To (continue) discount or not, that is the question!

January 31, 2024

Overview

Debate alert!

93% of orders are discounted (>1%) → Higher than the industry average[1,2]

Avg. discount rate is about 18% → Lower than the industry average of 26%[2]

Marketing Dept.

- Discounts are beneficial

Investors

- Avoid aggressive discounts
- Revenues declined last quarter (seasonality?)

Answer still unclear! → data analysis

Data considerations

Data overview

- Two levels of data:
  - Order-level
  - Product-level
- **Time:** 1.1.2017-14.3.2018
- **Corrupt columns:** Promo price, price, etc.
- Missing/duplicates

Data cleaning

Assumptions

1. Price column is correctly specified
2. Negative discounts (<-1) are not possible

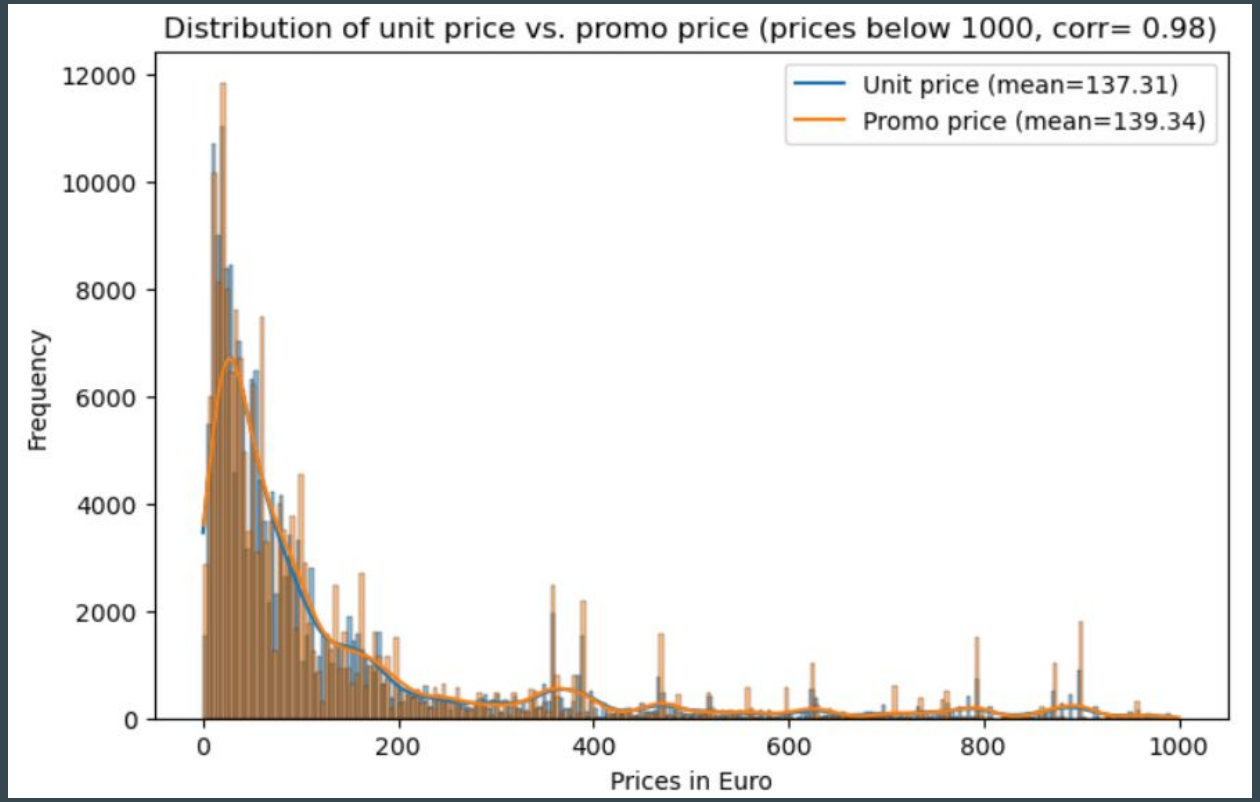
\+ Drop duplicates/missing and outliers (in discounts)

