ST2187 Business analytics, applied modelling and prediction

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Executive Summary

Our consultant agency is pleased to present these three recommendations to improve current business performance.

The first recommendation is to limit the discount level to 25% and introduce a shipping mode upgrade in the APAC market. Currently, the discounts negatively affect the products' profit margin. In the APAC market, transactions with discounts over 25% cumulatively created losses in 2018-2020. Imposing constraints on the discounts might influence ca. 48% of clients. To balance the limited discounts, we advise exploring an option of the shipping mode upgrade as a promotion. It might have a wide application since over 60% of clients choose standard class shipping mode, while the implementation of the recommendation to limit the discount up to 25% will lead to a higher profit margin of the Company in the APAC market.

The second recommendation is to increase discounts to up to 20% in the EU market for orders with over 6 products. The higher discounts will be applied to the orders with a greater number of products, leading to a decrease in the shipping cost per product in the EU market. Since the median number of products per order is six, we suggest applying the promotion to all orders with over six products. The discounts increase as the promotion is selected because the Company has the lowest discounts in the EU market across all markets globally and therefore, has an option to make the most noticeable change to affect the customers' behaviour. As a result of implementing the second recommendation, the shipping expenses per product will be decreased in the EU market.

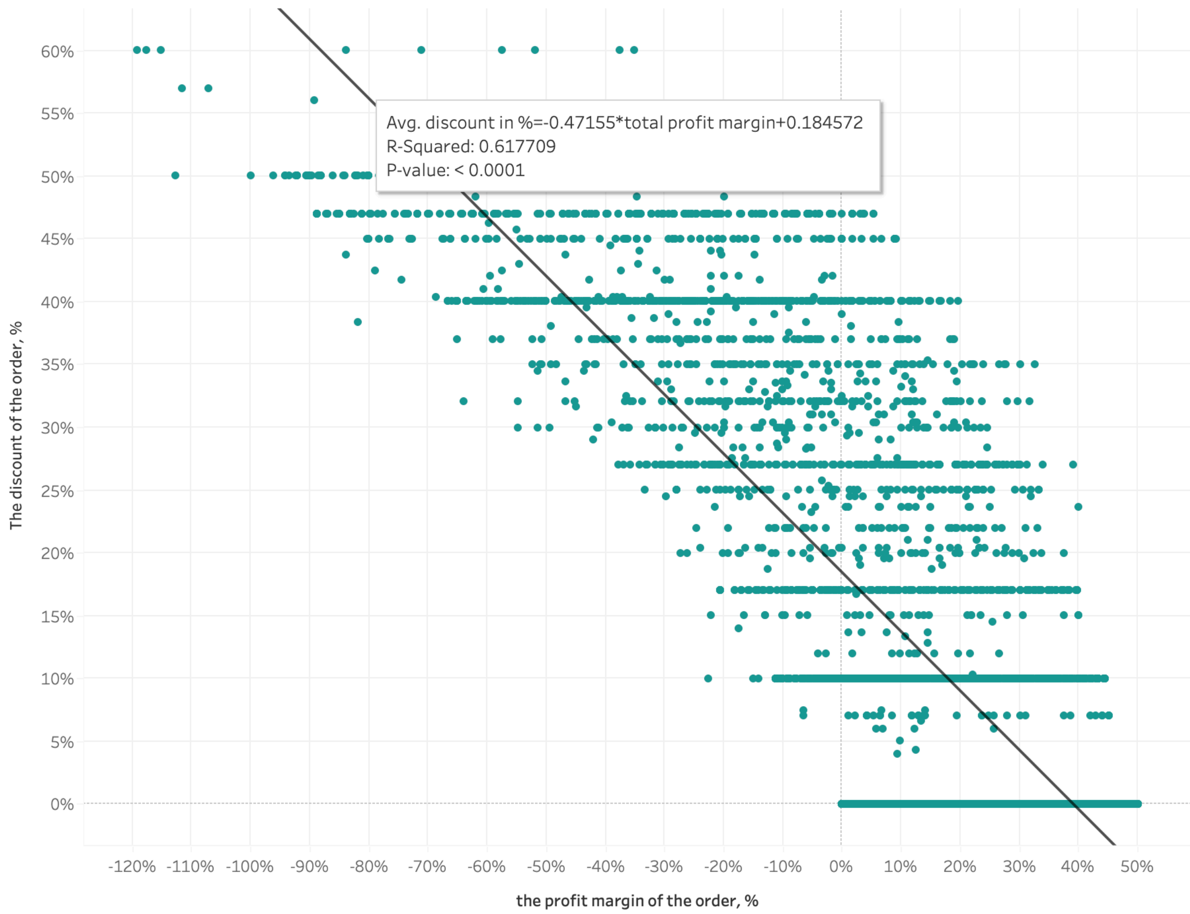
The third recommendation concerns two markets, Africa and EMEA, where the total profit margin constitutes 12% and 6%, respectively. There is room for significant improvement, as orders concentrated in the 3 African and 7 EMEA countries created negative profit. One of the main reasons for the negative profit is the "other" expenses that overcome sales: average "other" expenses and sales are $102 and $61 per product in the African market, and $95 and $76 per product in the EMEA market, respectively. We suggest exploring the option to substantially diminish the "other" expenses. If the latter is not feasible, we recommend terminating operations in selected countries. Consequently, the average total profit margin will become 22% and 18% in the African and EMEA markets, respectively.

