Least Square Support Vector Machine based on genetic algorithm for credit risk evaluation

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Abstract
One of the most important problems that banks and financial institutions always deal with is credit risk or the uncertainty in counterparty’s ability to meet its financial obligations. The significant amount of bank’s outstanding claims in all over the world shows the importance of this issue. Hence recently so much effort has been taken to develop an efficient model for the credit admission decisions. This study tries to apply a least square support vector machine based on genetic algorithm (Ga-LSSVM) to evaluate credit risk of obligators. A German dataset in UCI database is used as an experimental data to demonstrate the effectiveness and accuracy of Ga-LSSVM classifier. The results of the proposed method is compared with statistical methods including logistic and probit models and also with results of other studies which had been used the same dataset. The experimental results show that the proposed LSSVM classifier based on Ga for parameter and feature selection can produce promising classification results in credit risk evaluation, relative to other classifiers listed in this study.

Keywords: Credit risk, least square support vector machine, Genetic algorithm, Feature selection

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Mutual funds return forecast by artificial neural network approach

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Abstract
Prediction the returns is a kind of complex concepts and interests for investors and decision makers. Various models have been proposed to predict the returns. This study compares the predictive power of regression model using panel data as a linear model and predictive power of artificial neural network as a nonlinear method. Therefore 13 factors effecting mutual fund is identified.

To test the hypotheses of this research, data related to 30 active mutual funds in Iran capital market during 2011 to 2013 (monthly) is investigated to predict return using liner and nonlinear method.

The result shows that mutual fund return is predictable to some extent by using mentioned models and both methods include Least squares regression and artificial neural networks can predict the mutual funds return, but the artificial neural networks performance is more efficient. Also the Paired t-test shows that mean predicted returns and mean actual returns are not significantly different.

Key words: Mutual Funds - Artificial Neural Networks - Return

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The exploration of affective factors on price bulb in Tehran exchange

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Abstract

The Tehran exchange after reopening in 1368, has been undergone fluctuations during its activities that these fluctuations often were market inherent and indicate what it has happened in the markets. But sometimes the market reacts suddenly. Perhaps the decline of share market in 1383 was one of these reactions. In this research we explore the price bulb in public companies in Tehran exchange. Firstly by using of Box Jenkins method, we estimate the residual of model and based on model residual, the continuum, skew and unit root has been used that the price bulb have been occurred during 1383 to 1388. Then by testing price bulb, all of companies that have been undergone to high growth and decline of price in exchange are divided to 2 companies. One without bulb and other one with price bulb. In order to prediction of bulb, the independence variables inside of companies like company size, shareholders demography, P/E ratio, information transparency and liquidity speed have been used. In the next step, by using of binary logit and probit regression method, a model has been designed for the prediction of price bulb. For model reliability, the data 6 months before bulb expression have been used. The test of hypothesis show that there is no significant relationship between independent variables (company size, shareholders demography, P/E ratio, information transparency, liquidity speed) and price bulb, except 2 companies inherent independent variable (share floatability and company size).

Keywords: exchange Tehran, price bulb, liquidity speed, information transparency, share floatability, company size

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Asymmetric and Structural Changes Modeling of Financial Time Series with Markov-switching GARCH Processes

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Abstract
This paper introduces Markov-switching (MS) GARCH processes for capturing the skewness in the distribution of financial time series. The model class is motivated by the fact that empirical return distributions characterized by significant asymmetries, but the generic assumption of return distributions is Normal. The out of sample performance of symmetric and asymmetric MS GARCH models is compared in an application to Tehran exchange price index (Tepix). Finally, to put the Regime-switching models into perspective, we add to the list of competitors a popular model which may serve as a benchmark, i.e., the single-regime GARCH(1,1). It turns out that asymmetric MS GARCH processes perform best overall.