Final sample

Distinct # of orders: 144,416

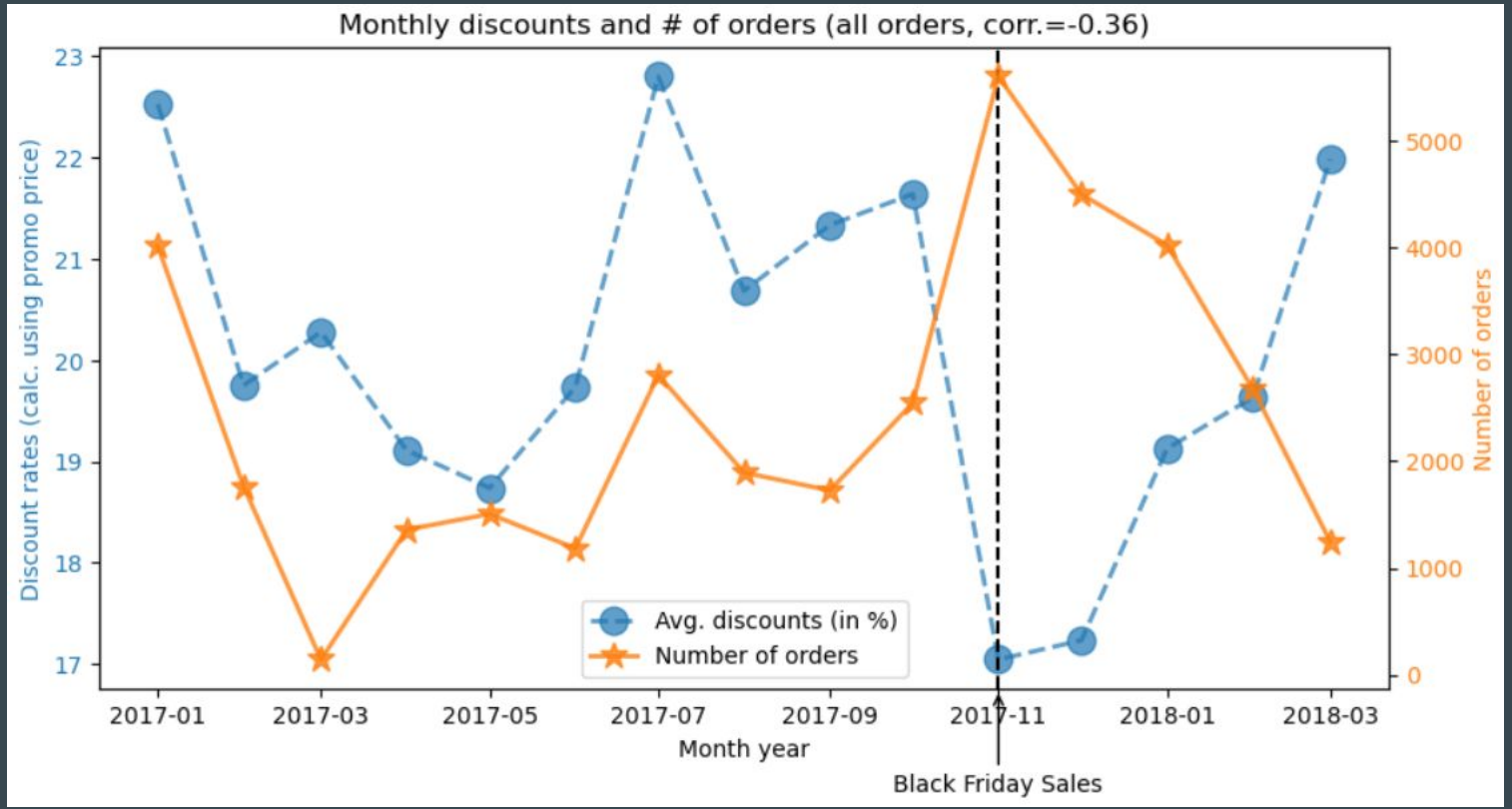
- # compl. orders: 36,900
- # sold products: 4,654

Promo price clean-up broadly worked out!