In conclusion, after the recommendations' implementation, the business results will be improved in the APAC, EU, EMEA and African markets.

Recommendation #1: to limit the discount level to 25% and introduce a ship mode upgrade in the APAC market

It was discovered that there is a negative linear relationship between the product discount and the product profit margin in the APAC region. The R^2 of this relationship equals ca. 0.62. Therefore, the relationship is strong enough to conclude that the discount reduction significantly influences the profit level.

The relationship of the discount and the profit margin of orders in the APAC market in 2018-2020



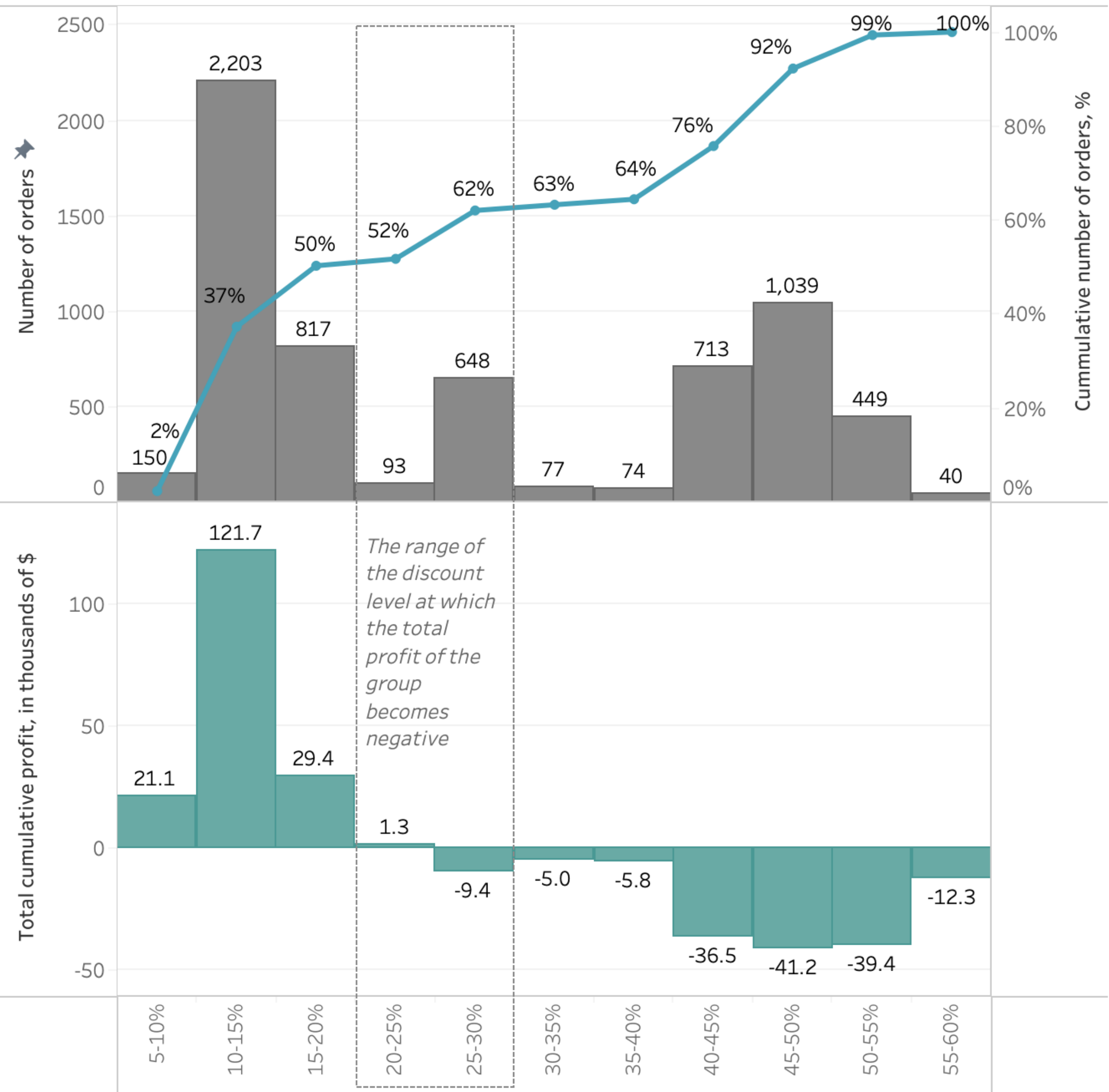
To balance the sales level which might be negatively impacted by the discounts' level proposed decline, we suggest exploring a shipping mode upgrade. First of all, it is a widely applicable method of promotion since over 60% of orders were made with the standard class shipping mode. Secondly, the shipping mode does not correlate with the discount level and, therefore, is be able to reach orders with all discount levels, including the ones limited by the recommendation.

Shipping mode APAC orders distribution in 2018-2020

Same Day	First Class	Second Class	Standard
5%	14%	20%	60%

As we mentioned before, the removal of all discounts might cause a sales decline, therefore, we seek the optimal level of discount to limit. In order to do that, we created batches with a 5%-interval and sorted all transactions made in the APAC market from 2018 to 2020 by these intervals.

Profit analysis by the discount level of the orders in the APAC market in 2018-2020



