Iranian Journal of Economic Studies

Shiraz University

Investigating the Recession Sustainability of Main Industries in Tehran Stock Exchange: Using Cox Regression

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Article History	Abstract
	This paper has introduced some theories and modeling methods in survival analysis and has applied the Cox Proportional Hazards Model to analyze stock survival times. The Tehran Stock Exchange fell in recession in December 2013, as it roughly persisted until the end of 2015. However, there are significant differences in the various industries in terms of the beginning and the end of recession. By the evaluation of the Bulls and Bears markets in the major industries in the Tehran Stock Exchange, the recession contexts can be identified and indicated. In the present study, the Lunde and Timmermann (2004) approach is applied to identify the situation of the different industries during the period of November 2008 to February 2016 and Cox regression is used to examine the impact of the industry type and the main macroeconomic variables affecting the Bears Market. The results indicated that since the beginning towards the end of the recession between the under-study industries, there were many differences which can be used as criteria to identify the key industries in the recession of the capital market. In addition, the results of Cox regression indicated that the type of industry and the inflation rate had a significant effect on the continuation of the Bears Market.

1. Introduction

In the financial literature, the topics of Bulls and Bears market are often used, which are significant variables in the economic and financial analyses. The information of the market situation is very crucial for investors in the financial markets and plays a role in clarifying their investment prospects. For example, the investors in a capital market who face the dynamics of the Bulls for a long time may choose the long-term investment while they would have short-term investment or nothing if they face the bear market.

The firms usually prefer to release their stocks in the Bulls markets since there is a higher quality of the stocks in the Bulls market and consequently the sales might be faster while it is very different in the Bears market (Rigobon and

Sack, 2003; and Bohl et al., 2007). On the other hand, the situation of the capital market and the industries is usually an influential factor in the identification of the economic circumstances. As Stock and Watson (2003) argued the stock prices can be used to predict the economic variables, since they are the future discounted dividends. Before them, Mitchell and Barnes (1993) considered the market as a crucial indicator of the business cycles. Despite the significance of the capital market, the identification of the market situation is also very important in different industries, since it is likely that several industries fall in the Bears (recession), while the other industries may fall in the Bulls.

Knowing the persistence of the Bulls and Bears in various industries allows the investors to make accurate decisions in determining their own investment priorities. In addition, if the stock price is seen as one of the determinant factors in the economic cycles, obviously, those industries that faced recession earlier can be seen as the determinant industries in the business cycles. In the present study, at first the market situation in 10 industries in the Tehran Stock Exchange has been identified and then it has been examined if the economic variables influence the persistence of the Bulls or Bears in these industries?

Before discussing the theoretical framework, it is better to define two common terms in the capital markets.

- Bulls market: It is a market where the stock prices are rising and hence this market is characterized by the steady rise of the stock prices in the market. In this situation, the investors believe that this incremental rise may last for a long time, thus the strong economy and high employment levels would go on.

- Bears market: It is a market where the stock price is continually falling and therefore the investments think this trend would continue for a long time. The national economy may become weak and the employment level due to the layoffs of the firms reduces.

Officially, the Bulls and Bears situation is defined in terms of stock price fluctuations between the peak and the trough situation. The previous studies (e.g. Fabozzi and Francis, 1977; Chen, 1982) simply defined the Bull market based on the excess return in a certain month compared to a threshold value. In the financial literature, there are two completely different approaches to predict the market situation. One of these approaches is parametric which is based on the rules and the other is non-parametric which is based on the modeling.