Promo prices closely match unit prices!
→ hereafter, applied to compute product-level revenues and discounts...

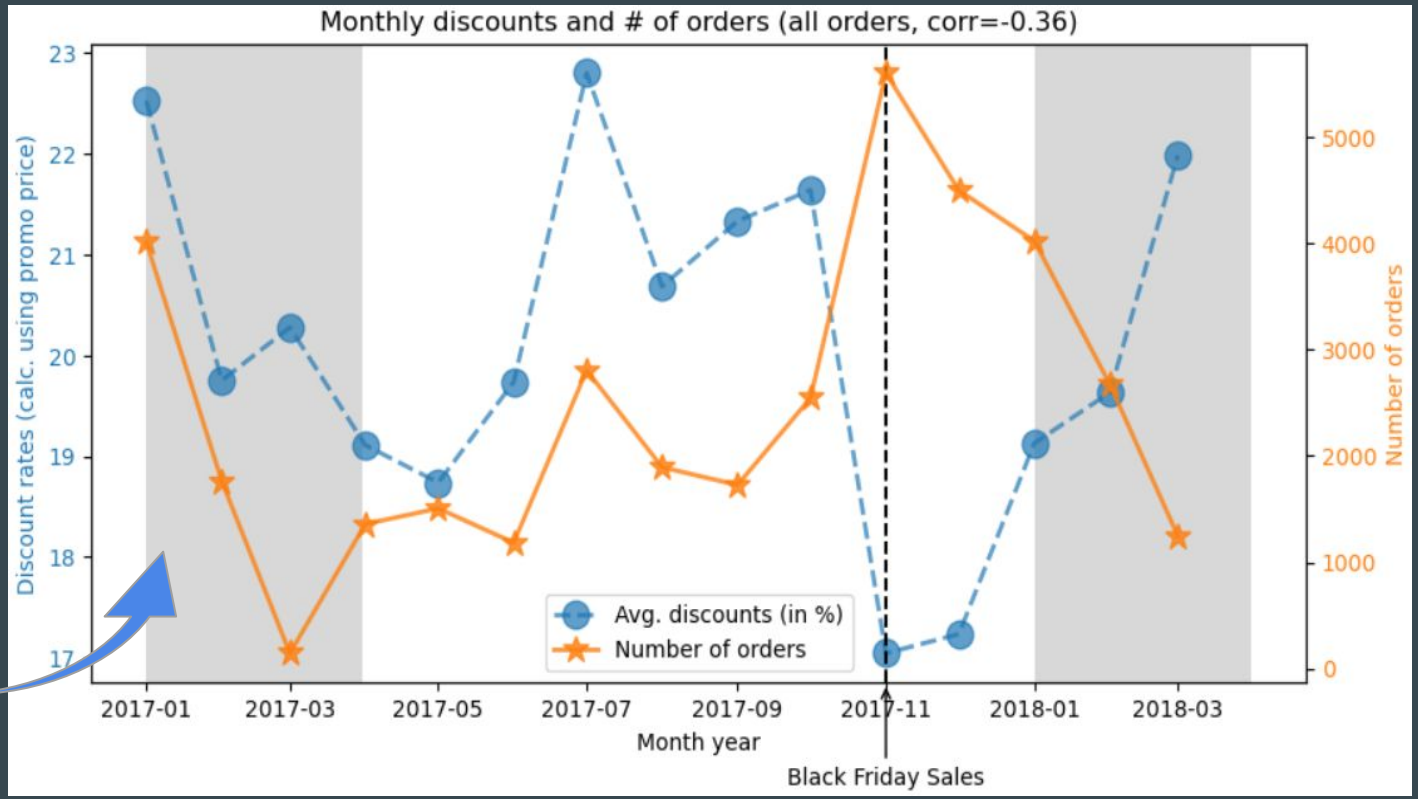
No visibly clear relationship pattern (seasonality?)!



Data note: all orders

Accounting for seasonality...

