 companies-years observations in the period 2012-2019. Descriptive statistics are presented in the form of Table 10, which shows the criteria of mean, median, standard deviation, minimum and maximum.

## Descriptive Statistics

In order to study the general characteristics of variables, as well as model estimation and accurate

**Table 10: Descriptive statistics**

	Mean	Median	SD	Min	Max	Skewness	Kurtosis
Accrued earnings management	-0.059	-0.051	0.132	-0.707	0.698	1.127	0.0928
REM	0.008	-0.031	0.891	-4.008	4.655	0.8362	0.0319
Growth stage from company life cycle stages	0.12	0.00	0.32	0.00	1.00	2.40	6.77
Maturity stage from company life cycle stages	0.78	1.00	0.41	0.00	1.00	-1.38	2.90
Decline stage from company life cycle stages	0.10	0.00	0.30	0.00	1.00	2.66	8.07
CEO tenure	3.108	2.276	1.104	1	5	2.337	4.302
Size	14.160	13.886	1.693	10.031	19.149	0.611	0.278
BIND	0.627	0.6	0.141	0.2	0.8	0.938	3.382
BSIZE	5.16	5	0.348	5	7	0.288	1.209
INST	0.636	0.582	0.347	0.000	0.915	2.273	1.002
LEV	0.618	0.617	0.224	0.090	2.224	0.786	3.715
Cash Flow	0.121	0.106	0.129	-0.336	0.642	0.523	1.129
Market Share	0.942	0.885	0.579	0.113	14.50	16.392	371.730

As can be seen in this table, on average, discretionary accruals in the management of real earnings are about 6% of the assets of the sample companies. The average tenure of the CEO showed that on average, there is a possibility of changing the CEO at the head of the companies under review once every three years. Also, considering the average value of board independence, it shows that 62% of the total board members are non-executive members of the board. In addition, on average, about 41% of the shares of the surveyed companies were owned by institutional investors, while some companies are almost owned by institutional owners and others have not been considered by this group of investors. Also, the average financial leverage of the surveyed companies shows that 61.8% of the total assets of the surveyed companies consist of borrowing. The average operating cash also shows that 12.1% of the total

assets of companies play a role in creating operating cash resulting from the processes of companies in the market.

## Main hypothesis testing and analysis

### Stationary test

The first step in analyzing dynamic patterns is to study the stationary state of variables because the non-stationary state of time series (having a unit root) leads to false regression.

**Table 11: Unit root test results**

	Statistics	Sig. level	N of companies	N of year-company
Accrued earnings management	-5.388	0.000	101	808
REM	-7.154	0.000	101	808
Growth stage from company life cycle stages	-3.217	0.000	101	808
Maturity stage from company life cycle stages	-2.329	0.000	101	808
Decline stage from company life cycle stages	-1.215	0.000	101	808
CEO tenure	-18.366	0.000	101	808
Size	-9.463	0.000	101	808
BIND	-17.265	0.000	101	808
BSIZE	-11.172	0.000	101	808
INST	-11.726	0.000	101	808
LEV	-17.203	0.000	101	808
Cash Flow	-15.110	0.000	101	808
Market Share	-9.367	0.000	101	808

The results of the unit root test showed that the probability statistic of the test is smaller than the probability statistic at the confidence level of 90, 95 and 99%. Therefore, all variables are stationary of order I (0), and there is no problem of false regression.

Constant residual' variance test

Another assumption in fitting the regression model is the assumption that the variance of the error term is constant. If the error variance does not have a constant term, it is called heteroscedasticity.

