



Statistical Analysis of Northwind Corp

By Umar Khan

Effect of Discounts on Quantity Ordered

1. When a discount was offered, it had a statistically significant effect on the quantity of items ordered.
2. However, this effect was small.
 - a. We saw a Cohen's D value of 0.286, which is considered small.



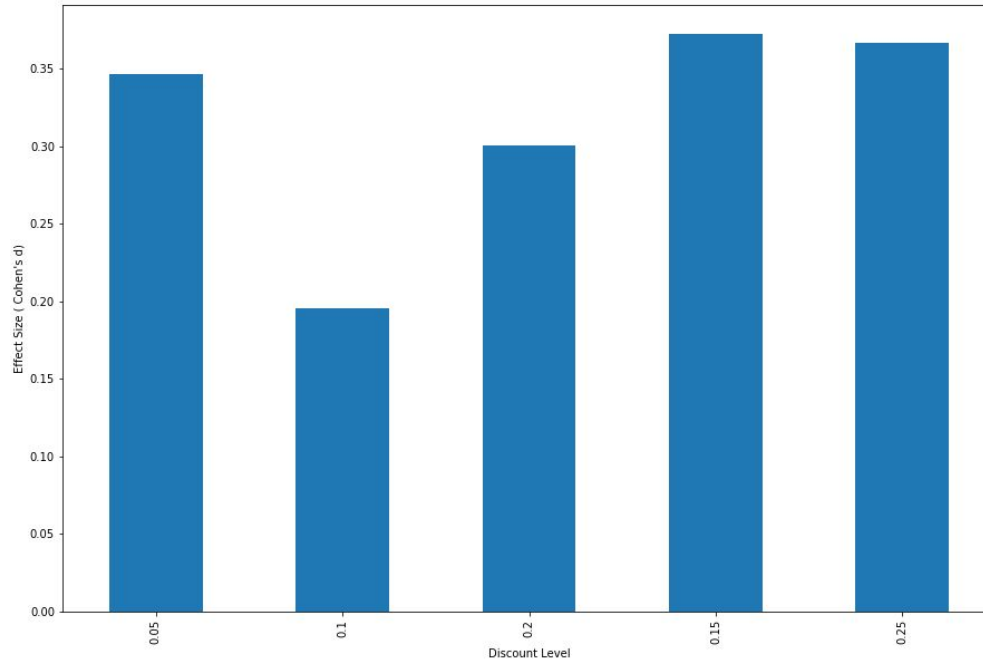
Conclusions slide

We have all insights, what do we do with them?

- Dont offer discounts D00
- Change way you sell in regions D00
- Xy labels D00
- Workign with aesthetics
- Update plots on slide deck
-



Effect of different sizes of discounts on quantity ordered

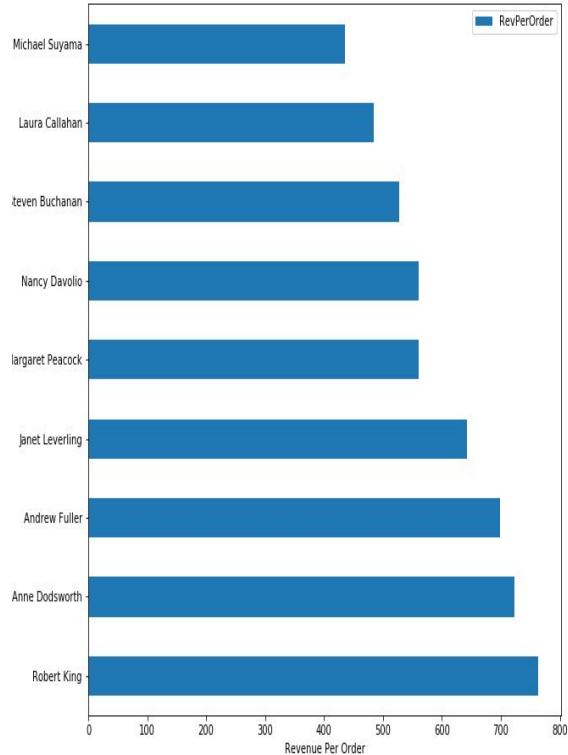


Does Discount level lead to higher revenue?

