TIME SERIES CASE STUDY
(Retail Giant Sales Forecasting)

SUBMISSION

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Business Overview and Objectives

Business Overview

- An online supermarket with a worldwide presence that deals with product orders across categories like consumer, corporate and home office.
- Store caters to products across 7 different segments in 3 major categories

Business Objective

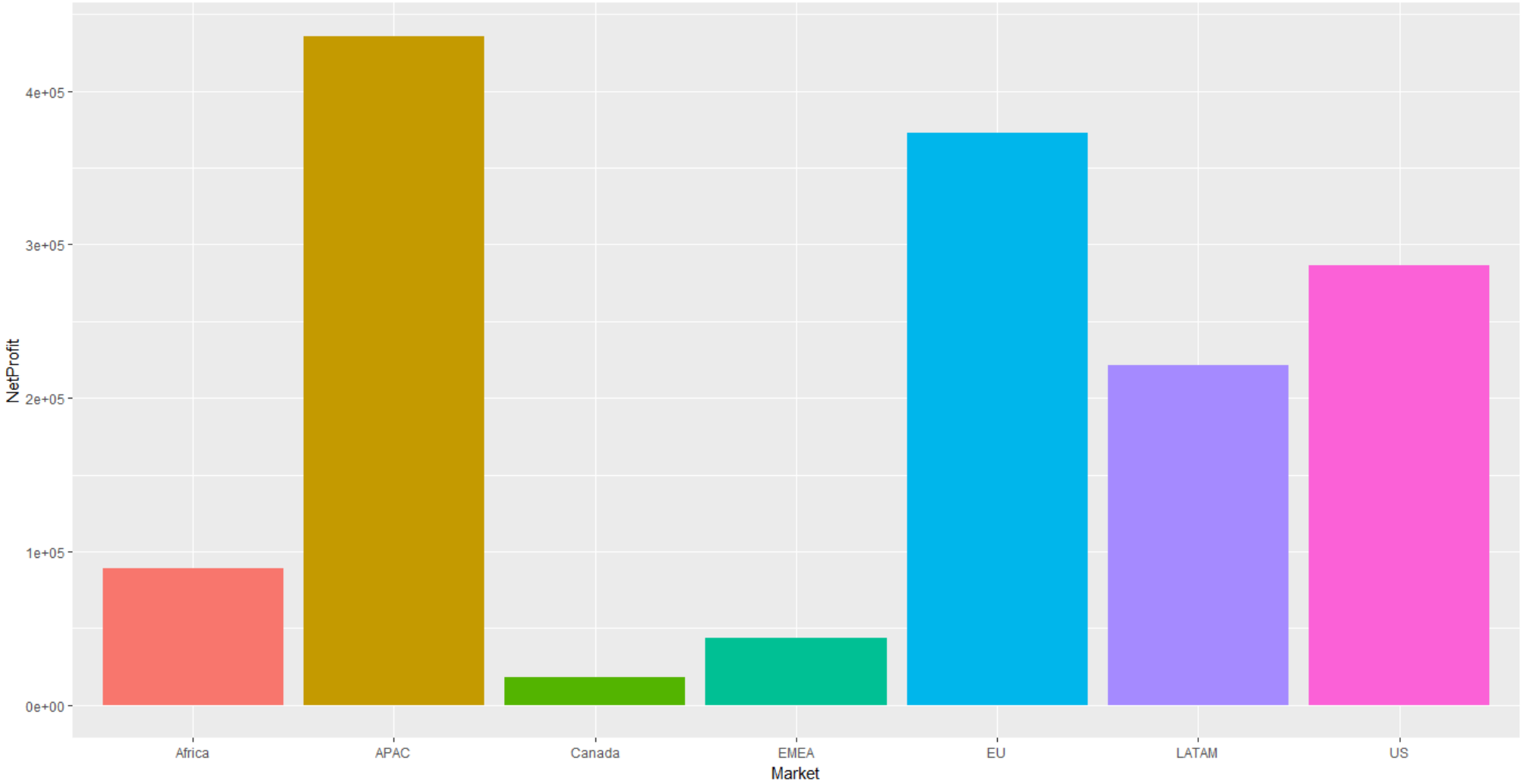
- Identify **two most profitable** (and consistent) **segments**
- Forecast **sales and demand** for **next 6 months** in the identified two segments
- Helping to manage the revenue and inventory accordingly

