How CS:GO 2 influenced CS:GO player count

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Forecasting Methods

Introduction

Counter-strike: global offensive (CS:GO) is a tactical first-person shooter (FPS) released on August 21, 2012 by Valve on Steam. Over the years, the player count of CSGO has been shaped by various factors, including updates and tournaments.

The primary focus of this study is to examine the impact of the release of CSGO 2 on the player count by using historical data for forecasting purposes. With the release of CS:GO 2 beta there was a rise and fall in the player count. Our objective is to make informed predictions of the game's future popularity.

Methodology

The data extracted from SteamDB [1], on CS:GO player count from 2012 to 2023, required changes due to missing values. To interpolate, the average of the neighbouring values were used. Then, the data was transformed into a tsibble, converting it into a format where observations were organized and indexed by month.

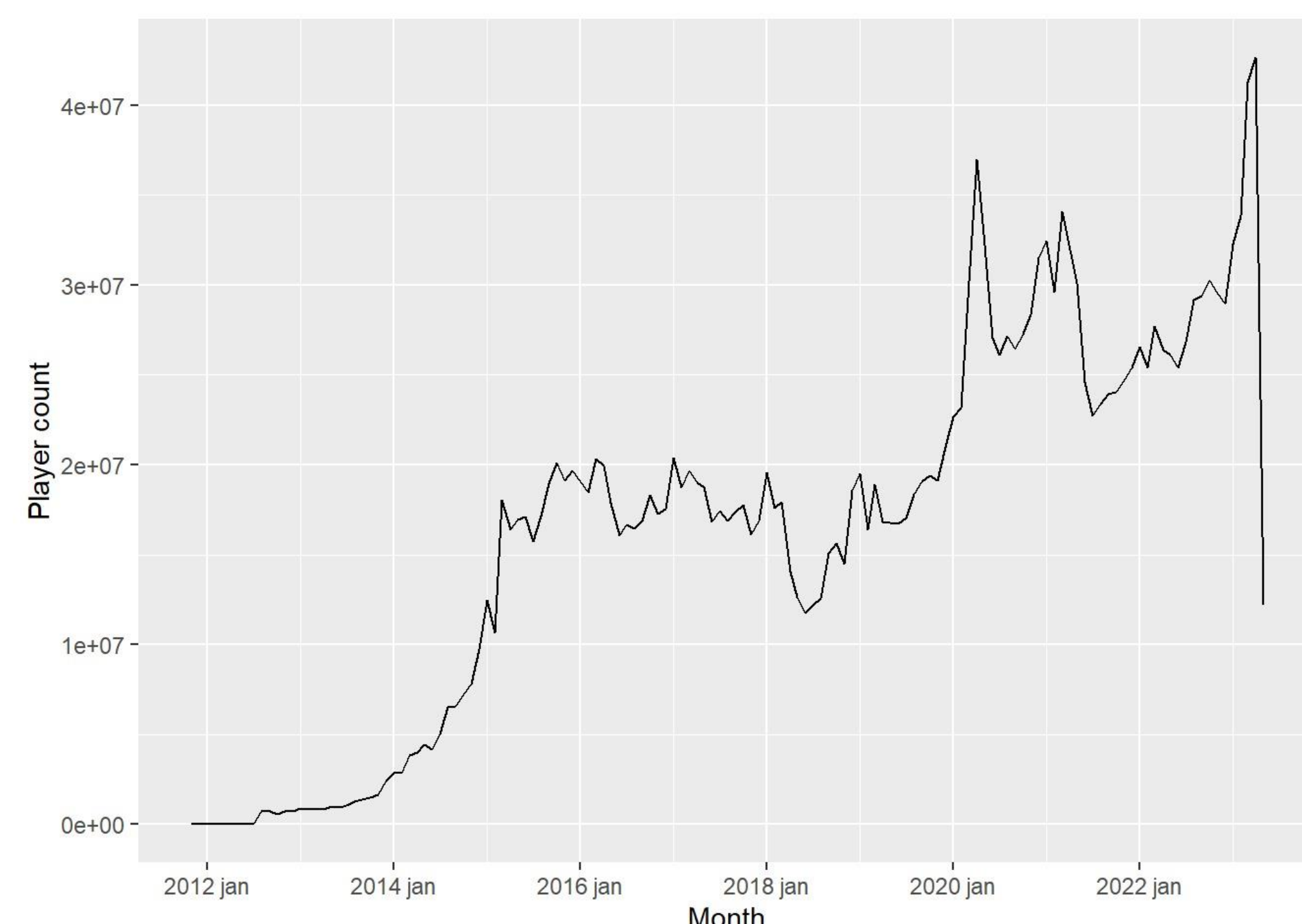The plot of the respective tsibble is displayed below.

Fig. 1 - Monthly data of CS:GO players

CS:GO witnessed a rise in player counts after 2014 due to the popularity of gambling with CSGO skins, which are items that can be obtained and sold to upwards of thousands of dollars.

