

## **The effect of biorhythmic states of traders on their perceptual decisions in Tehran Stock Exchange**

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### **Abstract**

The aim of this study is to find the effect of trader's biorhythmic cycles on their perceptual decisions in Tehran Stock Exchange. According to author's point of view, decision making is one of the major factors of management skills, and in some cases, it is equivalent of management (Simon's point of view). Also considering this fact that the knowledge of psychological factors and its effects on trader's performance is necessary to recognition of behavioural models of traders on their decision making, the necessity of researcher's attempt in this field is obviously clear, because knowledge, planning and effective guidance of inside perceptions (mental black box), and behavioural biases of traders in their decision makings will lead us to develop stock market. Data in this research are collected by questionnaires and interviews. The nature of research method in this study is descriptive survey study and its purpose is practical. The results show that biorhythmic factors influence perceptual decisions of traders, and the greatest impacts are intellectual, emotional and physical cycles respectively. The other results show, as the age and experience of investors increase the use of intuitive decision making will rise. Also the investors who have higher educational degree use the most intellectual analysis in their decision makings

**Keywords:** Biorhythmic cycles, perceptual decision makings, behavioral finance, mental models.

## **1. Introduction**

Decision making is one of the most important factors in human lives and those who can make efficient and effective decisions can always lead their way toward success. Many scientists have spoken about the importance of decision making, one of the most famous is Herbert Simon; Simon believed that management is equivalent decision making and this shows the importance of decision and decision making in the organization. In this research we focus on decisions made by investors, in the stock market. It is important to note that decision making happens under different circumstances such as intellectual, emotional, physical,... ; which is the main factor in shaping the Biorhythm science. Biorhythm is a collection of intellectual, emotional, and physical curves which demonstrates different moods in human being from birth to death,[15]. As a result, considering that decision making is influenced by different moods of humans (in this case, investors), in this research, we will try to evaluate the effect of biorhythmic cycle in the decision making of stock market traders. By doing so, we will be able to determine the best circumstances and time for decision making of the investors, so that we can reach the maximum effectiveness in their decision.

## **2- literature review and background**

The Biorhythm science has affected many of the sciences for years, and it is stabilizing its position in different fields as well as management.

Biorhythm states that people have different attitudes in different times and different fields,[4]. This internal change can cause external behaviours in different field. Hence specific and scientific comprehension of these behaviours, will lead to a better understanding of people's mental black box, reactions and external behaviours. Investors show different reactions under different Biorhythm circumstances. These differences are caused by the Biorhythmic cycles,[13].

Biorhythm asserts that each person's life is influenced by three rhythmic cycles, intellectual, emotional and physical. By defining these cycles, Biorhythms makes their tasks easier. The Biorhythm science can have effective application in investor's mental decisions and also comprehension of their behavioural biases to stock market.

### **2-1- General Concepts of Biorhythm**

Each cycle of Biorhythm acts like a sinus graph. Each frequency of this wave has three different zones. First zone is the positive or highly energetic which is located about the zero point. Second zone or the negative zone is located below the zero point and has less value and energy. The third zone is the critical point which is the transition zone from positive to negative or vice versa. It is very critical to find these zones. Nowadays nothing is predictable and the nature of human emotions and physical states are drastically changing. Usually the critical moment of people's lives is these days that their cycles is transitioning from positive to negative.

Since each cycle has various frequencies, people's biorhythm curve can have a different shape each day, which needs its own explanation. When all of the individual Biorhythm curves are in the negative zone it means that the vital energy of the body is in its worst and most vulnerable shape. When facing these situations people should not trust their usual intellectual, emotional and physical reactions.[4]

Physical cycle 23 days of positive zone are appropriate for heavy physical activities, facing difficulties and diseases, eagerness to sport, willingness to travel, having a surgery, solving dental problem and ... . In the negative zones of fatigueless there is need to rest. In the critical zone, the physical stamina is questionable, there is more chance of error, and people are prone to accident and to become short temper. Emotional cycle In 28 days of positive zone, there is a tendency to be with friends and group activities, public goodwill, happiness, balance and cooperation and readiness for exams and tournaments, and having good looks. In the negative zone the reverse is dominant.

