

THE WESTERN BALKANS INSURANCE MARKET: COMPETITION, CONCENTRATION AND MANAGERIAL PRACTICES¹

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ABSTRACT

This paper analyses the competition and concertation of insurance markets in Bosnia and Herzegovina, Montenegro, Serbia, and North Macedonia. We measure market structure using the Herfindahl–Hirschman Index (HHI) and market development using premiums per capita (EUR) and the share of premiums in GDP. Country-specific linear time trends are estimated with OLS and heteroskedasticity and autocorrelation-consistent standard errors, complemented with rank-based Kendall and Spearman tests designed for short series and potential nonlinearity. We document statistically significant deconcentration in Montenegro and Serbia, a significant increase in concentration in Bosnia and Herzegovina, and an inconclusive pattern for North Macedonia given the limited availability of data. In parallel, premiums per capita trend upward across all markets, with typical annual growth ranging from roughly 9% (Bosnia and Herzegovina) to 14% (Serbia). Taken together, the results support the hypothesis that higher competition is not directly or uniformly associated with market development over the 2019–2024 window. Policy recommendations emphasise proportionate entry facilitation, conduct-focused supervision, and investment in statistical capacity for line-of-business series and longer time frames.

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1. INTRODUCTION

In today's dynamic economic environment, competition is a key factor that shapes and influences the development of various industrial sectors, including the insurance sector. Competition within the insurance market has a significant impact on its development, efficiency, and innovation. Understanding the dynamics of competition and its effect on the insurance market is essential for proper sector management and the design of relevant policies.

Within insurance specifically, the Herfindahl–Hirschman Index (HHI) is the standard summary of market structure, computed as the sum of squared market shares. Its interpretation is straightforward: higher values indicate greater concentration and, by implication, less structural competition, while lower values indicate more fragmented structures. HHI's widespread use in merger analysis and regulatory diagnostics makes it a natural starting point for tracking structural trends in small markets. Nevertheless, HHI does not observe pricing to risk, claim-handling quality, or innovation, all of which mediate the mapping from structure to market development and consumer welfare. For this reason, our empirical design deliberately separates structural indicators (HHI) from development metrics, such as premiums per capita and the share of premiums in GDP, in order to study their co-movement.

The policy relevance for the Western Balkans is immediate. Historical legacies of direct state involvement and segmented distribution channels coexist with efforts to harmonise supervision, expand product availability, and digitise distribution. In such settings, market deepening may arise through scale economies and improved efficiency even if concentration rises, or conversely through entry and business-model diversification even if concentration falls. Understanding which of these trajectories is unfolding is a necessary input to proportionate, risk-based supervision and market conduct policy.

Empirically, we assemble annual country–year series for the four markets from 2019 to 2024, measuring concentration via HHI derived from company-level written premiums, and development via premiums per capita (EUR) and premiums/GDP. The data originate from national supervisory authorities and central banks, with local-currency premiums converted to EUR. North Macedonia's published series begins in 2022, which constrains inference for that market and motivates methods that remain valid in very short series.

Methodologically, we estimate country-specific linear time trends in HHI using ordinary least squares while conducting inference with Newey–West heteroskedasticity and autocorrelation-consistent (HAC) standard errors, which

are suited for short annual series that may exhibit heteroskedasticity and low-order serial correlation. Since linear trends can be sensitive to functional-form assumptions and outliers, and ultra-short series can yield limited power, we complement the parametric trends with rank-based Kendall and Spearman tests of monotone association between time and HHI. For development indicators, we similarly assess monotone trends and summarise typical dynamics using distribution-free medians of year-over-year growth in premiums per capita.

This study contributes in three ways. First, it integrates a theory-grounded discussion of competitiveness with a short-panel empirical assessment of structural and developmental trajectories in four transitioning insurance markets. Second, it deploys a dual-track inferential strategy, HAC-robust parametric trends alongside rank-based tests, calibrated to the realities of short series in small markets. Third, by analysing structure and development separately, it provides evidence on whether market deepening requires deconcentration or whether these dimensions can decouple over policy-relevant horizons.

The main hypothesis is that market concentration within each country has changed significantly over time during the observation window, as detected by HAC-robust linear trends and corroborated, where possible, by rank-based tests. This hypothesis recognises that even modest year-to-year changes may cumulate to economically meaningful shifts in small markets.

The first auxiliary hypothesis is that the insurance market development, measured by premiums per capita and the share of premiums in GDP, has increased over time across the four markets, consistent with ongoing modernisation and financial-sector deepening in the region. This hypothesis is evaluated using Kendall trend tests and robust summaries of year-over-year growth.

The second auxiliary hypothesis is that a higher level of competition in structure (lower HHI) is not directly or uniformly associated with a higher degree of market development over the sample period; that is, deepening can occur alongside either deconcentration or rising concentration depending on institutional and market-conduct conditions.

These hypotheses deliberately separate questions of change (H1 and H1a) from questions of association (H2a). The first two examine whether there are statistically detectable trends in structure and development within very short samples, while the third examines whether those trends co-move systematically. In this way, the analysis avoids conflating structure with outcomes and situates inference within a framework that is both empirically feasible and policy-relevant for supervisory authorities in the Western Balkans.

2. LITERATURE REVIEW

From 2020 to 2025, numerous studies have linked the structure of insurance markets with managerial practices, competition policy, digitalisation, and firm efficiency. Recent sources emphasise that both competition and market concentration have significant implications for insurers' performance, while managerial decisions and innovation can shape market structure. Regulators and researchers increasingly argue that competitive and efficient insurance markets contribute positively to the broader economy—an especially important point for small markets. For example, analyses of Albania's insurance market indicate that life insurance remains highly concentrated, though concentration is declining as new firms enter, whereas the non-life segment is moderately concentrated with a rising concentration trend. These findings confirm that the entry of new competitors can reduce concentration and strengthen competition. Given the sector's economic importance, researchers stress that the market should be as competitive and efficient as possible to provide consumers with protection at lower cost, and they highlight concentration analysis as a key tool for regulators and policymakers (Bezati, 2024).

