

# Module 2 Final Project

Northwind Database

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# Methodology

- ▶ Hypothesis Testing
- ▶ Welch's t-test

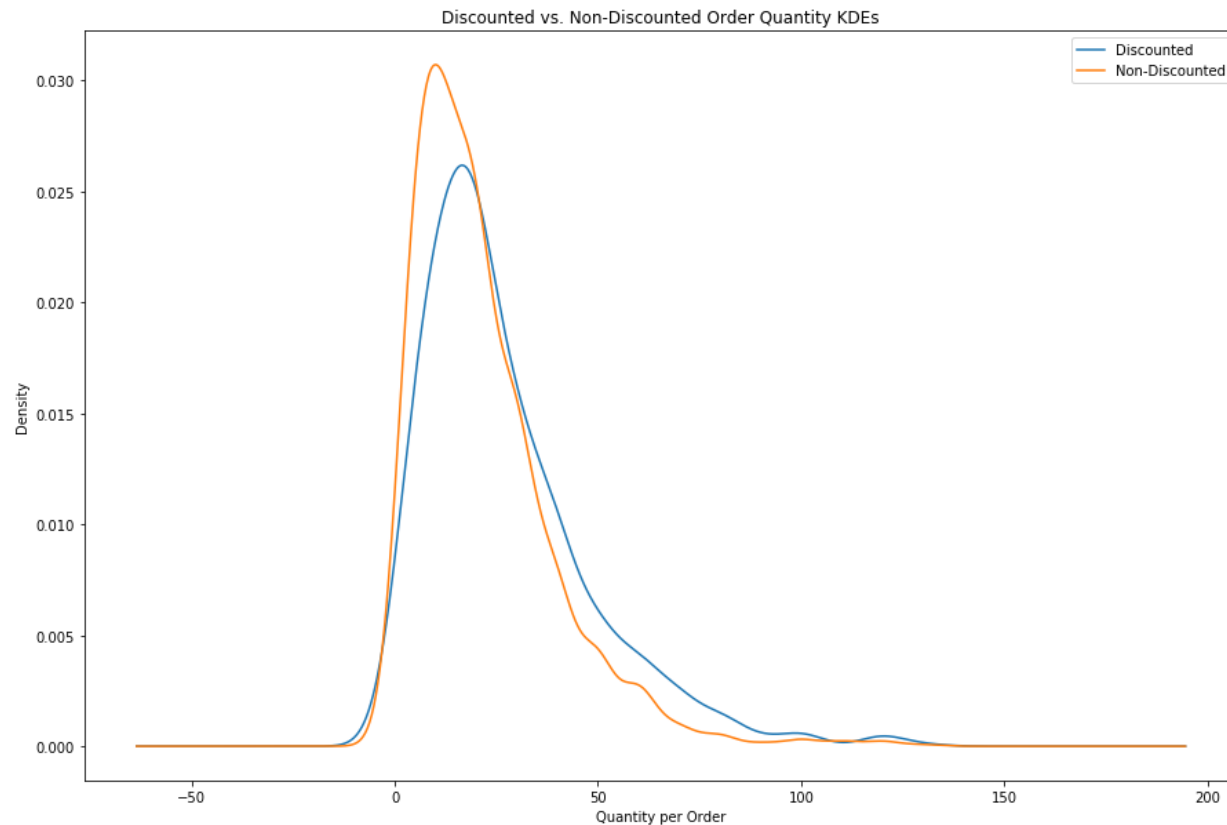
# Questions:

- ▶ Do discounts increase quantity sold per order? If so what is the optimal discount?
- ▶ Do discounts increase revenue per order? If so what is the optimal discount?
- ▶ Do discounts increase quantity sold or revenue for certain product groups?
- ▶ Are any products more popular in their local markets?
- ▶ Is there are lowest cost shipper?

