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Identifying and Ranking Performance Evaluation Indicators for Insurance Agencies: A Network-Based Conceptual Model Approach

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Abstract

One of the most essential steps in evaluating organizational performance is identifying suitable performance indicators and designing a conceptual model aligned with the actual functions of the evaluated units. In this study, a conceptual model was developed to assess the performance of insurance agencies. First, an extensive review of existing literature was conducted to identify potential indicators. Then, through several stages and expert consultations, the most important indicators were selected, and a network-based conceptual model was designed accordingly. This model was later refined using data from a selected insurance company and the operational performance of its agencies. The identified indicators were subsequently scored and ranked using a Criterion-Based Method (BCM). The primary contribution of this research is the comprehensive identification of evaluation indicators and the development of a conceptual model that incorporates the supply chain perspective of the insurance industry.

Keywords: Indicator, Insurance, Agency, Performance evaluation, Conceptual model, Criterion-based method.

1 | Introduction

Insurance is a key sector in the national economy, playing a vital role in supporting both other industries and individual households [1]. Among the various components of the insurance industry, agencies are particularly significant due to their direct role in policy sales and revenue generation [2]. However, several studies have shown that many insurance agencies underperform in terms of policy sales [3]. This highlights the need for insurance companies to evaluate the performance of their agencies, identify sources of inefficiency, and

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implement appropriate improvement strategies. One of the most crucial steps in this evaluation process is the identification of performance indicators and the design of a suitable conceptual model.

Several related studies provide insights relevant to the present research. Osta and Badpa[4] assessed the performance of agencies and branch offices affiliated with the Health Insurance Organization in Ilam province. They reviewed four documents and initially identified four leading indicators and twelve sub-indicators. Following expert consultation via a questionnaire, six final indicators were selected. Their conceptual model included administrative and operational costs, errors in issuing insurance cards, the number of complaints, and the number of employees as input variables, while output variables included net profit and the total number of issued insurance cards.

Daghighi Asl et al. [3] proposed a performance model for the insurance sales network. They identified several key performance drivers, including personal characteristics of insurance representatives (both inherent and acquired), organizational and communication factors, financial and service-related performance, insurer-level variables, central insurance authority characteristics, external environmental factors, and the overall empowerment level of the sales network.

Dwivedi et al. [5] evaluated an insurance company using the Balanced Scorecard (BSC) approach combined with the Best-Worst Method (BWM). Their evaluation focused on four key perspectives: customer, financial, learning and growth, and internal business processes, with five performance indicators defined for each dimension.

Fotova Čikovićb et al. [6] examined insurance companies in the North Macedonian market, using capital and labor as input indicators, and risk-pooling and intermediate function as output indicators.

Işık et al. [7] analyzed the performance of non-life insurance firms in Turkey based on financial ratios (e.g., capital adequacy, liquidity, operational, profitability), service network characteristics (e.g., number of personnel and agencies), and stock market performance (e.g., return and volatility).

Omrani et al. [8] conducted a performance evaluation of 21 insurance companies using a two-stage network model. The first stage included operational costs, number of staff, and number of branches as input indicators, while intermediate indicators involved direct written premiums, issued policies, and policy growth rate. The second stage incorporated investment as an independent input and considered growth in insurance claims and net profit as output indicators.

Zhang et al. [9] proposed a conceptual model for evaluating Chinese insurance companies using three input indicators: operational and administrative expenses, fixed assets, and investment expenditure. The model included two desirable outputs investment profit and insurance business income and one undesirable output: claims paid.

To the best of the author's knowledge, no prior study has comprehensively identified performance evaluation indicators for insurance agencies with a supply chain-oriented perspective. This research aims to address that gap by systematically reviewing existing literature, incorporating expert input, ranking relevant indicators, and designing a network-based conceptual model tailored to insurance agency performance.

2 | Research Methodology

This section outlines the stages followed to identify appropriate performance evaluation indicators, design a conceptual model for insurance agency performance, and implement the model in a case study.

