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3-Year Predicted Domestic Movie Box Gross Revenue Report

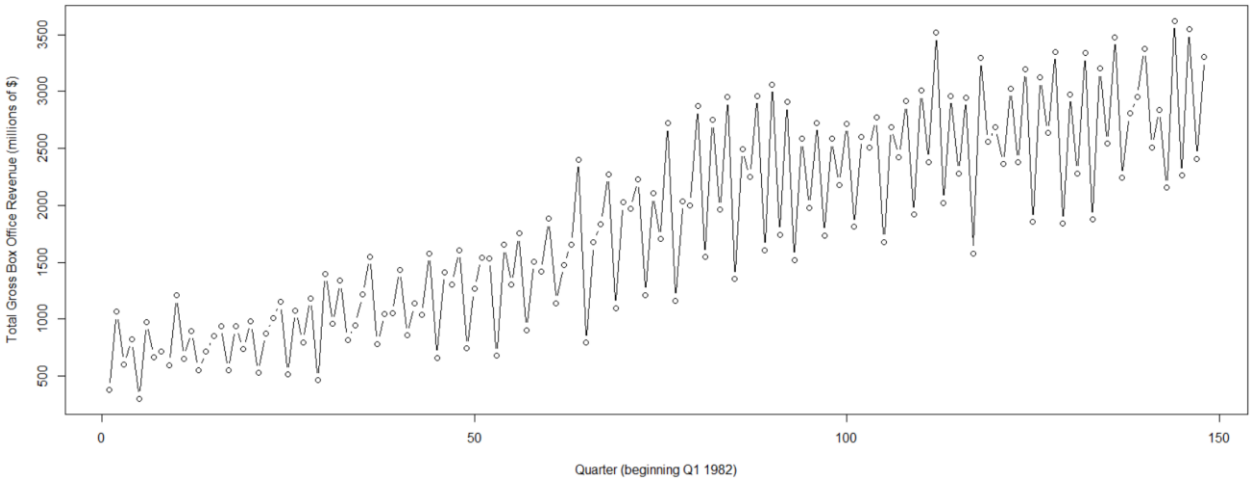

Fig. 1. Quarterly Box Office Revenue 1982 – 2018. This graph displays historical gross box office revenue by quarter from q1, 1982 through q4, 2018.

The historical data shows that the first quarter has usually had the lowest gross box office revenue in a given year. The box office revenue then typically rose significantly to a highpoint in the second quarter, dropped in the third quarter and rose slightly in the fourth quarter. This is likely because the two points during the year when blockbuster movies are typically released is at the beginning of the Summer vacation and during the Christmas season. During these times in the year there are more people with free time looking for entertainment. This increases demand and movie studios increase the supply by releasing new movies at these times. This is likely what inflates the revenue in the second and fourth quarters which contain the beginning of Summer vacation and the Christmas season respectively.

Our data fits the assumptions of a seasonal ARIMA model well. There appears to relatively constant mean change in total gross box office revenue from year to year which fits our assumption of constant mean change. There is also no evidence of curvature in our graph which means our data fits the assumption that our model is additive. There is a slight increase in variability in more recent years, but we do not believe that this will affect the validity of our ARIMA model.

	Estimate	Standard Error
Quarterly Long Memory	-0.221	0.089
Quarterly Short Memory	-0.880	0.049
Seasonal Long Memory	-0.008	0.122
Seasonal Short Memory	-0.707	0.093

Table 1. Parameter Estimates for the Seasonal ARIMA model. Table 1 displays the parameter estimates for long memory and short memory from quarter to quarter as well as estimates for seasonal long and short memory calculated from corresponding quarters in consecutive years.

			95% Prediction Interval	
Year	**Quarter**	**Point Predictions***	**Lower Bound***	**Upper Bound***
2019	**1**	2,348.138	1,921.839	2,774.437
	2	3,231.442	2,802.977	3,659.907
	3	2,575.968	2,143.227	3,008.709
	4	3,491.207	3,056.821	3,925.592
2020	**1**	2,351.867	1,887.314	2,816.420
	2	3,278.565	2,813.081	3,744.048
	3	2,610.524	2,141.278	3,079.770
	4	3,527.563	3,055.368	3,999.759
2021	**1**	2,389.201	1,884.456	2,893.946
	2	3,315.665	2,809.233	3,822.097
	3	2,647.698	2,136.233	3,159.164
	4	3,564.729	3,049.163	4,080.294

*All numbers reported in millions of dollars

Table 2. 3-Year Predicted Domestic Movie Box Gross Revenue. Table 2 displays the predictions for total box office revenue in millions of dollars for each quarter in the next three years as well as a 95% prediction interval for each estimate.

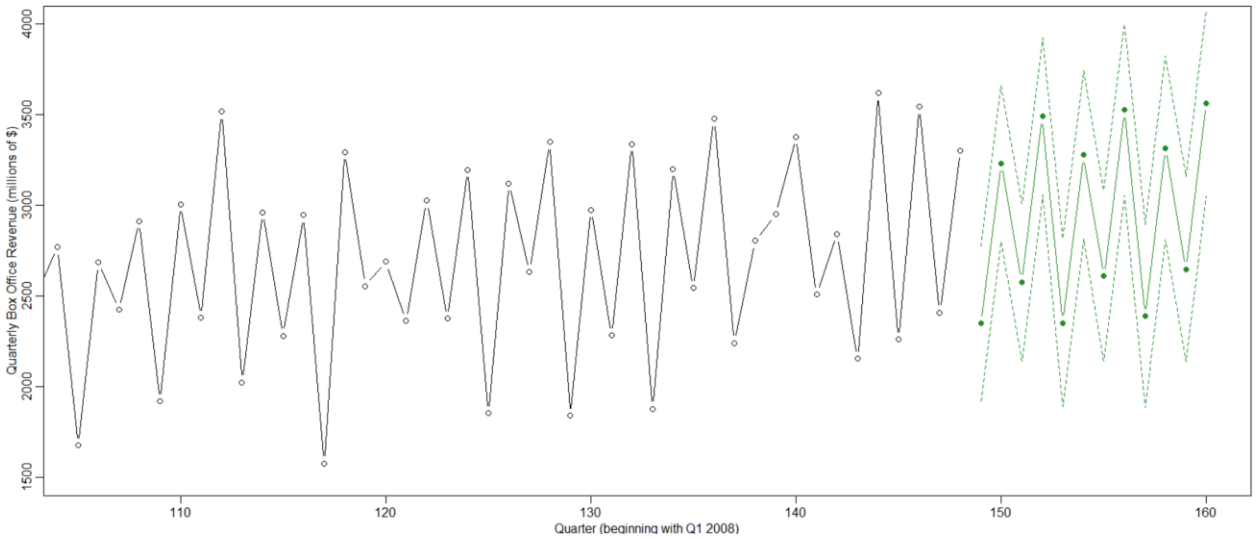

Fig. 2. 3-Year Predicted Domestic Movie Box Gross Revenue. Fig. 2 displays the quarterly domestic movie box gross revenue for the last ten years as well as our predictions for the next three years in green. The dotted lines surrounding the predictions indicate 95% prediction intervals.