Intellectual cycle In 33 days of positive zone, we have the most active intellectual activity. New concepts are learnt very fast. Better memory function and vivid mindset are the characteristic of this period. The negative zone is a good time to stabilize what have been learnt before. In the critical zone, there is less concentration, intellectual distractions, and it is a very bad time for decision making,[8].

## **2-2- The Purpose of Biorhythm**

The purpose of Biorhythmic cycles is to determine and calculate the rhythmic cycle of people's influence of rhythm of personal moods, calculation of efficient and critical days, effective performance of activities, not doing some activities in critical times and predicting the times of weakness and strength. Based on the researches and tier results, it is determined that, considering these cycles and syncing the activities with them, the quality of life can be improved. For instance it is better to try to have the exams and important activities in the high intellectual activity zone. It should be prevented to discuss important emotional issues while in the negative zones. Nowadays even successful managers, draw the mentioned curves for their employees, so that they can refer them based on their intellectual, emotional, and physical conditions. Also employees can make decisions, evaluate and schedules on the days which they are in the positive zone,[12].

## **2-3- Decision Making and the Process of intuitive Decision Making**

What is the decision making? The answer of this question is different from various dimensions. A simple definition of decision making is "the act of choosing". The definition is choosing one option from many options which the decision maker believes will lead to the best result. Another definition is "finding the effective solution for the problem". This kind of decision making involves

process of information and finding the efficient answer. Third definition, adds “intelligence” to other definitions and by describing the function of nerves system, put the learning as a part of the decision making process.

The “mathematic” patterns are usually used when the certainty is determined and the decision making parameters are known. On the other hand the method of using cognition theory is based on solving the problem with perceptual and judgmental method. Fans of this method believe that their method is more useful in real world. In these methods (perceptual methods) the quality of decisions is mostly based on the investors’ perceptions from different phenomenon. So the better the perception they have they have higher chance to make accurate decision. On the factors that influence investor perceptions are the intellectual models that are going to be discussed in this research.

### **Mental models**

Intellectual models can be defined as a reflection of reality that decision makers use to define the received information. Intellectual models shape reasoning, definition and ultimate action. Members of a group with a shared intellectual model are involved in the same perception of team essence, rules and its connections. They also use the same language, work method and tools,[9].

The list of shared concept which makes these groups is based on mind models. One of the most important

characteristic of intellectual model is decreasing the complexity.

Hignz vicinity effect states that all the actions that we take are based on the decisions that we see in the root causes of any problem and the result of these decisions will solve the problems

### **Decision making pattern**

When evaluating the influential parameters in decision making process we focused different factors such as: 1- factors related to market, 2- factors related to the firm, 3- factors related to characteristic of decision makers.

In many researches and books worked on the structure and the pattern of decision making of relative variables to the investment and common fields. In this research in evaluating the decision making algorithm of stock market investors, which is related to their personal characteristics, we had psychological view. This view, will help us to understand what are people thinking about, how they are thinking and probably how we can influence their thought. Cognition theory states that emotions and difficulties that we faced are caused by the way we think; so by changing the thinking process investor can balance their decision making and ultimately each of these characteristics will be an effective factor in investors decision making algorithm.

### **Intuitive decision making**

intuitive decision making is referring to the rules by which people make complex decisions in uncertain situation. Decision making is not

always based on complete set of information and rational but sometimes decision makers use mental shortcuts. There are many acceptable reasons to use observational processes especially when facing time limits,[10].

