Do Discounts Matter?
Does applying a discount significantly impact quantity sold?

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Product

Column Name	Condensed Type	Nulla...
ProductID	int	No
ProductName	nvarchar(40)	No
SupplierID	int	Yes
CategoryID	int	Yes

Order

Column Name	Condensed Type	Nullable
OrderID	int	No
CustomerID	nchar(5)	Yes
EmployeeID	int	Yes
OrderDate	datetime	Yes

Employee

Column Name	Condensed Type	Nullable
EmployeeID	int	No
LastName	nvarchar(20)	No
FirstName	nvarchar(10)	No
Extension	nvarchar(4)	Yes
Photo	image	Yes
Notes	ntext	Yes
ReportsTo	int	Yes
PhotoPath	nvarchar(255)	Yes

Customer

Column Name	Condensed ...	Nul...
CustomerID	nchar(5)	No
CompanyName	nvarchar(40)	No
ContactName	nvarchar(30)	Yes

Supplier

Column Name	Condensed Type	Nullable
SupplierID	int	No
CompanyName	nvarchar(40)	No
ContactName	nvarchar(30)	Yes
ContactTitle	nvarchar(30)	Yes
Address	nvarchar(60)	Yes
City	nvarchar(15)	Yes
Region	nvarchar(15)	Yes
PostalCode	nvarchar(10)	Yes
Country	nvarchar(15)	Yes
Phone	nvarchar(24)	Yes
Fax	nvarchar(24)	Yes
HomePage	ntext	Yes

OrderDetail

Column Name	Condensed Type	Nullable
OrderID	int	No
ProductID	int	No
UnitPrice	money	No
Quantity	smallint	No
Discount	real	No

CustomerCustomerDemo

Column Name	Condens...	Nullable
CustomerID	nchar(5)	No
CustomerType...	nchar(10)	No

EmployeeTerritory

Column Name	Condensed ...	N...
EmployeeID	int	No
TerritoryID	nvarchar(20)	No

CustomerDemographic

Column Name	Condens...	Nul...
CustomerTypeID	nchar(10)	No
CustomerDesc	ntext	Yes

Category

Column Name	Condensed Type	Nullable

Territory
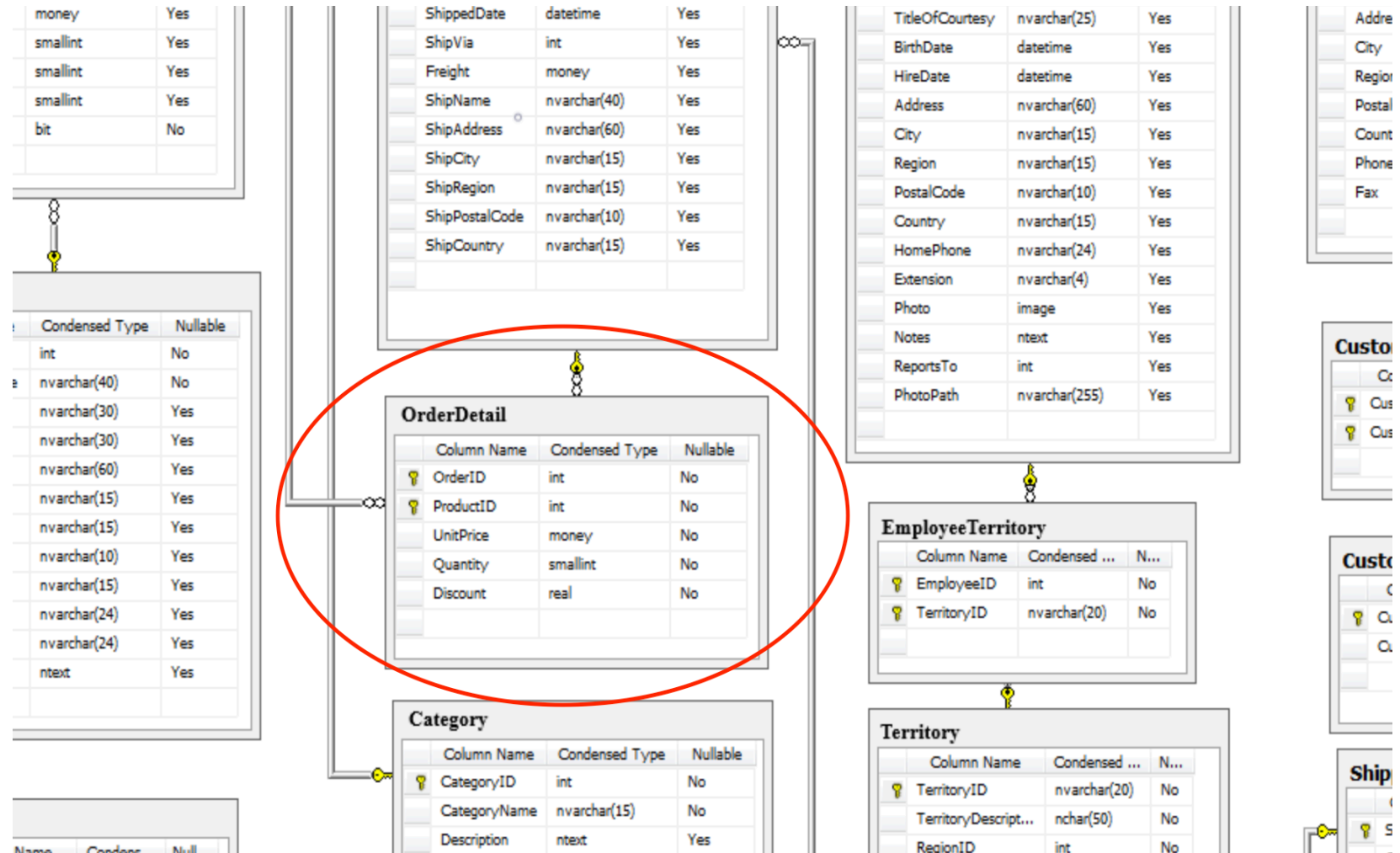
Column Name	Condensed ...	N...