Non-parametric method requires statistical inference, as a result, implies higher clarity and more error resistant in comparison with the modeling methods (Kole and Dijk, 2010). The approach of the present study has been also non-parametric approach and included two approaches provided by Pagan and Sossounov (2003) and Lunde and Timmermann (2004). In the both approaches, first the maximum and minimum points in the time series is identified and then some rules are determined on the translocation from one situation to another situation of the stock price in the market (transition from the Bulls to the bears

or vice versa). The main rules in the approach of Pagan and Sossounov require identifying the minimum cycle and the cycle of the Bulls and Bears markets while the approach of Lunde and Timmermann considers the minimum changes of the stock price of the transition from one situation to another. According to the approach of Lunde and Timmermann (LT), in a particular industry, the Bulls mode occurs, if the industry price index increases at least λ_1 percent in comparison with the previous minimum amount. Furthermore, if the stock price index of that industry decreases at least λ_2 percent in comparison with the previous minimum amount, the Bulls mode occurs in that industry.

In order to identify the minimum and maximum amounts of the stock prices an iterative search algorithm is used which includes a peak or trough situation and its rules are as:

1. The last peak value with P^{max} is the peak stock price and then the successive periods are studied. In the next periods, the decision-making rules will be:
    i.   If the stock price index is more than P^{max} in the next periods, the value of P^{max} will be updated.
    ii. If the stock price index decreases at least λ_2 percent, the lowest value or trough situation is formed.
    iii. If none of these conditions is satisfied, there is no update in P^{max}.

2. The lowest value of the stock price index is observed with P^{min} and then the following successive periods occur:
    i.   If the stock price index is less than P^{min} in the next periods, the value of P^{min} will be updated.
    ii. If the stock price index increases at least λ_1 percent, a peak situation is formed.
    iii. If none of these conditions is satisfied, there is no update in P^{min}.

In respect to LT model[1], $\lambda_1 = 0.15$ and $\lambda_2 = 0.15$ have been taken in the present study. It means that if the stock price index is more than 15% than the last minimum price, the industry will be the Bulls and the reduction of 15% will be taken from the last maximum in the Bears.

Therefore, the threshold can be considered on the stock price changes and if the stock price is decreased or increased, it will be considered as the market stratus alteration. For example, if the stock price is more than 15% of the last previous maximum price in a certain period, it means that it is the Bears and the period of this market is measured by the time variable t as the persistence of duration.

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1. There is not a unique method to determine threshold value for identifying bull and bear market. For example, Fabozzi & Francis (1977) considers an alternative definition of bull markets based on 'substantial' up and down movements. In this definition, a substantial move in stock prices occurs whenever the absolute value of stock returns in a given month exceeds half of one standard deviation of the return distribution. Our study, like several other studies, argues that the definition of the threshold level, λ, according to the approach of Lunde and Timmermann (LT) model.

There are a few studies in which the Bulls and the Bears are assessed in the capital market. However, many studies imply relevant topics related to the current topic. Fisher (1925) was one of the earliest researchers who proposed this concern whether it is likely to posit a business cycle (recession or booming). This state is related to the time when the business cycle of the investigated series is serially incompatible. Lunde and Timmermann (2004) examined the time dependence of the stock price via modeling the Bulls and Bears dependent on the persistence of the market and the independent variables such as the interest rate. Employing the survival analysis approach, they concluded that the increase of the interest rate may increase the probability of lower stock prices. Ohn et al. (2004) examined the time dependence of the Bulls and Bears Markets in USA during July 1937 to Jun 1994. They identified the Bulls and Bears markets by using Pagan and Sossounov (2003). According to their findings, there was time dependence in both of the Bears and Bulls Markets. It means that there was the survival probability in the Bulls and Bears Market directly dependent on the presence in that situation. Jiayi Ni (2009) examined the application of the survival analysis in the Shanghai Security Market. In this study, stocks are divided into 14 sectors by industry and then a Cox Proportional Hazards Model fits for stock data in the Shanghai Security Market. The results showed that the rate of the cashes, net asset value of each share and the operative profits have direct relationships with the survival time of the stock share in the industries of Shanghai, while it has no direct significant relationship with the non-floating stocks, stock return value, profit per share. Woodward and Anderson (2009) used the logistic smooth transition market model (LSTM) and a sample of the Australian industries to examine this issue: Whether the beta index in the Bears and Bulls are different or not? The feature of their model allowed the transition from the Bulls to the Bears and vice versa and the threshold of the transition between the both states is clarified by the data. The results of their study showed that (although the beta index is not very different among the industries) there was a significant difference in the Bulls and Bears markets. Ntantamis and Zhou (2013) examined the relationship between the Bulls and Bears markets on the prices of the goods and the situation of such markets affiliated with the stocks of these goods in Canada. Their findings showed that there was little statistical evidence on the relation of the situation of the goods' market and their stock prices.