Several recent studies examine the link between competition in insurance markets and insurers' performance. For example, an analysis of Eastern European markets finds that greater financial inclusion (broader availability of insurance) is associated with stronger underwriting outcomes, and that these positive effects are significantly more pronounced in more competitive (i.e., less concentrated) markets (Srbinoski et al., 2025). This result suggests that policies promoting competition and higher insurance penetration can yield better outcomes for consumers and firms (Srbinoski et al., 2025).

In other words, competition acts as a catalyst for efficiency: under more intense market rivalry, insurers are incentivised to improve performance and innovate, which translates into lower loss per policy and greater financial stability for the sector (Srbinoski et al., 2025). These findings align with a broader literature that bridges industrial organisation and management in insurance: market structure shapes firm behavior, while managerial decisions (e.g., expanding the customer base or pricing strategies) in turn influence market competitiveness (Srbinoski et al., 2025).

Efficiency of insurance companies as a performance measure is also a focus of recent studies, with Data Envelopment Analysis (DEA) frequently used to assess productivity and resource management. Koprivica et al. (2025) analyse the technical efficiency of insurers in five Western Balkan countries (2015–2022) and find substantial cross-country differences: insurers in Serbia exhibit the highest

average efficiency, while those in Albania show the lowest (Milašinovic et al., 2025). Moreover, efficiency levels are significantly influenced by management-controlled factors—such as firm size, degree of specialisation, growth rate, solvency, and profitability—which reflect managerial decisions and strategies (e.g., portfolio diversification, cost control, capital management) that can enhance or constrain efficiency. These findings imply that, through organisational design and business strategy, insurance management can indirectly shape market structure—more efficient firms may grow and capture larger market shares, potentially affecting market concentration (Milašinovic et al., 2025). A global literature review on insurer efficiency, including a bibliometric analysis of DEA studies, highlights a growing emphasis on digital transformation, artificial intelligence, and sustainability in performance evaluation (Kumar & Kumar, 2024). Differences between life and non-life insurers are also observed, partly due to product complexity and the intensity of market competition in those segments. In short, markets with sharper competition display distinct efficiency and productivity patterns, underscoring the importance of incorporating competitive dynamics into performance analyses.

A further key trend in the recent literature is digitalisation in the insurance industry and its implications for competition and management. Although the sector has traditionally been viewed as conservative, newer studies document an accelerated digital transformation that is reshaping how firms operate and compete. Digital technologies, such as InsurTech innovations, big data analytics, and artificial intelligence, have become critical strategic tools for insurance managers. Njegomir et al. (2021) argue that digital transformation permeates the entire insurance value chain, from underwriting and risk management to policy sales and claims handling and/or fundamentally altering operational processes. In this view, technology functions as the “fuel” of organisational strategy, enabling faster, better-informed decision-making across all functions Njegomir et al. (2021).

The adoption of new digital tools also deepens customer orientation: through digital channels and analytics, insurers better understand client needs, tailor products and prices to individual risks, and enhance the user experience

For example, digital platforms and online distribution reduce intermediation costs and expand insurers’ market reach, potentially intensifying competition among firms. At the same time, process automation increases speed and efficiency, lowers operating costs, and can put downward pressure on premiums.

Recent empirical work corroborates these benefits. Bayar et al. (2023) find a positive link between ICT penetration and insurance market growth in new EU

member states, with evidence of bidirectional causality suggesting that stronger digital infrastructure supports insurance development, while a growing insurance sector further stimulates ICT investment. Therefore, digitalisation strengthens industry competitiveness and compels managers to adopt new business models. During the COVID-19 period this shift accelerated: major insurers invested in online channels, chatbots, telematics, and automated claims assessment to maintain business continuity and retain customers. These experiences underscore that managerial adaptation to digital change has become essential for survival and growth, as digitally agile firms respond more quickly to market shifts and achieve operational advantages over traditional competitors [Bayar et al. \(2023\)](#).

The theory of competitiveness has its roots in trade theory on competitive advantage. The main views on competitiveness emerged in the 1980s and 1990s, and can be divided into two streams. The first stream links competitiveness with lower labour costs and favourable domestic policies ([Brander & Spencer, 1985](#)). The second emphasises productivity as the catalyst of competitiveness and prosperity ([Delgado, Ketels, Porter, & Stern, 2012](#); [Krugman, 1990, 1994](#); [Porter, 1990](#)). The productivity-based view as a measure of competitiveness has become the most widely used definition and remains the most common indicator of good performance and competitiveness.

However, from the perspective of policymakers aiming to raise national competitiveness, using productivity to measure competitiveness has two drawbacks. First, it provides no information on the determinants of competitiveness. Policymakers, therefore, would not know which policy instruments to use to improve competitiveness. Second, productivity reflects only a static measure of competitiveness and provides no information on whether the economy is prepared to face changes in the economic environment.

A multitude of components can affect a firm's ability to perform well. These components may be directly linked to firm characteristics or indirectly affect the firm through its business environment. The latter can be further divided into the immediate and the macroeconomic environment, depending on whether it is close to the firm (clients, suppliers, competitors, etc.) or further away (national infrastructure, governance, trade policy, etc.) in terms of connectedness and ability to influence. Moreover, since firms not only need to be competitive today but must remain competitive over time, it is important to consider not only static but also dynamic components of competitiveness.

