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Measuring the Impact of Acquisition Costs on Insurance Premiums

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Abstract:

Research Question: This paper examines the existence of statistically significant relationship between acquisition costs and insurance premiums in the Serbian insurance industry. **Motivation:** Marketing investments are of strategic importance for the firm performance increase (Morgan, Clark, & Gooner, 2002; Stewart, 2009; Edeling & Fischer 2016; Gligorijevic, 2013; Solomon, Marshall, & Stuart, 2017; Silveira Netto & Slongo, 2019; Haryanto & Retnaningrum, 2020; Shah, Goswami & Vidani, 2024). Empirical findings consistently confirm the positive financial effects of marketing activities across various industries (Narayanan, Desiraju, & Chintagunta, 2004; Pauwels, Silva-Rosso, Srinivasan, & Hanssens, 2004; Fukutomi, Yamashita, Uehara, & Fukuchi, 2021). The evidence of the relationship between marketing and financial performance remains limited within the insurance sector. Therefore, this paper addresses that gap by examining whether investments in customer acquisition generate measurable financial outcomes for insurance companies in the case of Republic of Serbia. **Idea:** The main idea is to investigate the necessity of applying quantitative methods such as simple regression analysis to obtain reliable conclusions about relationships between key factors that affect the financial position of an insurance company. **Data:** Data for empirical study were obtained from publicly available financial reports of 16 insurance companies operating in the Republic of Serbia for the year 2023. **Methods:** A simple linear regression model as a technique for investigating a statistical relationship was employed. The key model assumptions such as normality, homoscedasticity, and independence of residuals were tested and validated. **Findings:** The results indicate a statistically significant impact of acquisition costs on premiums. This is a highly relevant practical finding, providing insurance management with crucial insight into the justification of marketing investments. **Contribution:** The primary contribution of this paper is the original application of a linear regression model to examine the effects of marketing investments on the financial performance and therefore proposing the direction for future decision making in the insurance companies.

Keywords: insurance marketing, metrics, insurance premiums, acquisition costs, linear regression model

JEL Classification: M31

1. Introduction

The insurance companies operate in the markets under complex conditions characterized by inflation, increasingly frequent natural disasters driven by climate change, health crises such as pandemics, and the emergence of new and intensified risks. The insurers must redefine their business strategies, operational methods, and overall approaches in order to maintain financial stability and long-term profitability.

In such an environment managers are expected to quantify market opportunities and threats, justify the risks and benefits of decisions, assess strategic plans, and identify key areas for business improvement. All these responsibilities ultimately rely on metrics (Farris et al., 2006). In the process of making decisions about resource allocation, metrics are valuable only if they are linked to outcomes. For example, advertising is financially successful only if increases in awareness or intent led to higher sales or profit margins. Therefore,

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metrics should be systematically linked through the whole chain following the activities, customers, markets, and finally financial outcomes (Hanssens & Pauwels, 2016).

This paper explores the contribution of marketing investments to the financial stability of insurance companies. The aim of this paper is to emphasize how marketing metrics can promote productivity in insurance. Some of the managerial implications and future research opportunities are presented in Kocovic, Rajic and Gligorijevic (2016). The measurement of marketing investments and their impact on a company's financial position has led to a shift performance evaluation, especially through the introduction of marketing metrics as a form of quantitative analysis. The primary purpose of introducing marketing metrics in the insurance sector is to justify marketing expenditures by directly linking them to financial outcomes. These metrics enable quantitative evaluation, support timely and informed decision-making, and provide competitive advantage.

Metrics in marketing are used as the core mechanism for demonstrating the impact of activities and increasing credibility within management structures (Silveira Netto & Slongo, 2019). The establishment of clear reporting structures across hierarchical levels of management is particularly critical in this context. Moreover, Western-developed models, such as model proposed Mintz and Currim (2015) are not readily transferable to the Japanese corporate environment, as structural and functional differences persist. For instance, in many Japanese firms, sales teams often assume responsibilities traditionally associated with marketing, thereby influencing both decision-making processes and control mechanisms (Fukutomi et al., 2021). This suggests that effective metric implementation requires careful alignment with the decision-making process, levels and business context (Mintz & Currim, 2015).

The marketing theory and practice need to be firmly integrated in order to develop metrics that enable precise evaluation of both marketing and financial performance. Empirical research shows that metrics explicitly linked to financial results, such as return on investments or market share, are especially significant as financial measures (Silveira Netto & Slongo, 2019). On the other hand, research that integrates marketing and financial indicators are essential for effective management and data-driven decision-making (Chen, 2023).

