

RESEARCHING ALGORITHMS FOR CREDIT ALLOCATION USING DEEP LEARNING METHODS

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<https://doi.org/10.5281/zenodo.7391046>

Abstract. *This article discusses the main methods of credit placement. A credit rating involves the use of algorithms obtained by mathematical and statistical methods to separate potential credit transactions into mismatched risk groups. This article describes the advantages and limitations of various models and algorithms used in the distribution of credit, as well as the prospects for further development of this method of assessing credit risk.*

Keywords: *Credit rating, scoring models, credit risks, decision trees, neural networks.*

ИССЛЕДОВАНИЕ АЛГОРИТМОВ РАСПРЕДЕЛЕНИЯ КРЕДИТОВ С ИСПОЛЬЗОВАНИЕМ МЕТОДОВ ГЛУБОКОГО ОБУЧЕНИЯ

Аннотация. *В представленной статье рассматриваются основные методы кредитного размещения. Кредитный рейтинг предполагает использование алгоритмов, полученных математическим и статистическим методами, для разделения потенциальных кредитных операций на несовпадающие группы риска. В данной статье описаны преимущества и ограничения различных моделей и алгоритмов, используемых при распределении кредита, а также перспективы дальнейшего развития данного метода оценки кредитного риска.*

Ключевые слова: *Кредитный рейтинг, скоринговые модели, кредитные риски, деревья решений, нейронные сети.*

INTRODUCTION

Credit relations are an integral part of the modern economy. Thanks to lending, more households can maintain a satisfactory level of consumption, improve their living conditions, and enterprises have additional investment opportunities, etc. Depending on the goals and tasks of credit organizations, the mechanism of determining credit rates and the degree of influence of certain factors on them are different. In order not to set rates too high, while maintaining competitiveness and attractiveness for potential customers, banks carry out risk assessments and develop a program to minimize them.

One of the main risks is the borrower's failure to pay the loan amount in full or on time, that is, a breach of obligation. The assessment of a potential borrower's credit risk is called credit scoring. Speaking of credit scoring, as a rule, they mean risk analysis when lending to individuals, although there are also methods for assessing the reliability of organizations.

LITERATURE ANALYSIS AND METHODOLOGY

According to the objectives, credit risk assessment can be divided into 4 categories:

- application scoring - assessment of creditworthiness of borrowers for lending;
- behavioral scoring - assessment of the dynamics of the borrower's credit account and credit portfolio as a whole;
- debt collection rating - determination of priorities and areas of work with problem borrowers, monitoring of debts and choosing the optimal effect of collection;
- fraud scoring - timely detection of fraud by borrowers.

Credit rating consists of applying algorithms obtained using mathematical and statistical methods to divide potential credit operations into good and bad risk groups. Bad risks mean that there is a high probability that the borrower will not pay the loan, so it is necessary to determine the credit risk factors, their importance and interrelationship. Created models can identify patterns, so future credit operations will have the same result as operations with similar characteristics, one of which is known risk.

Factors considered in credit scoring may vary depending on scoring algorithms and objectives. Typical factors used include demographic information (marital status, age, etc.) and information about the borrower's work-related characteristics (type of job, position, etc.), credit history, and previous relationship with the lender. information, features of the provided service, information about the financial well-being of the client. However, it should be noted that the use of some information in credit scoring may be restricted by law. For example, some countries prohibit consideration of marital status, race, religion, and gender in credit scoring and credit decisions. The characteristics of the requested loan are equally important for risk assessment (for example, foreign currency loans are generally considered more risky).