A firm's ability to compete at a given moment is reflected in its ability to meet market requirements for quality, quantity, and timing at a competitive price. In economic models, this capacity is usually described through the optimisation of

the production function under certain constraints, where those constraints mainly reflect access to inputs. In business administration, the same concept is described as the optimisation of the production process, where management plays a key role in designing and monitoring that process.

Indeed, managerial competence has proven to be a good indicator of how well a firm performs in the market. Managerial practices can improve productivity through their influence on the marginal productivity of inputs and resource constraints (Syverson, 2011), as well as on growth and longevity (Bloom & Van Reenen, 2010). It has also been found that managers' years of experience affect firm performance (Bertrand & Schoar, 2003).

Another aspect that influences all four components (quantity, quality, timeliness, and price) of competitive ability is access to inputs and suppliers. Empirical evidence shows that access to foreign intermediate inputs can increase firm efficiency by providing more diverse and higher-quality inputs (Bas & Strauss-Kahn, 2014), especially for small and medium-sized enterprises (SMEs), as they can raise their productivity through learning, variety, and quality (Amiti & Konings, 2007). This aspect includes access to key services such as water and electricity. The ability to perform financial transactions smoothly is also important for production and sales processes.

The time dimension within the “competition” pillar largely depends on the quality of infrastructure and logistics services. Logistics costs make up a significant share of the value of final manufactured goods, especially for SMEs and in developing countries (Schwartz, Guasch, Wilmsmeier, & Stokenberga, 2009). Although logistics costs are influenced by firms' ability to manage logistics, they often depend on external factors. For example, an impact assessment of road network expansion in Peru between 2003 and 2010 estimates that total Peruvian exports in 2010 would have been roughly 20% lower without the road development program (Volpe Martincus, Carballo, & Cusolito, 2017).

Both the economics and business administration literature indicate that access to finance is an important determinant of firm performance in various aspects, including investment, growth, firm size distribution (Ayyagari, Demirgüç-Kunt, & Maksimovic, 2011), and innovation (Demirgüç-Kunt, Beck, & Honohan, 2008). Musso and Schiavo (2008) show how access to external finance in France positively affects firm performance in terms of sales, capital stock, and employment. Access to finance is consistently cited as one of the primary obstacles facing SMEs (Ayyagari, Demirgüç-Kunt, & Maksimović, 2012). It also determines a firm's ability to enter export markets and expand abroad (Bellone, Musso, Nesta, & Schiavo, 2010; Berman & Héricourt, 2010), which

are capital-intensive endeavours involving high fixed and variable costs. Access to and the expansion of credit largely depend on a supportive legal and regulatory framework.

Competitiveness is a key factor that shapes the insurance market, influencing its dynamics and prosperity. Through the lens of competitiveness, the state, insurance companies, and clients can either flourish or falter, depending on the quality of competition in the market.

High-quality competition in the insurance market can benefit all stakeholders. Clients benefit from a wide range of products and services, competitive prices, and a high level of service. Quality competition encourages insurance companies to innovate and provide better products tailored to market needs. This leads to improved service quality, greater efficiency, and transparency in the industry. The state also benefits from quality competition through increased consumption, job creation, and higher tax revenues. However, the loyalty and quality of competition are crucial factors. Unsportsmanlike behavior by competitors, such as unfair trade practices, can lead to market distortions, reduced consumer choice, and poor service quality. This can result in the loss of consumer trust, diminished competition, and market stagnation. Under such circumstances, to prosper, clients, the state, and insurance companies must rely on regulatory agencies and legislation that ensure fair and honest competition. It is also important that insurance companies focus their efforts on delivering high-quality products and services and on building long-term relationships with clients.

In the opposite scenario, loss of loyalty and low-quality competition can lead to the decline in all participants in the insurance market. Clients would suffer from a lack of choice, high prices, and poor service. The state would lose due to reduced consumption, job losses, and lower tax revenues. Insurance companies would face declining profits, increased costs, and loss of public trust.

Therefore, high-quality competition in the insurance market can be a key factor for the prosperity of all participants. Through fair and honest competition, clients receive better products and services, the state achieves economic benefits, and insurance companies realise stable growth and development. Managing competitiveness in the insurance market requires the cooperation of all stakeholders and the application of effective regulatory frameworks that promote fair competition and industry integrity.

3. METHODOLOGY

The empirical setting comprises four successor states of the former Yugoslavia that are not members of the European Union: Bosnia and Herzegovina (BIH), Montenegro, Serbia, and North Macedonia. The unit of observation is the country–year. For each market, we assemble annual series on total gross written premiums, market concentration, and two indicators of market depth: premiums per capita (in EUR) and the share of total premiums in domestic GDP. Premiums are collected from national supervisors in local currency and converted to EUR to enable cross-country comparability. Unless otherwise specified in the source documentation, we use the end-of-year exchange rate on 31 December for the conversion. North Macedonia does not publish the relevant premium series before 2022, which constrains the time horizon for that country and motivates the use of inference techniques that are valid in very short series.

Market concentration is measured by the Herfindahl–Hirschman Index (HHI), which summarises the dispersion of market shares across licensed insurers. The HHI is calculated using the data on written premiums of insurance companies operating in respective countries. We further report country-level means, standard deviations, and coefficients of variation to characterise HHI. These descriptive statistics indicate that within-country year-to-year changes are modest relative to cross-country level differences, a feature that is typical of small markets with stable firm configurations and that has implications for the power of formal tests. Graphical inspection of the annual HHI series complements the analysis.