Data Preparation

- Data Cleaning Methods Used
  - Check for cells with Null values: Only “Postal.Code” column contains null values
  - Check for duplicate rows: No rows are duplicate in the dataset

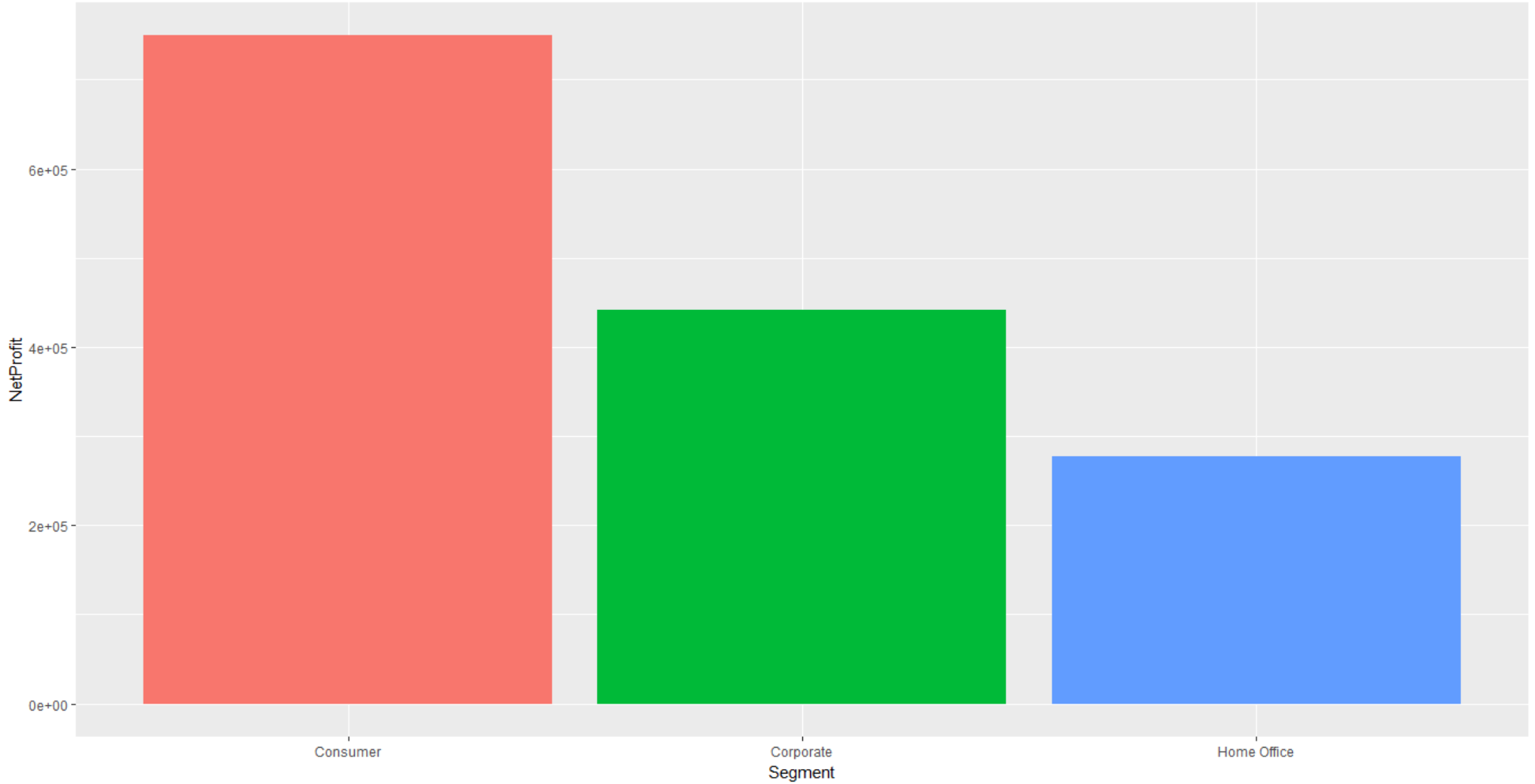
- Data Preparation
  - Segregating datasets for each of 21 segments (7 segments * 3 categories)
  - Separating month and year data for each segment
  - Aggregating data for sales, profit and quantity for all datasets