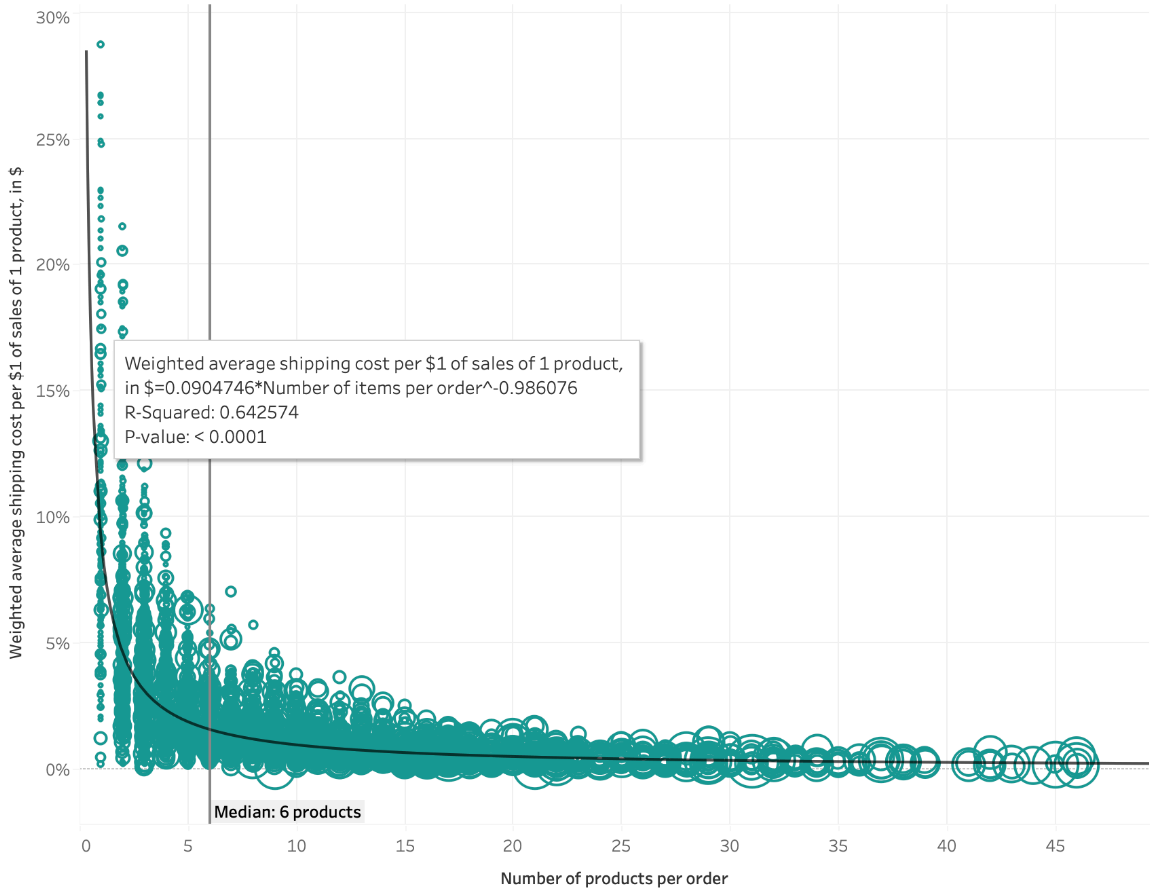
Thereafter, we calculated the total cumulative profit of the orders at each batch which indicates that the orders with over 25% discount cumulatively created losses. Therefore, we believe that imposing a discount threshold at the 25% level is the optimal choice. The discount limitation at 25% might affect ca. 48% of orders.

In conclusion, we recommend limiting the discount level to 25% in the APAC market, which leads to profit margin improvement.

Recommendation #2: to increase the discounts to up to 20% for the orders with over 6 products in the EU market