Abunoori and Moshrefi (2006) applied the monthly time-series data and the ARDL technique to evaluate the long-term balance between the inflation rate, the actual currency exchange rate and the oil price in relation with the stock index of the petroleum industry of Iran. The findings of their study showed that the variables of the inflation rate, actual currency exchange rate and the oil price had significant positive relationships with the stock index of the petroleum industry. Samadi et al. (2006) evaluated the relationship between the development of the financial markets and the economic growth in the developed and developing countries (including Iran) from 1988 to 2003. Their findings

indicated that there was no remarkable impact of the stocks market on the economic growth, however, the impact of the economic growth on stock market was significantly positive. In a study conducted by Samadi, Saeed and et al. (2006), the long-term and short-term relationships of the major economic variables have been assessed in respect to the stock price index of the Stock Exchange market of Iran from 1990 to 2004. The results of his study indicated that there was a significant relationship between most of the variables of the macroeconomics and the stock price index. This relationship in the long-term with the GDP was positive, the monetary volume was negative and the currency exchange rate and the oil incomes were both positive. The stock price index was related significantly and positively to the values of the last period which indicated that there was a positive time relationship in the stock price. Khorami (2013) examined the effective factors on the prices of the stocks of the banks in the Stock Exchange market of Tehran from the Winter 2003 to the Summer of 2012 and he concluded that there are always factors which positively affect the stocks of the banks and the macroeconomic factors, e.g. currency exchange rate and the monetary volume which variably affect the long-term and short-term stock prices of the banks. The deferred debts of the banks have no significant impact on the stock prices of the banks in the long-term as the inner firm variable.

Since Bull and Bear markets are important concepts used in both industry and academia, we have selected survival analysis and have used Cox regression model for the identification of Bull and Bear regimes for Tehran stock exchange market for the first time in Iran.

This paper is organized as follows: Section 2 describes the data and benchmark model and develops our proposed specification. Estimation and model comparison are discussed in Section 3 while section 4 presents results including parameter estimates, probabilistic identification of Bull and Bear regimes, and an analysis of the economic value of our proposed model through market timing strategies.

2. Data and Model
In the present study, the data samples of the stock prices of the active industries in Tehran Stock Exchange (i.e. the daily stock price information since November 2008 to February 2016) including (1) banks, credit institutions and other financial institutions, (2) basic metals, (3) chemicals, (4) conglomerate industries, (5) telecommunications, (6) metal ores mining, (7) petroleum, coke and nuclear fuel, (8) automotive and parts manufacture industry, (9) cement, lime and plaster manufacture, and (10) the investments, were collected from the Financial Data Processing Center of Iran and then the average monthly price of the stocks in these industries was calculated by using these information.

The reason for choosing these 10 industries was that these industries hold nearly 90% of the securities of the Tehran Stock Exchange Market. Then, by using the approach of Lunde and Timmermann (2004), as described in the

previous section, the market situation is clarified for these industries during different periods and the continuation of each monthly situation is measured, as well. Then, the descriptive analysis is used to compare the continuation of the Bulls and Bears markets in these industries based on the nominal and actual stock price index. In order to calculate the real stock price index in these industries, the nominal price index was divided by the total consumer price index.