Plotted Graphs b/w Market and Net Profit



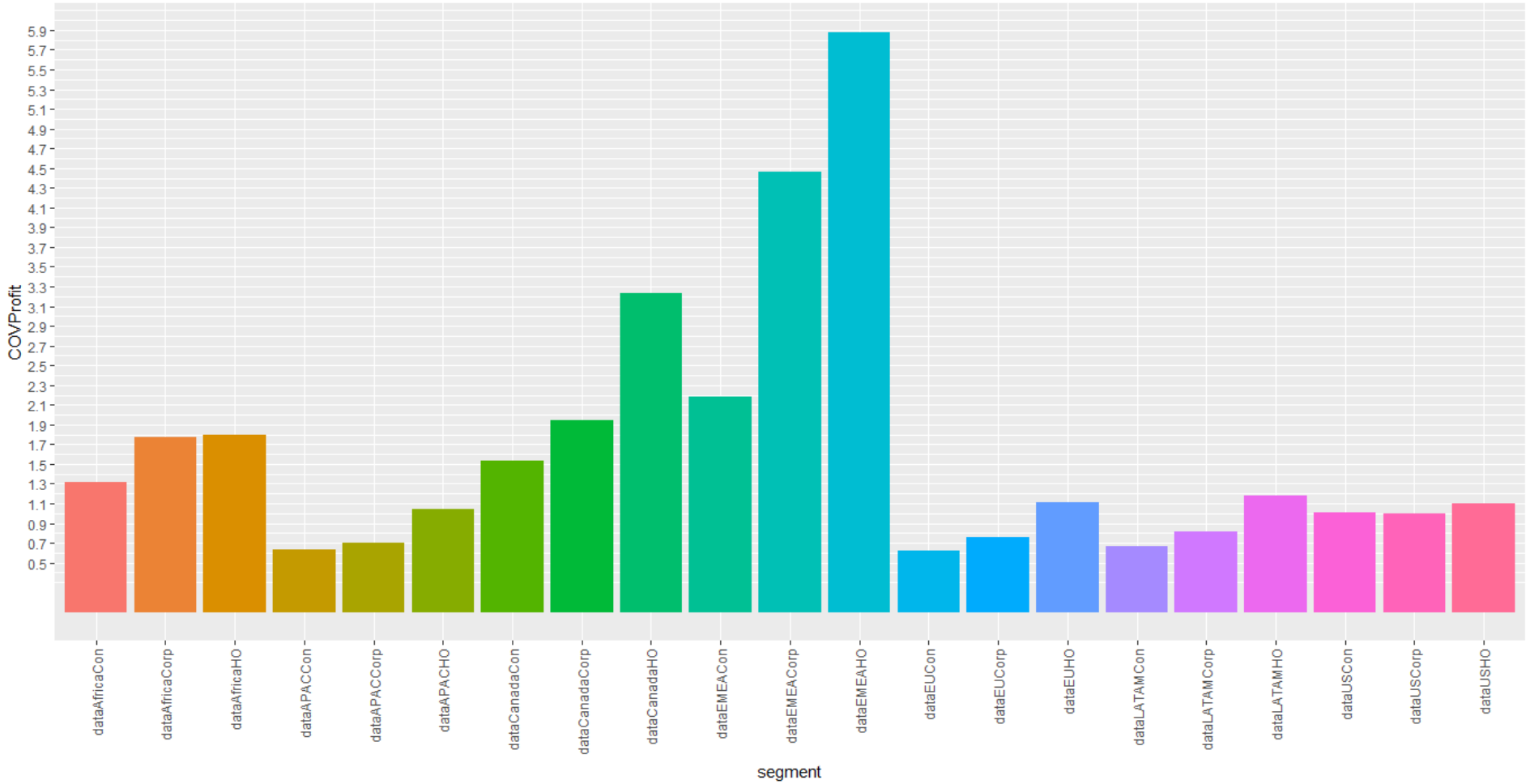
- APAC and EU Region has highest profit among all the markets

