UNACCEPTANCE OF RISK OF INVESTORS IN CASE OF TRADE IN OPTIONS

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Introduction

The stock market forms a capital movement basis, creating a market mechanism of its regulated redistribution in the most actual industries of economy by work with securities. Research of the stock market is vital need for Russia, it provides the economic growth on which the destiny and greatness of our country, its place in the world community depends.

The securities portfolio is a set of various financial instruments and assets which strongly differ on the indicators of risk and profitability and the set bring the maximum profitability in case of minimum risks. In practice in case of creation of a portfolio periodically there is a need of hedging (restriction) of risk of this or that event in the market attracting negative change of portfolio return. One of the financial instruments allowing to limit future losses by refusal of future superprofit are stock options.

The contract signed between two partners according to which one of them grants another the right to purchase a certain asset on fixed price within the set period of time (call option) is called as an option or grants the right to sell a certain asset on fixed price within the set period of time (put option). The investor during real time shall make the decision on an investment to them financial resources in risk or risk free assets for the short-term or long-term period. It is known that each investor gives in to some risk in case of an investment of the means. Considering a variety of human nature and the existing external factors, we can divide professional participants of the stock market into risk - neutral, preferring or denying risk. Therefore, these or those actions of investors have impact on liquidity or trade volume securities.

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In this work unacceptance of risk of investors is calculated. That is tendency of consumers and investors to acceptance of this or that finance solution in the conditions of risk. The coefficient which helps the investor to make the decision on an investment to them financial resources in risk or risk free assets for the short-term or long-term period, and also allows to divide set of professional participants of the stock market into risk - neutral, preferring or denying risk, is called as coefficient of unacceptance of risk and is designated a_t. We will remove a formula for calculation of coefficient of unacceptance of risk. Let

$$\zeta_T = \exp\left(\int_t^T \frac{\mu - r}{\sigma} d\omega - \frac{1}{2}\int_t^T \left(\frac{\mu - r}{\sigma}\right)^2 dt\right)$$

- Girsanov's multiplier. It is known [2] that for options of the European type it is calculated as

$$\zeta_T = c\left(\frac{S_T}{S_t}\right)^{-a_t}, \text{ где } c = \exp\left(\frac{(\mu - r)(\mu + r - \sigma^2)(T - t)}{2\sigma^2}\right)$$

It is known [2] that

$$Ln\frac{S_t}{S_{t-1}} = \lambda X_t,$$

λ – depth of the market. As

$$Ln\left(\frac{S_T}{S_{T-1}} * \frac{S_{T-1}}{S_{T-2}} * \ldots * \frac{S_{t+1}}{S_t}\right) = Ln\left(\frac{S_T}{S_t}\right)$$

$$Ln\left(\frac{S_T}{S_t}\right) = a_t Ln\frac{\zeta_t}{c}$$

Let

$$a_t = Ln\frac{\zeta_t}{c},$$

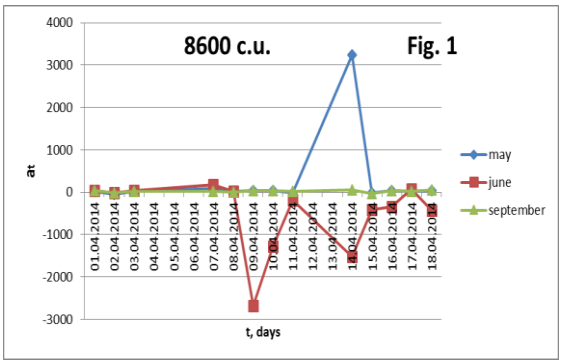
Then

$$a_t = \frac{1}{a_t} Ln\frac{S_T}{S_t}$$

The case of a_t=0 determines risk - the neutral condition of investors, a_t>0 determines prevalence of investors inclined to risk, and a_t<0 – prevalence of the investors denying risk.