**Table 12: Results of heteroscedasticity test**

Model	White test	Value	Sig. level	Result	State
Fist sub-hypothesis	F-statistics	0.617	0.842	H0 is accepted	Lack of heteroscedasticity
	Observation*coefficient of determination	0.862	0.917	H0 is accepted	Lack of heteroscedasticity
Second sub-hypothesis	F-statistics	0.525	0.809	H0 is accepted	Lack of heteroscedasticity
	Observation*coefficient of determination	0.873	0.799	H0 is accepted	Lack of heteroscedasticity
Third sub-hypothesis	F-statistics	0.425	0.825	H0 is accepted	Lack of heteroscedasticity
	Observation*coefficient of determination			H0 is accepted	
Fourth sub-hypothesis	F-statistics	0.626	0.827	H0 is accepted	Lack of heteroscedasticity
	Observation*coefficient of determination			H0 is accepted	
Fifth sub-hypothesis	F-statistics	0.527	0.789	H0 is accepted	Lack of heteroscedasticity
	Observation*coefficient of determination			H0 is accepted	
Sixth sub-hypothesis	F-statistics	0.782	0.879	H0 is accepted	Lack of heteroscedasticity
	Observation*coefficient of determination			H0 is accepted	

Examination of the results of heteroscedasticity test shows that the significance level of F-statistic value at 5% error level is not significant, or in other words, the F-statistic values obtained from the model are smaller than the values related to table statistics. Therefore, H0 hypothesis, i.e. the variance homogeneity of error

terms, is confirmed. Therefore, it can be argued that the data are of variance homogeneity.

**Serial autocorrelation test of residual terms**

In econometric studies based on time series, the assumption of lack of serial autocorrelation between the error terms, which is one of the important assumptions of the classical model, is often violated. Therefore, it is necessary to examine the phenomenon of serial autocorrelation between error terms before interpreting the results.

The results of the serial autocorrelation test of the error terms indicated that the probability values related to the F statistic are greater than 5% at the 95% confidence level, or in other words, the values of the F-statistic obtained by the model are smaller than the values related to the table statistic. The hypothesis that there is no serial first-order autocorrelation is accepted and the model error terms do not have serial autocorrelation.

**Table 13: Results of serial autocorrelation test**

Model	Breusch-Godfrey test	Value	Sig. level	Result	State
First sub-hypothesis	F-statistics	3.504	0.071	H0 is accepted	Lack of serial autocorrelation
	Observation*coefficient of determination	5.217	0.064	H0 is accepted	Lack of serial autocorrelation
Second sub-hypothesis	F-statistics	3.878	0.077	H0 is accepted	Lack of serial autocorrelation
	Observation*coefficient of determination	4.998	0.074	H0 is accepted	Lack of serial autocorrelation
Third sub-hypothesis	F-statistics	3.825	0.076		
	Observation*coefficient of determination				
Fourth sub-hypothesis	F-statistics	4.862	0.069		
	Observation*coefficient of determination				
Fifth sub-hypothesis	F-statistics	3.958	0.079		
	Observation*coefficient of determination				
Sixth sub-hypothesis	F-statistics	5.521	0.072		
	Observation*coefficient of determination				

**Investigation of the model by pooled data method**

Most researchers agree that by increasing the size of the studied samples, the strength of the tests increases and their results can be trusted. The main problem with collecting long-term time series data is that it is often not possible for researchers, especially in less developed countries.

**Fixed effects test (F-Limer)**

In the present study, a pooled data set has been used to analyze the model. In this way, several companies are reviewed and analyzed over time. In the pooled data section, it must first be determined whether there is an individual difference or the so-called heterogeneity in the sections or the sections are homogeneous? For this estimate, statistical data should be stacked and estimated using the pooled data or panel data method to select the appropriate method.