Plotted Graphs



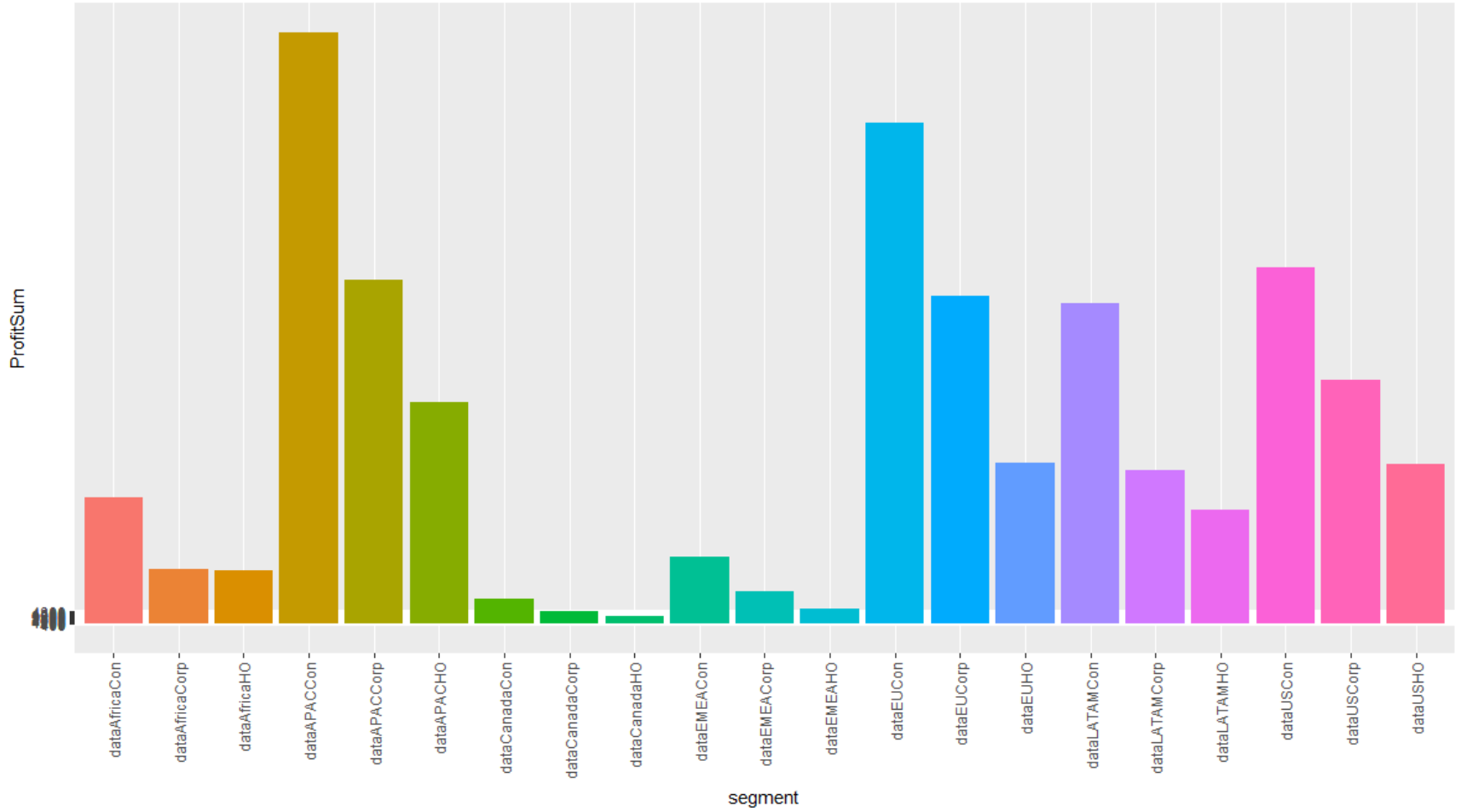
- Consumer segment has highest profit across three segments