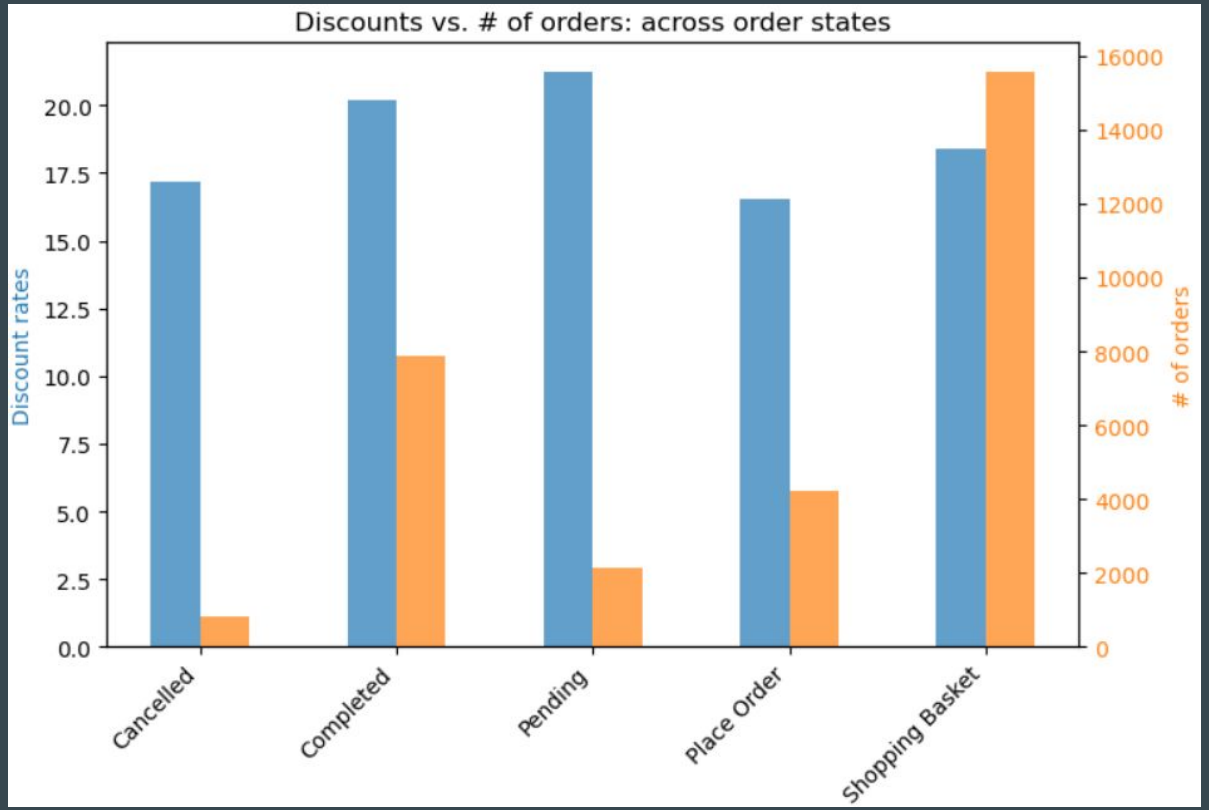
Grey shade: Data considered for analysis



Data note: all orders

Discounts do not differ much across order states!