Then, the survival analysis approach is used to assess the variable impacts, e.g. economic growth, exchange rates, quantity of money, inflation rate and the type of industry on the persistence of the market situation. In order to separate the industries from each other, the dummy variable is used. Therefore, the research model can be shown as:

$$\text{Survival Time} = \beta_0 + \beta_1 \text{exchange. rate} + \beta_2 \text{oilprice} + \beta_3 \text{growth} + \beta_4 \text{inflation} + \beta_5 M1 + \beta_6 X1 + \beta_7 X2 + \beta_8 X3 + \beta_9 X4 + \beta_{10} X5 + \beta_{11} X6 + \beta_{12} X7 + \beta_{13} X8 + \beta_{14} X9 + U_{it} \tag{1}$$

The survival time indicates when an industry would be posited in the Bulls and Bears market. The dummy variables, X1 to X9 are applied to assess the impacts of the type of the industry on the persistence of the market situation. The variable "exchange rate" is the nominal exchange rate in the market, "oil price" is the oil price variable, "growth" is the economic growth rate, M1 is the monetary volume, and "inflation" is the inflation rate. The logic of the application of these variables is based on the assets maintenance theory in the investment basket or the portfolio theory. According to this theory, the individuals in their financial assets basket in addition to the securities and stocks have varieties of caches, banking deposits, currency, gold, etc., therefore any fluctuation in any asset can affect the stock price index. Any change of such assets is seen as the opponents' assets and security alternative in the investors' assets basket, in which the security demand in the assets basket is affected and thus affects the stock price index (Sharp, 1995).

In order to analyze the data, the survival analysis method is used. The survival analysis is used to examine and study the continuous period of the unemployment, war, marriages, insolvencies, birth intervals, consistence period with new technologies, etc. In fact, in this approach, time is an event. One of the topics in this approach is whether the persistence probability of a certain situation or mode is dependent on the cycle of that event or not. If this issue is satisfied, there is time dependence in the event. In practice, in order to analyze this situation (Bulls or Bears Market) four functions are used: Cumulative distribution function, failure density function, survival function and hazard function. The cumulative distribution function is formulated in Eq. (2) as:

$$F(t) = P(Tt) \tag{2}$$

Where T is a random variable indicating the time spent in a particular situation. The corresponding density function of this function is shown with f (t)

with the differentiation of the distribution function. The density function represents the probability of the occurrence of an event at time t. The complementary of the cumulative distribution function is called survival function, as it shows the probability that the target event does not occur at time t and can be represented in Eq. (3):

$$S(t) = 1 - F(t) = P(T \geq t) \tag{3}$$

S(t) is a non-increasing function at the origin time with the value 1 and as the time passes, it tends towards zero. The relationship between failure rate and time is determined by the hazard function. The hazard function emphasizes the conditional probability. This function calculates the probability of the repetition of the previous point. For example, the hazard function shows the risk of the Bulls market for several months. The hazard function in Eq. (4) can be expressed as:

$$\lambda(t) = \Pr(T = t | T > t) = f(X, \beta) \tag{4}$$

In this function, X matrix includes the independent variables and the vector coefficient, β. It is expected that the independent variables affect the hazard function. After a few simple conversions, λ(t) can be interpreted as the density function of the survival function at the time t:

$$\lambda(t) = \frac{f(t)}{S(t)} \tag{5}$$

In other words, this function shows the probability that failure is likely to occur at the time t, supposing that any failure does not occur until that time. It is notable that the hazard rate depends only on the change of the model. When the time changes, the hazard rate can increase (positive time dependence), decrease (negative time dependence), be fixed or intermittent. The possible values of the hazard function varies from zero (if the probability of failure is zero) to infinite (if the failure is inevitable at that moment). In practice, there are three general methods for the estimation and the analysis of the survival patterns: 1. Non-parametric method, 2. quasi-parametric method, 3. parametric method. These methods include the survival functions and the manner, in which the survival rate is affected by the independent variables, which are essentially different. Cox regression method (1982) which is a common method for this situation suggests a hazard function being calculated by using Eq. (6):

$$\lambda(t, X, \beta, \lambda_0) = \exp(X'\beta)\lambda_0(t) \tag{6}$$

The advantage of this equation is that the non-negative coefficient φ does not incur specific conditions on the coefficients β. Therefore, the probability function can be estimated with the standard methods. The probability function is calculated in Eq. (7):

$$L(\beta) = \prod_{i=1}^{n} \frac{\lambda_i(t, X, \beta, \lambda_0)}{\sum_{j>i} \lambda_j(t, X, \beta, \lambda_0)} \tag{7}$$