2.1 | Determining Performance Evaluation Indicators and Designing the Conceptual Model

To determine relevant indicators and develop the conceptual model, eight structured stages were undertaken:

Stage 1. Reviewing literature on network-based performance evaluation in the insurance industry

An initial review of 21 domestic and international studies focused on network-based performance evaluation in the insurance industry was conducted. Expert consultations revealed that the indicators used in these studies lacked comprehensiveness and that more suitable indicators could be identified for evaluating the performance of insurance agencies.

Stage 2. Reviewing broader literature on performance evaluation and indicators in the insurance sector

This stage involved reviewing more than 80 academic sources, including journal articles, theses, and research reports, all of which addressed the performance evaluation of insurance branches, agencies, and companies. Various evaluation methods were identified, such as Data Envelopment Analysis (DEA), the BSC, and Multi-Criteria Decision-Making (MCDM) techniques. Collectively, these studies yielded over 360 performance indicators.

Stage 3. Categorizing the indicators

Given the large number of collected indicators and the presence of synonymous indicators with different labels a categorization process was applied. After merging duplicates, 350 distinct indicators were classified into 21 categories, as listed below:

Education and expertise of employees, work experience of employees, quality of work and customer satisfaction, number of employees, types of premiums, types of profits, types of income, types of losses, types of liabilities, types of assets, investments, capital and equity, insurance policies, types of expenses, number of branches and agencies, cash, insurer and broker, location, claims, performance status, miscellaneous financial indicators.

Stage 4. Selecting the most frequently cited indicators

Out of the 350 indicators identified, 46 were selected based on their high frequency of occurrence in the reviewed literature. *Table 1* presents the titles of these indicators along with their frequency of appearance across the analyzed studies.

Table 1. Most frequently occurring indicators in the reviewed articles.

Row	Indicator Title	Frequency	Row	Indicator Title	Frequency
1	Net profit to employee ratio	4	24	Fixed assets	5
2	Average claim settlement time	7	25	Current ratio	4
3	Number of policies issued	24	26	Return on equity	4
4	Land and building area (square footage)	5	27	Equity	6
5	Premium issued	5	28	Amount (value) of insurance policies issued	7
6	Reinsurance premium	6	29	Total expenses	5
7	Premium produced	7	30	Insurance expense	14
8	Premium	7	31	Administrative expense	27
9	Net premium	8	32	Personnel expense	11
10	Premium growth rate compared to the previous year	8	33	Investments	15
11	Direct premium	4	34	General expense	11
12	Operating profit	11	35	Operational expense	12
13	Underwriting profit	4	36	Liquidity	6
14	Investment profit	7	37	Claims/Receivables	5
15	Insurance profit	26	38	Customer satisfaction percentage	11
16	Revenue	7	39	Rate of new customer acquisition	6
17	Investment income	8	40	Loss ratio	11
18	Loss ratio	6	41	Number of employees with university degrees	15
19	Growth of issued and renewed insurance policies compared to the previous year	10	42	Number of insurance training hours per employee	4
20	Amount of claims paid	22	43	Average years of employee experience	8
21	Total number of claims paid	22	44	Human resources skills	10
22	Total liabilities	8	45	Number of employees	26
23	Total assets	11	46	Location score	8

Stage 5. Preliminary review and refinement of the 46 frequently occurring indicators

At this stage, a preliminary review was conducted with the support of an expert in the insurance industry. Indicators that were exclusively related to branches or insurance companies and therefore not relevant to insurance agencies were eliminated. Additionally, a number of new indicators were added based on expert recommendations. The final list of indicators considered in this stage is presented in *Table 2*.

Table 2. List of indicators reviewed by the expert.