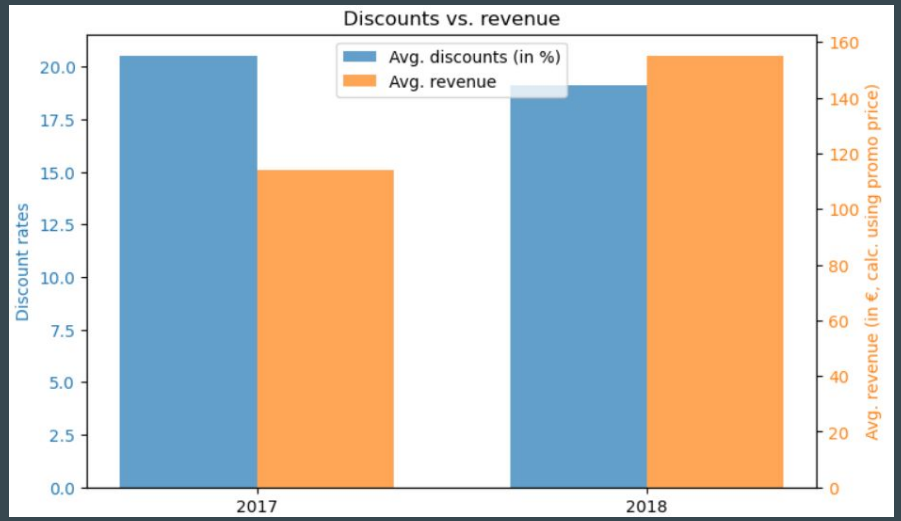
But a slight increase in discounts can increase the Shopping Basket conversion...



Data note: Seasonality-corrected, all orders

Discounts do not increase orders/revenue!

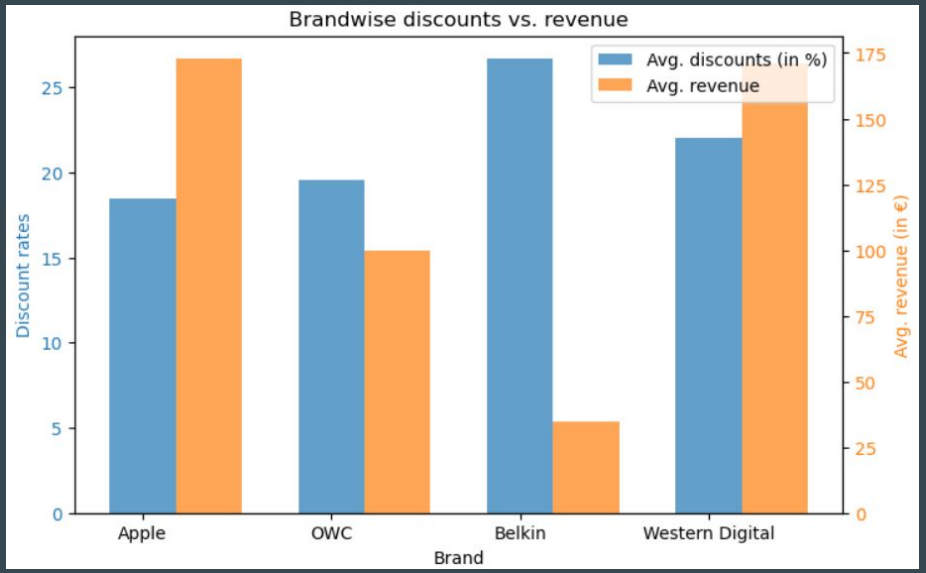
Lower discounts -> higher sales/revenue



Data note: Seasonality-corrected, completed orders

Discounts do not increase non-Apple orders/revenue!