The qualitative and quantitative analysis are increasingly combined in marketing research for the purpose of performance measurement. Using different tools of artificial intelligence such as machine learning or IoT in the marketing as scientific discipline is supported by Kumar & Kotler (2024). Insurance companies can improve also their business processes by implementing advanced data analysis tools for targeting specific market segments and compete more effectively (Gligorijevic, Kocovic & Rajic, 2025). The tools of data analytics and artificial intelligence rely on multiple data sources and the transparency of the processes of data collection. The results of quantitative analysis should be combined with experts' qualitative insights paying the attention to policyholders' preferences and satisfaction. In this way, marketing strategies are transformed and performance are improved.

The subject of this research is assessing the importance of marketing investments for the improvements of the financial performance of the insurance companies. Specifically, we are assessing the impact of acquisition costs on insurance premiums. The main objective is to demonstrate, using data from selected insurance companies and a simple linear regression model, how acquisition costs affect premium performance. This allows for assessment of whether marketing investments in insurance acquisition are financially justified and to what extent.

The rest of paper is structured into two main sections followed by a conclusion. The second section outlines the theoretical framework and emphasises the importance of marketing metrics to enable data-driven decision-making and introducing the importance of the metrics in insurance industry. The third section applies a simple linear regression model to a sample of 16 insurance companies operating in the Serbian market. Based on available data, the analysis explores the effect of acquisition costs on insurance premiums and evaluates whether a positive correlation exists and whether such expenditures are justified in terms of business performance.

2. The Importance of Introducing Metrics in Insurance

The systematic use of metrics in marketing has started relatively recently. Different definitions that can be found in the literature and in practice reflect different theoretical frameworks and research goals. However, most of them rely on the classical conceptualisation introduced by Professor Philip Kotler (Kotler, 1977).

2.1 Metrics

There are numerous definitions of marketing metrics in the literature. In accordance with Kotler, Keller, Brady, Goodman and Hansen (2019), marketing metrics are defined as quantitative measures that are used to support marketing decision-making. Ambler (2000a, 2000b) similarly defines marketing metrics as quantitative indicators of marketing activities that executives should monitor continuously.

Marketing metrics provide information that helps managers to understand market developments, the factors that are influencing outcomes, and the contribution of activities to company performance. Usage of quantitative metrics has contributed to the analytical dimension of marketing by enabling a more objective results assessment. As a result, marketing decisions can be based not just on managerial judgement and experience but also on measurable indicators that support resource allocation and the achievement of strategic goals. The usefulness of these metrics to managers depends on how they interrelate (Edeling & Fischer, 2016). Marketing managers must justify marketing investments and ensure that marketing budgets are properly allocated since a quantitative assessment of marketing strategy performance enables the firm to use resources with maximum efficiency (Gligorijevic & Veljkovic, 2022). As noted by Lehmann and Reibstein (2006), marketing can play a more important role in strategic decision-making only when its impact on company's financial performance can be clearly shown and measured.

The interaction between marketing and finance is reflected in their complementary roles within the company. While marketing activities depend on the availability of financial resources, financial results are partly shaped by the effectiveness of marketing decisions. For this reason, insufficient coordination between these functions can reduce organisational effectiveness and endanger the implementation of strategic plans. Stronger integration of marketing and financial perspectives enables more consistent decision-making and strengthens the adjustment of operational activities with corporate objectives (Shah, Goswami & Vidani, 2024).

Management approaches to planning and evaluation increasingly rely on quantitative indicators. By integrating empirical data and statistical methods, organisations can better understand consumer behaviour, identify market trends, and adequately evaluate campaign effectiveness. The integration of modern information technologies alongside continuous employee training further optimises data analysis and application. This approach facilitates informed decision-making, optimal resource allocation, and risk mitigation, thereby enhancing competitiveness and sustainable organisational growth (Hanssens & Pauwels, 2016).

In practice, marketing metrics are used to monitor market developments, identify factors that influence business performance, and predict future trends. Marketing metrics have a wide range of applications, including planning marketing resources, evaluating distribution and sales channels, estimating customer lifetime value, and assessing the financial effects of marketing actions. For example, Narayanan, Desiraju, and Chintagunta (2004) analysed marketing return on investment in the pharmaceutical industry, while Pauwels et al. (2004) investigated the effects of marketing investments on sales and profitability in the automotive sector. O'Sullivan and Abela (2007) analysed the impact of the ability to measure marketing performance on firm success. Their research findings showed that organisations that effectively measure and monitor marketing outcomes achieve higher perfomance. Therefore, developing marketing metrics systems is an important prerequisite for improving business performance and making higher-quality managerial decisions.