Accordingly, this formulation of the hazard (transition risk from one market to another) is calculated by Eq. (8) as:

$$\frac{\lambda(t_1, X_1, \beta)}{\Sigma_{i>j}^n \lambda(t_1, X_1, \beta)} = \frac{\varphi(X_1 \beta)}{\Sigma_{i>j}^n \varphi(X_1 \beta)} \tag{8}$$

Hence, the probability function only depends on the β coefficient vector and it is not needed to improve the function of the hazard rate. Therefore, Cox probability function in Eq. (9) will be as the following:

$$L(\beta) = \sum_{i=1}^n \{ \ln\varphi(X_i, \beta) - \ln[\Sigma_{i>j}^n \varphi(X_j, \beta)] \} \tag{9}$$

$$\varphi(X_j, \beta) = \exp(X', \beta) \tag{10}$$

    If this general situation is expressed in the frame of the survival model of the stock price, it should be said that the stability of the Bears market in an industry, i.e. the onset of the Bears market until the termination of this situation, is interpreted as survival in this market.

3. Results

By using the approach of Lunde and Timmermann (2004), the market situations of 10 industries were identified during the period under the survey. If we consider the recession situation of the capital market in late 2013, it will be clear that the Bears (recession) is not initiated in all industries simultaneously.

Table 1. Evaluation of the last recession situation of capital market via the separation of the industries in terms of the beginning and the end of the recession

Industry	Beginning of last Bears Market	End of last Bears Market
Automotive	February 2014	December 2015
Chemical	January 2014	February 2016
Cement	February 2014	February 2016
Basic metals	February 2014	February 2016
Investments	February 2014	February 2016
Metallic minerals	January 2014	February 2016
Conglomerate industries	February 2014	November 2015
Oil	January 2014	February 2016
Radio	January 2014	July 2015
Bank	February 2014	July 2015

    According to Table 1 and the definition of recession (Bears Market), the recession veils the capital market at the end of 2013, where the oil, chemical, metal and radio ore industries were prioritized subject to recession in December 2013 (Bears Market). Hereafter, the other industries, including banks, automotive, cement, conglomerate industries and basic metals and the investments in the recession were studied. Thus, if there is any tendency that we could attribute the recession to one of these industries, certainly certain

industries, e.g. oil, chemical, metal and radio ores depict some specific higher priorities of the origin of the recession.

In addition, in this table, the Bears market ends in the both banking and radio industries primarily, then the industrial conglomerates depict the end of the recession, and afterwards, the automotive industry left the recession and the other industries left the recession in February 2016 under survey.

According to the length of the boom and recession period, the mean and the standard deviation of the Bulls and Bears markets are calculated. These calculations are counted on the nominal and actual stock price index. In Tables 2 and 3 and also, Figures 1 and 2 the descriptive results of the market situation in various industries which are calculated by Stata software are shown.

Table 2. Duration of the booming and recession periods (monthly) via the separation of the industries on the nominal stock price index

Industries ↓	The Bulls (boom)			The Bears (recession)		
	Mean	Standard deviation	Coefficient of variation	Mean	Standard deviation	Coefficient of variation
1. Automotive	4.60	6.96	0.66	3.21	4.46	0.72
2. Chemical	19.9	18.06	1.10	1.42	3.56	0.40
3. Cement	18.37	18.46	1.00	3.64	6.72	0.54
4. Basic metals	20.4	19.44	1.05	3.58	6.87	0.52
5. Investments	19.85	18.99	1.05	2.76	5.63	0.49
6. Metallic minerals	19.26	18.79	1.03	3.91	7.15	0.55
7. Conglomerate industries	20.76	18.24	1.14	1.09	2.92	0.37
8. Radio	13.67	12.55	1.09	0.91	2.35	0.39
9. Banks	7.61	8.92	0.85	2.87	4.65	0.62
10. Oil	6.98	8.66	0.81	3.58	6.29	0.57

