


# Technical and Software-Based Opportunities for Applying Limit Models and Blacklist Mechanisms in the Process of Managing Accounts Receivable in Insurance Companies

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## Դերհտորական պարտքերի կառավարման գործընթացում լիմիտային մոդելի և սև ցանկի կիրառման տեխնիկաձրագրային հնարավորությունները ապահովագրական ընկերություններում

Ղազարյան Լուսինե Ե.

ասպիրանտ, դասախոս, ֆինանսական շուկաների և ինստիտուտների ամբիոն,  
Հայաստանի պետական տնտեսագիտական համալսարան (Երևան, ՀՀ)

**Անփոփագիր.** Դերհտորական պարտքերի կառավարումը ցանկացած կազմակերպության, հատկապես ապահովագրական ընկերությունների, ֆինանսական կայունության հիմնասյունն է: Այդ պատճառով ընկերության ղեկավարները պետք է առաջնահերթ ուշադրություն դարձնեն պարտքերի կառավարման արդյունավետ համակարգի մշակման և ներդրման վրա: Դերհտորական պարտքերի կառավարման գործընթացը ներառում է ոչ միայն մարդկային գործունի կողմից պարտքերի արդյունավետ կառավարումը, այլև տեխնիկական և ծրագրային ապահովումների կիրառումը, որոնք կարող են զգալիորեն նպաստել գործընթացի արդյունավետությանը:

Այս ուսումնասիրությունը կենտրոնանում է ոչ կյանքի ապահովագրական ընկերություններում դերհտորական պարտքերի կառավարման արդյունավետության բարձրացման հնարավորությունների վրա, հատկապես լիմիտային մոդելների և «սև ցանկի» մեխանիզմների կիրառման համատեքստում:

**Հանգուցաբառեր և բառակապակցություններ**՝ ոչ կյանքի ապահովագրական ընկերություն, լիմիտային մոդել, սև ցանկի մեխանիզմ, պարտքի ռիսկի նվազեցում

## Технические и программные возможности применения лимитных моделей и механизмов «черных списков» в процессе управления дебиторской задолженностью в страховых компаниях

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**Аннотация.** Управление дебиторской задолженностью является основой финансовой стабильности любой организации, особенно страховых компаний. Поэтому руководство компаний должно придавать первостепенное значение разработке и внедрению эффективной системы управления дебиторской задолженностью. Этот процесс включает не только эффективный контроль со стороны персонала, но и использование технических и программных решений, которые могут существенно повысить эффективность управления.

Настоящее исследование направлено на изучение возможностей повышения эффективности управления дебиторской задолженностью в компаниях, занимающихся страхованием от несчастных случаев и имущественным страхованием, особенно в контексте внедрения лимитных моделей и механизмов «черного списка».

**Ключевые слова и словосочетания:** страховые компании, занимающиеся имущественным страхованием, лимитная модель, механизм черного списка, снижение рисков дебиторской задолженности

**Introduction.** The management of accounts receivable in insurance companies is of crucial importance in terms of ensuring financial stability and increasing asset efficiency. In particular,

accounts receivable that are not managed in a timely manner can negatively affect a company's cash flow, potentially jeopardizing its solvency. From the perspective of asset utilization efficiency, a large

volume of receivables and low collection efficiency reduce the amount of resources available for investment, which in turn affects the company's profitability. The management of receivables is directly linked to the frequency and severity of insurance claims. If a customer fails to pay the insurance premium on time, it affects not only the company's income but also the timely payment of claims. The main difference between managing receivables in non-life insurance companies and in other sectors lies in the specific nature of insurance transactions, the types of risks involved, and the regulatory requirements set by supervisory authorities. In non-life insurance companies, receivables are more sensitive and have a direct impact on the overall financial stability of the company, which makes strict management essential. Based on these justifications, we have identified and proposed the use of several management tools that are especially suitable for handling receivables in non-life insurance companies, namely:

- Utilizing digital tools such as the **limit model**, which allows monitoring the debt limits of agents or clients;
- Implementing **insurance scoring systems** for clients to assess their risk level;
- Conducting continuous **monitoring and follow-up** on receivables;
- Applying **early warning systems** to prevent excessive debt accumulation.

Ultimately, if the above-mentioned debt recovery methods do not yield results, the company may resort to legal actions to recover the receivables.