Background & Hypothesis

- Northwind database
  - 2,155 orders
  - Avg quantity/order = 23.8

- Hypothesis: Discount will increase quantity sold

	Condensed Type	Nullable
	money	Yes
	smallint	Yes
	smallint	Yes
	smallint	Yes
	bit	No

	Condensed Type	Nullable
	int	No
e	nvarchar(40)	No
	nvarchar(30)	Yes
	nvarchar(30)	Yes
	nvarchar(60)	Yes
	nvarchar(15)	Yes
	nvarchar(15)	Yes
	nvarchar(10)	Yes
	nvarchar(15)	Yes
	nvarchar(24)	Yes
	nvarchar(24)	Yes
	ntext	Yes

ShippedDate	datetime	Yes
ShipVia	int	Yes
Freight	money	Yes
ShipName	nvarchar(40)	Yes
ShipAddress	nvarchar(60)	Yes
ShipCity	nvarchar(15)	Yes
ShipRegion	nvarchar(15)	Yes
ShipPostalCode	nvarchar(10)	Yes
ShipCountry	nvarchar(15)	Yes

OrderDetail

Column Name	Condensed Type	Nullable
OrderID	int	No
ProductID	int	No
UnitPrice	money	No
Quantity	smallint	No
Discount	real	No

Category

Column Name	Condensed Type	Nullable
CategoryID	int	No
CategoryName	nvarchar(15)	No
Description	ntext	Yes

TitleOfCourtesy	nvarchar(25)	Yes
BirthDate	datetime	Yes
HireDate	datetime	Yes
Address	nvarchar(60)	Yes
City	nvarchar(15)	Yes
Region	nvarchar(15)	Yes
PostalCode	nvarchar(10)	Yes
Country	nvarchar(15)	Yes
HomePhone	nvarchar(24)	Yes
Extension	nvarchar(4)	Yes
Photo	image	Yes
Notes	ntext	Yes
ReportsTo	int	Yes
PhotoPath	nvarchar(255)	Yes

EmployeeTerritory

Column Name	Condensed ...	N...
EmployeeID	int	No
TerritoryID	nvarchar(20)	No

Territory

Column Name	Condensed ...	N...
TerritoryID	nvarchar(20)	No
TerritoryDescript...	nchar(50)	No
RegionID	int	No