To identify systematic changes in concentration within each market, we estimate simple time trends by country using ordinary least squares (OLS) but conduct inference with heteroskedasticity- and autocorrelation-consistent (HAC) Newey–West standard errors. For each of the countries, we fit

$$HHI_{it} = \beta_0 + \beta_1 Year_t + \varepsilon_{it}$$

and interpret as the average annual change in concentration. Negative slopes indicate deconcentration and positive slopes indicate rising concentration. Because annual series in small markets can exhibit both heteroskedasticity and low-order serial correlation, HAC standard errors provide more reliable uncertainty quantification than classical OLS under these conditions (Kiefer, Vogelsang & Bunzel, 2000). For comparison, both HAC and classical p-values are reported. Residual diagnostics include tests for first-order autocorrelation (Durbin–Watson) and for heteroskedasticity (Breusch–Pagan). Given the very

short samples, these diagnostics are interpreted descriptively while primary inference rests on HAC standard errors.

Recognising that a linear parametric trend can be sensitive to outliers and that the true trajectory may be non-linear, we complement HAC-OLS with rank-based, non-parametric tests of monotonic association between calendar time and HHI. Specifically, we compute Kendall's τ and Spearman's ρ along with two-sided p-values for each country. These tests do not impose a functional form and are robust in small samples, thereby providing a validity check on the direction of change inferred from . In instances where the time series is extremely short and contains repeated or rounded values, exact small-sample p-values may be uninformative even when the ordering over time is monotonic. In such cases, we report the direction of change and rely on magnitude measures from robust estimators.

Market depth is analysed using two complementary measures, of which premiums per capita, expressed in EUR, serve as a proxy for the intensity of insurance activity per resident, while the share of premiums in GDP scales sectoral activity by macroeconomic size. For premiums per capita, we assess monotonic trends using Kendall's τ and quantify typical dynamics through distribution-free summaries of median year-over-year (YoY) growth rates and their interquartile ranges, which are less sensitive to outliers than mean growth rates. For the share of premiums in GDP, we again compute Kendall's τ , but given the shortness of some series and the prevalence of ties, we emphasise the observed direction and robust magnitude measures over formal small-sample p-values.

4. RESULTS

We collected data on the premiums of insurance companies in the countries of the former Yugoslavia that are not a part of the European Union and analysed the competition on the insurance markets using HHI and premium per capita. The results are presented in the Table 1.

The premiums were collected in local currencies and converted to EUR for the comparability of premiums. The exchange rate on the 31st of December of the respective year was used for the conversion, unless otherwise stated in the methodology of the regulatory body issuing the data.

Table 1: Premiums and HHI indices

Country	Year	Total Premium (local currency)	Total Premium (EUR)	HHI
BIH	2019	762,780,531.58	390,003,493	574.06
BIH	2020	755,894,109.41	386,482,521	581.66
BIH	2021	818,406,455.45	418,444,576	573.83
BIH	2022	881,056,957.44	450,477,269	570.78
BIH	2023	984,030,976.00	503,127,049	619.23
BIH	2024	1,085,511,265.66	555,013,097	630.85
Montenegro	2019	94,763,244.58	94,763,245	1,902.55
Montenegro	2020	93,673,540.74	93,673,541	1,830.12
Montenegro	2021	98,811,849.58	98,811,850	1,844.15
Montenegro	2022	108,283,270.53	108,283,271	1,820.06
Montenegro	2023	119,453,724.61	119,453,725	1,726.81
Montenegro	2024	134,194,150.59	134,194,151	1,688.49
Serbia	2019	107,449,872,000	913,745,331	1,544.70
Serbia	2020	109,916,743,000	934,823,576	1,526.06
Serbia	2021	119,408,670,000	1,015,534,422	1,468.39
Serbia	2022	133,925,041,000	1,141,512,968	1,434.87
Serbia	2023	155,254,730,000	1,324,996,394	1,410.26
Serbia	2024	177,382,869,000	1,515,899,847	1,391.92
North Macedonia	2022	12,785,429,800	207,916,157	894.25
North Macedonia	2023	14,438,596,000	234,793,008	873.02
North Macedonia	2024	15,970,227,000	259,699,602	924.73

Sources: [Insurance Agency of Bosnia and Herzegovina \(2025\)](#); [Insurance Supervision Agency of Montenegro \(2025\)](#); [National Bank of Serbia \(2025\)](#); [Insurance Supervision Agency of North Macedonia \(2025\)](#).

The overview of the main descriptive statistical measures is given in Table 2.

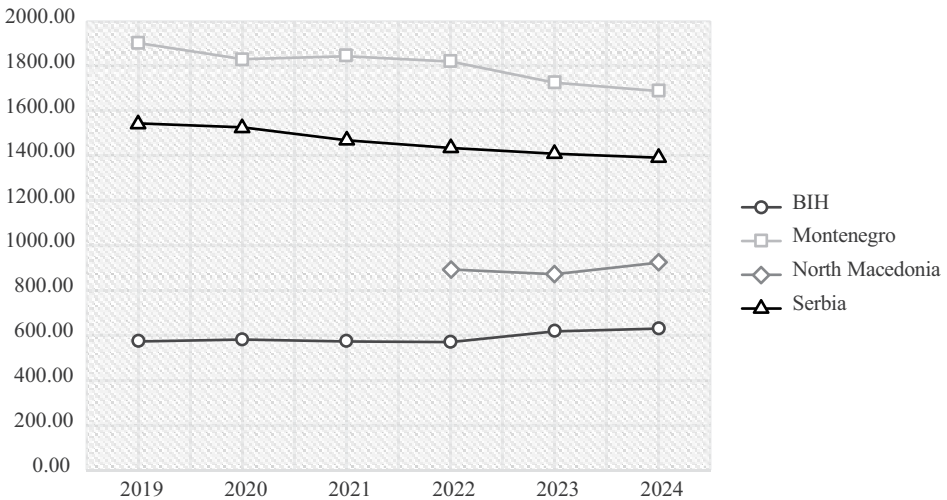
Table 2: Descriptive Statistics

Country	Number of observations	HHI mean	HHI Standard Deviation	HHI Coefficient of Variation (%)
BiH	6	592	26.3	4.45
Montenegro	6	1,802	79.4	4.41
North Macedonia	3	897	26.0	2.90
Serbia	6	1,463	62.2	4.29