**Literature Review.** Limit models and “blacklist” mechanisms are widely used in the international insurance sector for managing accounts receivable and regulating debt relationships with intermediaries and clients.

WNS, a leading global business process outsourcing (BPO) company with a strong presence in insurance services, particularly in North America and Europe, has developed real-time tools to assess the performance of intermediaries with the goal of reducing receivables. Their model integrates credit control strategies, analytics, and relationship management to minimize risk. WNS uses analytical tools and artificial intelligence (AI) to predict debtor behavior and classify clients according to risk levels. This allows insurance companies to take preventive actions to reduce instances of non-payment [3].

Another applied methodology is the **behavioral and predictive modeling** by **Finalyse**, which uses

machine learning algorithms or logistic regression to forecast the likelihood of default. These models allow for segmentation of clients into different risk levels and the development of corresponding collection strategies — for instance, reminders for low-risk clients or more stringent approaches for high-risk groups [4].

Global insurance companies such as **Ping An**, **Prudential**, **Allianz**, **AXA**, **Zurich Insurance**, and **Generali** use various limit models as part of a broader financial risk management strategy. They impose restrictions on intermediaries based on their creditworthiness and payment history. These systems automatically enforce those limits [5; 6; 7; 8].

In the Armenian market, such systems are not currently in use by insurance companies. Summarizing international experience, it can be concluded that insurance companies worldwide are able to manage debt-related risks using systematic models, while simultaneously ensuring operational efficiency.

**Methodology.** The aim of this study is to assess the feasibility of implementing the **limit model** and the “**blacklist**” **mechanism** to improve the efficiency of accounts receivable management. The analysis was conducted in the following steps:

1. **Data analysis** – The volume, maturity, and dynamics of changes in accounts receivable over the past 5 years were examined.

2. **Comparison with international practices** – Global approaches to receivables management were studied.

3. **Model evaluation** – The applicability of the limit model and the blacklist mechanism was analyzed.

4. **Cost analysis for implementation** – Technological requirements and cost levels were evaluated.

5. **Practical application** – The readiness of *Armenia Insurance* to implement the proposed model was assessed.

This approach makes it possible to forecast the impact of the model's implementation on the financial stability of insurance companies and the efficiency of payment management.

**Analysis.** To assess the efficiency of receivables management in insurance companies, it is essential to study the **volume**, **structure**, and **dynamics** of receivables. For this study, we selected **Armenia Insurance**, a mid-sized insurance company in the Armenian market. The objective is to analyze the changes in the volume, structure, and maturity of the company's receivables from **2020 to 2024**.

**Table 1: Volume of accounts receivable, 2020–2024 [2].**

Types	2024	2023	2022	2021	2020
Debtor receivables from insurers arising from direct insurance operations	1,026,142	263,221	166,225	148,468	94,557
Debtor receivables from subrogation	45,186	39,256	15,055	7,766	39,908
Debtor receivables from insurance companies	14,889	16,681	24,411	26,558	12,946
Debtor receivables from agents arising from direct insurance operations	100,546	95,069	90,699	46,005	148,223
Debtor receivables from reinsurance	1,601	434	6,301	2,711	6,195
Reserve for debtor receivables related to insurance	-38,743	-13,607	-6,930	-19,675	-31,153
Subrogation reserve	-8,222	-5,068			-8,654
Total	1,143,423	398,009	297,783	213,854	264,042

**Analysis of Table 1** shows that in 2024, the volume of accounts receivable of the insurance company increased significantly compared to previous years. While in 2023 the total accounts receivable amounted to AMD 398,009 thousand, in 2024 this figure reached AMD 1,143,423 thousand, indicating a possible change in payment management policy or new market conditions. Accounts receivable from policyholders in 2024 amounted to AMD 1,026,142 thousand, which is almost **four times higher** than the previous year. One of the

main reasons for this increase is that **non-overdue receivables** in 2024 totaled AMD 829,784 thousand, whereas in 2023 this figure was AMD 197,260 thousand. This may be due to two main factors:

1. The insurance company has provided longer payment terms.
2. The number of insurance contracts has increased due to higher demand for insurance services.