The second recommendation relates to the EU market, where the shipping cost per sale of each product decreases with the growth of the number of products at the order. The R^2 of this relationship equals 0.64. Hence, it is reasonable to assume that the increase in the number of products per order would diminish the share of the shipping cost in the sales per product.

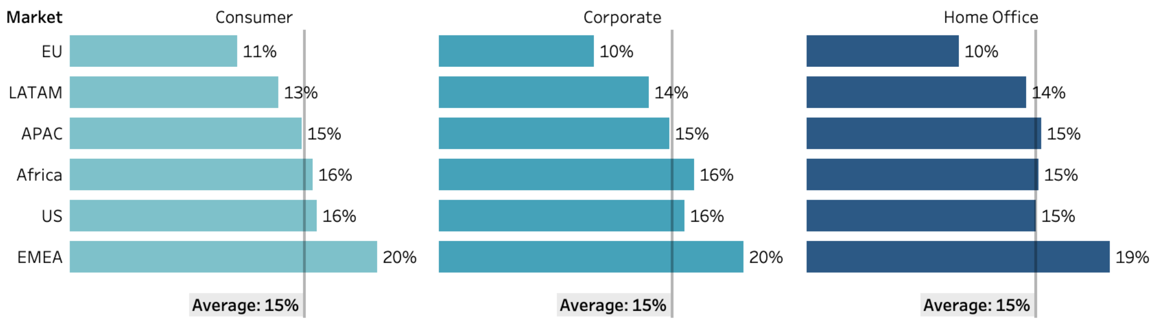
The relationship of the number of products per order with the weighted average shipping cost per $1 of sales of 1 product and the total profit margin of the order in 2018-2020