Plotted Graphs b/w CoV and Segments



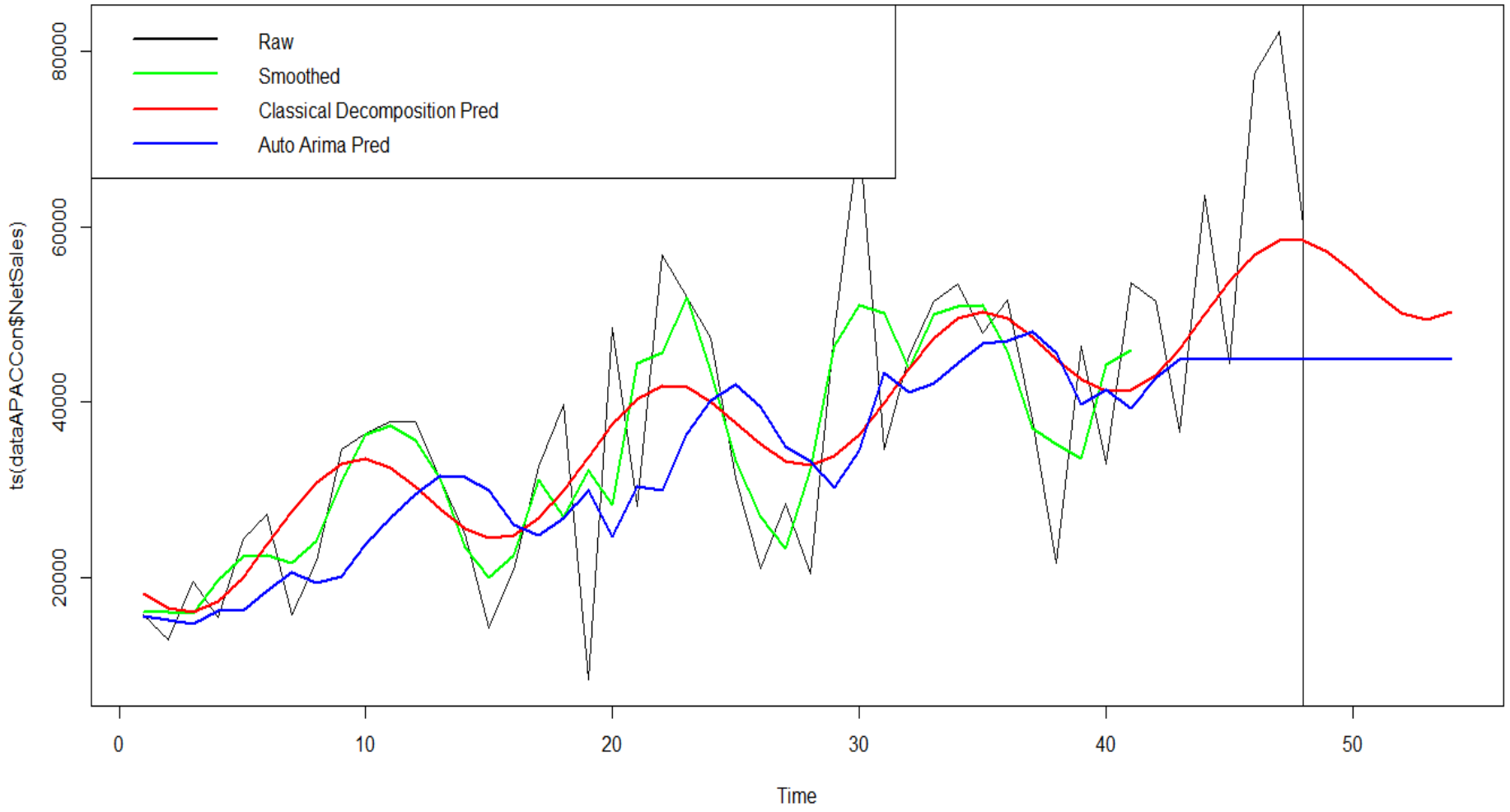
- Identifying two segments having the least coefficient of variation
- APAC Consumers and EU Consumers are the segments having least CoV
- Segments having the least CoV are the most consistent in terms of profit