**Table 2: Maturity structure of accounts receivable from agents related to insurance [2]**

	2024	2023	2022	2021	2020
Not overdue	1199	416	336	2,901	8,249
1-30 days overdue	9714	13000	20,141	5,451	1,416
31-90 days overdue	22540	446	9226	5,051	59,717
91-180 days overdue	30,411	10,798	30,361	16,990	50,254
181-365 days overdue	36,682	70,409	30,635	15,612	28,587
Total	100,546	95,069	90,699	46,005	148,223

**Table 3: Maturity Structure of Accounts Receivable from Policyholders Related to Insurance [2]**

	2024	2023	2022	2021	2020
Not overdue	829,784	197,260	133,507	116,978	31,103
1-30 days overdue	94,979	26,549	14,120	11,315	16,875
31-90 days overdue	62,714	30,931	12,768	8,640	15,572
91-180 days overdue	3,396	2,127	2,339	7,181	12,732
181-365 days overdue	35,269	6,354	3,491	4,354	18,275
Total	1,026,142	263,221	166,225	148,468	94,557

According to Tables 2 and 3, we observe the following picture: overdue receivables have also increased, especially those overdue by 1–30 days, which in 2024 amounted to AMD 94,979 thousand compared to AMD 26,549 thousand in the previous year. This may indicate certain payment difficulties or new terms introduced for clients. Accounts receivable from agents in 2024 totaled AMD 100,546 thousand, compared to AMD 95,069 thousand in 2023. Although the increase appears minor, it is important to note that certain risks are

observed in the structure of overdue receivables. Specifically:

- Receivables overdue by 91–180 days in 2024 amounted to AMD 30,411 thousand, significantly higher than AMD 10,798 thousand in 2023.
- Receivables overdue by 181–365 days totaled AMD 36,682 thousand, which, although lower than the AMD 70,409 thousand in 2023, still remains considerably high.

These figures may indicate that agents are facing some difficulties in making timely payments,

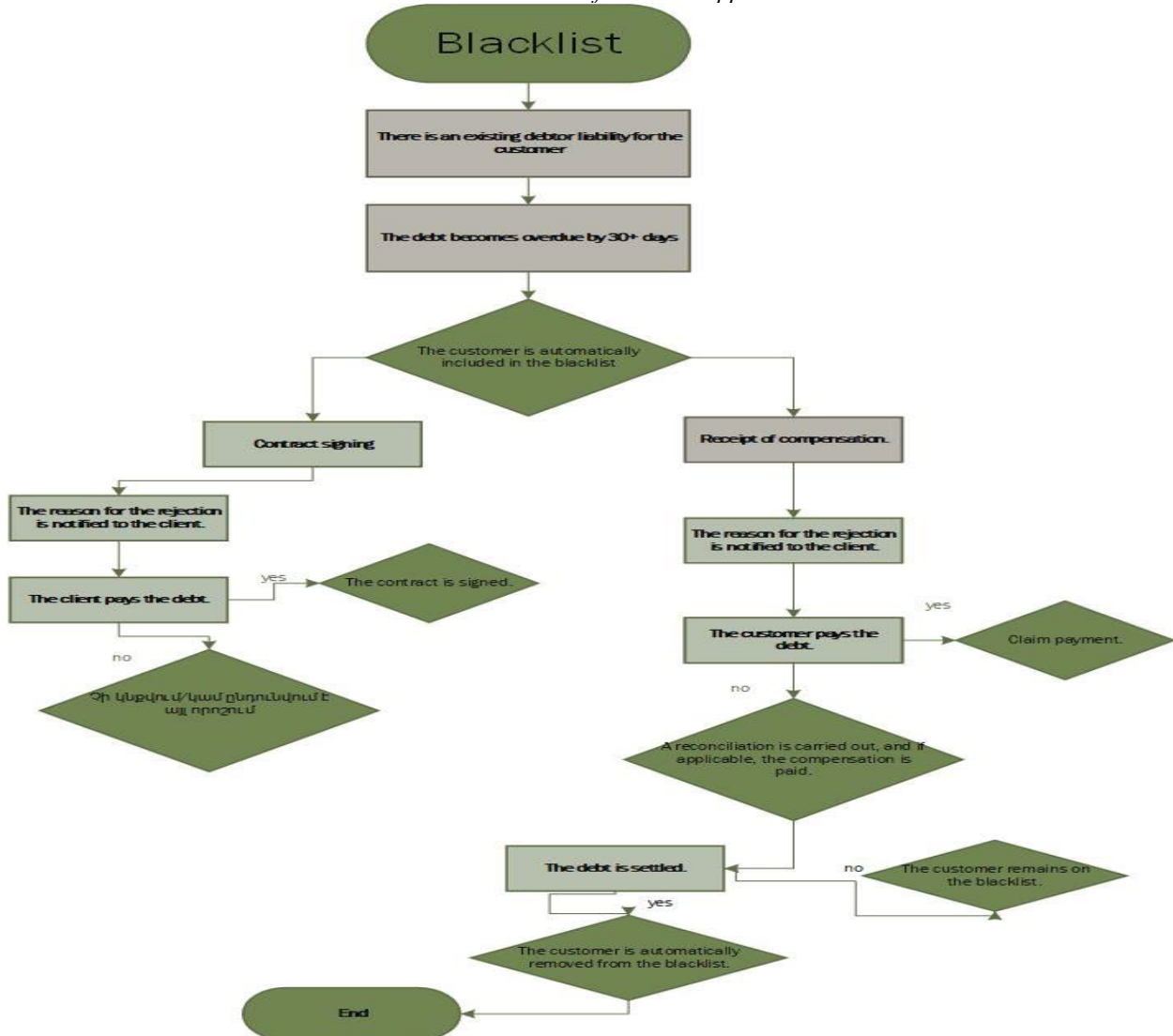
which could be attributed to changes in the economic environment or certain structural characteristics of the agent network.