**Table 14: Positive effects test results**

Null hypothesis	Model	F-statistics	DF	Sig. level	Test result	Selected model
The intercepts of all sections are the same	1 <sup>st</sup> sub-hypothesis	1.404	131.436	0.0012	H0 is rejected	Panel data
	2 <sup>nd</sup> sub-hypothesis	1.261	(127.571)	0.0034	H0 is rejected	Panel data
	3 <sup>rd</sup> sub-hypothesis	1.321	125.532	0.0013	H0 is rejected	Panel data
	4 <sup>th</sup> sub-hypothesis	1.412	134.412	0.0026	H0 is rejected	Panel data
	5 <sup>th</sup> sub-hypothesis	1.291	119.412	0.0038	H0 is rejected	Panel data
	6 <sup>th</sup> sub-hypothesis	1.361	141.391	0.0021	H0 is rejected	Panel data

The results of F-Limer test are shown in Table 14. Examination of the results of the table shows the rejection of the null hypothesis and heterogeneity of sections at the level of 5%. Therefore, according to the obtained results, it can be said that the panel data method is suitable for testing the hypotheses.

**Hausmann test**

As can be seen in Tables 16, 17, and 18, the results of Hausmann test show that the significance level of chi-square statistic for each of the studied models is greater than 5%. It can be said that the null hypothesis in the studied models is acceptable and the random effects are suitable for estimating the model.

**Table 15: Random effects test results**

Null hypothesis	Model	Chi-square	DF	Sig. level	Test result	Selected model
There is no difference in systematic coefficients.	1 <sup>st</sup> sub-hypothesis	0.718	3	0.626	H0 is accepted	Random effects
	2 <sup>nd</sup> sub-hypothesis	0.827	3	0.681	H0 is accepted	Random effects
	3 <sup>rd</sup> sub-hypothesis	0.726	3	0.625	H0 is accepted	Random effects
	4 <sup>th</sup> sub-hypothesis	0.837	3	0.654	H0 is accepted	Random effects
	5 <sup>th</sup> sub-hypothesis	0.758	3	0.689	H0 is accepted	Random effects
	6 <sup>th</sup> sub-hypothesis	0.834	3	0.691	H0 is accepted	Random effects

**Research hypotheses testing**  
**First and second sub-hypotheses testing**

Table 16 shows the results of the first and second sub-hypotheses testing.

**Table 16: First and second sub-hypotheses testing**

Dependent variable: growth stage of company from company life cycle stages				
Number of companies surveyed: 101 companies			Number of observation: 808 (year-company)	
Variable	Regression coefficient	Standard error	T-statistics	Sig. level
Constant number	-0.185	0.042	-5.411	0.0184
Accrued earnings management	-0.087	0.030	-2.874	0.049
REM	-0.045	0.023	-3.970	0.003
CEO tenure	-0.003	0.0038	-0.795	0.426
SIZE	0.0011	0.0028	4.394	0.0002
BIND	0.0039	0.0012	3.043	0.002
BSIZE	0.0036	0.0109	4.336	0.009
INST	0.0375	0.0478	0.7842	0.433
LEV	-0.1487	0.0758	-2.9621	0.0143
Coefficient of determination	0.578	F-statistics		6.236 (0.000)
Adjusted coefficient of determination	0.569	Durbin-Watson		1.969

**Sub-hypothesis 1:** Accrued earnings management has a significant effect on the growth stage of the company.

Based on statistical analysis, it should be noted that the study of the coefficient of determination of the model of the first sub-hypothesis shows that 57% of the total changes in the growth stage of companies are explained by independent variables of the research. Also, the significance of the fitted regression model shows that the value of F-statistic (6.236) is significant

and less than 1% at the significance level of 1% (sig <0.01). Therefore, the null hypothesis is rejected and H1 is accepted with more than 99% confidence level. Examination of the significance level of t-statistic of the variables included in the model shows that the accrued earnings management criterion is equal to (-2.874), which indicates the negative and significant impact of accrued earnings management on the growth stage of the company. The study of control variables also shows the company size with a t-statistic of



(4.394), the board independence with a t-statistic of (3.043), and the board size with a t-statistic of (4.336) have a positive and significant effect on the growth stage of the company, while financial leverage with a t-statistic of (-2.962) has a negative and significant effect on the growth stage of the company.