Source: authors' calculation

The tabulated panel confirms marked level differences in concentration across markets. Average HHI is lowest in BIH and North Macedonia, and highest in Montenegro and Serbia. Coefficients of variation are modest, between roughly 2.9% and 4.5%, which implies that within-market year-to-year fluctuations are small relative to cross-market level gaps. The graphical series reinforces this finding, with the important caveat that North Macedonia’s series begins in 2022 and thus provides only three annual points for inference.

This graphical representation of the HHI indices is given in Graph 1.



Graph 1: HHI Indices
Source: authors’ calculation

We also calculated the premium per capita as a measure of the development of the insurance market.

To further examine the concentration of insurance markets, we examine whether the concentration changes monotonically over time for each country separately by estimating a linear trend in the following notation:

$$HHI_{it} = \beta_0 + \beta_1 Year_t + \varepsilon_{it}$$

While the estimation of the regression coefficients employs the OLS method, the Newey-West standard errors estimator (HAC) is utilised to account for heteroskedasticity and autocorrelation in the annual data. We report both HAC and OLS p-values for the tes, and check OLS for autocorrelation and heteroskedasticity using Durbin-Watson and Breusch-Pagan tests.

Additionally, to avoid linearity assumptions and limit the sensitivity to outliers, we test for a monotonic association between time and HHI using Kendall's and Spearman's with two-sided p-values (Puth, Neuhäuser & Ruxton, 2015).

The results are given in Table 3.

Table 3: OLS, HAC, Durbin–Watson and Breusch–Pagan Results

Country	OLS slope	HAC SE	p-value (HAC SE)	p-value (not robust)	Durbin– Watson p-value	Breusch– Pagan p-value
BIH	11.24617	2.728044	0.014584	0.056084	0.092	0.66
Montenegro	-40.1239	3.688453	0.000405	0.00444	0.303	0.89
North Macedonia	15.2395	8.594384	0.3269	0.601101	1.000	1.00
Serbia	-32.71	1.747496	4.810 ⁻⁰⁵	0.000344	0.191	0.94

Source: Authors' calculation

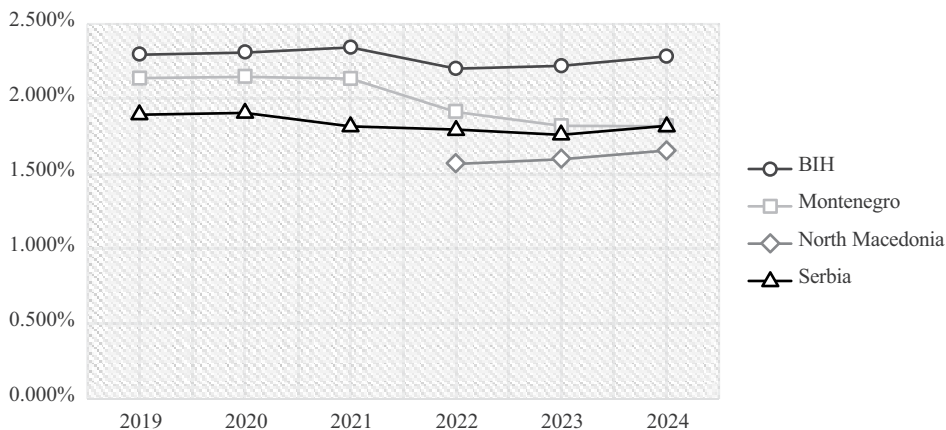
Over the observed period, trends in market concentration diverge across the four insurance markets. In Bosnia and Herzegovina (BIH), concentration increased: the HAC-robust linear trend equals +11.2 HHI points per year ($p = 0.0146$). Although the rank-based checks point in the same direction, they are not statistically significant (Kendall $\tau = 0.333$, $p = 0.452$; Spearman $\rho = 0.486$, $p = 0.329$). Residual diagnostics do not reveal major issues beyond a hint of autocorrelation (Durbin–Watson $p = 0.0917$), nor is heteroskedasticity detected (Breusch–Pagan $p = 0.665$), and HAC inference already addresses these concerns.

By contrast, Montenegro and Serbia exhibit a tendency of deconcentration. In Montenegro, the HAC-robust slope is -40.1 HHI points per year ($p = 0.000405$), implying a cumulative reduction of about 200 HHI points. Both Kendall ($\tau = -0.867$, $p = 0.0242$) and Spearman ($\rho = -0.943$, $p = 0.0048$) confirm a downward monotonic trend, and there is no evidence of meaningful curvature or problematic residual structure. Serbia shows a similarly strong decline with a HAC-robust slope of -32.7 HHI points per year ($p = 0.000048$), and the rank tests indicate a perfectly monotonic decrease (Kendall $\tau = -1.000$, $p = 0.0085$; Spearman $\rho = -1.000$, $p < 0.001$).