Besides the cost efficiency, the number of products in the order drives the orders' profit margin. As we see on the graph above that the median number of products per order is six, we suggest starting the application of the promotion for all orders with over six products and updating the threshold, the number of products at the order, based on the results received.

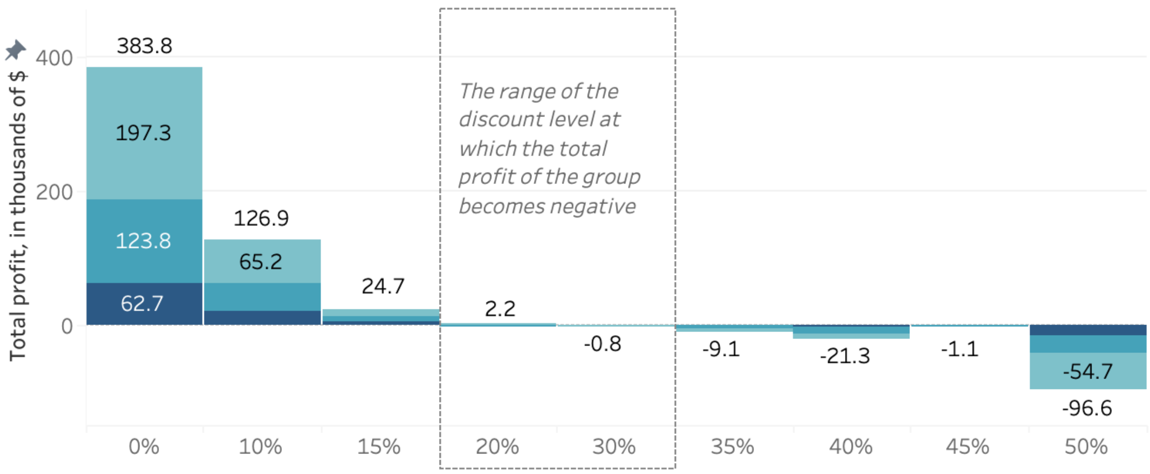
We recommend the increase of the discounts as a promotion option because the discount levels of the EU market across all client segments are the lowest among markets where the Company operates (besides Canada, where no discount promotion is applied). Hence, even the increase to the average global level of discounts might be a noticeable change with a significant effect on the consumers' behaviour.

The average discounts of each client segment by markets in 2018-2020



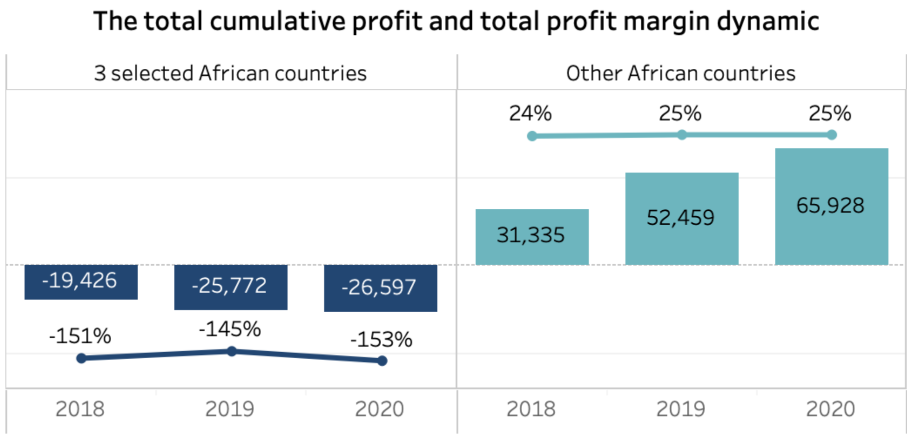
To estimate the optimal discount level, we sorted orders made in the EU market in 2018-2020 by the discount levels as batches and calculated the cumulative profit of all orders for each batch. The orders with up to 20% discount have a positive cumulative profit ($2,200) and the ones with over 20% discount have a negative one (-$800). Therefore, we believe that the best option will be to raise the discount to a 20% level and to consider a future increase based on the results of the introduced promotion.