The transition to a free-to-play model on December 6, 2018, coupled with the COVID-19 pandemic and the release of Valorant in 2020, significantly contributed to a spike in player counts. However, in 2021, those numbers declined due to exclusive features for CSGO Prime members.

In order to eventually reach an optimal model, the data was split into a training and a test dataset, which were subject to different tests. By analyzing the variance of the training dataset, it was concluded that no transformation was necessary to stabilize it. It was also under a unit root testing, leading to its seasonal differentiation followed by a non-seasonal differentiation. The phenomenon of seasonality manifests as a notable increase in player activity during holiday periods. Additionally, these numbers also tend to rise during promotional events on the Steam platform, such as the Winter Sale and Summer Sale. Subsequently to all these tests, the training data set exhibited stationarity, and was ready to be analysed with the purpose of identifying candidate seasonal ARIMA models.

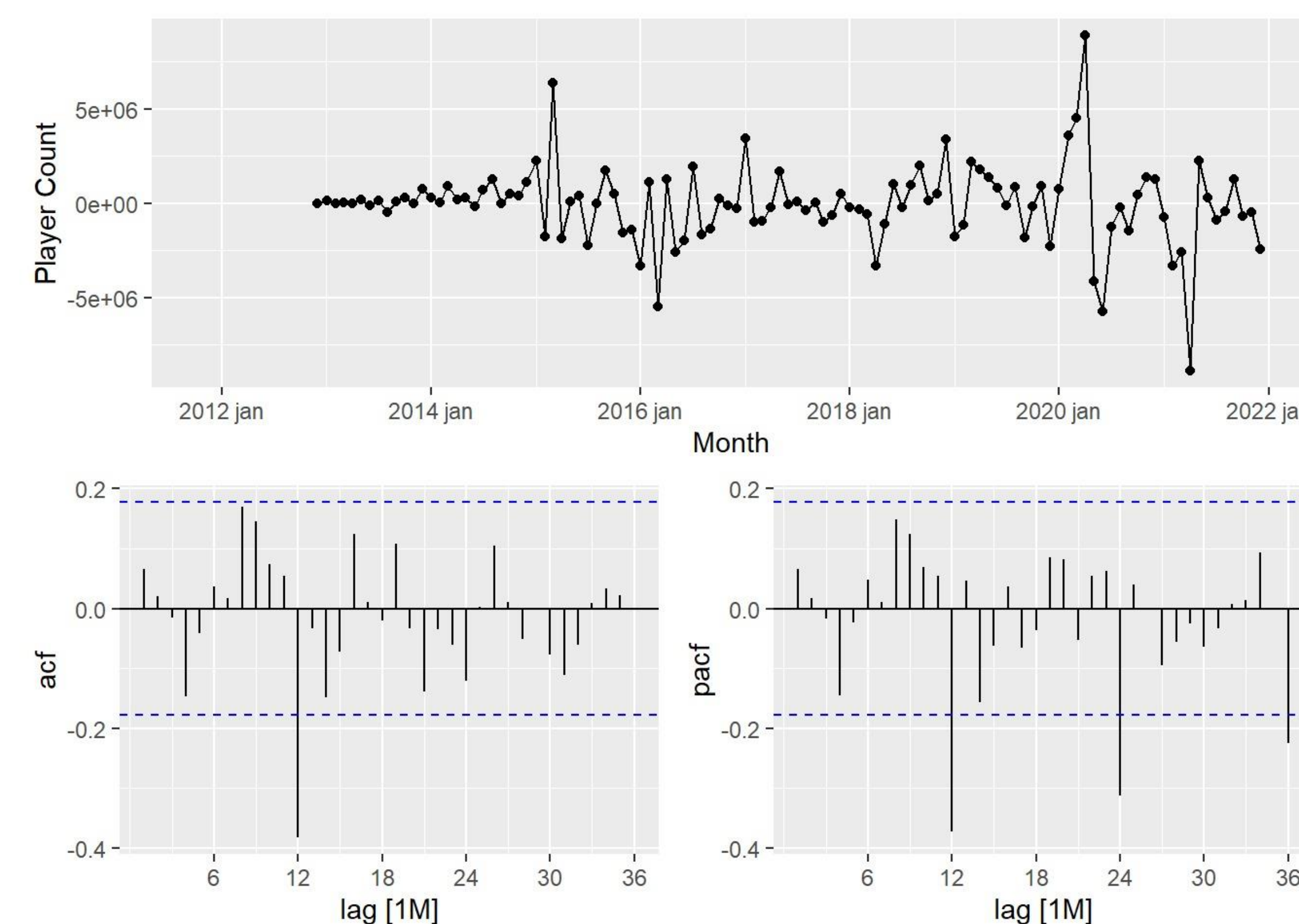The PACF and ACF of the differenced data is displayed below.

Fig. 2 - ACF and PACF of the differenced data

The candidate models selected were:
- SARIMA(0,1,0)(0,1,1)[12]
- SARIMA(0,1,0)(3,1,1)[12]
- SARIMA(0,1,0)(3,1,0)[12]

In this section, the test data set was used to obtain the forecasting accuracy. From these models, the first one had the best values for the information criteria and forecasting accuracy. Hence, the sarima model selected for the eventual forecast is SARIMA(010)(011)12.