For North Macedonia, the series is too short to support firm inference. With only three annual observations, the HAC-robust slope of $+15.2$ HHI points per year ($p = 0.327$) is not statistically different from zero, and neither Kendall nor Spearman provides significant evidence of a monotonic trend. Taken together, these results indicate a statistically significant and accelerating increase in

concentration in BIH, pronounced deconcentration in Montenegro and Serbia, and an inconclusive pattern for North Macedonia within the limited sample.

Then, we analysed the premium per capita for the four countries, denoted in EUR, to be comparable. Their trend can be seen in Graph 2.



Graph 2: Premium per capita in EUR
Source: Authors' calculation

Turning to market depth, premiums per capita increased across all four markets, as shown in Table 4.

Table 4: Kendall rank–trend results and median year-over-year growth in premiums per capita

Country	Kendall τ (p-value)	Median YoY growth (%)
BIH	0.867 (0.0242)	0.0896
Montenegro	0.867 (0.0242)	0.101
North Macedonia	1.00 (1)	0.121
Serbia	1.00 (0.00853)	0.136

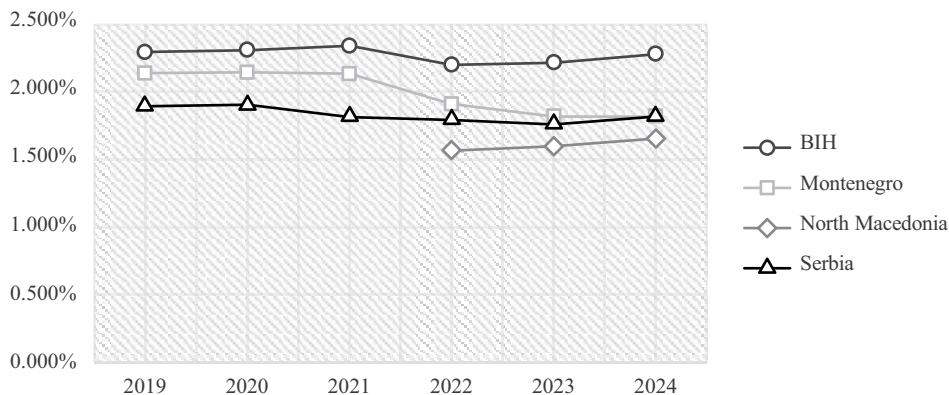
Source: Authors' calculation

The Kendall rank–trend test indicates a statistically significant upward monotonic trend in Bosnia and Herzegovina ($\tau = 0.867$, $p = 0.024$) and in Montenegro ($\tau = 0.867$, $p = 0.024$), and a very strong, statistically significant increase in Serbia

($\tau = 1.000$, $p = 0.0085$). North Macedonia also shows an upward pattern ($\tau = 1.000$), but with only three annual observations, the test lacks power and the result is not statistically informative ($p = 1.000$). The series are short and contain ties due to rounding and limited annual variation. In this setting, Kendall’s τ may take an extreme value, while the corresponding exact small-sample p-value is uninformative. We therefore interpret the results primarily in terms of the direction of change and robust magnitude summaries, rather than relying on the exact p-values.

Median year-over-year growth in premiums per capita is about 9.0% in Bosnia and Herzegovina, 10.1% in Montenegro, 12.1% in North Macedonia (based on only two year-over-year observations), and 13.6% in Serbia. Interpreted as typical annual changes, these medians point to sizable compounding over the sample, with the fastest deepening in Serbia and Montenegro and more modest but still positive growth in Bosnia and Herzegovina.

Finally, the share of premiums in GDP trends upward in all four countries, as seen in Graph 3.



Graph 3: Share of total premiums in the country’s GDP
Source: Authors’ calculation

For the share of premiums in GDP, the Kendall statistics equal $\tau = 1.000$ with $p = 1.000$ for all four countries. This combination typically arises when the series are nearly monotonic but extremely short and/or contain ties (e.g., repeated rounded values), which makes the exact small-sample p-values uninformative (Brossart, Laird & Armstrong, 2018).

5. DISCUSSIONS

Taken together, the evidence points to a region that has been deepening in insurance activity while experiencing heterogeneous movements in market concentration. On the development side, premiums per capita rise across all four markets; the rank-based trend tests detect statistically significant upward monotonic paths in Bosnia and Herzegovina and Montenegro and an even stronger signal in Serbia, with North Macedonia also increasing but in an ultra-short series that constrains inference. The median year-over-year growth rates, roughly 9% in Bosnia and Herzegovina, 10% in Montenegro, 12% in North Macedonia and 14% in Serbia, suggest economically meaningful compounding over the sample window. These patterns are consistent with a sustained post-pandemic expansion of insurance penetration from relatively low bases, and with the idea that sectoral deepening can proceed even in the presence of frictions typical of small markets.

On the competition side, concentration trends are not uniform. Montenegro and Serbia show robust deconcentration, with HAC-robust slopes of about -40 and -33 HHI points per year, respectively, and corroborating rank-based evidence of monotonic declines. Bosnia and Herzegovina, in contrast, exhibits a statistically significant rise in concentration of roughly $+11$ HHI points per year, while results for North Macedonia are inconclusive because only three annual observations are available. The level differences are material (mean HHI values range from roughly 600 to 1,800), but within-country dispersion is modest, with coefficients of variation around 3–4%, which implies that trend diagnostics are extracting signal from small year-to-year movements against large cross-country gaps. From an industrial-organisation perspective, declining concentration in Montenegro and Serbia is consistent with either incremental entry and expansion by smaller firms, more aggressive price or product competition by incumbents, or both. Conversely, the increase in Bosnia and Herzegovina suggests consolidation, asymmetric growth among incumbents, or a combination of product and distribution advantages accruing to larger carriers. Because HHI is a structural metric, these contrasting trajectories do not mechanically translate into consumer welfare, but they do signal changes in competitive conditions that deserve regulatory and market attention.