## Do discounts increase quantity sold per order? If so what is the optimal discount?

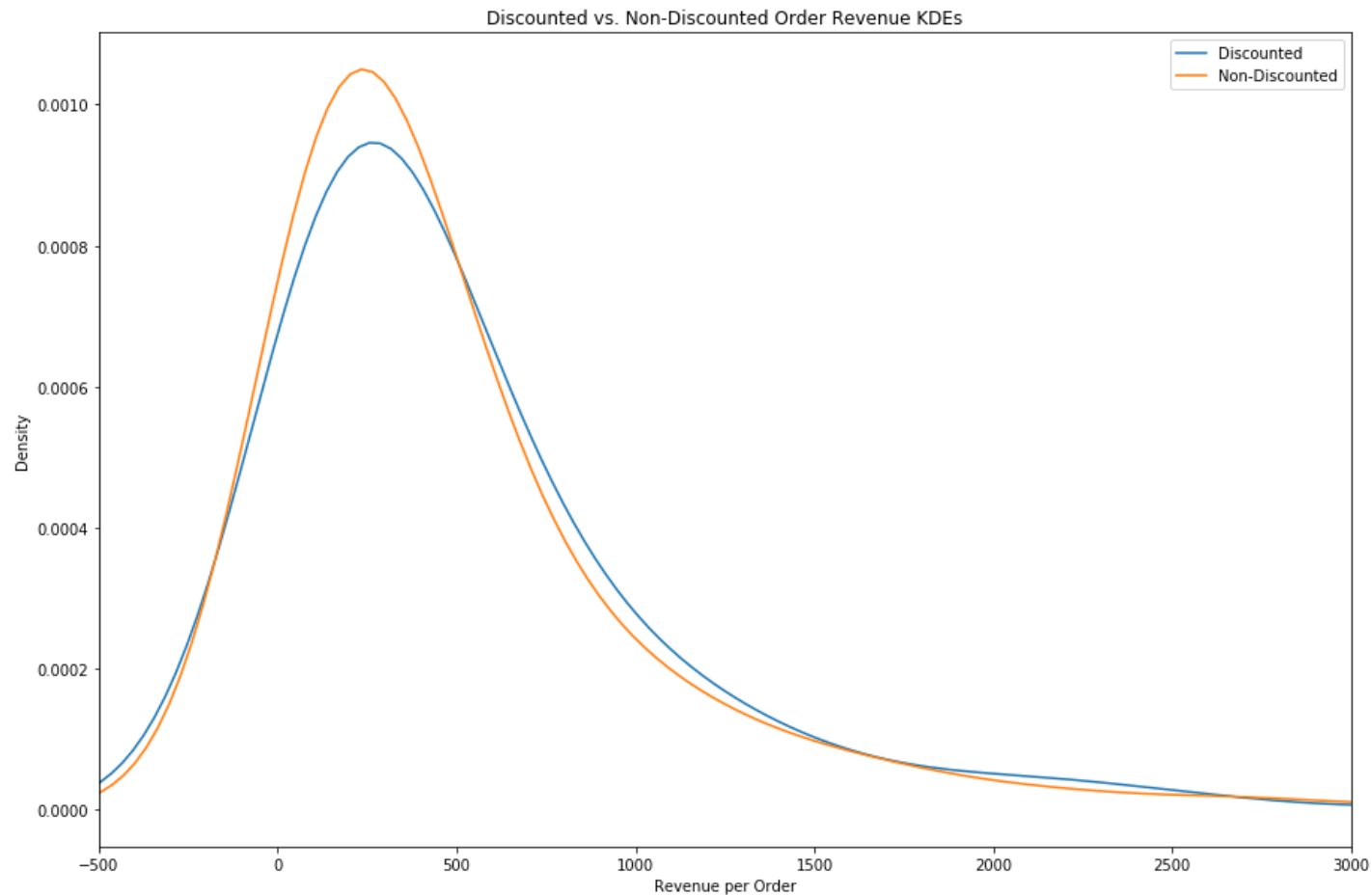
Answer: Yes and all discount levels are equal

- Average order size increased by 6 units across all purchases (figure below)
- Average order size increased by 2 units on orders at the same per unit price
- The level of discount did not effect the average order size



## Do discounts increase revenue per order? If so what is the optimal discount?

Answer: No, discounts did not increase revenue per order.