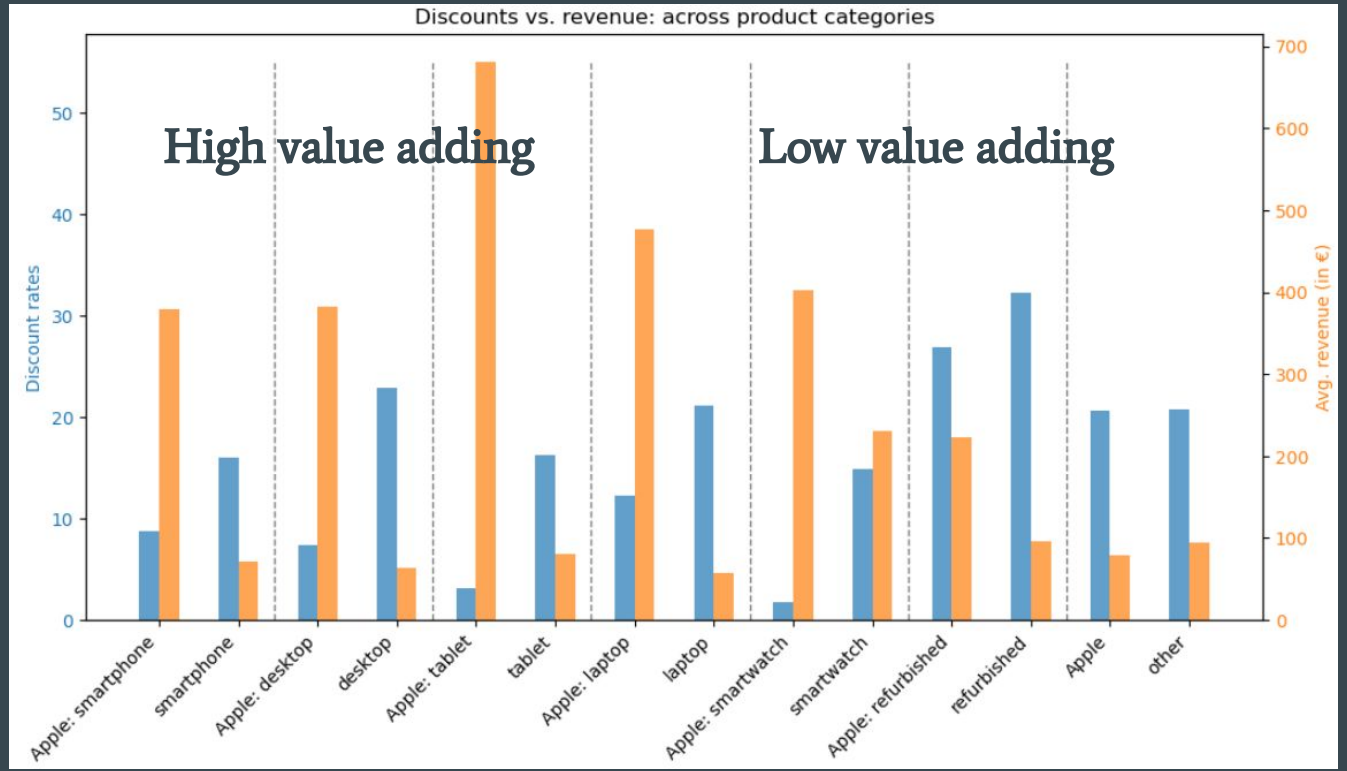
Aggressive discounting targets
low value adding brands



Data note: Top 4 most-sold brands, Seasonality-corrected, completed orders

Discounts do differ across product categories!

Aggressive discounting targets low value adding product categories



Data note: Seasonality-corrected, completed orders

Conclusion

- Evidence summary
  - Efficient flexibility in discounting through time to keep the sales up
  - Suitable tweaking across brands (↓ apple, ↑ non-apple products)
  - But low value adding products are aggressively discounted
    - **Suggestion 1**: adjust discounts for high-value adding products to tweak sales
  - **Suggestion 2**: tweak shopping basket discounts to improve conversion

Conclusion

- Data on user experience is not available
  - Needed to understand the factors determining conversion
  - **Suggestion 3:** Collect more user reviews/feedback

- Assumptions/efforts needed to clean up promo prices
  - → Promo prices ≅ unit prices, but should they?
  - **Suggestion 4:** Improve data collection quality at source!

References

[1]
https://www.forbes.com/sites/priceonomics/2017/11/16/which-e-commerce-retailers-discount-the-most/?sh=77f216904062

[2]
https://pickystory.com/blog/ecommerce-sales-trends-top-future-trends-statistics-ecommerce/#:~:text=%234%3A%2030%25%20of%20all,were%20on%20sale%20in%202022