The joint reading of development and concentration provides the most policy-relevant insight. Where premiums per capita are rising while HHI is falling (Montenegro and Serbia), market deepening appears to be taking place in a competitive environment, which is typically favorable for consumer outcomes through pricing discipline, innovation and coverage expansion. In settings where premiums per capita rise alongside increasing concentration (Bosnia and

Herzegovina), the development objective is being met, however, market power may be accruing to a subset of firms. Monitoring should therefore focus on conduct indicators, such as pricing dispersion, broker remuneration structures, ancillary fee dynamics, and claims settlement performance, to ensure that observed scale advantages reflect efficiency rather than anti-competitive behavior. For North Macedonia, a cautiously positive reading on development is warranted, but the paucity of years precludes any reliable statement about competition dynamics; extending the series is a priority for evidence-based supervision. Altogether, the results suggest that supply-side competition and demand-side deepening need not move in lockstep: mixed combinations are feasible and observable in the region over the sample window.

The implications for supervisors and policymakers follow directly. First, deconcentration with rising penetration argues for continuing to remove frictions to entry and growth of smaller or specialised carriers, including digital-first distribution, proportionate capital and reporting for low-risk product lines, and portability of intermediaries across networks. Second, in markets where concentration has risen, the case for granular market-conduct surveillance is strong. Routine tracking of price-to-risk gradients, quote-to-bind conversion rates, renewal spreads for otherwise similar risks, and claims leakage indicators can help distinguish efficiency-driven consolidation from conduct that may harm policyholders. Third, given the fluid cross-country ranking of per-capita premiums, regional peer benchmarking should be dynamic rather than static. Supervisors might emphasise improvement relative to a rolling frontier rather than to a fixed comparator. Fourth, since the share of premiums in GDP exhibits stable ranks, macroprudential or fiscal policies that affect GDP may mechanically influence penetration ratios, so the interpretation of movements in that ratio should separate insurance-side growth from GDP-side fluctuations. These policy priorities are consistent with the dataset, the econometric choices and the cross-checks reported in the paper, and they are implementable with the information systems available to the region's supervisory authorities.

Two data features deserve explicit interpretation. The first is the combination, in the share-of-GDP series, of perfectly monotonic τ values with uninformative exact p-values in very short and tie-heavy samples. This reflects small-sample exact tests that lack power when values repeat and orderings are deterministic. The second concerns the small within-country dispersion of HHI relative to its cross-country level differences. This structure limits the detectability of modest trend shifts over short windows and explains why HAC-robust inference is essential: classical OLS p-values can be borderline even when robust tests reveal statistically reliable slopes, as in the case of Bosnia and Herzegovina. These two

features, far from being nuisances, are common in small markets and justify the paper's blend of HAC-OLS, rank-based tests and distribution-free growth summaries.

The study has several limitations that materially shape the interpretation of the results. The most important limitation is the short time dimension of the dataset. A six-year series for Bosnia and Herzegovina, Montenegro, and Serbia, and especially a three-year series for North Macedonia, cannot fully reveal whether the identified changes are structural, cyclical, or event-driven. In practical terms, this means that the paper can detect recent directional movement, but it cannot conclusively establish persistence. This limitation is especially important because insurance markets may react with delay to regulatory reforms, macroeconomic shocks, ownership changes, or consolidation episodes, so the full competitive effects may become visible only over a substantially longer horizon. A second limitation is that the analysis is based on aggregate market indicators and therefore cannot separate developments across life and non-life business lines, nor identify whether concentration changes originate in motor insurance, property insurance, health, life insurance, or another segment. A third limitation is that HHI, while standard and informative, is not the only relevant structural indicator. Because the empirical design intentionally remained parsimonious, the paper does not incorporate additional concentration or inequality measures such as share of the largest enterprises, entropy, or the Gini coefficient. Their inclusion could have provided a richer picture of market structure and allowed more robust triangulation of the findings. A fourth limitation is that the present design does not control for potentially important explanatory factors such as mergers and acquisitions, foreign ownership, regulatory interventions, inflation, GDP shocks, or changes in distribution channels. As a result, the paper identifies structural movement, but not its causal drivers. Finally, converting premiums into EUR using end-of-year exchange rates improves cross-country comparability, yet it may also introduce minor measurement noise when exchange-rate movements and local nominal growth interact.

Future research can address these limitations in concrete ways. The first priority is to extend the time horizon to at least a decade, which would make it possible to distinguish more convincingly between structural change and short-term fluctuation, test for breaks in trend, and evaluate whether recent movements persist once temporary shocks dissipate. Additionally, using control variables, such as the share of the 3 or 5 largest insurance companies, the entropy index or the Gini coefficient, could potentially enable a multidimensional assessment of concentration rather than reliance on HHI alone. The third priority is to introduce explanatory and control variables capable of clarifying the sources

of the observed change, including variables capturing mergers and acquisitions, ownership structure, regulatory reforms, macroeconomic conditions, inflation, and digitalisation of insurance distribution. The fourth priority is to disaggregate the analysis by line of business, because aggregate market-level concentration may conceal different competitive dynamics across life and non-life insurance segments. Finally, future work should connect structural indicators with conduct and performance outcomes, such as pricing behaviour, claims settlement, profitability, and consumer choice, in order to evaluate more directly whether changes in concentration improve or weaken effective market competition and welfare.