Addre	
City	
Regio	
Postal	
Count	
Phone	
Fax	

Custo

Custo

Ship

Questions

1. Do discounts matter for quantity sold?

2. Does the discount amount matter for quantity sold?

3. Which price level is most impacted by discounts?

4. Within each price level, does increasing discount amount increase quantity sold?
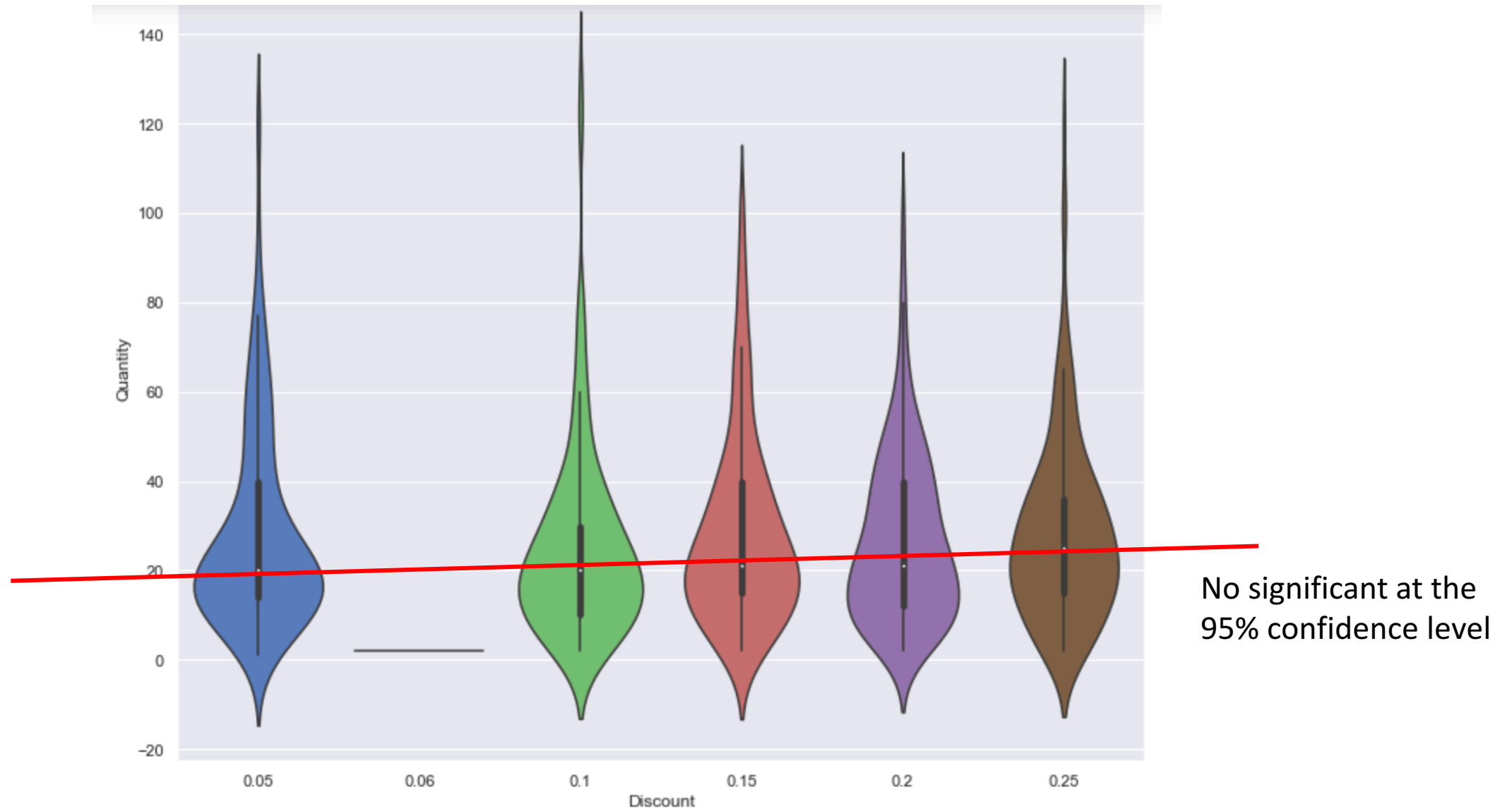
Results: Discount Does Matter