**Sub-hypothesis 2:** Real earnings management has a significant effect on the growth stage of the company.

Based on statistical analysis, it should be noted that the study of the coefficient of determination of the model of the second sub-hypothesis shows that 57.8% of the total changes in the growth stage of companies are explained by independent variables of the research. Also, the significance of the fitted regression model

shows that the value of F-statistic (9.362) is significant and less than 1% at the significance level of 1% (sig <0.01). Therefore, the null hypothesis is rejected and H1 is accepted with more than 99% confidence level. Examination of the significance level of t-statistic of the variables included in the model shows that REM criterion is equal to (-3.970), which indicates the negative and significant impact of REM on the growth stage of the company.

### Third and fourth sub-hypotheses testing

Table 17 shows the results of the third and fourth sub-hypotheses testing.

**Table 17: Third and fourth sub-hypotheses testing**

Dependent variable: maturity stage of company from company life cycle stages				
Number of companies surveyed: 101 companies			Number of observation: 808 (year-company)	
Variable	Regression coefficient	Standard error	T-statistics	Sig. level
Constant number	-0.141	0.032	-5.411	0.0144
Accrued earnings management	-0.067	0.021	-2.544	0.029
REM	-0.025	0.013	-3.970	0.001
CEO tenure	-0.003	0.0021	-0.795	0.421
SIZE	0.0021	0.0029	4.244	0.0002
BIND	0.0019	0.0015	3.058	0.001
BFSIZE	0.0026	0.0107	4.456	0.007
INST	0.0341	0.0521	0.742	0.435
LEV	-0.1487	0.0652	-2.789	0.0113
Coefficient of determination	0.628	F-statistics		5.786 (0.000)
Adjusted coefficient of determination	0.609	Durbin-Watson		1.869

**Sub-hypothesis 3:** Accrued earnings management has a significant effect on the maturity stage of the company.

Based on statistical analysis, it should be noted that the study of the coefficient of determination of the model of the third sub-hypothesis shows that 62% of the total changes in the maturity stage of companies are explained by independent variables of the research. Also, the significance of the fitted regression model shows that the value of F-statistic (5.786) is significant and less than 1% at the significance level of 1% (sig <0.01). Therefore, the null hypothesis is rejected and H1 is accepted with more than 99% confidence level. Examination of the significance level of t-statistic of the variables included in the model shows that the accrued earnings management criterion is equal to (-

2.544), which indicates the negative and significant impact of accrued earnings management on the maturity stage of the company. The study of control variables also shows the company size with a t-statistic of (4.244), the board independence with a t-statistic of (3.058), and the board size with a t-statistic of (4.456) have a positive and significant effect on the maturity stage of the company, while financial leverage with a t-statistic of (-2.789) has a negative and significant effect on the maturity stage of the company.

**Sub-hypothesis 4:** Real earnings management has a significant effect on the maturity stage of the company.

Based on statistical analysis, it should be noted that the study of the coefficient of determination of the model of the fourth sub-hypothesis shows that 62.8% of the

total changes in the maturity stage of companies are explained by independent variables of the research. Also, the significance of the fitted regression model shows that the value of F-statistic (9.362) is significant and less than 1% at the significance level of 1% (sig <0.01). Therefore, the null hypothesis is rejected and H1 is accepted with more than 99% confidence level. Examination of the significance level of t-statistic of

the variables included in the model shows that REM criterion is equal to (-3.970), which indicates the negative and significant impact of REM on the maturity stage of the company.

#### **Fifth and Sixth sub-hypotheses testing**

Table 18 shows the results of the fifth and sixth sub-hypotheses testing.

