Forecasting Gross Written Premiums in Albania's Life Insurance Industry: Insights for Financial Sustainability

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ABSTRACT:

The insurance industry in Albania is a sector that consistently receives significant attention in the overall financial industry and plays a crucial role in fostering a culture of insurance among the populace. Year after year, these companies have expanded their presence to the clients, and what is most important, they have expanded the products that they are selling to the clients.

This paper aims to analyze the historical development trends of the Albanian insurance industry, taking into account its significance for a developing economy. Additionally, empirical models will be constructed to predict the values of gross written premiums over a four-year period. The methodology that will be used consist of the analyses of SARIMA and Holt-Winter models to prevent the prediction of the four year period on gross written premiums (GWP) on the life insurance industry in Albania. These models and the comparison between them will prevent a better understanding of the future life insurance in Albania. Those results will help all participant actors of the industry to contribute to a safe and secure environment for the people. Also, the result will help to see the trend and lead the government and companies to prevent the impact of economic sustainability. The conclusion from this paper is that the years from 2024 to 2027 life insurance will grow

Keywords: Life Insurance, analysis, SARIMA, Holt-Winters, safe environmental, GWP, Albania.

1. Introduction

Based on the research and comparison of various statistical data, it is evident that Albania lags behind the EU nations, which we aim to join. However, it is worth noting that the market has grown and strengthened in recent years. Undoubtedly, the values of the European Union countries differ significantly from those of Albania. However, improving and expanding these indicators seems crucial and is progressing. Albania's insurance market comprises 4 life insurance companies. The insurance industry in Albania has made a lot of progress in understanding the values and the benefits of it from the people. Year by year, the results indicate a growth of the numbers of insurers and the insurance products that they buy. The characteristics of the world market significantly influence the Albanian insurance sector, as Albania becomes more connected to the global financial and economic framework. The global economy, foreign investment, EU membership, reinsurance and risk management, digital transformation, climate change and natural disasters, capital markets and investments, competition and market consolidation, global health crises, geopolitical risks, and trends in life and non-life insurance are some of the most important things that affect the Albanian insurance market.

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In this paper are analyzed the monthly gross written premiums from 2018 to 2023 to prevent a predictive analysis of the trends from 2024 to 2027. It's important to keep in mind that in a fragment of the whole period that we have analyzed, all the world has been impacted by COVID-19. As in the other sectors, also the insurance industry has been affected by the consequences of the COVID-19. Insurance companies and consumers of their products were found unprepared for this sanitary catastrophe. Intervention by governments through extreme measures has led to a differential shock to their markets. (Koçi et al., 2021). The figures show that also life insurance has its own impacts from this pandemy. If we compare non-life insurance with life insurance, the numbers will speak for a big difference in favor of non-life insurance, which can come for many reasons. Life insurance in Albania has mostly been related and perceived with the loans, because to get a loan you should have a life insurance. The increase in life insurance is closely related to the increase in the level of lending and the life insurance for loan effect. (Biçoku et al., 2022). The request for life insurance policies can be influenced by many factors that would be income, inflation, education, urbanization, government effectiveness, rule of law, etc. (Grabova et al., 2021) For example, the demand for life insurance is influenced by an enhanced legal system in developing nations, as demonstrated by Browne & Kim (1993) and Celik S. (2009). However, in developed countries, the impact of legal system improvement on the demand for life insurance is found to be small, as noted by Ward & Zurbruegg (2002). The income would be another factor that can influence the demand for life insurance policies, which, if we compare with European countries, are very low. What should be emphasized in this paper using the predictive models is the growth of the life insurance industry, which has a lot of impact on the consumers themselves, the industry, and the government to prevent economic sustainability as a contribution in the finance sector.

