**Tractor Sales**

Lauren Alexandra

Colorado State University Global

MTH 410: Quantitative Business Analysis

Dr. Leslieann Humphreys

November 7, 2020

**Introduction**

International Tractor Motors (ITM) launched a campaign to sell an IT-8 large specialty tractor in a country in Asia. ITM instructed 4 sales associates to sell the tractor across the country, with one associate assigned to each segment (East, West, North, and South). Regulations permitted an associate to only sell one tractor per day. The success or failure of an associate was indicated by a daily sale. For ITM this meant the company achieved success with its associates if they sold 4 tractors total each day.

**Number of Successes**

A probability distribution shows the probability of acquiring the values that a random variable, discrete or continuous, can have. A relative frequency distribution highlights the frequency proportion for each outcome (Manikandan, 2011). This distribution is a probability distribution because the probability is represented as the proportion and the random variable as the discrete outcome. The mean number of successes is 1.69. This indicates approximately 2 daily sales on average, occurring about 36% of the time.

**Binomial Experiment**

A binomial distribution computes probability for a binomial process or a Bernoulli process, if there is only one trial. In this process there are only two potential outcomes for a trial: success or failure, and the probability of success is constant for each trial. To have constant probability, the trials are independent (Holmes et al., 2018). A binomial experiment is an experiment which adheres to the tenets of a binomial process and must occur over a fixed number of trials (Holmes et al., 2018). The tractor sales can be understood as a binomial experiment because of the two possible outcomes, unchanging probability of success and established number of trials. For the binomial distribution, the average number of successes is 2. This is only slightly higher than the mean of the probability distribution. Likewise, the mean of the binomial probability is 0.014% greater than the mean of the probability distribution.

**Further Experimentation**

International Tractor Motors can employ the binomial distribution to investigate the unexamined variables of the campaign such as country regions and farm size. The success or failure in a particular region, for instance, West, or for a specific farm size such as medium, can be isolated and measured within a binomial experiment. If ITM aims to approximate the tractor sales in other Asian countries, region similarity as well as farm diversity may need to be taken into consideration.

**Conclusion**

The results of the binomial experiment for the IT-8 tractor campaign provided insight into the frequency of daily sales for the tractor throughout the country. ITM should not limit the measurement of success to sales by associate. Understanding the relationships between regions, farms, seasons, and sales may elucidate when ITM can expect tractor sales and why. Lastly, when conducting the experiment in similar countries, noting any differences can magnify any confounding variables.

**References**

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

Manikandan S. (2011). Frequency distribution. *Journal of pharmacology &*

*pharmacotherapeutics*, *2*(1), 54–56. https://doi.org/10.4103/0976-500X.77120