In respect to the nominal price of stocks in all industries under survey, the average duration of the Bulls market was more than the Bears market. In the conglomerate industries in comparison with the other industries, the duration of the Bulls market is far more than the Bears market. However, in the automotive industry in comparison with the other industries, this difference was much lesser.

According to the nominal price of the stock index in the industries, it can be concluded that the purchase of the stocks of the conglomerate, chemical and investment industries have had higher priorities, while the purchase of the stocks of the automotive industry, oil and banking industries have had lower priority than other industries.
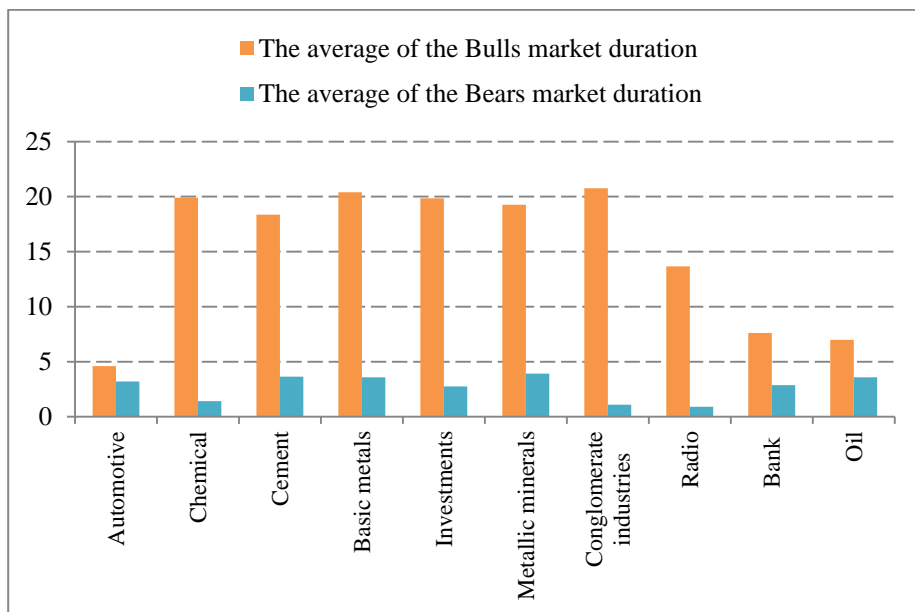
Figure 1: Comparison of duration of the Bears and the Bulls based on the nominal stock price index of the industries

Table 3. Duration of the period of boom and recession (monthly) via the separation of the industries on the actual stock price index

Industries ↓	The Bulls (boom)			The Bears (recession)		
	Mean	Standard deviation	Coefficient of variation	Mean	Standard deviation	Coefficient of variation
1. Automotive	4.01	6.64	0.60	5.7	7.31	0.78
2. Chemical	19.17	18.7	1.03	3.02	6	0.50
3. Cement	4.7	6.42	0.73	5.5	7.06	0.78
4. Basic metals	6.08	8.83	0.69	4.53	6.66	0.68
5. Investments	4.47	7.02	0.64	6.5	7.58	0.86
6.Metallic minerals	5.22	6.99	0.75	5.5	7.3	0.75
7.Conglomerate industries	5.87	7.29	0.81	4.19	6.05	0.69
8. Radio	2.25	3.77	0.60	6.45	7.61	0.85
9. Banks	6.27	8.83	0.71	3.71	5.08	0.73
10. Oil	4.46	6.06	0.74	4.70	6.99	0.67