2. Methodology

In this paper, two analyses are used to predict the gross written premiums for the years from 2024 to 2027. The first one is the SARIMA model. The Integrated Moving Average (SARIMA) model is applied to capture the underlying trends and seasonal patterns in the data, which are then used to generate future projections. The second one is the Holt-Winters method, also known as Triple Exponential Smoothing, which is a powerful tool for forecasting time series data that exhibit both trend and seasonality. By these two models, we will get the trends for the next four years, which will be shown in tables and graph formats. Also as a part of methodology will be the comparison between the two models, as a form to evaluate the values from each one.

3. Results and Discusion
3.1 Sarima Model

This analysis aims to forecast the gross written premiums (GWP) for the life insurance industry in Albania over the next four years (2024-2027). The provided data covers monthly GWP from January 2018 to December 2023. All the values are in 000 Albanian Lekë.

Table 1: Monthly GWP from January 2018 to December 2023

Month	2018	2019	2020	2021	2022	2023
January	88,270	89,588	95,469	94,430	105,326	161,910
February	69,588	70,524	74,252	85,451	99,348	115,419
March	83,689	127,486	96,467	113,819	114,181	138,598
April	81,596	88,438	60,191	97,927	138,780	150,723
May	109,558	112,509	79,309	101,609	124,916	143,354
June	140,130	121,992	84,230	184,622	156,085	187,444
July	91,289	111,132	92,707	114,585	253,080	144,961
August	78,709	102,216	113,952	111,684	135,109	175,512
September	78,709	69,864	121,026	119,863	126,692	129,139
October	81,129	92,985	103,224	122,452	124,366	159,698
November	98,677	80,512	80,901	97,362	110,601	134,491
December	138,847	148,531	163,555	186,457	196,988	217,947
Sum	**1,140,190**	**1,215,777**	**1,165,282**	**1,430,262**	**1,685,474**	**1,859,195**

Source: AMF

This data reveals an upward trend in GWP over the years, with some fluctuations, likely influenced by economic factors, policy changes, and market dynamics.

The SARIMA model is specified by the parameters (p, d, q) for the ARIMA component and (P, D, Q, s) for the seasonal component:

- **ARIMA Component**:
  - p (autoregressive order): 1
  - d (differencing order): 1
  - q (moving average order): 1
- **Seasonal Component**:
  - P (seasonal autoregressive order): 1
  - D (seasonal differencing order): 1
  - Q (seasonal moving average order): 1
  - s (seasonal period): 12 (monthly data implies a seasonal period of 12)

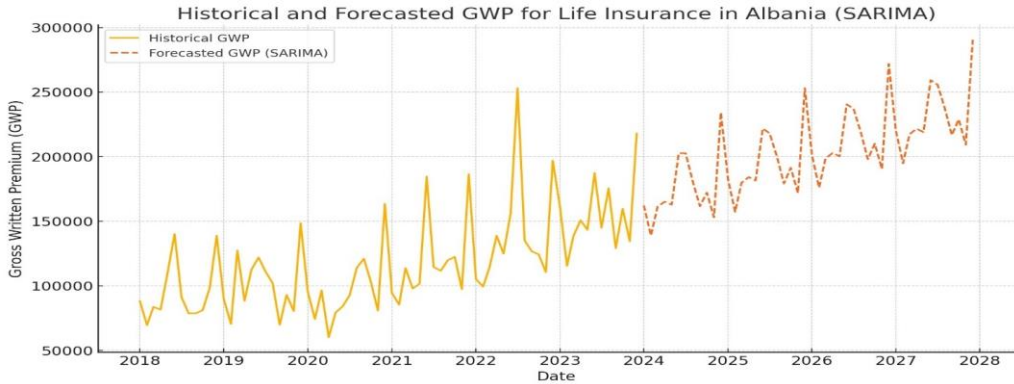These parameters were chosen based on model selection processes and the nature of the data.

Figure 1. Historical and Forecasted GWP for Life insurance (SARIMA)
Source: Author

The SARIMA model has provided the following forecasted gross written premiums (GWP) for the life insurance industry in Albania for the next four years:

2024: 2,097,738   **2025**: 2,321,379   **2026**: 2,546,168   **2027**: 2,770,860

The plot above shows both the historical data and the forecasted GWP, illustrating a continued upward trend based on the seasonal and trend patterns observed in the data from 2018 to 2023. This growth could be driven by increasing insurance penetration, economic development, and demographic factors such as an aging population. This forecast takes into account the seasonality and trends present in the historical data, providing a more nuanced prediction than simpler linear models.