**Table 18: Fifth and sixth sub-hypotheses testing**

Dependent variable: decline stage of company from company life cycle stages				
Number of companies surveyed: 101 companies			Number of observation: 808 (year-company)	
Variable	Regression coefficient	Standard error	T-statistics	Sig. level
Constant number	-0.135	0.022	-5.251	0.0134
Accrued earnings management	-0.047	0.020	-2.524	0.029
REM	-0.025	0.043	-3.652	0.003
CEO tenure	-0.003	0.0028	-0.795	0.236
SIZE	0.0021	0.0034	4.179	0.0003
BIND	0.0049	0.0015	3.028	0.001
BSIZE	0.0026	0.0104	4.251	0.008
INST	0.0415	0.0474	0.7252	0.332
LEV	-0.1287	0.0754	-2.625	0.0143
Coefficient of determination	0.638	F-statistics		6.126 (0.000)
Adjusted coefficient of determination	0.615	Durbin-Watson		1.969

**Sub-hypothesis 5:** Accrued earnings management has a significant effect on the decline stage of the company.

Based on statistical analysis, it should be noted that the study of the coefficient of determination of the model of the fifth sub-hypothesis shows that 63% of the total changes in the decline stage of companies are explained by independent variables of the research. Also, the significance of the fitted regression model shows that the value of F-statistic (6.126) is significant and less than 1% at the significance level of 1% (sig <0.01). Therefore, the null hypothesis is rejected and H1 is accepted with more than 99% confidence level. Examination of the significance level of t-statistic of the variables included in the model shows that the accrued earnings management criterion is equal to (-2.544), which indicates the negative and significant impact of accrued earnings management on the decline stage of the company. The study of control variables also shows the company size with a t-statistic of (4.179), the board independence with a t-statistic of (3.028), and the board size with a t-statistic of (4.251)

have a positive and significant effect on the decline stage of the company, while financial leverage with a t-statistic of (-2.625) has a negative and significant effect on the decline stage of the company.

**Sub-hypothesis 6:** Real earnings management has a significant effect on the decline stage of the company.

Based on statistical analysis, it should be noted that the study of the coefficient of determination of the model of the sixth sub-hypothesis shows that 63.8% of the total changes in the decline stage of companies are explained by independent variables of the research. Also, the significance of the fitted regression model shows that the value of F-statistic (9.362) is significant and less than 1% at the significance level of 1% (sig <0.01). Therefore, the null hypothesis is rejected and H1 is accepted with more than 99% confidence level. Examination of the significance level of t-statistic of the variables included in the model shows that REM criterion is equal to (-3.652), which indicates the negative and significant impact of REM on the decline stage of the company.

## **Discussion and conclusion**

In this study, the effect of recognizing the behavioral biases of managers on the stages of company life cycle in companies listed in the Tehran Stock Exchange was explained. For this purpose, hypotheses were developed and analyzed using available information.

Understanding the decision-making process of managers and the factors affecting it plays a vital role in evaluating the company. Risky preferences and behaviors are the main foundation of managers' decisions that have important consequences on the growth, performance and longevity of the company. According to life cycle theory, the company has different capabilities during its lifetime that cause risky behavior and different functions in the stages of its life. In this way, the company maintains a different combination of resources throughout its life, and the way it interacts and manages these resources allows it to grow. However, there is one thing to keep in mind in this regard, and that is the management's attitude towards profit. Such an attitude leads to the dynamics of the company's risk-taking behavior. Sometimes the best explanation for why a manager accepts different levels of risk is nothing more than the manager's past behavior and personality traits.

When a company reaches maturity, the role of assets reflected in the balance sheet in its valuation is highlighted and its profit margin changes within a certain and predictable range. At this stage, the company shows a positive performance due to easier access to resources, increasing debt capacity, and reducing risk. The company completely loses its growth value by entering the decline stage and faces a surplus of resources that may not be able to obtain adequate returns from them. At this stage, the manager behaves risky in order to survive. How such behavior affects performance is a matter for reflection (Damodaran, 2009). In general, in relation to the effect of behavioral and ethical characteristics of managers on the emotional tendencies of investors, there is an argument that companies with managers with higher behavioral and ethical standards (ethics-oriented) that work for the interests of shareholders and society have transparency, and more accurate monitoring and planning. Also, these companies try to present a stable trend to the market and avoid creating tension in the market. With greater transparency, less decline stage is expected in this type of companies. In terms of observing the moral issues, the growth stage of these