Plotted Graphs b/w Aggregate Profit and Segments



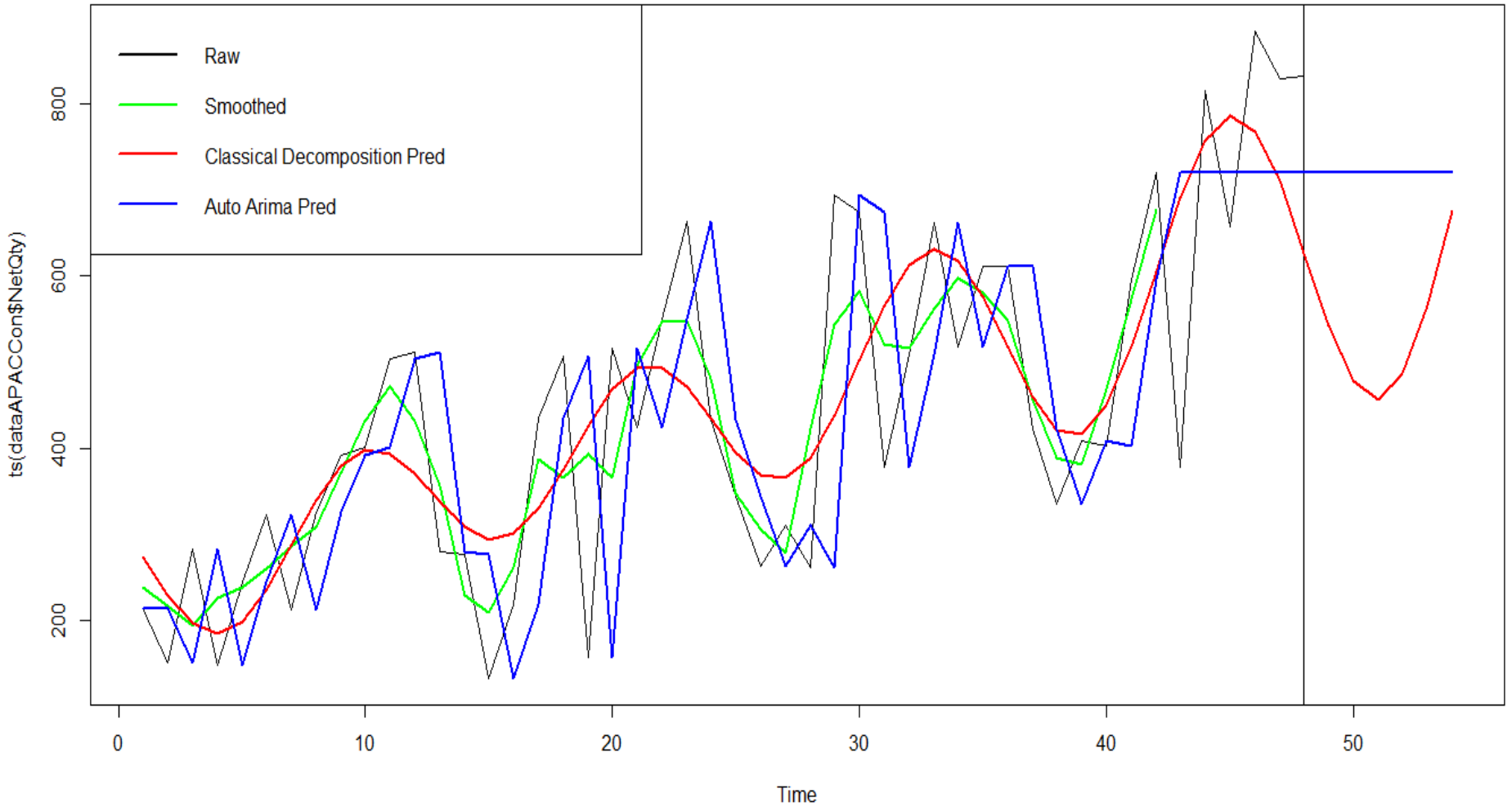
- Comparing the average profit for all the segments
- APAC Consumers and EU Consumers have the highest average profit as well