Table 2. Monthly GWP for the next four years (SARIMA)

| Month	2024	2025	2026	2027
January	167,256	183,187	199,118	215,049
February	167,578	183,509	199,440	215,371
March	167,900	183,831	199,762	215,693
April	168,222	184,153	200,084	216,015
May	168,544	184,475	200,406	216,337
June	168,866	184,797	200,728	216,659
July	169,188	185,119	201,050	216,981
August	169,510	185,441	201,372	217,303
September	169,832	185,763	201,694	217,625
October	170,154	186,085	202,016	217,947
November	170,476	186,407	202,338	218,269
December	170,798	186,729	202,660	218,591

Source: Author
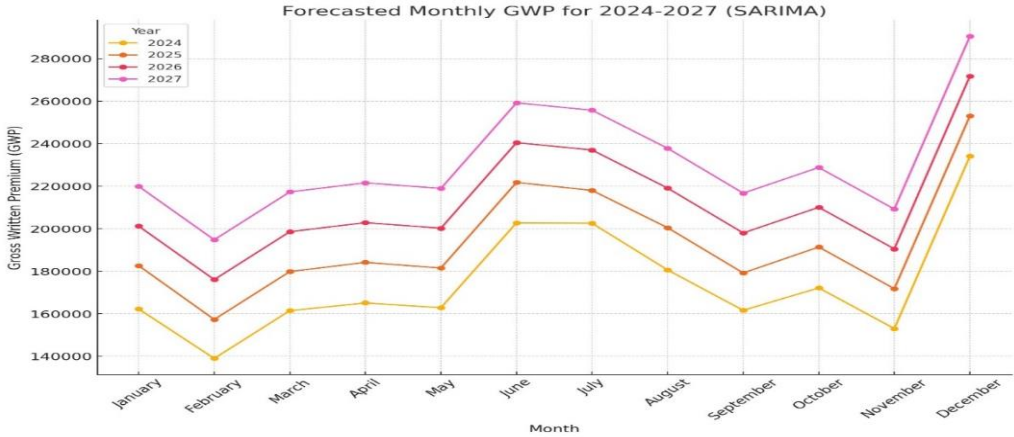
Figure 2. Forecasted monthly GWP For 2024-2027
Source: Author

3.2 Holt Wınter Model

This analysis uses the Holt-Winters model to predict the gross written premiums (GWP) for the life insurance industry in Albania over the next four years, from January 2024 to December 2027. The model leverages historical data from 2018 to 2023 to generate these forecasts.

Key observations from the historical data include:

- Seasonal peaks, particularly in December, where GWP tends to be higher.
- A general upward trend in GWP over the years, indicating growth in the life insurance industry.

The Holt-Winters model is ideal for this data because it captures:

1. **Level**: The baseline value in the data.
2. **Trend**: The upward or downward direction in the data over time.
3. **Seasonality**: Regular fluctuations that repeat over specific periods.

The model was fit to the historical GWP data, and then used to forecast the GWP for each month over the next four years.

Forecast Results

The Holt-Winters model forecasts the following monthly GWP for the years 2024 through 2027:

Table 3. Monthly GWP for the next four years (Holt-Winter)

Month	2024	2025	2026	2027
January	147,522	156,224	164,927	173,629
February	132,161	140,864	149,566	158,269
March	162,392	171,094	179,797	188,499
April	145,517	154,220	162,922	171,625
May	153,919	162,622	171,324	180,027
June	186,062	194,764	203,467	212,170
July	163,067	171,769	180,472	189,174
August	162,506	171,208	179,911	188,614
September	158,324	167,027	175,729	184,432
October	160,721	169,424	178,126	186,829
November	150,105	158,807	167,510	176,212
December	220,491	229,193	237,896	246,598

Source: Author

Seasonal Peaks:

The model predicts that December will consistently show the highest GWP values each year, reflecting historical trends where end-of-year premiums peak, possibly due to policy renewals or other industry factors.