Although the nominal prices of the stocks provide much information on the stock market, it is possible that the stock price changes result from the changes of the index of all prices in the national economy. It is even possible that the stock price index increases less than the index of all prices and thus the lack of

the price changes in the economy will be considered and the decisions are made based on incorrect results on the nominal price and it will mislead the investors. In this event, the actual indicator of the stock prices can be helpful by dividing the nominal stock index on the consumer price index.
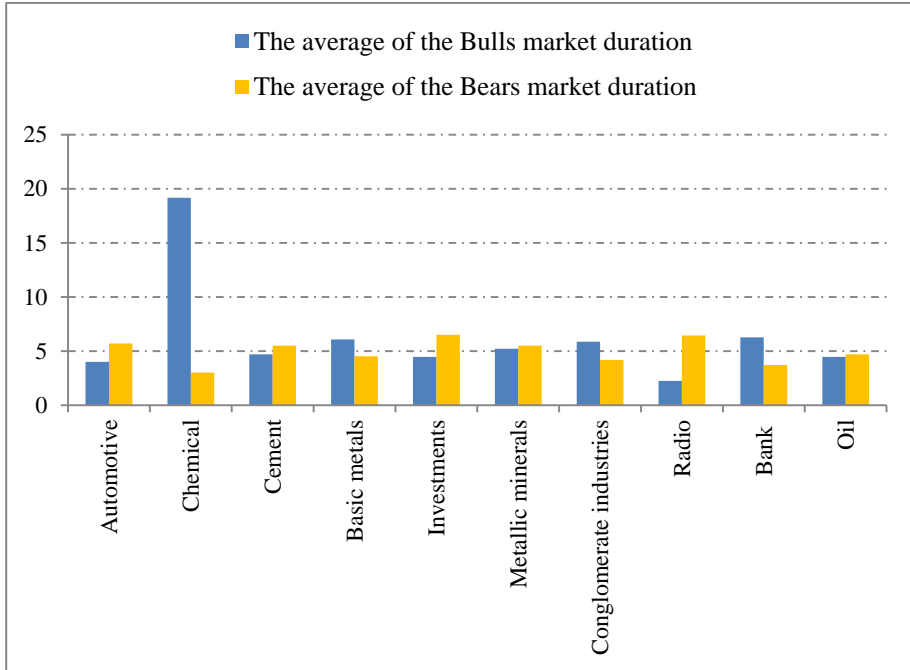

Figure 2: Comparison of duration of the Bears and the Bulls based on actual stock price index of the industries

According to Figure 2, during the financial period of 2008 to 2015 in the chemical, basic metals, conglomerate industries and banks, the average of the Bulls market duration is more than the mean during the Bears market. In other words, in those periods the actual stock price index of these industries are rising and the market booming is longer. However, the oil, radio, automotive, metal ores, investment, cement and automotive industries face longer periods of the Bears market than the Bulls market and therefore there would be longer recession in these industries. Here, according to the literature, the effects of the macroeconomic variables on the persistence of the recession in these industries are examined employing Cox regression method.

Table 4. Assessment of macroeconomic variables and types of industries on persistence of the Bears market by using Cox regression method

	Variables	**Hazard rate**	**Standard deviation**	**Z-statistics**	**Significance level**
Dummy variables	Automotive	8.95	7.90	2.48	0.013
	Chemical	10.88	9.19	2.83	0.005
	Cement	5.25	4.82	1.81	0.071
	Basic metals	12.09	11.89	2.53	0.011
	Investments	7.03	6.52	2.10	0.035
	Metallic minerals	7.24	6.67	2.15	0.032
	Oil	4.09	3.24	1.78	0.075
	Conglomerate industries	7.73	7.00	2.26	0.024
	Radio	3.34	2.38	1.70	0.090
	Bank	7.69	8.51	1.84	0.065
Macroeconomic variables	Oil prices	1.01	0.01	0.88	0.380
	nominal exchange rate	1.00	0.00	1.41	0.160
	Money volume	1.00	0.00	-2.43	0.015
	Inflation	0.46	0.18	-1.98	0.048
	Economic growth	1.00	0.04	0.12	0.907