Prediction of Future APAC Sales



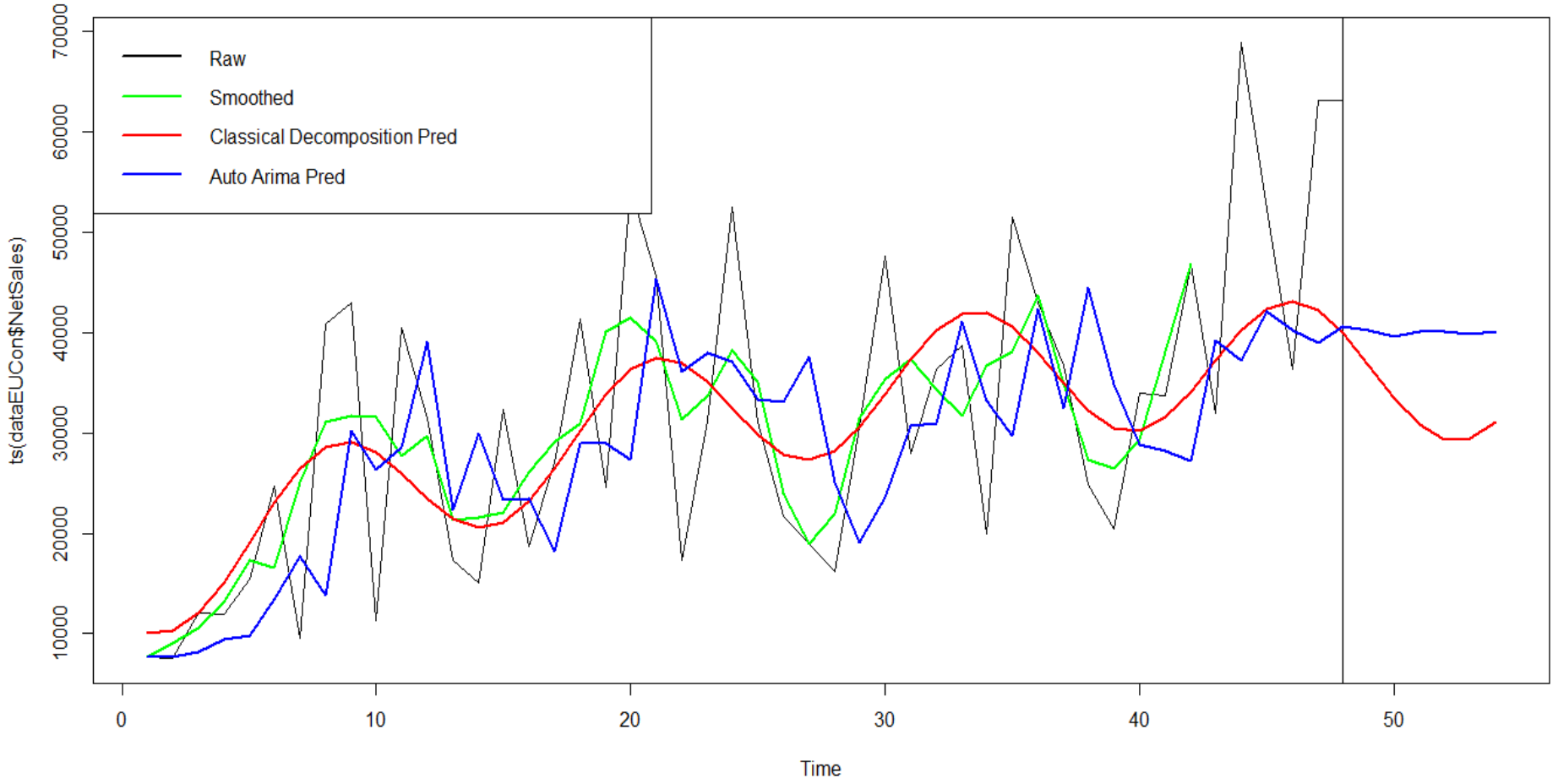
- Time Series of APAC Sales for the 48 months shows an increasing trend
- It also shows the Sales forecasting for the next 6 months
- Classical Decomposition method shows that there is a seasonality trend present in the time series with a forecast of drop in Sales in the next 6 months and is expected to increase after 6 months

Prediction of Future APAC Quantity (Demand)