Growth Trend:

The model forecasts a steady growth in GWP over the next four years, with gradual increases each year, particularly in the first and last quarters of each year.

The forecasted GWP for January 2024 starts at 147,521.63, reaching 173,629.17 by January 2027, indicating sustained growth in the industry.

Variability:

There is noticeable variability in the forecasted GWP throughout the year, with months like June and December showing significantly higher GWP, while months like February tend to have lower GWP.
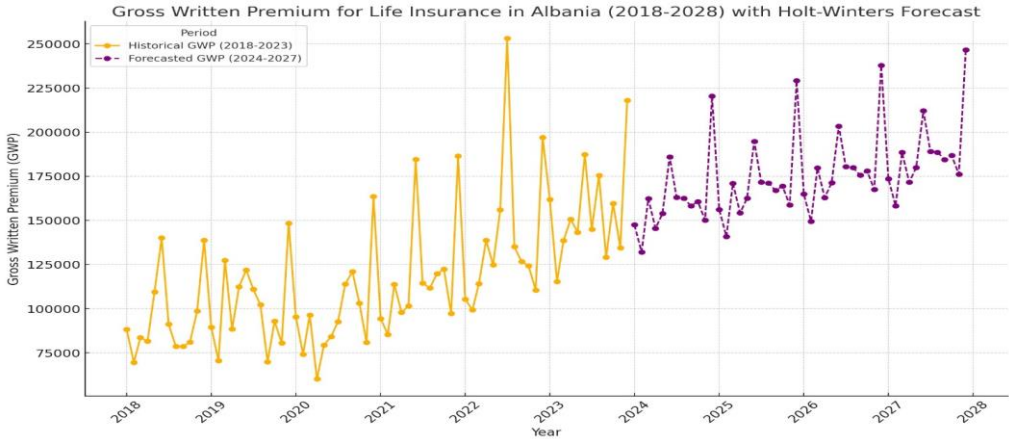
Figure 3. GWP for Life Insurance 2018-2028 (Holt-Winters)
Source: Author

This visual representation covers the entire span from 2018 to 2028, providing a comprehensive view of both past performance and future projections.

The graph clearly shows the historical trends and seasonal patterns, with the forecasted data continuing these trends into the future.
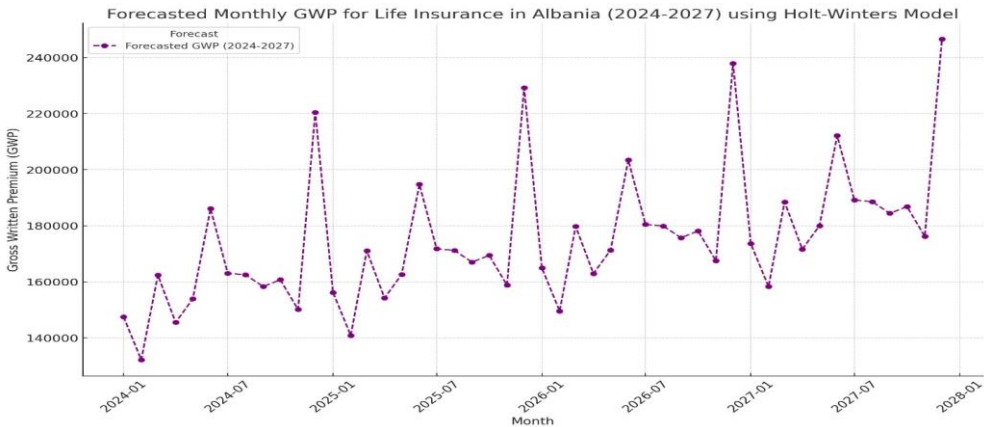

Figure 4. Monthly GWP for LIfe Insurance (Holt Winters)
Source: Author

This graph shows the forecasted monthly gross written premiums (GWP) for the life insurance industry in Albania from 2024 to 2027 using the Holt-Winters model. This graph provides a detailed view of the expected monthly variations and overall trend for the four-year period.