Since there is no intercept in the Cox regression, it is likely that there is no concern on the dummy variables, thus there is a dummy variable in the modeling of each industry. It is notable that the higher hazard rate means an increased risk of events and the lower hazard rate means that there is a reduced risk of events. The results of Cox regression showed that the basic metals, chemical, and automotive industries are the three industries which were more likely to continue recession compared with other industries, while radio industries, oil, and cement industries were likely to face relatively less recession than other industries under survey.

Among the macroeconomic variables, only the effects of exchange rate and inflation rate on the persistence of the hazard rate of the Bears market in the industries were significant. Nevertheless, as the hazard coefficient ratio was equal to 1 for the nominal exchange rate, it means that the hazard rate remains constant and, when the variable changes, the risk of constant recession would not increase or decrease. However, the inflation rate had a negative impact on the persistence of the Bears market.

4. Concluding Remarks

The purpose of the present study was to assess the Bears and Bulls situations for 10 major industries in the Tehran Stock Exchange. By using Lunde and Timmermann approach, the situations of the industries during the financial

period of 2008 to 2015 have been identified. In this approach, in order to identify the market situation, at first, the threshold of the stock price changes is determining and if the stock price decreases more than the previous maximum threshold value, the market situation changes from the Bulls to the Bears and if the stock price increases more than the previous one minimum threshold, the market will change from the Bears to the Bulls. It is not necessary that the both thresholds to be the same.

Also, in the present study, the both thresholds were considered equal to 0.15 and therefore there was a similar outlook on the incremental and decrementing price. After the situation of the industries has been identified during the different periods (monthly), the industries have been measured. The descriptive analysis of the survival period of the Bears market is depicted based on the actual stock price where the chemical industry in average has been longer in the Bulls market and shorter in the Bears market than the other industries. However, the situation was quite different for the automotive radio industry which had longer Bear market.

In addition, by considering the nominal price as a benchmark, it would be possible to reach to quite different conclusions. However, the radio and automotive industries confront very different circumstances than the other industries, where they were longer in the Bears market on average. Nevertheless, regarding the nominal price as the decision-making measure, the very different results can be obtained. In this event, the conglomerate industries face longer Bulls and shorter Bears compared to the other industries. Though, in this event, the automotive industry faces shorter Bulls and Bears compared to the other industries. In addition, the results of the present study showed that counting the recent recession of the capital market, chemical, oil, radio and metal ores compared to the other industries faces recession sooner than the other industries and the radio, chemical and conglomerate industries first left out of the recession.

The data analysis results via Cox regression showed that in general during the period of November 2008 to February 2016, the type of industries affect the persistence of the Bears market and among the macroeconomic variables the inflation rate has had a negative impact on the persistence of the Bears market. According to the results of the study, the following recommendations can be mentioned:

1. Since the Bull market shows a boom in stock prices, and the chemical industry is more likely to be in Bull market situation based on the real prices of Bull market, it seems to be more profitable in terms of buying stocks in these industries. Because the Bull condition continues, expectations of rising prices also increase.

2. Since the automotive industry faces longer Bears market than the other industries, the purchase of the securities/stocks of these industries is not recommended for the investor.

3. It seems that among the industries under study, oil, petroleum, chemical, metal ores and radio industries are the initiator of the recession in the capital market, since they have faced recession earlier than the other industries. Since these are the industries dependent on the foreign trade, it seems that they are influenced by the economic sanctions. However, regardless of the recession reason in these industries, the role of these industries should be considered in the beginning of the recession in the capital market.

4. Another point of obvious interest from an asset pricing point of view is whether long run portfolio performance can be improved by accounting for the duration dependence reported in this paper. The finding that Bull markets are particularly fragile when they are relatively young while Bear market hazard rates increase as a function of duration should be useful information for stock market investors.

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