Row	Indicator Title	Row	Indicator Title
1	Number of personnel	15	Claims paid amount
2	Portfolio composition	16	Return on assets
3	Infractions	17	General and administrative expenses to written premium ratio
4	Premium growth rate	18	Operating expense ratio
5	Return on investment	19	Agent's operating location
6	Insurance profit	20	Total renewal premium
7	Total written premium	21	Customer satisfaction percentage
8	Number of policies issued	22	New customer acquisition rate
9	Loss ratio	23	Growth in written and renewal policies compared to the previous year
10	Number of claims paid	24	Employee education level
11	Premium collection ratio	25	Number of insurance training hours per employee
12	Outstanding claims	26	Years of insurance experience of the agency manager
13	Outstanding receivables	27	Agent's tenure with the insurance company
14	Loss ratio	28	Cash obligation fulfillment ratio

Stage 6. Expert interviews to assess the importance of each indicator

In this stage, semi-structured interviews were conducted with seven insurance industry professionals, including branch managers, brokers, and agency representatives. Each of the 28 indicators was individually reviewed, and participants were asked to explain their views regarding the relevance or irrelevance of each indicator. Additional suggested indicators and their justifications were also collected during these interviews.

Stage 7. Interview analysis and refinement of indicators

The collected interview data were analyzed and reviewed. Indicators such as return on investment, return on assets ratio, and outstanding claims and receivables were removed due to their limited relevance to Iranian insurance agencies. Similarly, indicators related to the amount of claims paid, number of paid claims, and loss ratio were excluded due to redundancy. Some indicators were merged, and others were renamed for broader and clearer representation.

Stage 8. Designing the conceptual model of insurance agency performance

Based on the refined set of indicators from Stage Seven, a conceptual model of insurance agency activities was developed in collaboration with academic experts. The model is presented in *Fig. 1*.

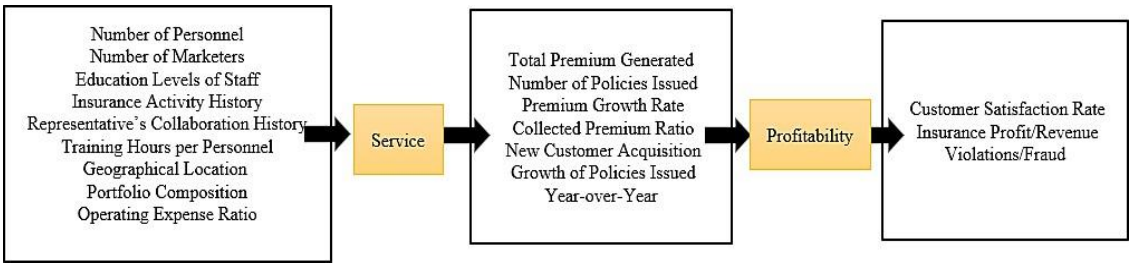


Fig. 1. Conceptual model of insurance agency performance.

2.2 | Case Study Implementation and Removal of Indicators Due to Data Limitations

As the conceptual model illustrated in *Fig. 1* represents a general framework, it must be adapted to the context of individual insurance companies based on their available operational data and accessible information sources. In this study's case company, specific data were unavailable for several indicators, including customer satisfaction with agencies, agency violations, the number of new customers acquired, training hours, number of agency personnel, number of marketers, and educational qualifications of agency staff.

Among these, the number of personnel, marketers, and the education levels of staff can potentially be collected through field research. Therefore, to ensure practical applicability, the conceptual model was refined by removing or adjusting indicators for which reliable data were not available. The modified conceptual model tailored to the case study is presented in *Fig. 2*.



Fig. 2. Conceptual model of the performance of insurance agencies of the selected insurance company.

Table 3 presents the definitions of the performance evaluation indicators utilized in the conceptual model illustrated in *Fig. 2*.

Table 3. Performance evaluation indicators.