2.2 Metrics in the Insurance Industry

Metrics measuring is very important in the insurance sector, where business operations are exposed to a great number of risks. In such conditions, managers need reliable information to identify potential opportunities and threats and to consider the financial implications of their decisions. Insurance companies decrease clients' exposure to financial losses and promote responsible business conduct by strict risk management and setting clear criteria (Mukdad, 2023). Therefore, measuring an insurance company's performance, from a financial and a marketing perspective together, is crucial for ensuring its financial stability. The main purpose of introducing marketing metrics in the insurance sector is to justify marketing expenditures by connecting marketing investments and financial outcomes. Given that the effects of marketing initiatives are often delayed, their assessment typically requires a longer period, emphasising the long-term nature of marketing investments (Kendirli, 2024).

Assessing the financial effects of marketing activities is particularly demanding in insurance industry. Key indicators for evaluating marketing performance in insurance industry, can be classified in several categories:

market metrics, product metrics, price (insurance premium) metrics, sales and distribution metrics, promotion metrics, and consumer-related metrics (i.e., policyholders). Particularly important for this research are pricing metrics. Authors in (Njegomir, Stojic & Demko Rihter, 2023) emphasise that the premium is a fundamental financial mechanism for transferring risk to the insurer, thereby securing the financial protection provided by the insurance policy. The determination of the premium involves both actuarial and marketing approaches. From an actuarial standpoint, the premium must not fall below the actuarially justified threshold required to adequately cover the underlying risk. From a marketing perspective, it is essential that pricing strategies targeting new market segments do not compromise this actuarial minimum. Furthermore, insurers with a larger premium volume typically have greater influence in the price-setting process within the insurance market (Kocovic De Santo & Jovovic, 2015). This pricing power is often a direct function of scale, market share, and the insurer's competitive position.

The evaluation of the financial effects of marketing activities provides a foundation for examining marketing's contribution to the overall performance of insurance companies. Contemporary approaches to insurance management are focused on long-term value creation rather than on short-term improvements in premium income or profitability. As a consequence, the effectiveness of marketing activities is increasingly assessed in terms of their contribution to sustainable competitive position, customer retention, and the growth of company value over time. As Konak (2015) points out, marketing investments must generate not only immediate financial returns but also sustained value creation over time in order to be justified.

3. Determining the Impact of Acquisition Costs on Insurance Premiums

In this study, we aim to establish a relationship between acquisition cost as promotional marketing metrics and insurance premiums as an financial outcome. in the insurance industries. Such a study determines the importance of marketing investments on the one hand and provides the direction for future managerial decisions on the other hand.

The empirical study uses publicly available financial report data from 16 insurance companies operating in the Serbian insurance market in 2023. (source: National Bank of Serbia website).

Table 1 presents premiums and acquisition costs for these companies, while Figure 1 provides graphical representations of their values.

Table 1: Insurance Premiums and Acquisition Costs in 2023 (RSD, thousands)

Company	Insurance Premium	Acquisition Costs
AMS	5 642 359.00	1 425 860.00
DDOR	14 499 219.00	4 163 300.00
Dunav	30 950 319.00	8 080 357.00
GeneraliOsig	22 031 617.00	5 995 371.00
Globos	4 883 059.00	1 892 401.00
Grawe	5 360 754.00	1 160 582.00
MerkurOsig	773 412.00	108 801.00
Milenijum	3 459 523.00	1 049 528.00
Sava non-life	2 773 254.00	1 262 874.00
Sava life	807 154.00	155 893.00
Sogaz	146 991.00	47 310.00
Triglav	6 945 184.00	2 602 070.00
Uniqa non-life	4 064 045.00	1 445 596.00
Uniqa life	1 563 965.00	290 925.00
Wiener	12 146 438.00	3 102 623.00
OTP	1 233 955.00	258 883.00