The total cumulative profit of orders sorted by the discount level in the EU market in 2018-2020

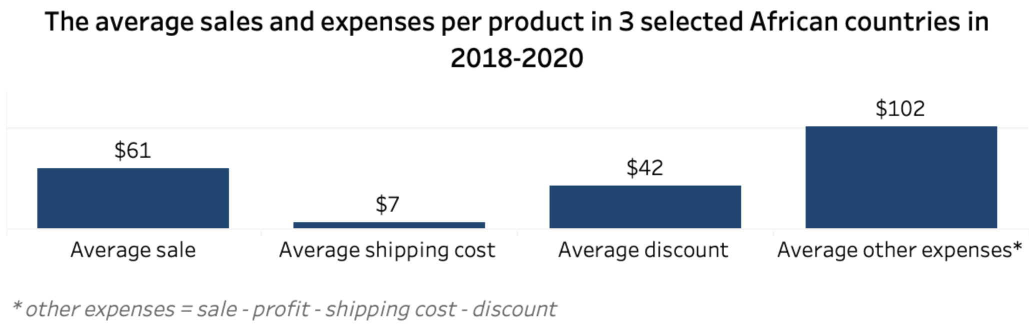


Recommendation #3: to terminate operations in 3 African and 7 EMEA countries if the option to reduce “other” expenses is not feasible.

On the fourth slide, the overview of the African market is presented. Only three out of 45 countries in the African market created losses from 2018 to 2022: Nigeria, Zimbabwe, Uganda, while the other 42 countries combined generated a positive profit every year.

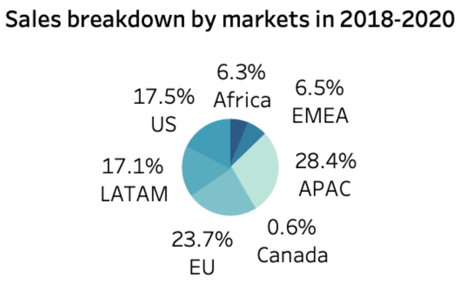


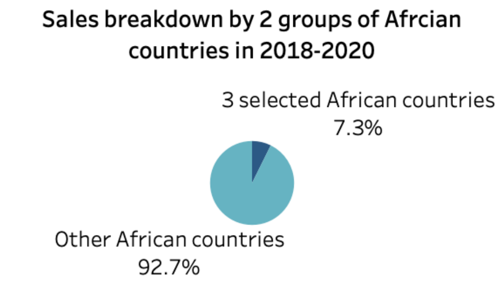
The average of “other” expenses constitutes $102 per product, while the average sale accounts for $61 per product in Nigeria, Zimbabwe and Uganda. As a result, it is vital to significantly decrease “other” expenses before considering the shipping cost optimization or the discount level decrease.



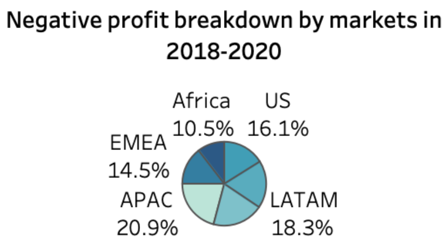
Foremost, we recommend accumulating the data regarding the breakdown of “other” expenses and investigating the option to substantially decrease them. If such a scenario is not feasible, we believe that it is efficient for the total profit margin profile of the African market to terminate operations in the three mentioned countries.

