CMC MSU IPI RAN PTMS PFUR

XXXI International Seminar on Stability Problems for Stochastic Models

and

VII International Workshop "Applied Problems in Theory of Probabilities and Mathematical Statistics Related to Modeling of Information Systems"

and

International Workshop "Applied Probability Theory and Theoretical Informatics"

Book of Abstracts

2013

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23 – 27 April
Moscow, Russia

Book of Abstracts

Edited by
Prof. Victor Yu. Korolev and Prof. Sergey Ya. Shorgin

Moscow
Institute of Informatics Problems,
Russian Academy of Sciences

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XXXI International Seminar on Stability Problems for Stochastic Models (ISSPSM'2013), VII International Workshop "Applied Problems in Theory of Probabilities and Mathematical Statistics Related to Modeling of Information Systems" (APTP + MS'2013) and International Workshop "Applied Probability Theory and Theoretical Informatics" . Book of abstracts. – M.: IPI RAN, 2013. - 135 p. - ISBN 978-5-91993-020-4.

The book includes the abstracts of communications submitted to the XXXI International Seminar on Stability Problems for Stochastic Models (ISSPSM'2013), associated VII International Workshop "Applied Problems in Theory of Probabilities and Mathematical Statistics Related to Modeling of Information Systems" (APTP + MS'2013) (Spring Session) and International Workshop "Applied Probability Theory and Theoretical Informatics".

XXXI Международный семинар по проблемам устойчивости стохастических моделей (ISSPSM'2013), VII Международный рабочий семинар "Прикладные задачи теории вероятностей и математической статистики, связанные с моделированием информационных систем" (APTP + MS'2013) и Международный рабочий семинар "Прикладная теория вероятностей и теоретическая информатика". Сборник тезисов. – М.: ИПИ РАН, 2013. - 135 с. - ISBN 978-5-91993-020-4.

В сборник включены тезисы докладов, представленных на XXXI Международный семинар по проблемам устойчивости стохастических моделей (ISSPSM'2013), VII Международный рабочий семинар "Прикладные задачи теории вероятностей и математической статистики, связанные с моделированием информационных систем" (APTP + MS'2013) (весенняя сессия) и Международный рабочий семинар "Прикладная теория вероятностей и теоретическая информатика".

ISBN 978-5-91993-020-4

The preliminary analysis and the data processing, intended for creation of a mathematical market model of grain crops in Russia

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The purpose of the present paper is a preliminary analysis of the available information related to the grain market, based on the concept of mathematical model of control of the Russian market of cereals. Here is a description of the basic parameters of a mathematical model characterizing the state and ontrol.

As a basic parameter characterizing the state of the object (grain market) would naturally consider price per unit volume (tonne) grain, which is formed as a result of trades on the stock exchange.

It is necessary to clarify whether the definition of the state take into account additional factors, namely, a kind of grain culture and region of Russia. If Yes, then you must build mathematical models for each region and each type of grain separately.

The general structure of these models will be the same, but their specific characteristics can vary significantly. Each model you must set specific values for maximum and minimum levels of rates. These values should be set, on the basis of economic considerations. Price is valid if it takes values from the set between the minimum and maximum levels.

Prices above the maximum permissible values conditionally corresponds to unacceptable levels, the values of the top, below the minimum allowed conditionally unacceptable level indicate the lower. On the basis of the broad economic patterns of behaviour of prices in commodity markets, it can be assumed that control in this economic system is connected to the external impact on the market, sold in the form of interventions. Under the intervention as a whole requires understanding the following two possible types of influences on the market:

1) Supply to the market lump of significant volumes of grain from State intervention fund. Such action should lead to lower prices in a short period of time.

2) Buying on the market lump of significant volume of grain and put it in the State Interventional Fund. Such action should lead to an increase in prices in a short period of time.

Used grain prices, trades and volumes of interventions. The following shows the association of price and volume of intervention.

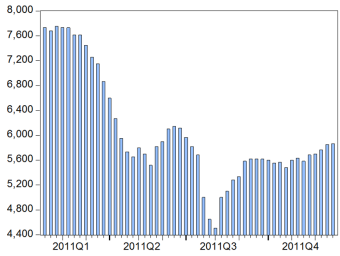

Figure 1: Price. Center - Wheat 3rd class. Annual schedule of prices (2011)

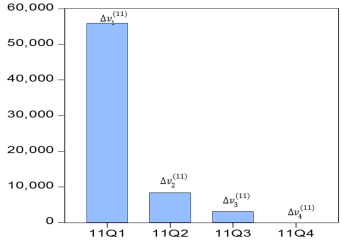

Figure 2: The annual quarterly volume chart of interventions (2011)

The designations employed

$\Delta\nu_i^{(.)}$ - of intervention for the i-th quarter of the year

An analysis of the available data generally confirms the above associations between external (control) impacts, implemented in the form of interventions, and the price of the cereals. Next, you must determine which rule will change the price of grain in any possible relevance of intervention (volume of supply or procurement). The idea of such a rule must be probabilistic in nature as to define deterministic way to change prices in a market where there are random factors is not possible. This will be the next stage of the development of a mathematical model.

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