- Discount
  - Avg quantity/order = **27**

- No discount
  - Avg. quantity/order = **22**

- Discount ⬆ Quantity

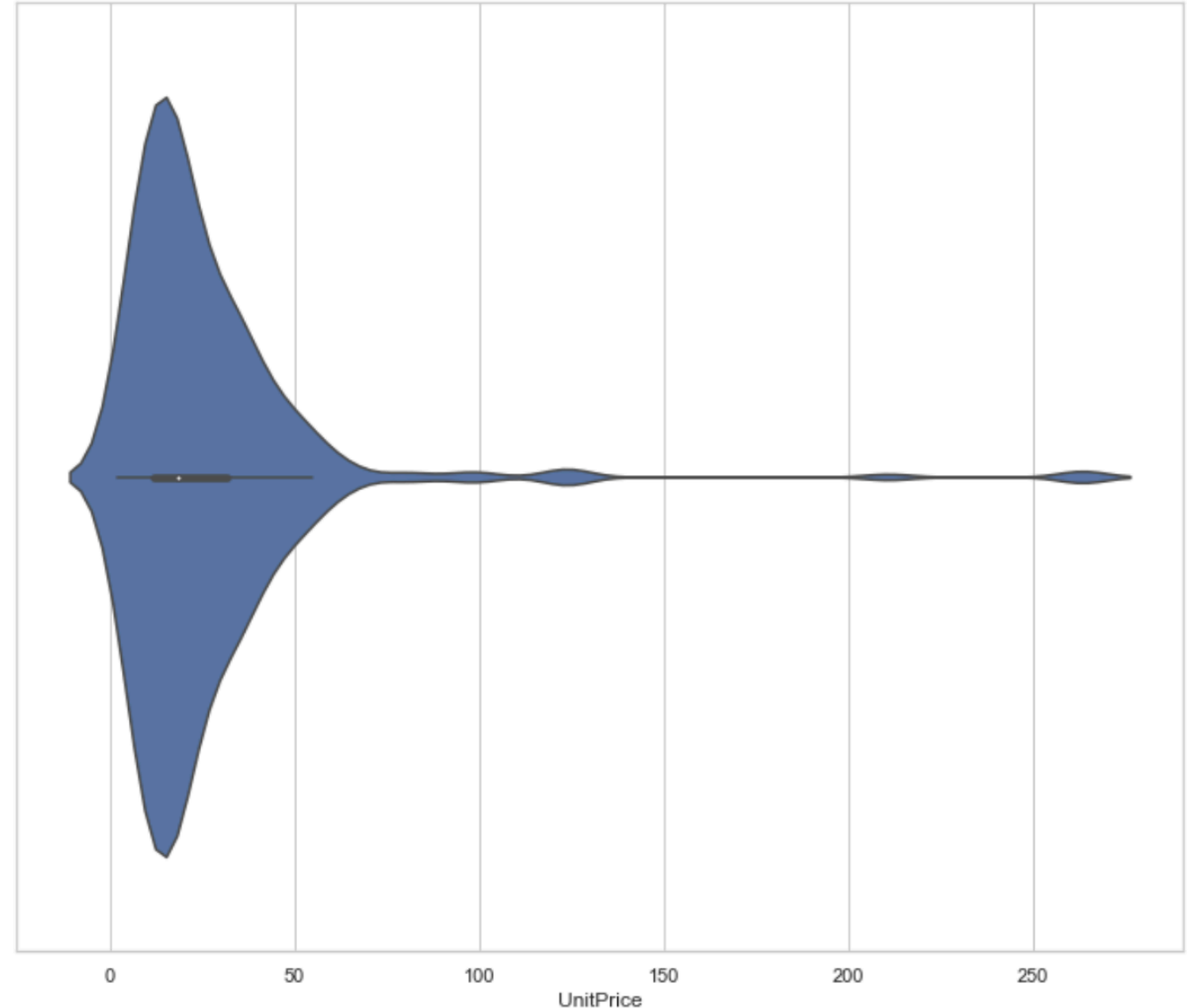No Discount vs. Discount
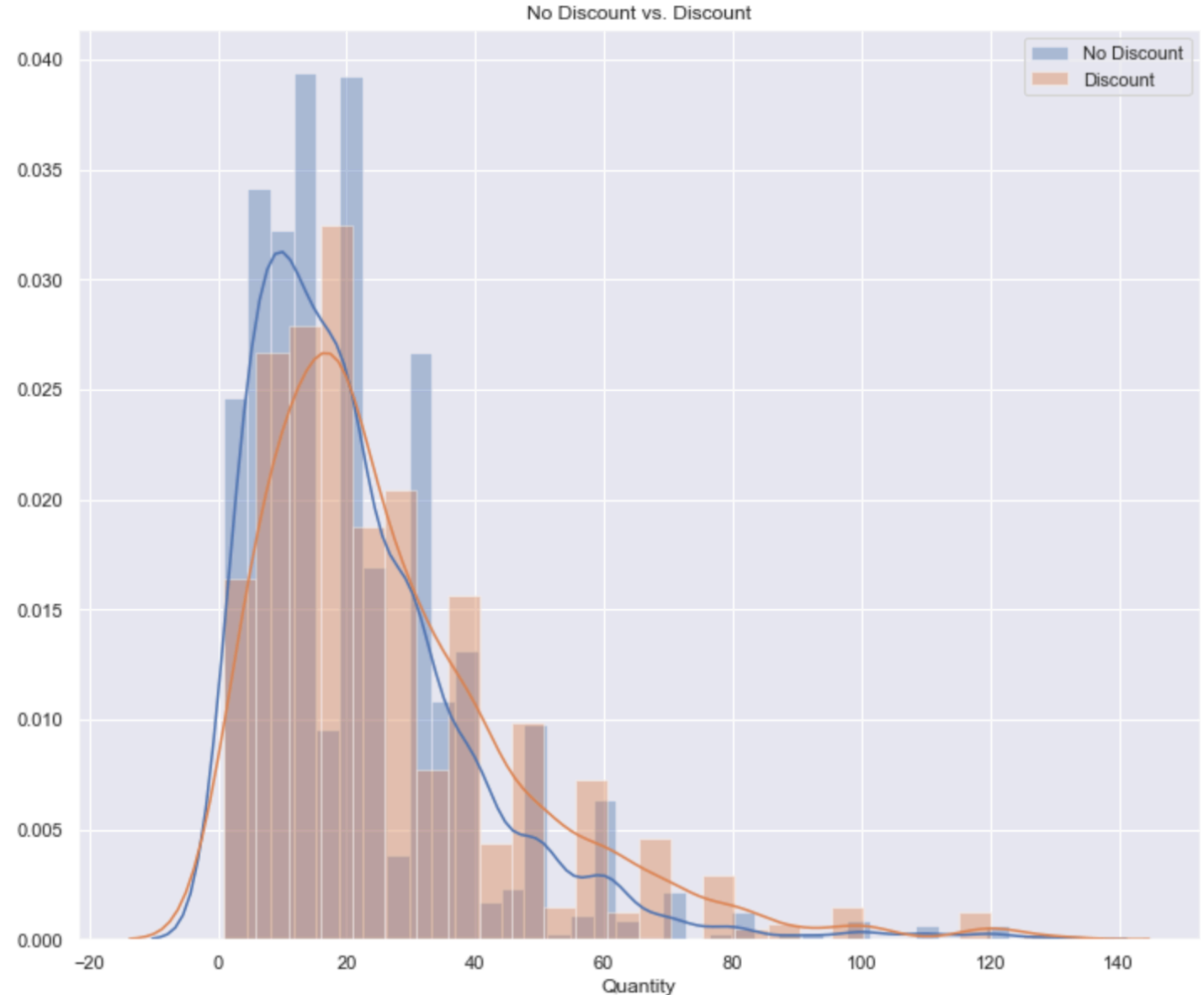
Results: Level of Discount Does NOT Matter