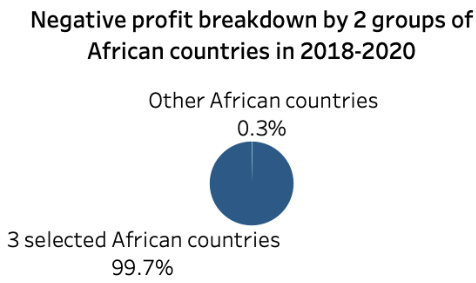
The African market constitutes 6.3% of the total sales of the Company. The three highlighted African countries accounted for 7.3% of the sales of the African market. Hence, by stopping operations in Nigeria, Zimbabwe and Uganda the Company loses only 0.4% of sales across all markets.





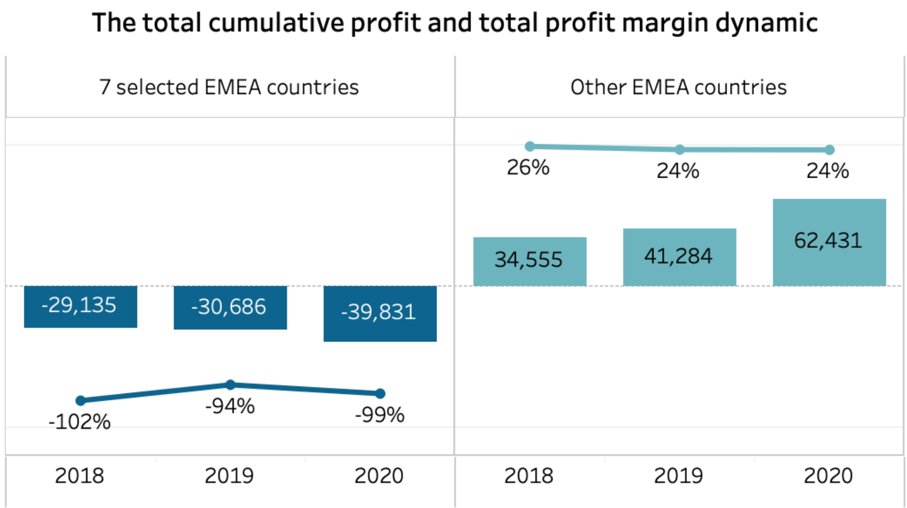
Losing ca. 0.4% of the global sales is massively compensated by the amount of losses abandoned: the three selected countries accounted for 10.5% and 99.7% of the negative profit in the global and the African market, respectively.



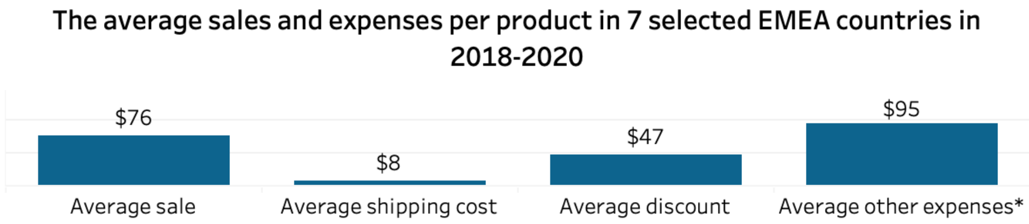


Consequently, we suggest considering the Company's operations termination in Nigeria, Zimbabwe and Uganda if the substantial diminishment of the "other" expenses is not possible.

In the EMEA market, we observe a similar situation: seven out of 40 countries created losses in 2018-2020. These countries are Kazakhstan, Turkey, Turkmenistan, Tajikistan, United Arab Emirates, Yemen, Lithuania.