Source: www.nbs.rs

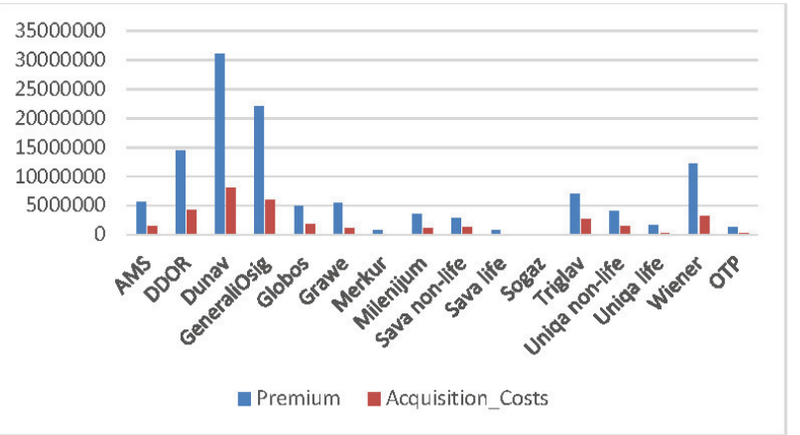

Figure 1: Acquisition Costs and Insurance Premiums for 16 Insurance Companies in Serbia in 2023 (RSD, thousands)
Source: Output from Excel based on data from www.nbs.rs

For the purpose of investigating statistical relationship between two variables, we have employed a simple linear regression model was estimated in SPSS. Based on the observed data on insurance premiums and acquisition costs, the Pearson correlation coefficient between these two variables was calculated at 0.991, which indicates a very strong positive linear correlation between insurance premiums and acquisition costs.

Figure 2 presents the scatter plot with empirical data points for premiums and acquisition costs in 2023. Taking the premium as the dependent variable and the acquisition cost as the explanatory variable, the corresponding regression line is also displayed in the plot.

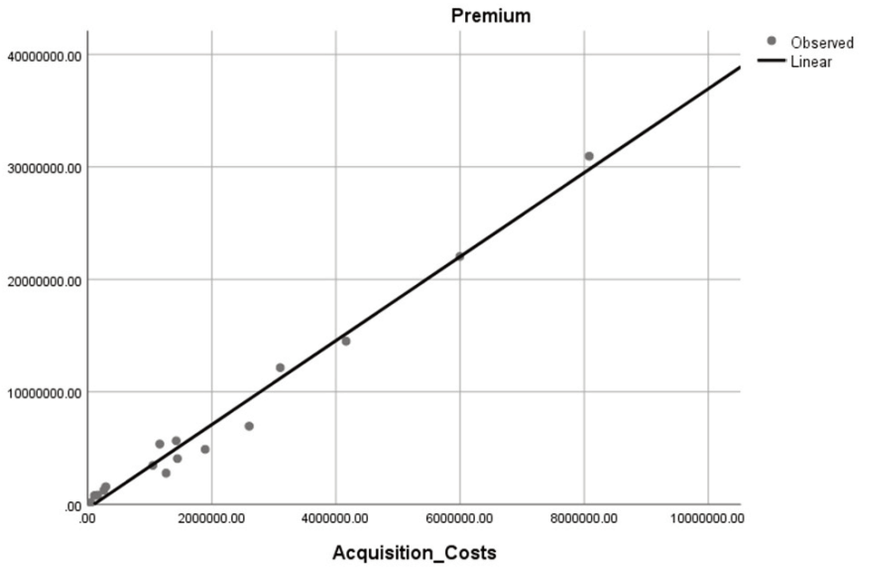

Figure 2: Scatter Plot and Regression Line for the Sample
Source: Output from SPSS

The coefficient of determination (R^2) was estimated at 0.982, indicating that 98.2% of the variation in total premiums can be explained by acquisition costs.

Table 2: Coefficients of the Regression Line

	Coefficient	Standard Error	t	p-value
Intercept	−377,563.118	404,909.295	−0.932	0.367
Slope	3.732	0.134	27.930	0.000

Source: Output from SPSS

Based on Table 2, the regression equation is:

$$Premium = -377{,}563.118 + 3.732 \cdot Acquisition\ Costs \quad (1)$$

The estimated slope coefficient is 3.732, indicating that an increase in acquisition costs by one unit (i.e., RSD 1,000) is associated with an average increase of RSD 3,732 in premiums. This suggests that investments in acquisition costs tend to result in higher premium volumes.

When testing the significance of the estimated regression coefficients, it is concluded that the slope coefficient estimate is statistically significant. This means there is a linear relationship between the observed variables in the sample (p-value = 0).

Table 3 reports the realized value of the F-test statistic, which assesses whether the regression model is statistically significant as a whole. The obtained p-value was less than 0.001, indicating that the regression model as a whole is statistically significant.