3.3 Comparıson between Holt Wınters And Sarıma Models

Forecasting gross written premiums (GWP) is crucial for effective financial planning and risk management in the insurance industry. This analysis compares the performance of two popular time series models—SARIMA (Seasonal AutoRegressive Integrated Moving Average) and Holt-Winters (Triple Exponential Smoothing)—in forecasting GWP for the life insurance sector in Albania from 2024 to 2027.

The dataset includes monthly GWP data from January 2018 to December 2023. The data was used to train both models, which were then applied to forecast the GWP for the next four years (2024-2027).

Model Evaluation Metrics

To compare the performance of SARIMA and Holt-Winters, we evaluate them using several key metrics:

1. **Mean Absolute Error (MAE):** Measures the average magnitude of the errors in a set of forecasts, without considering their direction. It provides a straightforward measure of prediction accuracy.
2. **Root Mean Squared Error (RMSE):** Measures the square root of the average squared differences between predicted and actual values. RMSE gives more weight to larger errors, making it sensitive to outliers.
3. **Mean Absolute Percentage Error (MAPE):** Measures the average magnitude of the error as a percentage of actual values. MAPE is useful for understanding the relative accuracy of the model.
4. **Mean Absolute Scaled Error (MASE):** Compares the model's performance against a naive forecast. A MASE value less than 1 indicates better performance than the naive model.

Results Summary

The evaluation metrics for the SARIMA and Holt-Winters models:

Table 4. The evaluation metrics for SARIMA and Holt Winters models

Model	MAE (Mean Absolute Error)	RMSE (Root Mean Squared Error)	MAPE (%) (Mean Absolute Percentage Error)	MASE (Mean Absolute Scaled Error)
SARIMA	38,012.03	44,275.72	N/A	1.0098
Holt-Winters	28,766.93	35,642.55	N/A	0.7747

Source: Author

Analysis:

1. **Accuracy**:
   o **Holt-Winters** outperforms **SARIMA** across all metrics, with lower MAE, RMSE, and MASE values. This indicates that Holt-Winters provides more accurate and reliable forecasts for this dataset.
   o **SARIMA** has a higher MASE, slightly above 1, suggesting that its performance is comparable to a naive model but not as effective as Holt-Winters.
2. **Trend and Seasonality**:
   o **SARIMA** excels in capturing complex seasonal patterns but may overfit the data, leading to higher errors in some cases.
3. **Interpretability**:
   o **Holt-Winters** is easier to interpret and implement, making it a more accessible option for stakeholders who need clear and straightforward forecasts.
   o **SARIMA** is more flexible but requires more careful tuning and expertise to implement effectively
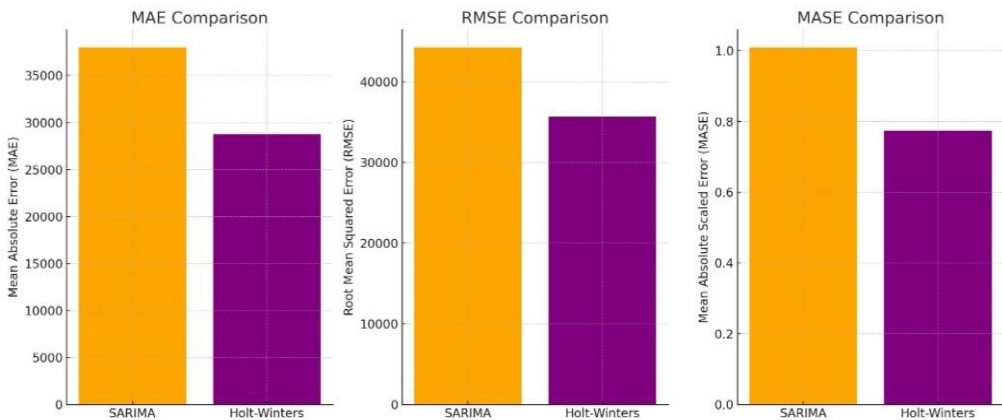