In work the historical data for April, 2014 of quotations of the euro options "call" of the Taiwan stock exchange of TAIFEX which are in an open entry (www.taifex.com.tw) were used. a_t coefficient for options with strikes of 8600 c.u., 8800 c.u. and 9000 c.u., performed in May, June, September was calculated.

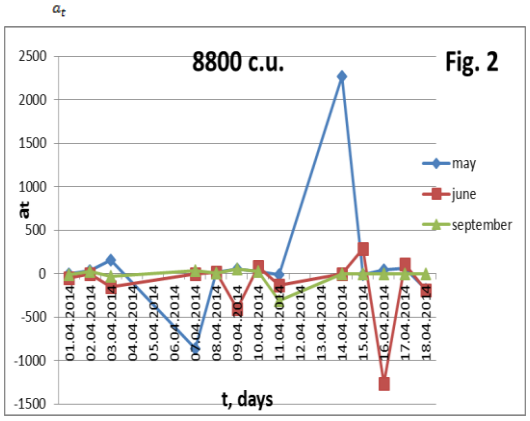
From the schedule (fig. 1) it is visible that value of coefficient of unacceptance of risk for a strike of 8600 c.u. is included into an interval [-3000; 4000].



Investors were interested in purchase of May options, were afraid of risk upon purchase June and were positively adjusted upon purchase of September options.

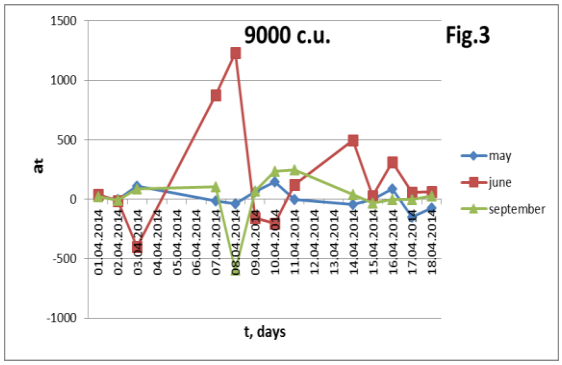
It is also possible to draw a conclusion that investors aimed to purchase on April 9 June options, and on April 14 to sell May options and to sell the also June. In other all the time in the market presence of the long-term investors who aren't making any actions is traced.

a_t value for an option with a strike of 8800 c.u. (fig. 2) is included already into much smaller interval [-1500; 2500].



For options with different completion dates investors behave differently. For example, 14.04.2014 investors of May options were predisposed to risk while investors of June and September options were neutral to risk. It is possible to notice that for the end of month denial of risk is observed. Also we will draw a conclusion that on April 7 investors had a desire to purchase May options, on April 9 and 16 – to purchase June options, and on April 14 – to sell May options.

As for options with a strike of 9000 c.u., it is visible (fig. 6) that a_t varies in an interval [-1000; 1500].



It is possible to draw a conclusion that on April 3 and 10 investors aimed to purchase June options, on April 8 to purchase September and to sell June options. Also the desire to sell June options was observed on April 14 and 16.

Analyzing the obtained data, it is possible to notice that similar high activity of investors is observed on April 7 - 9. Because hyperactivity of the investors wishing to purchase or sell options was revealed, we will calculate profit which we can receive by results of transactions: upon purchase and sale of the options which are performed in May, June, September with various strikes. In total amount it was succeeded to earn 18% upon purchase and sale of options with a strike of 8600 c.u., 25% upon purchase and sale of options with a strike of 8800 c.u. and 16% upon purchase and sale of options with a strike of 9000 c.u.

Conclusions

Calculation and the comparative analysis of size of unacceptance of risk in case of various strikes was carried out and with different completion date. The maximum profitability according to transactions is calculated. It didn't exceed 18% on options with a strike E = 8600 c.u., 25% - with a strike E = 8800 c.u. and 16% - with a strike E = 9000 c.u. On the basis of these calculations high activity of investors which was connected later with the political events on April 7-9, 2014 occurring on Taiwan was revealed. It is revealed that with growth of strike price the number risk - neutral investors decreases. Besides, than some of option, that investors become more sensitive to risk.

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