Results

Using the determined model, we forecast the CS:GO player count from 2023 to 2024, and the resulting plot and interval forecasts are presented below.
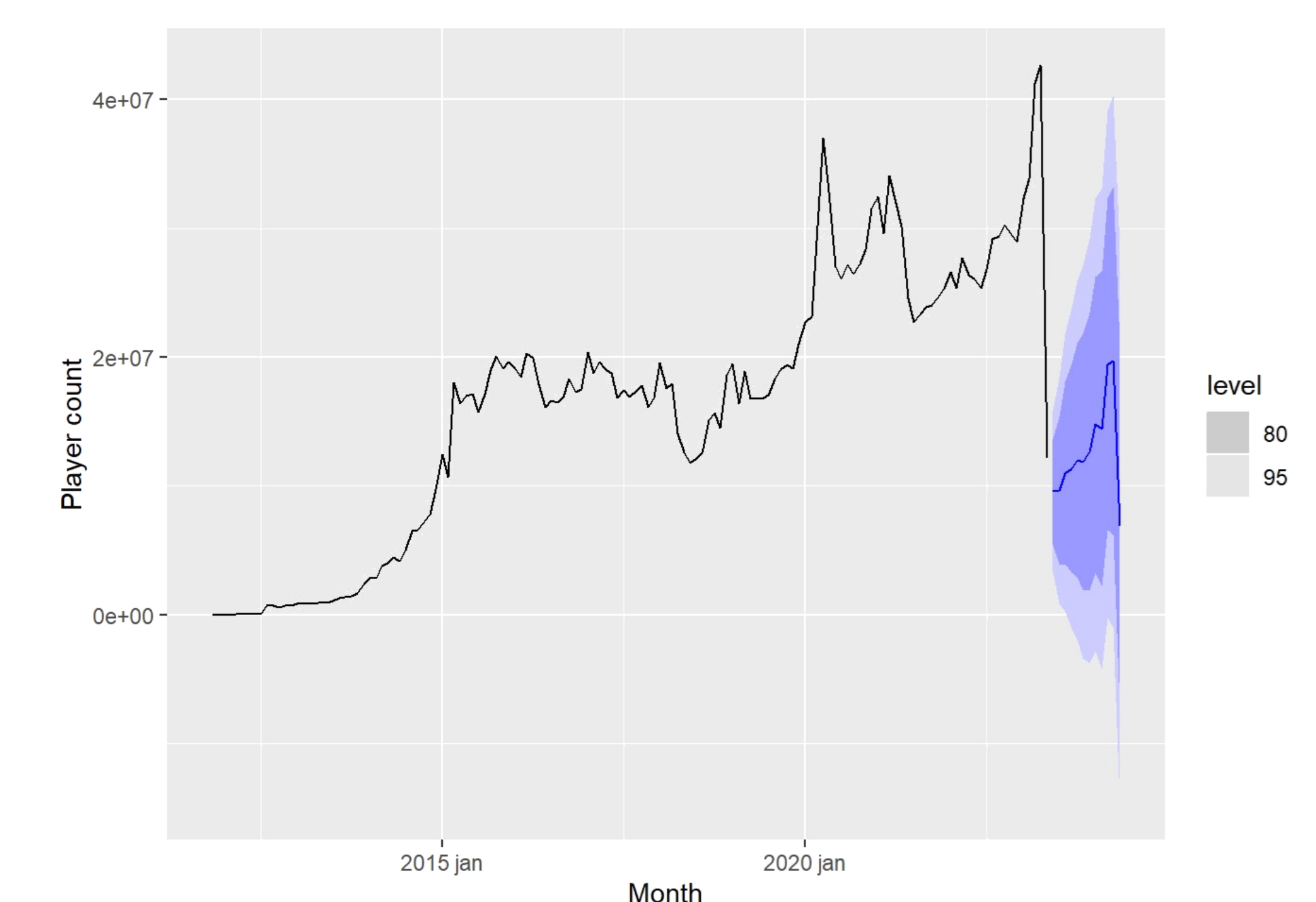

Fig. 3 - Forecasting for next year

It is clear, when observing the output image, that after the severe decline in player count present on the last observations of 2023, the player count is expected to remain somewhat low.

Conclusion

With the knowledge that the decline in player count was caused by the upcoming release of CS:GO 2, it is fair to assume that this new game will have a long-term impact on the CS:GO playerbase. This will be difficult to overcome, which, in turn, will split the community and shift the competitive focus of CS:GO to CS:GO 2.

References

[1] Valve. (2012, August 21). Counter-strike: Global offensive on steam. Steam. URL: https://store.steampowered.com/app/730/CounterStrike_Global_Offensive/

[2] Counter-Strike: Global Offensive. SteamDB. URL: https://steamdb.info/app/730/charts/

[3] Hyndman, R. J. Athanasopoulos, G. (2020) Forecasting: principles and practice, 3rd edition