6. CONCLUSIONS

This study set out to examine how competition relates to insurance market development in four Western Balkan economies: Bosnia and Herzegovina, Montenegro, Serbia, and North Macedonia, over the period 2019–2024. Using the Herfindahl–Hirschman Index (HHI) to track structural concentration and premiums per capita and premiums/GDP as indicators of market deepening, we combined linear time trends with HAC-robust inference and rank-based tests suitable for short annual series. The empirical picture that emerges is clear on two fronts and instructive on a third. First, structural dynamics diverged across markets: Bosnia and Herzegovina experienced a statistically significant increase in concentration, whereas Montenegro and Serbia deconcentrated. North Macedonia did not provide enough data to render a meaningful conclusion. Second, insurance activity deepened across the board, with sustained growth in premiums per capita and rising premiums/GDP despite heterogeneous movements in structure. Third, and most importantly for the policy debate, structure and development did not move in lockstep.

These findings bear directly on the proposed hypotheses. The main hypothesis, positing significant within-market changes in concentration, is partially supported: shifts are significant in Bosnia and Herzegovina, Montenegro, and Serbia, but not inferentially settled in North Macedonia, given the ultra-short series. The first auxiliary hypothesis, anticipating a region-wide increase in market development, is supported by the monotone upward patterns in premiums per capita (and, with caveats about small-sample exact tests, in premiums/GDP). The second auxiliary hypothesis, asserting that lower concentration is not uniformly associated with higher development in the observed window, is supported by the documented decoupling: market deepening coincides with both rising and falling HHI, depending on the market.

Theoretically, the results reinforce a productivity- and conduct-oriented view of competitiveness in services. Structural concentration is an important state variable, but it is not a sufficient statistic for welfare or development. In emerging and transitioning insurance markets, changes in underwriting capacity, distribution channels (especially digital and bancassurance), pricing to risk, and claims-handling efficiency can generate growth in coverage and premiums independent of contemporaneous shifts in structural concentration. Conversely, deconcentration may not translate into deeper markets if entrants remain small, product scope is narrow, or intermediation frictions persist. By separating structural metrics from development indicators and triangulating parametric and rank-based evidence, our design makes explicit that the relevant mechanisms operate through conduct and capabilities as much as through firm counts and market shares.

From a policy perspective, the implication is a two-pillar supervisory strategy. Where deconcentration and deepening occur together (Montenegro, Serbia), proportionate regulation that facilitates entry and scale for efficient carriers can preserve competitive pressure while expanding access. Where deepening accompanies rising concentration (Bosnia and Herzegovina), the emphasis should shift toward market-conduct supervision and transparency. These indicators allow authorities to distinguish efficiency-driven consolidation from exclusionary conduct and to intervene with targeted instruments. For North Macedonia, the priority is to extend the public series and harmonise definitions to enable credible inference before decisive structural policy is considered.

Methodologically, the analysis demonstrates how to extract robust, decision-useful signals from short administrative series. HAC-robust linear trends provide interpretable estimates of direction and magnitude, while Kendall and Spearman statistics offer complementary evidence when functional-form assumptions are tenuous or sample sizes are very small. That said, several limitations should temper interpretation. Our series is short and aggregate, and it cannot reveal line-of-business reallocation, differential growth between life and non-life segments, or within-line pricing dynamics. Currency conversion at year-end and cross-jurisdiction differences in reporting may introduce measurement noise. Finally, without linked microdata on policy prices, risk classes, and claims outcomes, the welfare mapping remains indirect.

This limitation opens a clear agenda for future work. Longer time series, additional concentration indicators, disaggregated line-of-business evidence, and the inclusion of explanatory control variables would substantially improve the capacity to distinguish persistent structural change from temporary fluctuation.

Such extensions would also make it possible to examine whether observed changes in concentration are driven by mergers and acquisitions, regulatory reforms, foreign entry, macroeconomic shocks, or other market-specific developments.

In sum, the paper shows that the Western Balkan insurance markets deepened over the observed period, but not through a single common structural path. Development occurred under both deconcentration and rising concentration, which suggests that the relationship between competition and market development is conditional, country-specific, and sensitive to time horizon. For that reason, any stronger claim about the structural nature of these changes must await longer datasets and richer empirical specifications.

Conflict of interests

The authors declare there is no conflict of interest.

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ТРЖИШТЕ ОСИГУРАЊА НА ЗАПАДНОМ БАЛКАНУ: КОНКУРЕНЦИЈА, КОНЦЕНТРАЦИЈА И МЕНАџЕРСКЕ ПРАКСЕ

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САЖЕТАК

Овај чланак анализира однос између тржишне структуре и развоја тржишта осигурања у четири земље Западног Балкана: Босни и Херцеговини, Црној Гори, Србији и Сјеверној Македонији, у периоду 2019–2024. Степен конкуренције мјери се Херфиндал–Хиршман индексом док се развијеност

тржишта процјењује користећи премије по глави становника (у еврима) и удео премија у БДП-у. Емпиријска анализа комбинује линеарне трендове по земљама са робусним стандардним грешкама и ранговне тестове кратким временским серијама. Резултати показују статистички значајну деконцентрацију у Црној Гори и Србији, раст концентрације у Босни и Херцеговини, те неутврђен образац за Сјеверну Македонију због кратке серије. Истовремено, премије по глави становника расту у све четири земље, што указује да се развој тржишта може одвијати уз пад и уз раст концентрације. Хипотезе о промјенама у концентрацији (дјелимично подржана), расту развијености (подржана) и одсуству јединствене везе између ниже концентрације и већег развоја у кратком временском року (подржана) потврђују да је за регулаторе кључно руковођење на бази емпиријских података, које омогућава јединствен приступ у свакој земљи.

Кључне ријечи: *тржиште осигурања, конкуренција, концентрација, Западни Балкан.*