Table 3: ANOVA Table

Source	SS	df	MS	F	p-value
Regression	1.096×10^{15}	1	1.096×10^{15}	780.080	0.000
Residual	1.967×10^{13}	14	1.405×10^{12}		
Total	1.115×10^{15}	15			

Source: Output from SPSS

Next, assumptions of the simple linear regression model were tested (conducted using the R programming language). The first assumption is that there is no autocorrelation of the residuals. The null hypothesis is H_0: the random errors are mutually independent; the alternative H_1: there exists first-order autocorrelation. The Durbin–Watson test produced a test statistic of DW = 2.0927 with a p-value of 0.51, suggesting that H_0 cannot be rejected, i.e., the residuals are uncorrelated.

The second assumption relates to the normality of the residual distribution. The null hypothesis is that residuals are normally distributed (H_0), while the alternative states that they are not (H_1). The Shapiro–Wilk test yielded a statistic of W = 0.89817 and a p-value of 0.07513. At the 5% significance level, H_0 is not rejected, indicating that the residuals do not deviate significantly from normality.

The third assumption concerns homoscedasticity (equal error variances). The null hypothesis states that variances are constant across observations (H_0), while the alternative assumes heteroscedasticity (H_1). The Breusch–Pagan test was applied, yielding a test statistic of BP = 0.090261 with a p-value of 0.7638. Since H_0 cannot be rejected, the residuals may be considered homoscedastic. Taken together with the previous tests, these results indicate that all key assumptions of the simple linear regression model are satisfied, justifying its application in this analysis.

In this part of the study, the focus was placed on the effect of acquisition costs on insurance premiums, which provided the rationale for employing a simple linear regression model. The results confirm that acquisition costs exert a statistically significant influence on insurance premiums, as the regression model is significant as a whole. While it is acknowledged that numerous other factors—such as the growth of insured risk, increases in administrative costs, or prevention expenditures—also affect premium levels, the analysis nonetheless supports the general conclusion that marketing expenditures on acquisition are financially justified. The findings further suggest the existence of a significant and direct relationship between acquisition costs and insurance premiums.

A similar conclusion was reached by Kocovic and Rajic (2018), who analyzed data from ten insurance companies in Serbia for 2016 and, in addition to regression analysis, applied bootstrap confidence intervals to test the robustness of their estimates. Their findings confirmed a strong positive relationship between acquisition costs and calculated premiums, with the slope estimated at 4.237, and emphasized that marketing costs should be treated as investments in insurers' financial performance

Conclusion

The aim of this study was to examine, based on data from 16 insurance companies over a one-year period, the relationship between insurance premiums and acquisition costs. The application of a simple linear regression model revealed a statistically significant effect of acquisition costs on premiums. The estimated slope coefficient of 3.732 indicates that an increase in acquisition costs by one unit (1,000 dinars) is associated with an average increase in premiums of 3,732 dinars. This finding suggests that investments in acquisition costs are typically reflected in a higher volume of premiums. This is significant from the perspective of the marketing department in justifying acquisition costs to company management, as well as from the perspective of the insurance company itself, given that promotional marketing activities influence both the retention of existing policyholders and the acquisition of new ones. It is also important from the perspective of policyholders — particularly new ones — who, thanks to insurance promotion, will protect their assets by purchasing insurance products.

However, the positive impact of acquisition costs on premium income, and consequently on the profit of the insurance company, should be viewed with caution, as growth in premium income may be accompanied by growth in claims liabilities and other operating costs. If the growth in claims outpaces the growth in premiums, this leads to a deterioration of the underwriting result — that is, the result from core insurance operations. A decline in the underwriting result negatively affects profitability, as a larger share of premium income is allocated to settling obligations to policyholders. In this regard, a higher claims burden may reduce the insurance company's profit.

It also frequently occurs that insurance companies attract new policyholders by lowering insurance prices, which may result in attracting higher-risk policyholders who carry a greater probability of an insured loss and therefore generate higher claims. In this way, claims growing faster than premiums — as a consequence of investing in the acquisition of bad-risk policyholders — can lead to an increase in the loss ratio and a deterioration of the technical result, and consequently to a reduction in profit.

Therefore, a future research topic could be to examine the impact of acquisition costs not only on insurance premiums but also on profit. In this context, an additional independent variable — claims paid — would be included, and its impact on profit would also be investigated. Furthermore, the impact of these factors on profit should be examined dynamically over a longer time horizon in order to obtain more adequate research results.

It can be concluded that caution is warranted when drawing conclusions about the impact of acquisition costs on insurance premiums, and that managing premium growth while controlling the loss ratio represents important factors in the financial stability of insurance companies.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this manuscript, the autor used ChatGPT-5, for tehnical help in reference, formatting and mild language polishing. The autor reviewed and edited the content as needed take full responsibility for accuracy and integrity of the final version.

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