**Cars**

Lauren Alexandra

Colorado State University Global

MTH 410: Quantitative Business Analysis

Dr. Leslieann Humphreys

November 19, 2020

**Introduction**

A car expert collected random data on two categories of new and used cars: Domestic and Foreign. This report aims to provide the expert a clearer understanding of car sales by examining the following dataset features: list price, sale price and number of days it takes to sell each car.

**Descriptive Statistics**

         Foreign cars were listed on average $16,000 higher than Domestic cars. Across a range of $75,000, the standard deviation for the Domestic cars was $18,000, about $6,000 less than Foreign cars over a range of $88,400. Both Foreign and Domestic cars sold on average about $2,000 less than list price. However, Domestic cars maintained a coefficient of variation of about 6% greater than Foreign cars. This means we can expect more dispersion around the average sale price with Domestic cars (Brown, 1998). Ultimately, Foreign cars sold over a notably longer range of 99 days as compared to Domestic cars’ 69 days. This is due to an outlier at 100 days, far above the mean. On average Domestic cars required 32 days to sell, close to Foreign cars at 35 days.

**Confidence Intervals**

Using a 98% confidence interval we can estimate the population mean sales price and mean number of days to sell for Domestic and Foreign cars. The confidence interval is described as the population mean plus or minus the confidence level, the percentage that the confidence interval contains the true population mean (Holmes et al., 2018). Domestic cars on average sell between $26,710 and $32,770 within 30 and 36 days. On the contrary, Foreign cars on average sell between $41,990 and $50,430 within 32 and 38 days. Typically, Foreign cars require about 2 days more to sell, but return almost $20,000 more revenue.

**Estimates**

The car expert requested estimates of the mean number of days to sell for the Domestic cars with a margin of error of seven days and the mean selling price of Foreign cars with a margin of error of eight days. For a 98% confidence interval, the sample sizes should be 276 and 211 days for Domestic and Foreign, respectively. A larger sample size would produce more accurate mean values as estimates for the population (Holmes et al., 2018). The larger the sample size, the smaller the margin of error. Further, we can compare the list prices of Domestic and Foreign, starting near the Domestic’s mean list price at $30,000 to examine the differences in the final selling price and number of days to sell. Starting at a list price of $30,000, a Domestic car’s final sale price will be about $2,500 lower than list price and selling close to 32 days later. Likewise, a Foreign car with the same starting list price will also sell approximately $2,500 less than list price, but around 10 days sooner. These estimates suggest that a car dealership should consider advertising more Foreign than Domestic cars to bring in faster revenue.

**Conclusion**

Foreign cars may take longer to sell on average, but it is a minimal difference. Given the same list price as a Domestic car, Foreign cars sell nearly 10 days earlier. They return around $41,990 on average, $20,000 more than a Domestic car. Lastly, Foreign cars have a smaller coefficient of variation so we can expect less volatility in the final sale price.

**References**

Brown C.E. (1998) Coefficient of Variation. In *Applied Multivariate Statistics in*

*Geohydrology and Related Sciences*. Springer, Berlin, Heidelberg.

https://doi.org/10.1007/978-3-642-80328-4\_13

Holmes, A., Illowsky, B., & Dean, S. (2018). Introductory business statistics. OpenStax.