companies should be more important and authoritative. In addition, there is an argument that in companies with managers with opportunistic behaviors and lower standards of ethics, there is a lower level of transparency and a lower level of oversight, where not much attention is paid to ethical issues and there exists less stable conditions. Also, these managers do not care about the interests of shareholders, so it is expected that they face decline in these companies. Managers do not manage earnings merely to mislead shareholders into the actual economic performance of the company. Due to the increase in capital market regulatory processes, they try to replace the manipulation of accruals with REM methods. Therefore, the company life cycle does not affect the REM.

Behavioral psychology today is not confined to the realm of recognizing interpersonal behaviors and repairing relationships, and is beyond just one field, affecting other economic, political, social, and cultural fields. In fact, recognizing the personality differences of managers in companies operating in capital markets can help investors and shareholders to better analyze their behavioral performance to better understand the situation (Dew and Xiao, 2011). Although managers are selected from among knowledgeable and experienced people in the field of company management and are expected to make rational decisions, studies show that managers' behaviors also influence their decisions (Fernandes et al., 2014). In the traditional financial economics model, it was assumed that decision makers behave rationally and always seek to maximize their desirability (Gathergood, 2012). However, empirical researchers believe that sometimes, in order to find the answer to financial riddles, one must accept the possibility that decision-makers may not behave in a completely rational manner. In other words, managers' personality traits can also be an important factor in their decisions (Yannick, 2018). Behavioral finance notifies financial and economic theorists to consider human behavior, among other variables. In fact, behavioral finance is a paradigm according to which financial markets are studied using models that abandon the two main and limiting assumptions of the traditional paradigm of maximizing expected utility and complete rationality (Ballinger et al., 2011). In fact, the CEO as a decision maker can experience cognitive biases when making decision that deprive him of making completely

rational decisions. This reduces the quality of the company's performance towards the capital market, shareholders, and investors and makes market confidence to undergo fundamental changes.

#### **Finding result**

According to the findings of the present study, based on the significant effect of different stages of the company's life cycle (growth stage, maturity and abundance) on the company's profit sharing policy, it can be concluded that companies in the growth stage of their life cycle and in the maturity stage of In their life cycle, they distribute less profit among the shareholders so that they can provide the financial resources they need to carry out production, marketing and sales operations, but in the decline phase of their life cycle, due to the stagnation in their business activities, and in order to prevent the company from depreciating and increase the ability to attract financial resources, distribute more profits among their shareholders to make their shares in the capital market attractive.

According to the findings of the present study, based on the significant effect of different stages of the company's life cycle (growth stage, maturity and abundance) on the company's stock return, it can be concluded that companies in the growth stage of their life cycle, stock returns They have less, because at this stage, companies do the preliminary production processes and their business activities, and therefore do not have much profitability to stimulate the stock market price, which causes insufficient stock price growth and insufficient return on the company's stock. Becomes. But in the maturity stage of the company life cycle, the profitability of companies increases and this issue causes the growth of stock prices and increases the stock returns of companies.

According to the findings of the present study, based on the significant impact of different stages of the company's life cycle (growth stage, maturity and decline) on the cost of equity, it can be concluded that the expectations of shareholders in the growth stage of the company's life cycle, is low because at this stage, companies carry out the preliminary production processes and their business activities and therefore shareholders do not expect high returns from the company and this causes the cost of equity for companies at this stage is low

#### **Practical implications**

In line with the results of the research, the following suggestions are made:

Suggestions resulting from the qualitative section

1. Since there is a legal gap in the Iranian capital market regarding the CEO tenure without time limit, the governance structure of companies and the board of directors are suggested to codify a specific period for the CEO tenure in their articles of association to create more transparency and mechanisms of change in the board of directors and CEO. While reducing the utilitarian motives of managers, the creation of strong anchors by the CEO is prevented and companies reduce the gap in agency costs. Accordingly, periodic evaluations of CEO decisions and disclosure of honest and reliable performance in financial reporting can help maintain the company's credibility so that the company has the reliability and competitiveness to gain more market share.