#### **2-4- Background Research**

Subsidiary subjects in finance and specially in behavioural finance, studies about knowing the decision making process of investors and designing and showing their decision making pattern in the stock market, are in the uncertainty situation. The first study about investors' behaviour in the capital market was in the 1970 to 1980. The lebaron's studies, Farrelly and Gula,[6] proved that the degree of risk aversion is related to internal factors of people and does not related to the market.

The results of Lewellen's studies, Lease and Schlarbaum,[7] show that there is a meaningful relationship between age, sex and level of education and investment preferences of people.

Epstein,[3] considered the effect of social information on the real investor's behaviour. The results of this study show that the annual financial reports of companies do not have a great effect on decisions which make by investors.

Merilkas and his co-workers[11] tried to find the effective factors on real investors' behaviour in the unique capital market by using the survey method. The results of their study show that the economical and psychological factors are the main factors which are considered in buying the shares. They

found that the investors' decision makings are not completely a rational process.

Decision making about the idea, if it can be an opportunity or not, is based on Judgments are made under conditions of uncertainty and complexity. (Das and Teng,1997),[1]

- When there is not enough time for long term analysis
- When information is overwhelming
- When the problem does not sound important
- When the required information for decision making is not sufficient
- When something brings an innovative idea within the problem

Hutchison (1997), discussed about using the creativity power during the strategic decision making and how to use it for controlling the world. (Richard and Alan 2006),[14].

Spetialty approach mentions that entrepreneurs can be identified by their specific characters such as their risk taking desire, need for success and control center.

Observational approach is related to a method which entrepreneur uses for collecting, processing and evaluating the information,(Katrin, and Christian 2007),[5].

Pratkaniz (1989) did a lot of studies on the situation in which people, use their creativity power instead of systematic analysis. (Richard and Alan 2006),[14].

Cognitive tendencies of people influence their decisions about running a risky business. Although others show

that cognitive tendencies influence running the risky business. (for example Simon, Houghton and Aquino, 2000), but there is no certainty about entrepreneurs' unique cognitive tendencies, (Simon and et al, 2000)[16]

Franzoi (1996) believed that initiatives are mental shortcuts for converting the complex judgment into the simple general rules, (Richard and Alan 2006), [14].

Researches about decision making show that entrepreneurs continuously use simplifying heuristics and most of the time show the cognitive errors (Katrin, and Christian 2007), [5].

Based on one of the researches in Iran about studying the effective psychological factors on people's decisions to invest in Tehran stock exchange, one of the variables in this research is biorhythmic factors. Based on the results of this research, biorhythmic factors influence people's decisions in investing, [2].

### **3- Research Methodology**

The used method in the research is of descriptive nature and the goal for that is to be applicable in real life situation. The statistic input data for this research consists of some stock market employees, stock brokers and also some of active investors of Tehran stock market who have at least one year of experience in the field of stock market. Also incidental sample selection is used for this research. The sample size with confidence interval of 95% and with  $p=0.5$  and based on limited society formula, almost equal to 55 but in order to increase the certainty

degree in this research, 60 people from our statistic data were asked to fill the questionnaires. In this research the needed information was gathered at two stages. In the first stage the researchers gathered the research literature by using libraries, magazines and academic articles from valid websites. In the second stage the questionnaires were used to gather information. The questionnaires were made based on comparison of Likert scale. The important point in making these questionnaires is that, some of the statistic sample did not know about the biorhythm science, so the researchers first gave them a summary about the biorhythm science. In order to make sure that respondents have read the summary, the researcher put some true-false questions below the summary note. After gathering the true-false questionnaires, only those who had the minimum acceptable grade were given the main questionnaires.

### **4- Research's variables and its operational definitions**

#### **Dependant variable**

Perceptual decision making as a dependent variable is, the decisions which make the problem solving process in the observational, judgmental manner and the quality of the decision is mostly based on the perception of the investors from peripheral phenomena.