Receivables from subrogation amounted to AMD 45,186 thousand in 2024, compared to AMD 39,256 thousand in 2023, indicating a continued process of recovering claims previously paid by the insurance company. Receivables from reinsurance totaled AMD 1,601 thousand in 2024, a slight increase compared to the previous year. This suggests that the debt management process with reinsurers remains stable and has not undergone major changes. This analysis shows that the trends in the development of the insurance market demand increased attention to the management of accounts receivable, especially in terms of the agent network and payments from policyholders. Given this situation in the company, the **limit model** and **blacklist mechanism** proposed by us may serve as the most effective approach from a debt management perspective. Before initiating the

implementation of these models, a study was conducted on the potential costs of implementation. The integration of limit models and blacklist mechanisms may require minimal costs if the company already possesses the necessary internal technological resources. The company's software developers can design the models, reducing dependency on outsourcing services and thus minimizing costs. This approach is particularly efficient when the company's tech team is familiar with the existing business processes and possesses the necessary skills in data management and analysis.

Accordingly, we initially selected a company whose internal working software is commonly used by multiple companies in the market. Applying the model in such a company will make its implementation more valuable. For this purpose, we designed a schematic draft of the model to provide the company with a general understanding and simplify its deployment.

Chart 1: Mechanism of Blacklist Application

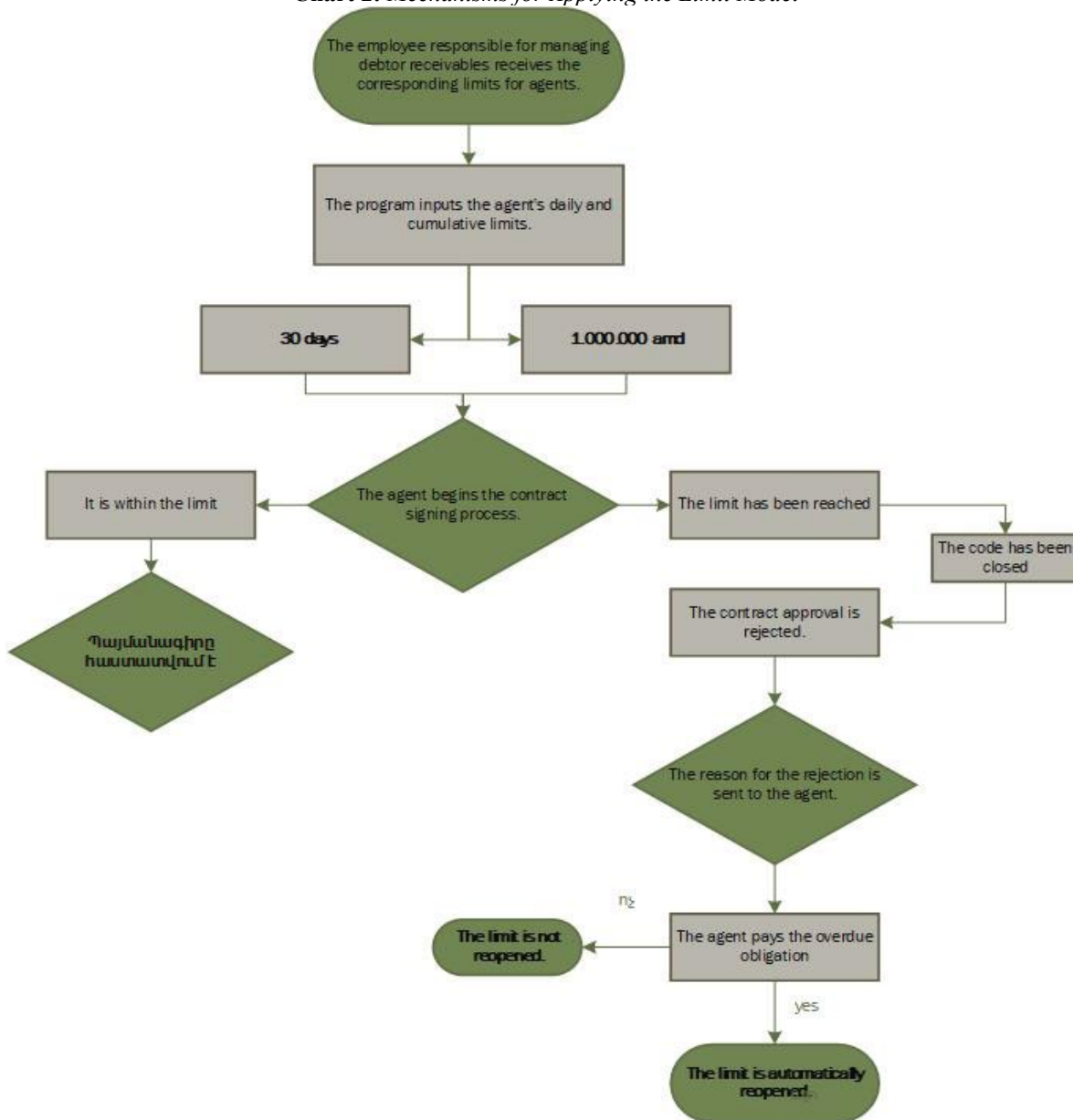


The diagram was created by the author.

**Chart 1** presents the mechanism for applying the blacklist, according to which the company sets a delinquency threshold for policyholders' accounts receivable. For example, if the receivable becomes overdue by more than 30 days, the client is

automatically added to the blacklist. Once on the blacklist, no new contracts can be issued or claim payments made under the client's name until the outstanding debt is fully settled.