RESULTS

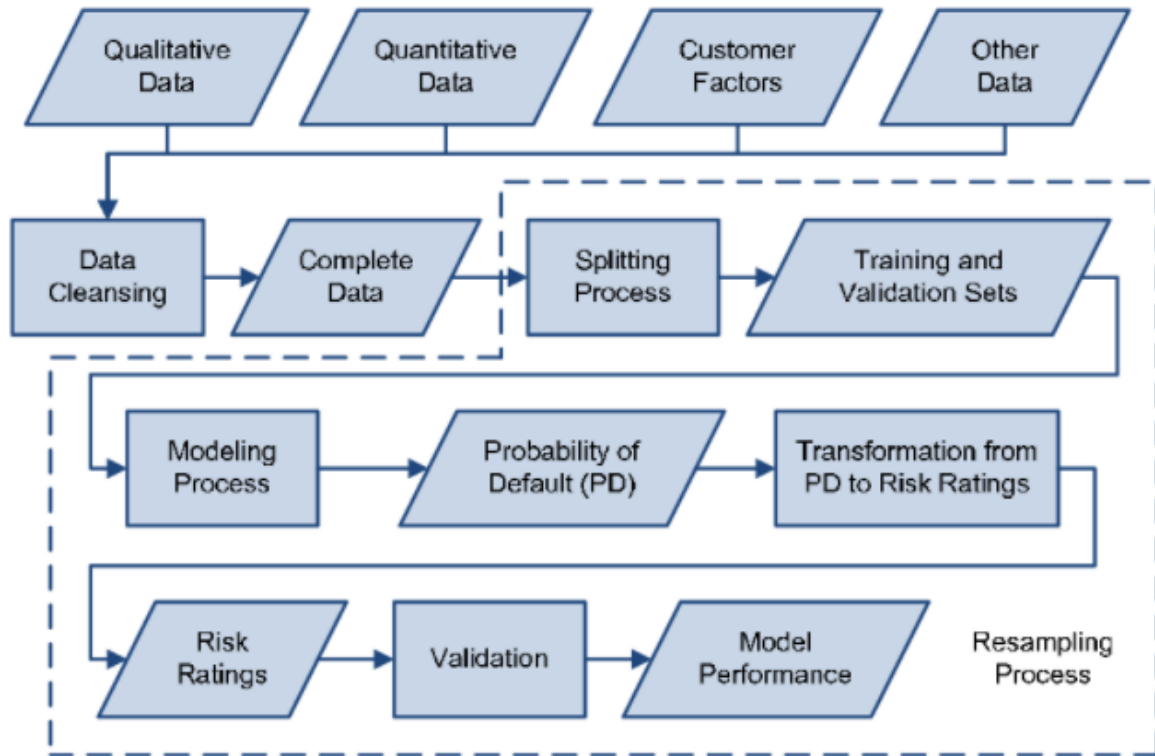
To date, the bank is actively using information provided by credit bureaus / credit bureaus, along with information on potential borrowers, which can be obtained independently from the loan application. Credit bureaus help banks and other lenders to eliminate information asymmetries between existing and potential borrowers, thereby enabling more efficient credit scoring, which in turn improves financial security, retail and SMEs. B reduces operating costs in lending. The activity of such organizations is useful not only for creditors, but also for conscientious borrowers, because when risks are reduced, banks have less opportunity to cover risks through high interest rates, and lending decisions are made faster. Different methods are used to develop credit scoring algorithms: classical methods based on statistical discriminant and regression analyses, decision trees, methods based on neural networks, etc.

The exact calculation formula is a trade secret, however, it is known what information and to what extent is used in forming the FICO credit score:

- 35%: credit history (including account payment history);
- 30%: debt burden (including the number of bills, balances, the amount of debt on various types of accounts, the percentage of funds used from a possible loan, etc.);
- 15%: length of credit history (for example, average age of the account, age of the longest account);
- 10%: types of credit used (for example, revolving credit, mortgage credit, etc.);
- 10%: recent loan applications.

CONCLUSION

Credit scoring can provide a bank with significant competitive advantages, reduce operating costs and increase profits, including risk reduction. To use it effectively, you need to be aware of the advantages and limitations of models and algorithms and be able to use them in a way that meets the requirements of business conditions. It is important to master the best existing credit scoring approaches and participate in the development of new ones in order to ensure the optimal quality of the provided credit services and the bank's place in the industry.



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