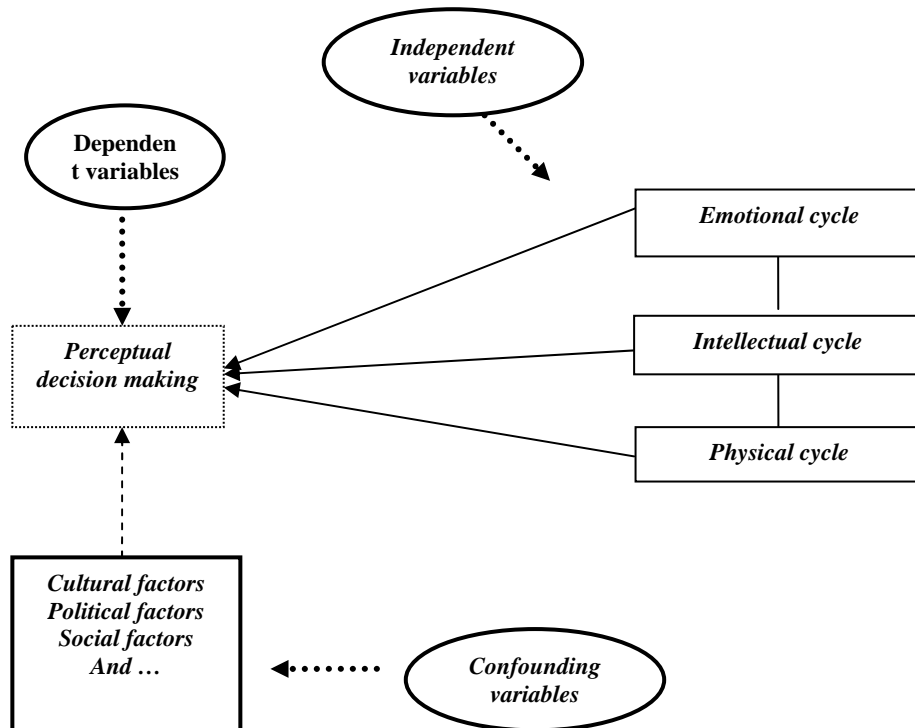
#### **Independent variable**

The intellectual cycle, the emotional cycle and the physical cycle are some of the independent variables. Each

person has three cycles, 22 days of physical cycle, and 28 days of emotional cycle and 33 days of intellectual cycle. Half of each period is positive and the other is negative.

Physical, intellectual and emotional cycles demonstrate different state of people in different times of their lives which are measure in questions 1 to 11 of questionnaires.

### 5-The research model



### 6- Research hypothesizes

#### Main hypothesizes

There is a positive and meaningful relationship between biorhythmic factors and traders' perceptual decisions in the stock exchange.

#### Sub-hypothesizes

1. There is a positive and significant relation between biorhythmic intellectual cycle and traders' perceptual decisions in the stock exchange.

2. There is a positive and significant relation between biorhythmic emotional cycle and traders' perceptual decisions in the stock exchange.

3. There is a positive and significant relation between biorhythmic physical cycle and traders' perceptual decisions in the stock exchange.

## 7- The research's results

### 7-1- descriptive results

In this research 88% of respondents were male and 12% of them were female. 68% of the sample had B.Sc. and 14% of them had M.Sc., most of the members of sample were between 27 to 35 years old. Most of them had 2

to 5 years of work experience. Based on table 1 and table 2, and the results of tests about random and normally, it is shown that, data in this research were totally random selected and the variables in this research are normal.

**Table1) Normal test results data (kolmogorof smirnof)**

<i>Normal Parameters<sup>a</sup></i>	<i>emotional.cycl</i>	<i>intellactual.cycl</i>	<i>physical.cycle</i>
Kolmogorov-Smirnov Z	1.051	.905	1.760
Asymp. Sig. (2-tailed)	<b>.220</b>	<b>.386</b>	<b>.004</b>

Test distribution is Normal.