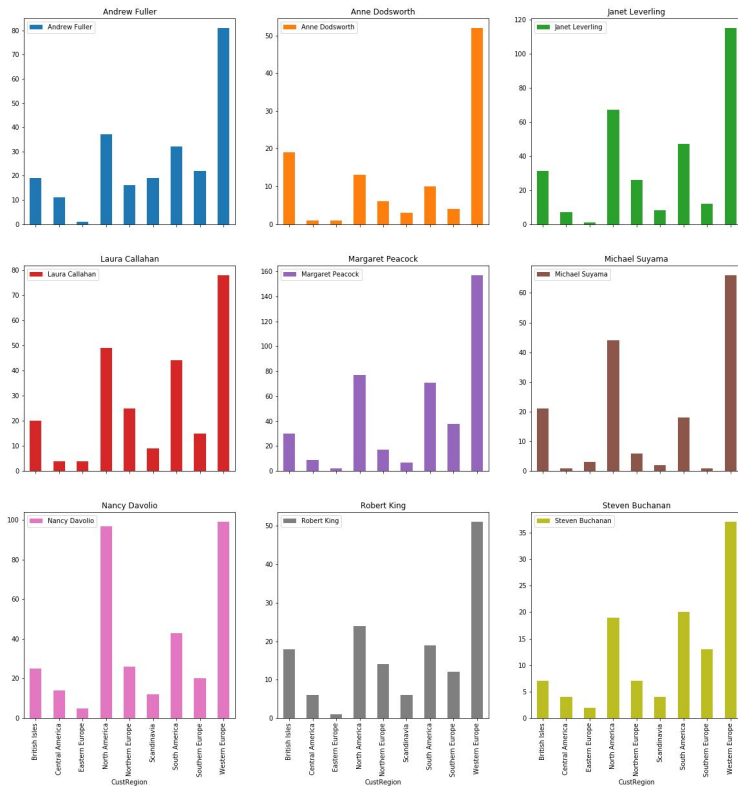
1. Ultimately more important question:
 - a. We want to see if discounts are improving our bottom line
 - b. We don't want to lose money
2. Turns out discounts don't really increase revenue
 - a. The difference in average revenue from discounted vs regularly priced orders is \$44.
 - b. This difference is not statistically significant. There is a high probability that it is the result of random chance.



Do some employees have better sales skills?



1. Metric to evaluate sales skills: Revenue per order
 - a. Accounts for varying employment duration, work hours and other factors
2. Some employees seem to have higher average revenue per order
 - a. Robert King is at the top
3. But is this statistically significant?
 - a. Yes. The probability that Robert King's higher revenues could be the result of random chance is around 2.5%



Employee sales by region

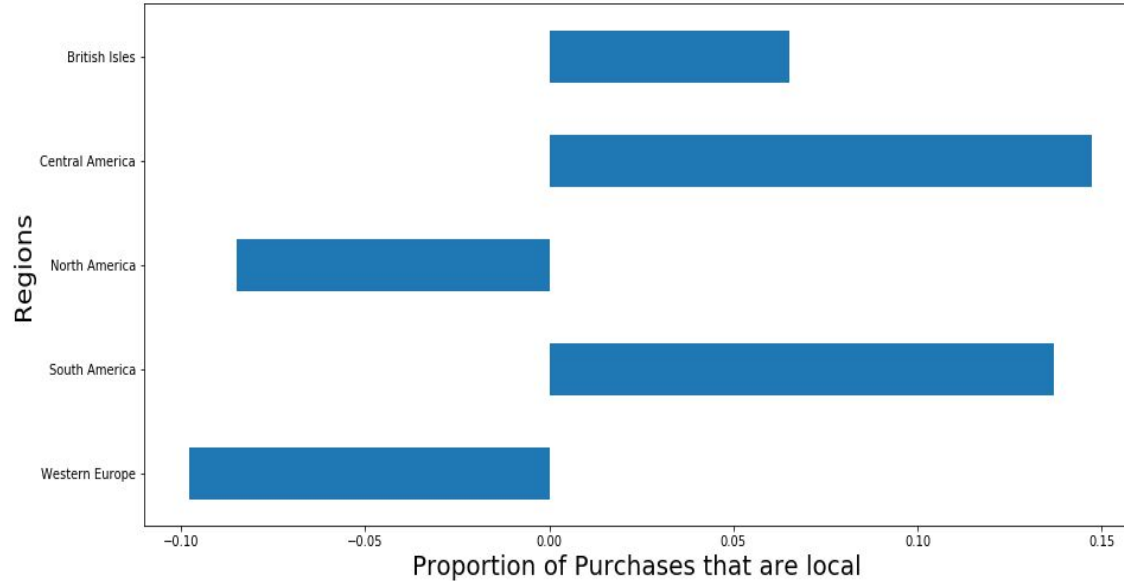
1. Is it possible there is something other than sales ability that accounts for Robert King's success?
 - a. What if he sells more in some regions than others?
 - i. This could still be astute sales acumen on his part.
2. The distributions of employee sales by region seem similar across employees so that's probably not a factor.

Buying preferences by region: Local or imported?

1. Do customers in particular regions prefer local or imported products?
 - a. Knowing this we can calibrate sales strategy accordingly.
2. To find out we :
 - a. Count purchases of local products by customers in a given region
 - b. Count purchases of local products by all other customers
 - c. Compute the probability of observing a count of local products as high or as low as that of that particular a customer given the average for the remaining population.



Results:



- North America and Western Europe seem to prefer buying locally
- Central America, South America and the British Isles prefer imports

Conclusions

1. Discounts are ineffective, and are only leading to lower revenue. We should either reconfigure or eliminate them
2. Employee sales skill seems to play a role in revenue generate by each employee. We should take a closer look at what makes a good sales person, and perhaps assign higher performing sales people to more lucrative markets.
3. We should increase inventory levels of improted products in Britain and Latina America.