## Do discounts increase quantity sold or revenue for certain product groups?

Answer: Yes to quantity, No to revenue.

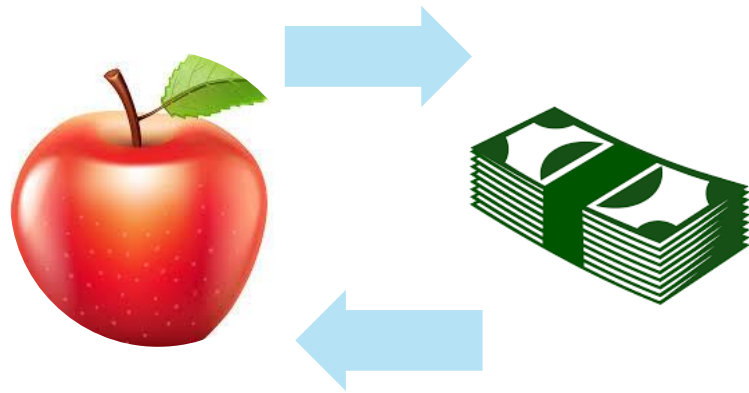
Product Category	Change in Units per Order	Change in Revenue per Order
Condiments	3.48	None
Confections	2.75	None
Grains/Cereal	3.54	None
Produce	2.34	None

“None” means that the change was not statistically significant and thus we cannot accept the findings

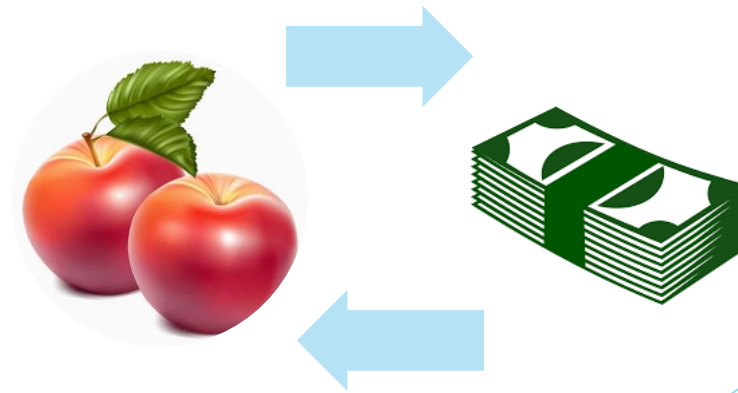
## What does this mean?

- ▶ Discounts increase quantity sold but do not increase revenue, meaning that profit margins are being lowered by offering discounts.
- ▶ Takeaway: Northwind should not offer discounts.

### No-Discounts



### Discounts



## Are any products more popular in their local market?

Answer: Yes, and some are less popular in their local markets.

Product	Local - Foreign Revenue per Order
Sirop d'érable	2.546
Chocolade	2.219
Camembert Pierrot	2.179
Louisiana Hot Spiced Okra	-2.442
Ravioli Angelo	-2.517
Gustaf's Knäckebröd	-3.223
Scottish Longbreads	-3.812



## Is there a lowest cost shipper?

Answer: Yes, Speedy Express and Federal Shipping depending on the destination.

The chart shows the price difference per package compared to the average for each destination region.

Delivery Destination	Speed Express	United Package	Federal Shipping
North America	-3.69		
Southern Europe	-2.10	3.08	
British Isles		2.00	-2.04
Scandinavia	-2.21	4.47	-3.74
Northern Europe		4.35	-3.43
South America	-2.13	2.37	

Note: The chart only show statistically significant results

# Summary of Findings

- ▶ The company should not offer discounts because discounts only increase quantity sold and but do not increase revenue. This leads to a reduction in profit margin.
- ▶ Speedy Express or Federal Shipping should be the preferred shipper because of their consistently lower costs across almost all distribution routes.

# Further Inquiry

- ▶ Obtain additional company data in areas such as marketing in order to isolate ways to increase revenues.
- ▶ Obtain data on competitors and broader market conditions to identify Northwind's strategic advantages.