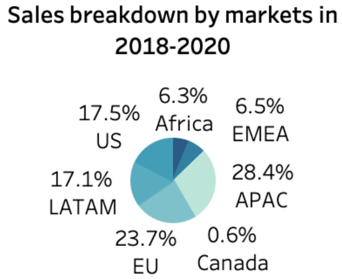
The "other" expenses are the largest category of the expenses, making them the main source of negative profit. Moreover, the average "other" expenses ($95 per product) overcome the average sales ($76 per product).

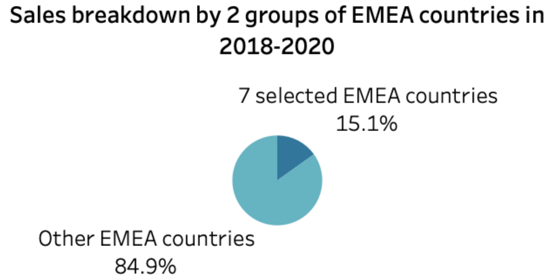


** other expenses = sale - profit - shipping cost - discount*

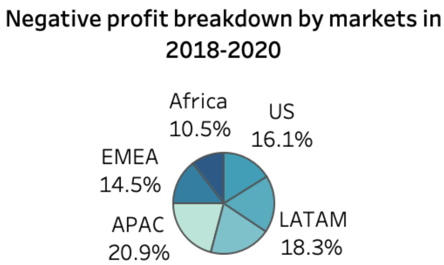
First of all, we propose gathering the data on the breakdown of "other" expenses and researching the option to substantially decrease them. If it is not possible, we believe that it is efficient to terminate operations in the seven selected countries in order to improve the total profit margin in the EMEA market.

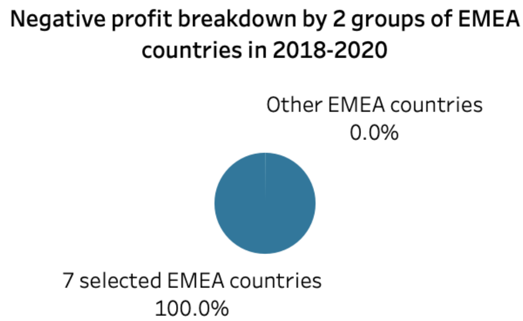
The EMEA market constitutes 6.5% of the total global sales of the Company. The seven mentioned EMEA countries accounted for 15.1% of the EMEA market. Therefore, by stopping operations in Kazakhstan, Turkey, Turkmenistan, Tajikistan, United Arab Emirates, Yemen and Lithuania, the Company loses only ca. 1% of sales across all markets.





Giving up ca. 1% of the global sales is compensated by the abandoned negative profit: the seven selected countries accounted for 14.5% and 100% of the negative profit in the global market and the EMEA market, respectively.





As a result, we recommend considering terminating the Company's operations in Kazakhstan, Turkey, Turkmenistan, Tajikistan, United Arab Emirates, Yemen and Lithuania if the alternative of the "other" expenses' substantial reduction is not feasible.

Assumptions

Years used:

The analysis is constrained to the 2018-2020 years due to the following reasons:

1. Not all countries were operated before 2018, therefore the comparison of the countries' indicators might have been biased.
2. The countries' statistical figures were much lower before 2018 since the Company's operations only started, hence the growth rate was huge due to a low-base bias and not representative for the analysis provided.
3. Since the markets are changing over time, the data before 2018 might provide a false perspective of the current situation, leading to incorrect estimates.

Calculated fields at Tableau:

The following calculated fields were created to perform the analysis:

- Total profit margin = SUM([Profit])/SUM([Sales])
- Total expenses = SUM([Sales])-SUM([Profit])
- Number of products per order = SUM([Quantity])/COUNTD([Order ID])
- Weighted average shipping cost per $1 of sales of 1 product, in $ = SUM([Shipping Cost])/SUM([Sales])/SUM([Quantity])
- Discount, in $ = Sales * [Discount]
- Other expenses = [Sales]-[Profit]-[Discount, in $]-[Shipping Cost]