

# THE FUZZY LOGIC ESTIMATION OF CREDIT RISK

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**Introduction.** Management decisions in the sphere of market economy practical problems taken in conditions of uncertainty regarding the future and are accompanied by risk. Risk is the possibility emergence of circumstances that prevent getting the expected results from the implementation of supplying goals. If the uncertainty is unavoidable quality of the market environment, the risk - is a numerical description of the possibility of losses. Used accounting methods and risk assessment, as a rule, too much personal and is bordered on the premises, resulting in an incorrect assessment of project risks. So, in the economy probabilistic analysis and minimax approaches replace by methods of fuzzy logic. Benefits of fuzzy logic consist in the possibility to operate the direct data on the spread of parameters. That is, in fuzzy-plural calculation all possible scenarios of the development of events fall. Currently fuzzy modeling is one of the most promising areas of applied research in the field of management and decision-making. Fuzzy logic as a model of people thought processes built into the systems of artificial intellect and automated tools to support decision-making. For the decision of fuzzy logic tasks the special programs are created. The license software (Fuzzy Logic Toolbox, Fuzzy TECH, CubiCalc) are requiring the special preparation of user. The software package FuziCalc, uniting the mathematical apparatus of fuzzy logic with spreadsheets is presented particular interest. FuziCalc has a friendly interface, analogical an interface of Excel, acquaintance to the users. Its feature is possibility of description of fuzzy object in a cell, noting the object as «fuz-zy» and building function of distributing in the special window. In connection with inaccessibility of this commercial package in educational process are presented actually analysis the possibility of work with fuzzy data in freeware spreadsheets.

**The goal** of work is design the fuzzy logic model for calculation numerous value of credit risk in the environment of OpenOffice.org Calc.

**Fuzzy logic model the task about credit risk.** The data about credit history are presented in this table.

№	Risk	Credit history	Income
1	High		from 0 until 40 000grn
2	Middle	Bad	over 75 000grn
3	Middle	Good	from 40 000grn until 75 000grn
4	Low	Good	over 75 000grn
5	High	Bad	from 40 000grn until 75 000grn

Fuzzy logic linguistic variables are: HISTORY (Adequate, Inadequate),

INCOME (Low, Average, High), RISK (Negligible, Moderate, Unacceptable).

The next cognitive opinions correspond to the data of above table.

If INCOME is High and HISTORY is Adequate, then RISK is Negligible.

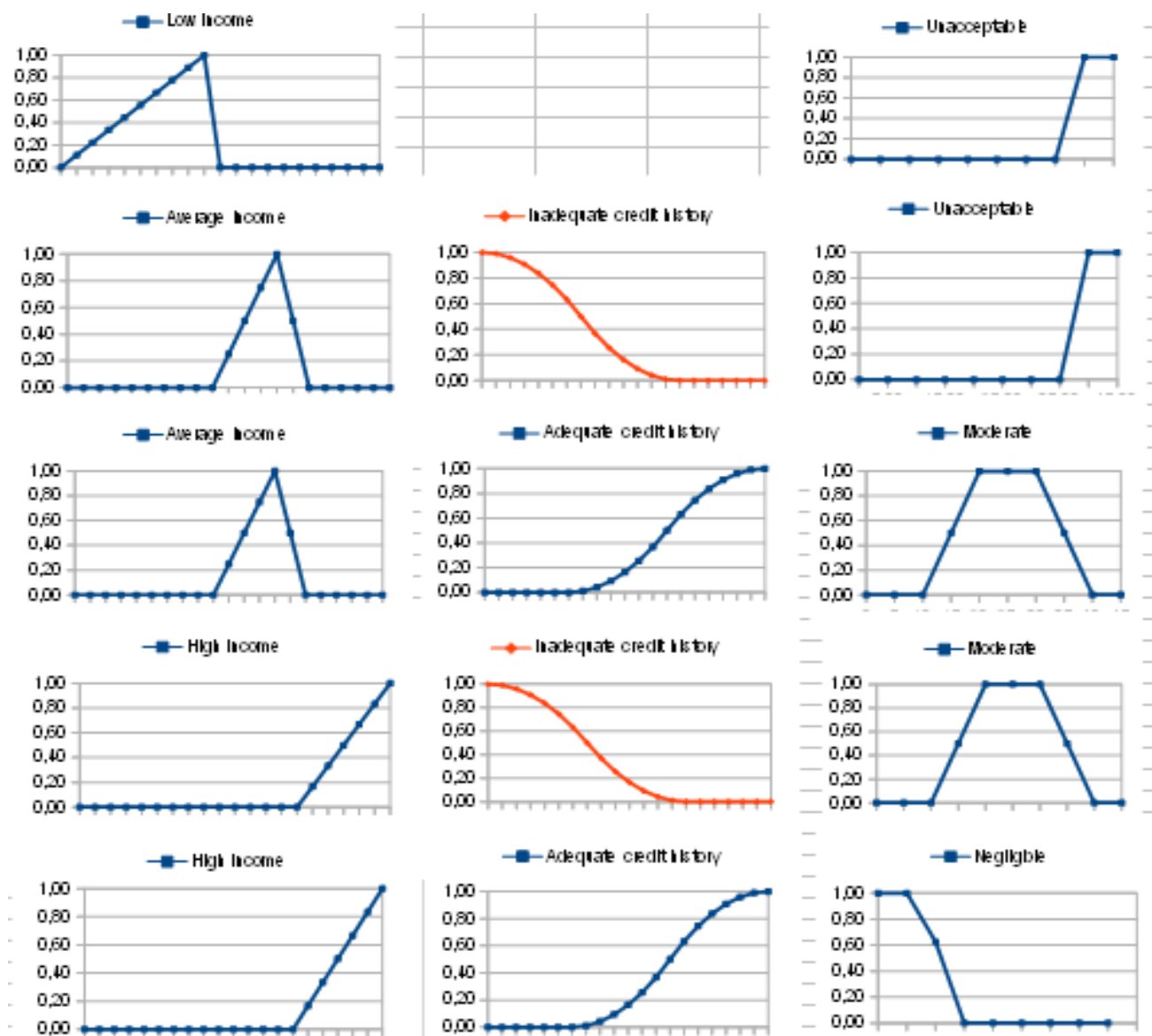
If INCOME is High and HISTORY is Inadequate, then RISK is Moderate.

If INCOME is Average and HISTORY is Adequate, then RISK is Moderate.

If INCOME is Average and HISTORY is Inadequate, then RISK is Unacceptable.

If INCOME is Low then RISK is Unacceptable.

This base of cognitive opinions with linguistic variables functions of belonging is realized in the environment of OpenOffice.orgCalc.



**Conclusions.** The created fuzzy logic model for evaluation of credit risk on the base of credit history and income gives calculative value of credit risk after defuzzification of fuzzy set by the Mamdany method.