2. Companies are suggested to meet the level of expectations of the capital market and investors to maximize their wealth through the appointment of capable CEOs with managerial insights. This, while increasing the company's growth period in the direction of sustainable development, will help to achieve the effectiveness and efficiency of the company's investments in selecting projects with positive net present value, higher returns and less risk, and the company will gain an advantage over other companies in a competitive market.

3. In order to improve the quality of financial reporting, companies are recommended to consider a clear and reliable tone in order to enhance the decision-making power of shareholders, as a transparent strategy in all financial records of the company to achieve a significant level of trust and confidence in the capital market. Therefore, one of the common solutions in international markets is the use of specialized and public reporting language. The presence of financial advisors in the capital market to explain performance facts to investors in the stock market can be another creative way to disclose financial information to enhance decision-making power.

4. Finally, investors and shareholders in the capital market are suggested to be obsessed and sensitive to the use of consultants and competent brokers of the stock exchange because this issue, while helping to develop the capital market in the country's economy,

can be fruitful in creating psychological security by proper investment and protecting rights against companies. Also, the interaction of the stock exchange organization with investors and holding training courses for investment can help standardize companies' behaviors towards the capital market, while increasing the level of learning and knowledge in the field of investing in the stock market. Therefore, behaviors such as profit manipulation, both accrued and real, may be less.

Suggestions resulting from the quantitative section

1. Based on the result of the first sub-hypothesis of the quantitative part, companies are suggested to have more control over opportunistic behaviors, such as accrued earnings management, by upgrading the level of their governance mechanisms, such as increasing the size and creating independence of the board of directors or creating non-duplication of duties. In this way, while maintaining the credibility and maintaining the level of satisfaction of its shareholders, they will be more successful and more importantly competitive in selecting investment projects and using the opportunities created for investment, because the level of feedback and speed of correct information flow go higher with correct and transparent disclosure, which increases the company's growth period.

2. Based on the result of the second sub-hypothesis of the research, in order to grow and improve the level of competitiveness in the market, companies should reduce the level of manipulation by managing their real profits. Such behaviors cause a chain of bad news in the company to become a mass that is transmitted to the market at any moment by changing the conditions and rules and increases the level of risk-taking of the company, such as the risk of falling, by hiding company's news and information. Under these circumstances, companies must change their strategic approaches in a competitive market environment. Instead of distorting information by manipulating real activities, such as production or abnormal discretionary costs, they should create more investment dynamics, reduce their costs, and significantly make the level of expression of their actions more clear and transparent.

3. According to the results, company managers can identify and control the effects of different stages of the company life cycle. In addition, managers are advised to pay attention to factors, such as recognizing the behavioral bias of managers, in analyzing the

various stages of the company life cycle and include it in their analysis and evaluation. Also, it is recommended to the managers of companies to pay attention to the effect of their over-trust on their decisions and the consequences that these decisions have on the performance and return of stocks so as to make rational decisions.

4. In addition, legislators and financial policymakers are advised to support financial markets as well as the capital market to prevent disruption and instability. They are also recommended to enact laws to increase exemptions for companies that pay more attention to behavioral and ethical issues, which will motivate companies to make long-term decisions and strategies. Observers are suggested to pay more attention to issues related to the ethical and behavioral characteristics of managers and discuss the reduction of market fluctuations in order to reduce the extreme tendencies of investors, as these factors provide signals of future market failure.

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**Note**

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<sup>1</sup> Receipt of received accounts is calculated, if it is less than the standard, it has a recession and if it is higher, it doesn't have.  
<sup>2</sup> Receipt of received accounts is calculated, if it is less than the standard, it has a recession and if it is higher, it doesn't have.