Results: Level of Discount Does NOT Matter

No significant at the 95% confidence level
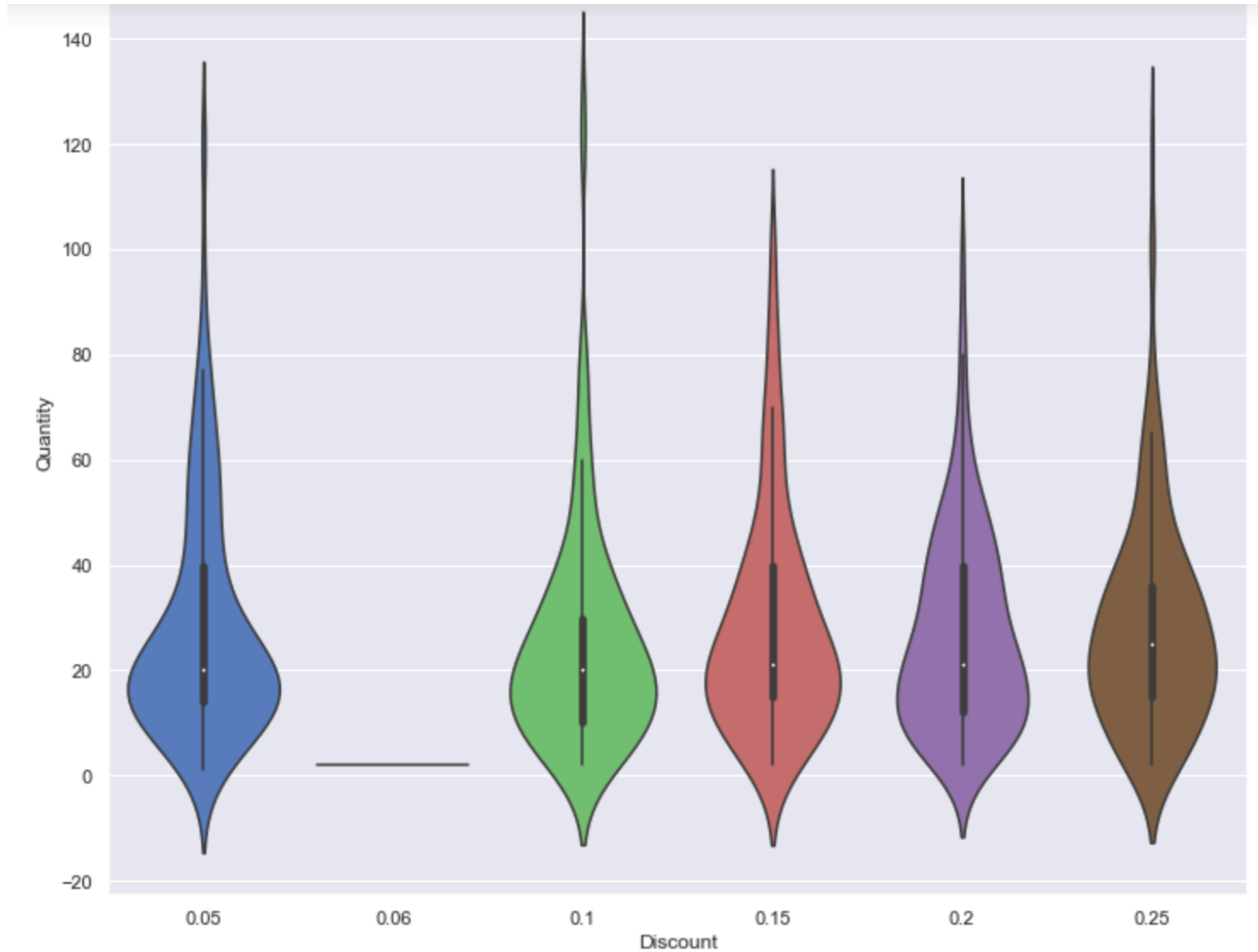
How is Price Distributed?

- Mean = $26.22
- Minimum = $2.00
- Max = $263.50

- 25% = $12.00
- 50% = $18.40
- 75% = $32.00

- Low Price Group →   < $12.00

- Mid-Low Price Group → $12.00 -- $18.40

- Mid-High Price Group → $18.40 -- $32.00

- High Price Group →   > $32.00

Results: Discount Matters at All Price Levels

- #1 Mid-High Price Group
- #2 Mid-Low Price Group
- #3 High Price Group
- #4 Low Price Group