Keywords: Volatility, Markov-switching, Mixture models, skewness, GARCH, Value at Risk

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Abstract

The present study has been examined the causal and contemporaneous relations stock returns, trading volume and return volatility using of VAR-GRJ-GARCH and GRJ-GARCH-DCC multivariate models. To estimate contemporaneous relations stock return and trading volume, rather than a single stage procedure, was used the two-stage procedure, which will prevail to definite numerical problems that often arise in estimating of Multivariate GARCH models. In the first and to respond to the first hypothesis, by using a VAR model (but not standard), positive evidence was apparent of causality of trading volume to the stock returns. Reviews of second and third Hypothesis confirmed that, respectively, there is bi-directional causality between stock returns and trading volume and positive causality of return volatility to the trading volume. The result of fourth hypothesis that using the VAR model's residuals in the conditional variance bivariate model, in 10% level shows the significant positive causality of past trading volume to the return volatility. In the reviews of contemporaneous relationship between returns and trading volume, results of AR(1)-MGRJ-GARCH(1,1)-DCC model, indicates the positive correlation coefficient and significant at the 1%. Research findings about the sixth hypothesis indicating that, respectively, by increasing or decreases in privatization in the studied periods, that meets data published by the Privatization organization, contemporaneous relationship between stock returns-trading volume does not increase or decrease; and Even in most periods, contemporaneous relationship between these two variables is not necessary significant. Finally, the findings strongly support the existence of an abnormal distribution in Tehran Stock Exchange.

Keywords: Stock Return, Trading Volume, Return Volatility, Causal and Contemporaneous Relation, MGRJ-GARCH, VAR, DCC

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Day of the Week Effect in Stock Returns by using Least Mean Square (LMS) Algorithm Regression

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Abstract
This paper propounds to examine the day of the week effect on the returns of daily stock price entire index, in Tehran Stock Exchange market during 1383 to 1388 and 1389. Various approaches have been presented for investigation about calendar effects on stock returns. We apply "Least Mean Square (LMS) Algorithm Regression". In fact, Least Mean Square (LMS) Algorithm Regression avoids the classification of dummy variables to values of one and zero, as we do in the traditional statistical and econometric methodology. The paper concludes that during 1383 to 1388 will lead to a positive effect on the returns on Sunday and in the course of 1389, there is no efficiency significant.

Keywords: LMS, Square (LMS) Algorithm, Regression, day of the wee
The estimate and evaluation of value at risk in forex market

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Abstract
The purpose of this study is estimating and evaluating the value at risk in forex market. For this purpose based on logritme of Euro/Dollar ratio the value at risk were estimated to three methods: Parametric, Historical and Montecarlo, Simulization from 12/10/2004 to 12/3/2009 in time periods 3, 6, 9, 12, 36 months and in confidence level 90, 95, 99 percent. The results of multi-variable tests demonstrated that there is no significant difference in value at risk average based on three methods and the confidence level and multi-time periods on two currency Euro and dollar. The results of back tests demonstrated that validity of calculations for the minimum value at risk is not confirmed but for the maximum value at risk is confirmed.

Key words: Forex market, Value at risk, Euro/Dollar ratio, Parametric, Historical and Monte Carlo
Evaluating the Performance of Tehran Stock Exchange Companies by the Revised Sharp Ratio

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Abstract
Initially In this study, we introduce a new index called Revised Sharp (R-Sharp) for evaluation of portfolio in investment companies in Tehran Stock Exchange, and then examine this index were compared with the Sharp index. In the R-Sharp index, value at risk concept was used due to the properties of VaR and its application in the international financial institutions.

The results indicate that the VaR calculation by GARCH is not applicable since time series data have not heteroscedasticity. Therefore, VaR was calculated for 10 investment companies by RiskMetrics method with $\lambda=0.94$ in coefficient level at 99.9%, 99% and 95% for 1-day and 10-day. In order to assess the accuracy of VaR calculation, the Wilcoxon signed ranks test was utilized. The results indicate that VaR Backtesting at 95% and one-day period for all companies, were reliable.

In this study, after calculating VaR and VaR Backtesting, R-SHARP and SHARP indexes calculated for the period of study (2007-2010). The results show that there are some differences in the ranking of R-SHARP and SHARP indexes. So we tested the difference of R-SHARP and SHARP indexes by nonparametric tests such as Wilcoxon signed ranks test. Results of these tests indicate that slight insignificant differences of indexes.

Key Words: Revised Sharp ratio, Sharp ratio, Value at Risk, VaR Backtesting, GARCH, RiskMetrics

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