**Chart 2: Mechanisms for Applying the Limit Model**



The diagram was created by the author

**Chart 2** illustrates the mechanisms for applying the limit model, according to which daily and total credit limits are set for each agent. If the agent exceeds these limits, they are no longer allowed to issue new insurance contracts until the outstanding obligations within the defined limits are fulfilled [1, pp. 241-250].

**Result.** *Armenia Insurance*, a mid-sized insurance company, has expressed willingness to implement the limit model. Company representatives stated that the model is applicable and aligns with their strategy to improve debt management. The

company has evaluated the model's effectiveness as a tool to reduce the risks of unpaid debts arising from intermediaries and contractual relationships. *Armenia Insurance* noted that their technical and software development teams are ready to support the integration process without significant costs, as the required software solutions can be developed in-house. The company anticipates that implementing the model will strengthen financial control and foster improved relationships with both intermediaries and clients.

**Conclusion.** The implementation of limit models and blacklist mechanisms can become an effective tool for managing accounts receivable in insurance companies. These models contribute to:

1. Reduction of unpaid debts,
2. Increased control over policyholders and clients,
3. Decreased financial risks,
4. Formation of trustworthy relationships with intermediaries and customers.

The experience of *Armenia Insurance* demonstrates that such models can be integrated without significant expenses, provided the company has the necessary technical capabilities. This approach enables insurance companies to efficiently address solvency and credit control issues while also ensuring long-term profitability. As a result, the application of these models can not only solve existing problems but also serve as a strategic investment—creating a flexible and technologically advanced management system for the future.

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