- No significant difference between LEVELS of discount for any price group

No Discount (Mid-High Price Group) vs. Discount (Mid-High Price Group)
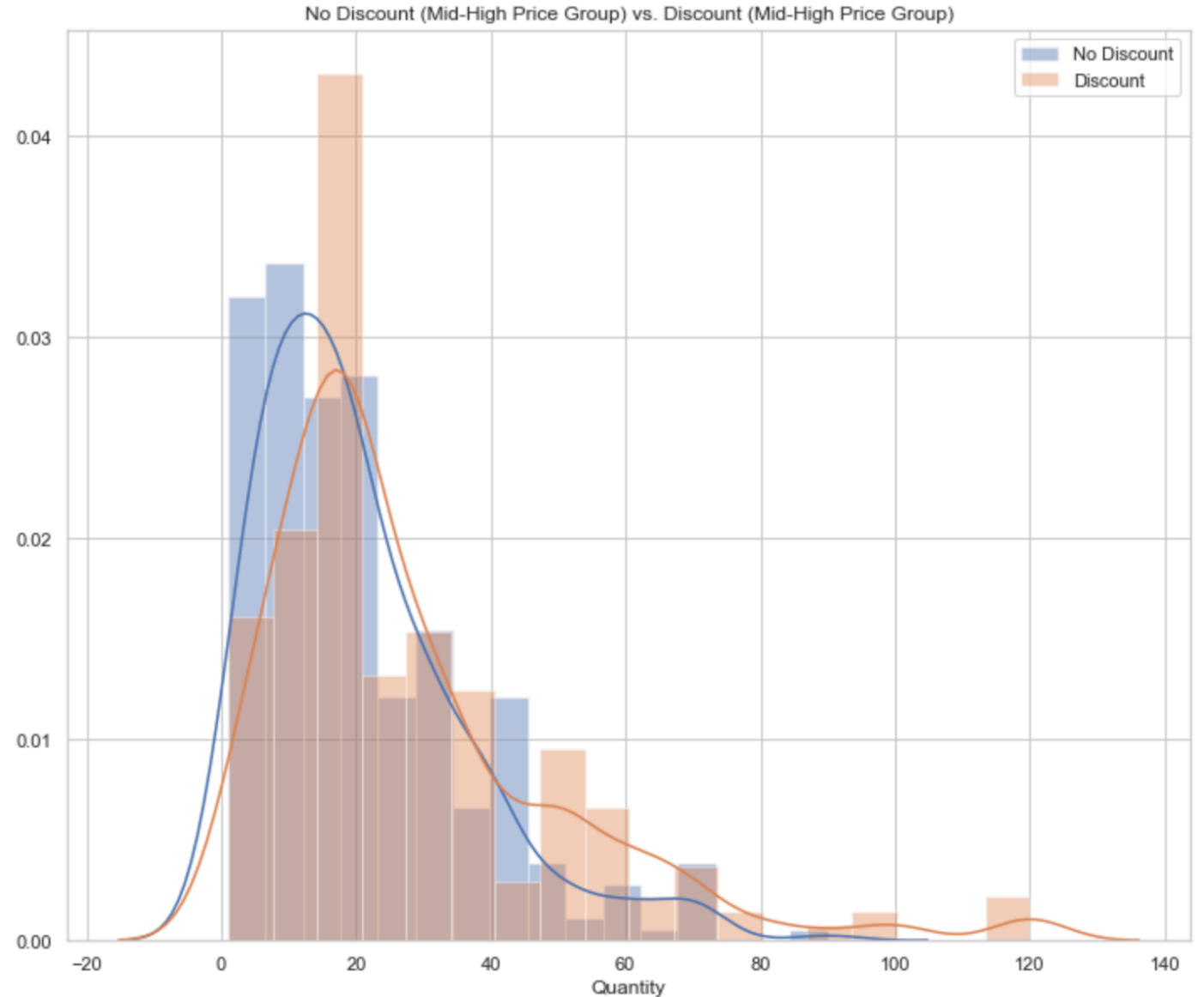
Summary

1. Discount increases quantity sold

2. Level of discount doesn't matter

3. All price groups are impacted by discounts

4. Level of discount doesn't matter for any price group

Recommendations

To sell more units:

- General: Apply a discount at any price point

- Targeted: Apply discounts to product priced $18 - $32

Limitations & Future Work

Limitations:

- Recommendations only apply to the Northwind dataset
- Tests were conducted with a threshold of 95% confidence, 5% chance conclusions are false

Future work:

- Best time of year to apply discounts?
- Which regions are most sensitive to discounts?

Thank you!

- Questions?