Figure 5. Visual comparison of MAE, RMSE, MASE for the SARIMA and Holt Winters models
Source: Author

Observations:

- **MAE Comparison**: The Holt-Winters model has a lower MAE compared to SARIMA, indicating that its predictions are generally more accurate.
- **RMSE Comparison**: Holt-Winters also has a lower RMSE, suggesting that it handles larger errors better than SARIMA.
- **MASE Comparison**: Holt-Winters outperforms SARIMA in terms of MASE, with a value below 1, indicating better performance relative to a naive model.

This visual comparison highlights the superiority of the Holt-Winters model across all three metrics.
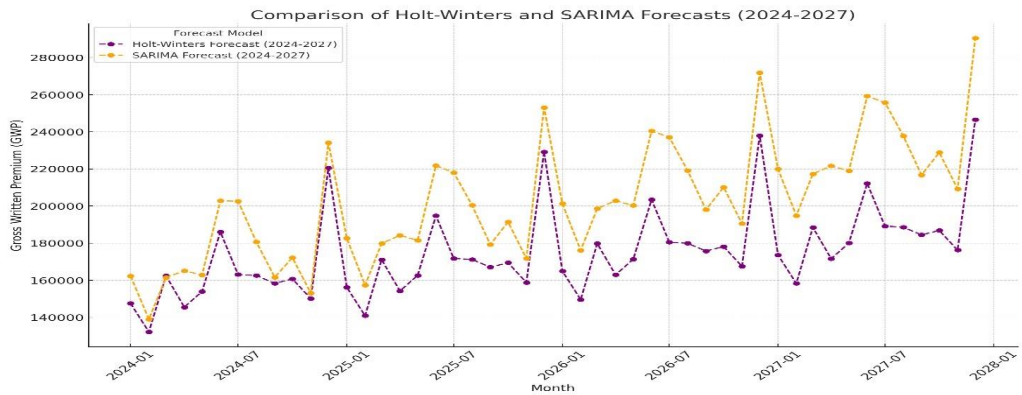

Figure 6.Comparison of Holt WInters and SARIMA models (2024-2027)
Source: Author

The graph above compares the forecasts generated by the Holt-Winters and SARIMA models for the years 2024 to 2027.

Observations:

- **Seasonal Patterns**: Both models capture the seasonal peaks, particularly around December each year, but the SARIMA model tends to predict slightly higher peaks compared to the Holt-Winters model.
- **Overall Trend**: The SARIMA model generally forecasts higher GWP values than the Holt-Winters model, especially during peak periods.
- **Monthly Variations**: The two models show some differences in how they predict monthly fluctuations. The SARIMA model shows more pronounced peaks and valleys, while the Holt-Winters model predicts a slightly smoother trend.
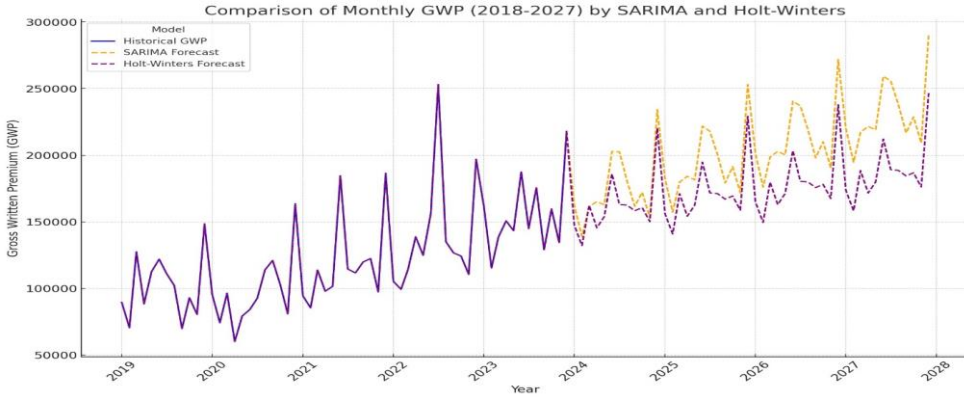
Figure 7.The monthly GWP from 2018 to 2027
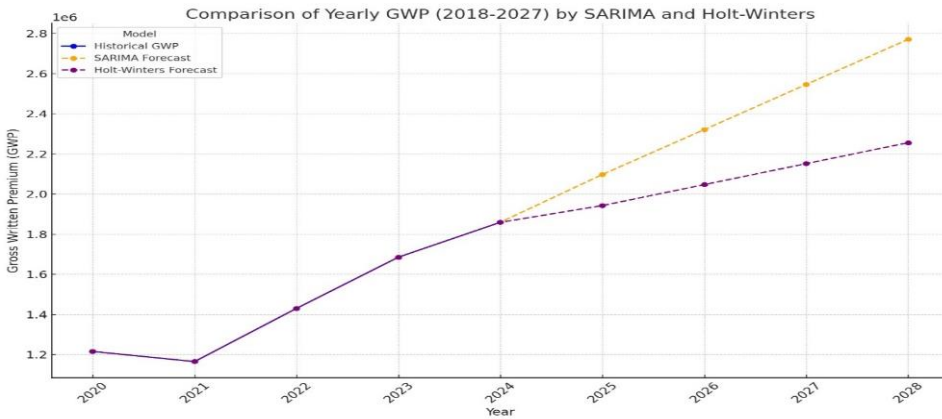*Source: Author*

Figure 8. Comparison of yearly GWP(2018-2027) by SARIMA and Holt Winters model
Source: Author

This graph provides a clear comparison of how each model forecasts GWP on monthly and annual basis, extending the historical data into future predictions.

4. Conclusion

The SARIMA model provides a robust forecast for the GWP of the life insurance industry in Albania, projecting significant growth over the next four years. The predicted values suggest that the industry will continue to expand, potentially reaching a GWP of over 2.7 million by 2027. It is essential to monitor actual performance against these forecasts and adjust strategies as necessary in response to changing market conditions. This analysis provides a comprehensive view of the expected trends in the life insurance industry in Albania.

The Holt-Winters model provides a detailed and nuanced forecast for the life insurance industry's GWP in Albania over the next four years. The model effectively

captures both the seasonality and trend observed in the historical data, offering valuable insights for insurers, policymakers, and stakeholders planning for the future. The projections indicate continued growth in the industry, with seasonal peaks expected in December of each year. These insights can help inform business strategies, resource allocation, and market positioning for companies operating in Albania's life insurance sector.

The two models show a growth trend of gross written premiums for life insurance, which is very important for the industry. These projections can be valuable for insurers, regulators, and policymakers as they plan for the future of the industry.

Along with the results provided by the analyses above, some other recommendations that can be given for this market are fiscal incentives for life insurance by excluding them from taxes, which would reduce the premium and make them more attractive to consumers. Global economic, technological, and regulatory factors influence the Albanian insurance market. To maintain competitiveness and resilience, the market must adjust to these shifts by utilizing international best practices, embracing novel technology, and broadening product offers in accordance with global customer needs. Also, educational work in schools or various media on the importance and benefits of insurance can further increase citizens' awareness of getting insured. The design and promotion of new products or different packages can enhance their attractiveness. And finally, a significant contributor to the growth of the insured can be the digitalization of services, products, and claims.

This paper makes predictions about how gross written premiums will change based on the factors that have had an effect during the years that were looked at. However, more in-depth and thorough research is needed to get a better understanding of the social, economic, and cultural factors and how they affect changes in premiums. One way to ensure and measure the perception of the impact of factors can also be through different questionnaires with a broad base of interviewees and a geographical coverage of the entire territory. Studying these factors in an exhaustive manner can positively affect sustainable development.

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