Indicator Title	Concept
Geographic location score	The geographic location score should consider components such as population density and traffic flow in the area, whether the agency office is located on a main or side street, if the office is on the ground floor or not, and the number of insurance agencies near the location.
Insurance agency establishment history (year)	This indicator of the agency's activity history is based on the number of years.
Years of insurance experience of the agency manager	The insurance activity history of the agency manager, both prior to and following the acquisition of the agency, is presented.
Number of personnel	This refers to the number of employees working in the agency office, excluding the manager.
Number of marketers	Insurance marketers receive commissions from the agency for introducing and selling insurance products.
Employees education score	This indicator represents the average education score of the manager and administrative staff of the agency. In this scoring, a doctoral degree can be given a score of 5, a master's degree a score of 4, a bachelor's degree a score of 3, an associate degree a score of 2, a diploma a score of 1, and below diploma a score of 0.
Number of insurance lines	This criterion represents the number of insurance branches in which each agency operates.
Number of issued insurance	This criterion represents the total number of issued and renewed insurance policies during the evaluation period.
Average insurance premium	This criterion indicates the average premium that the agency has transferred to the insurance company through policy issuance during the evaluation period.
Growth in the number of issued insurance policies	This indicator is calculated by dividing the difference between the number of insurance policies issued in the previous year and the number of insurance policies issued in the current year by the number of insurance policies issued in the previous year.
Insurance company profit	This criterion represents the profit earned by the insurance company from the agency's activities. It is calculated by subtracting the commission and claims paid from the premiums during the evaluation period.
Agency profit	This indicator is calculated by subtracting rent, administrative, and general expenses from the commission received. The administrative and general expenses include personnel-related and operational costs, each of which comprises several subcomponents.

2.3 | Weighting and Ranking Of Indicators

To determine the relative importance of each indicator in the conceptual model shown in *Fig. 2*, MCDM methods can be employed. One of the most recent techniques is the Criterion-Based Method (BCM), introduced in 2019 by Haseli and his colleagues. This method determines indicator weights through a four-step procedure [10].

Step 1. Define a set of decision-making criteria $(C_1, C_2, C_3, \dots, C_n)$.

Step 2. Select one of the criteria as the base criterion, as determined by the decision-maker.

Step 3. Determine the relative importance of the base criterion compared to other criteria (from 1/9 to 9) and determine the set $(a_{B1}, a_{B2}, \dots, a_{Bn})$.

Step 4. Calculate the weights of the criteria using a mathematical model, where W_j represents the weight of criterion j and W_B represents the weight of the base criterion.

$$\text{Min } \varepsilon, \quad \textbf{(1)}$$

$$\text{s.t.}$$

$$\left|\frac{w_B}{w_j} - a_{Bj}\right| \le \varepsilon, \quad \textbf{(2)}$$

$$\sum_{j=1}^{n} R(W_j), \quad \textbf{(3)}$$

$$W_j \ge 0. \quad \textbf{(4)}$$

By conducting interviews with two experts and using the base-criterion model, the weights of the indicators in the conceptual model (*Fig. 2*) were calculated as shown in *Table 4*.

Table 5. Results of determining weights and ranking of indicators using the base-criterion method.

Indicator Title	The Weight (Expert 1)	The Weight (Expert 2)	Average Weight	Indicator Rank
Geographic location score	0.033	0.035	0.034	12
Insurance agency establishment history (year)	0.033	0.039	0.036	11
Years of insurance experience of the agency manager	0.033	0.045	0.039	10
Number of personnel	0.053	0.035	0.044	8
Number of marketers	0.066	0.039	0.052	7
Employees education score	0.038	0.045	0.043	9
Number of insurance lines	0.066	0.052	0.059	6
Number of issued insurance	0.088	0.045	0.066	5
Average insurance premium	0.013	0.079	0.104	3
Growth in the number of issued insurance policies	0.065	0.1	0.083	4
Insurance company profit	0.26	0.32	0.29	1
Agency profit	0.13	0.16	0.14	2

3 | Conclusion

In this study, a conceptual network model and a set of performance evaluation indicators for selected insurance agencies were developed through an extensive literature review and expert interviews. These indicators were subsequently weighted and ranked using the BCM. The results showed that the insurance company's profit index was identified as the most important indicator, while the agency's location score index was ranked as the least important. For future research, it is recommended that the proposed conceptual model be applied to evaluate the performance of insurance agencies in various contexts.

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