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## **DEVELOPMENT OF A PORTFOLIO OF FINANCIAL PAYMENT OBLIGATIONS PROTECTED FROM SYSTEMATIC RISKS**

### *Summary*

Developing a model for studying banking operations related to financial risk seems to be very promising. Banks with heterogeneous fundamental funds often face a potential outflow of their creditors. The ability to affect a particular bank depends on the intermediate liquid value of its assets, whereas the latter value endogenously depends on the status of other banks in the asset market. Mathematical modeling of economic risks forms an idea of the peculiarities of modern economic risks, including financial ones. The study of various aspects of financial risk is one of the fundamental concepts of modern economic theory and management, as well as is increasingly being applied in practice in all areas of economic activity. Obviously, it is not necessary to use experience and intuition in economic activity. However, it is essential to possess the information about the causes of risk situations and to carry out qualitative and quantitative risk analysis.

The purpose of the article is to develop a mathematical model of immunizing a portfolio of financial transactions and to study the immunization of a portfolio of financial payment obligations regarding the risk of changes in market interest rates.

The article identifies the basic typical models of investment portfolios and studies the methods of portfolio optimization, using different types of financial instruments. Initially, it is necessary to study the net present value of payments (NVP), for which the NVP formula is introduced. Next, the main factor of change in the yield curve should be taken into account - a parallel shift by the value of  $h$  ( $NPV(h)$ ) so that  $NPV(h)-NPV(0)$  is minimal, using a more complex deformation of the yield curve. To mitigate this risk, it is important to apply factor immunization, however, with a due regard to the three factors that describe almost all changes in structural interest rates. All studies are formulated in the form optimization problems. To protect a portfolio from market risk, its structure needs to be rebuilt. Therefore, the possible volatility and liquidity risks for the existing portfolio of financial liabilities have to be taken into consideration as well.

*Keywords:* non-systematic and systematic risks, risk management – hedging (simulation), risk index, factor and dynamic immunization, cost of payments.

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