**Table2) the results of the random test data**

<b>Runs Test</b>	<i>emotional.cycle</i>	<i>intellactual.cycle</i>	<i>physical.cycle</i>
Test Value <sup>a</sup>	3.33	3.80	<b>3.00</b>
Total Cases	60	60	<b>60</b>
Asymp. Sig.	<b>.684</b>	<b>.072</b>	<b>.500</b>

**Table 3) the results of average and standard deviations of variables**

	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>
<i>emotional.cycl</i>	3.3639	.37140	<b>.04795</b>
<i>intellactual.cyc</i>	3.7200	.37947	<b>.04899</b>
<i>physical.cycle</i>	3.3167	.83345	<b>.10760</b>

**Table 4) test results of comparing variables with a fixed number**

	<b>95% Confidence Interval of the Difference</b>				
	t	Sig. (2-tailed)	Mean Difference	Lower	Upper
<i>emotional.cycle</i>	7.589	<b>.000</b>	.36389	.2679	<b>.4598</b>
<i>intellactual.cycle</i>	14.697	<b>.000</b>	.72000	.6220	<b>.8180</b>
<i>physical.cycle</i>	2.943	<b>.005</b>	.31667	.1014	<b>.5320</b>

Test Value = 3

**Table 5) the results of correlation coefficient between independent variables and dependant variables in the research**

<b>Pearson Correlation</b>	<i>emotional.cycle</i>	<i>intellactual.cycle</i>	<i>physical.cycle</i>
<i>conceptual.decision</i>	.381**	.640**	.817**
<b>Sig. (2-tailed)</b>	<b>.003</b>	<b>.000</b>	<b>.000</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed).



All of hypothesizes in this research, were approved based on comparison with a fixed number test(table4), and the results of correlation coefficient(table5); because the sig in the test was smaller than the considered error in the research so the hypothesizes were approved with the available information.

Also by using the Friedman's ranking test the variables were analyzed (table 6). The mean of ranks for biorhythmic intellectual cycle was 2.45 and for biorhythmic emotional cycle was 1.67 and after that the variables of biorhythmic physical cycle ranked by 1.88.

**Table 6) the result of Friedman rank means test**  
Friedman Test

<i>Independent variable</i>	<i>Mean Rank</i>
emotional.cycle	<b>1.67</b>
intellactual.cycle	<b>2.45</b>
physical.cycle	<b>1.88</b>

**Table 7) the results of Friedman test**

<i>Chi-Square</i>	20.667
<b>Asymp. Sig.</b>	<b>.000</b>

**Table 8) the results of the research Hypotheses regarding the Statistical analysis**

<b>Research hypothesizes</b>	<b>Statistical test results</b>
➤ There is a positive and significant relation between biorhythmic intellectual cycle and traders' perceptual decisions in the stock exchange.	<i>The research hypothesis is not rejected</i>
➤ There is a positive and significant relation between biorhythmic emotional cycle and traders' perceptual decisions in the stock exchange.	<i>The research hypothesis is not rejected</i>
➤ There is a positive and significant relation between biorhythmic physical cycle and traders' perceptual decisions in the stock exchange.	<i>The research hypothesis is not rejected</i>

### 8) Conclusion

In this research the biorhythmic factors which affect on traders' perceptual decision makings were studied to find if there is a relation between these two factors (table 8). After that, the most effective factors were found. Based on the results of this study it is found out that the biorhythm factors, influence on the quality of

traders decision making and the most effective are intellectual, emotional and physical cycle respectively. The other result of this study is that by the age and experience of traders get more, the intuitive decision making get more also the traders' who have higher level of education use the most intellectual analyses in their decision making process. It can be inferred from the

results of this applicable study that, if the traders in the stock market have a good knowledge about their perceptual decisions and their behavioral biases and also about their different biorhythmic states, they can make the optimum decisions and this will lead to be better and more efficient stock markets.

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