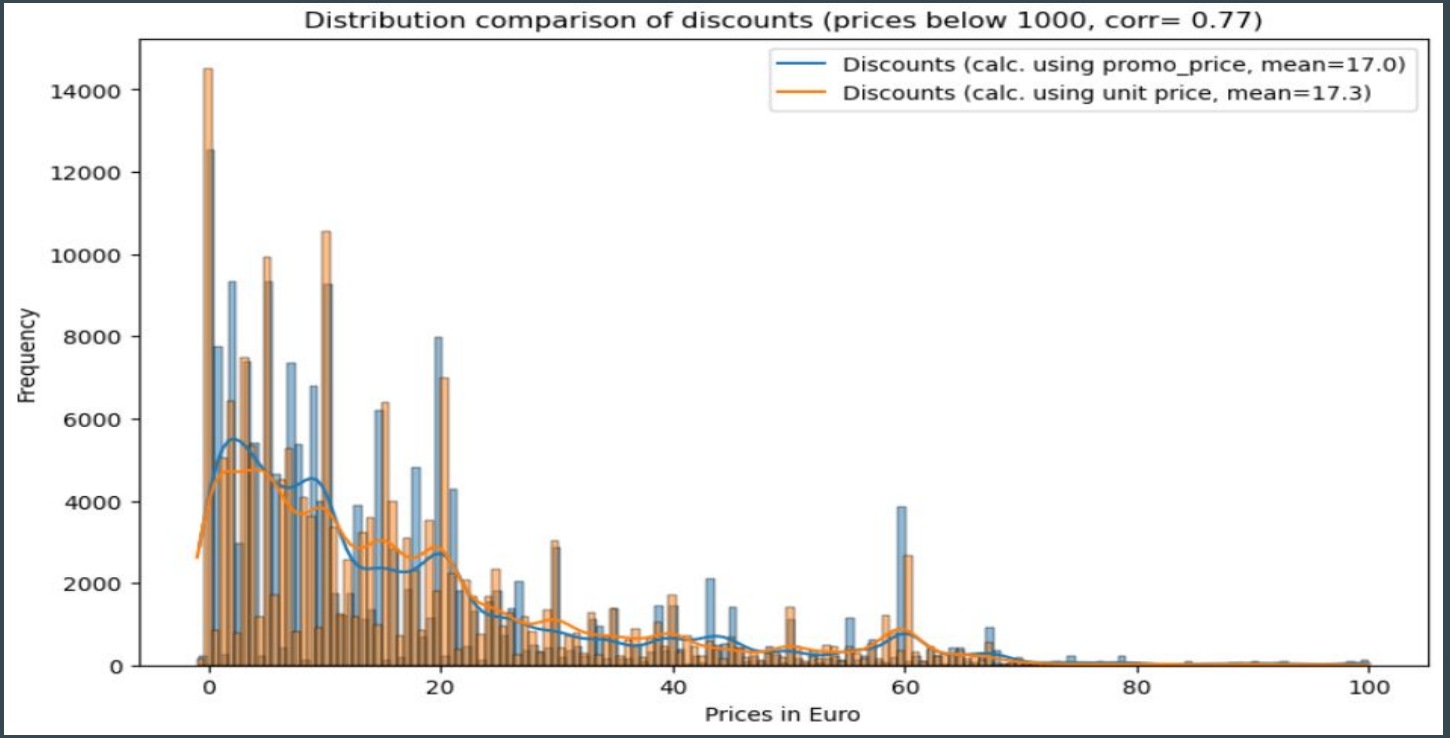
Some metrics

Around 93% of orders received discounts (>1%) → Higher than industry average[1,2]

Avg. discount rates offered is 18.1% → Lower than the industry average (26%)[2]

Avg. price of the discounted product is €158.8

Appendix


Distribution comparison of discounts (prices below 1000, corr= 0.77)
Discounts (calc. using promo_price, mean=17.0)
Discounts (calc. using unit price, mean=17.3)
Frequency
14000
12000
10000
8000
6000
4000
2000
0
0
20
40
60
80
100
Prices in Euro

Data Considerations

- **Two levels of data:** Order-level and Product-level
- **Time range:** 01.01.2017-14.03.2018
- **Unclean data set:** duplicates/missing, corrupt columns (2-decimal-dots)
- **Assumptions:**
  - Price column is correctly specified
  - Negative discounts (<-1) are not possible

- # of orders: **144,416**
- # compl. orders: **36,900**
- # sold products: **4,654**