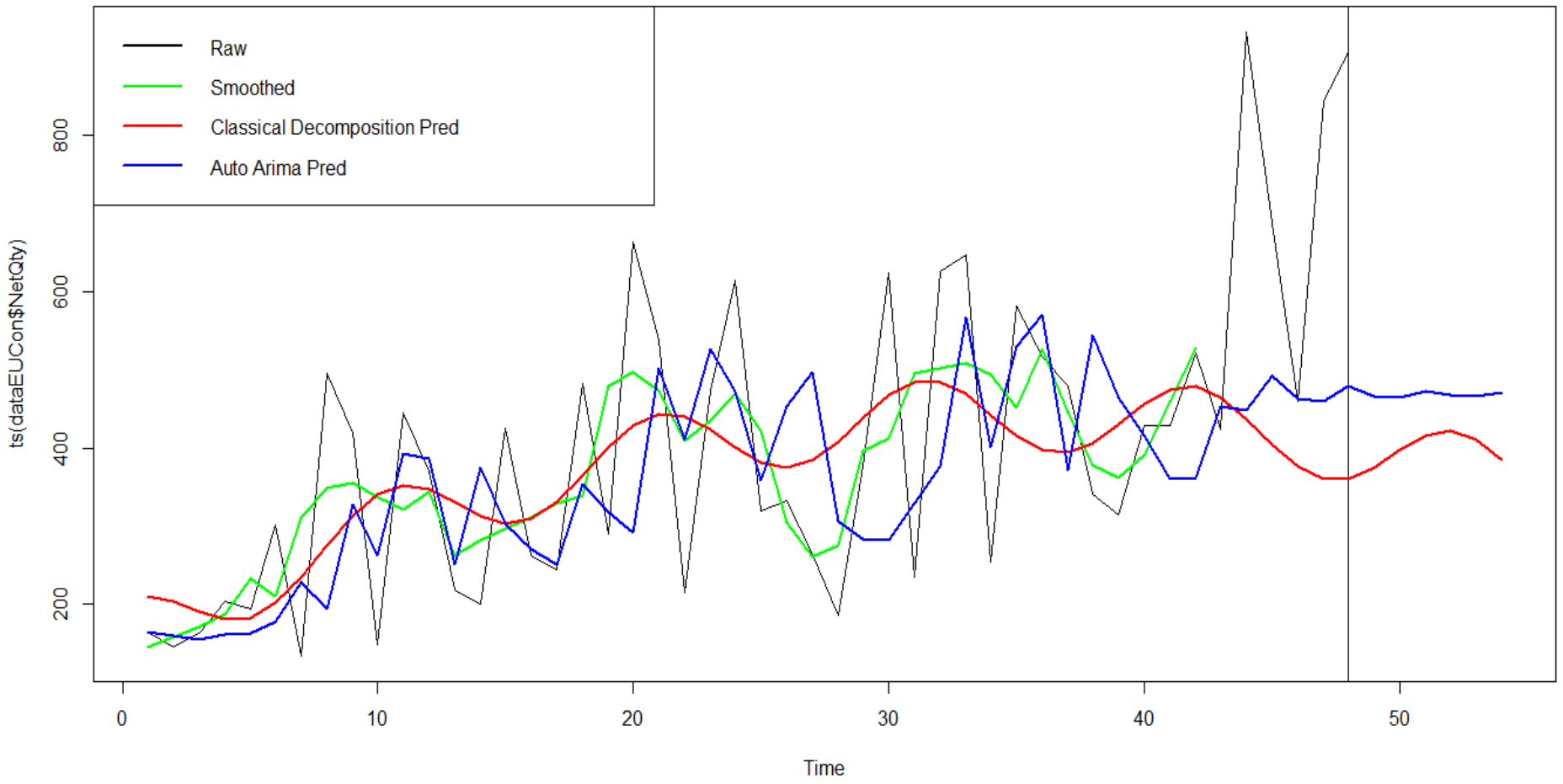
- Time Series of APAC Quantity for the 48 months shows an increasing trend
- It also shows the Quantity forecasting for the next 6 months
- Classical Decomposition method shows that there is a upward trend in the time series with a forecast of initial decrease and then increase in Quantity in the next 6 months

Prediction of Future EU Sales



- Time Series of Europe Sales for the 48 months indicates it is stabilizing
- It also shows the Sales forecasting for the next 6 months
- Classical Decomposition method shows that there is a stabilizing trend in the time series with a forecast of drop in Sales in the next 6 months

Prediction of Future EU Quantity (Demand)



- Time Series of Europe Quantity for the 48 months shows it is stabilizing
- It also shows the Quantity forecasting for the next 6 months
- Classical Decomposition method shows that there is a stabilizing trend in the time series with a forecast of drop in Quantity in the next 6 months

Conclusions

- Amongst the 21 subsets across segments and categories, the APAC Consumer and Europe Consumer segments were found to be the most profitable and consistent ones
- Time Series analysis based on these two sub-segments indicate:

1) APAC Consumer sub-segment: Rising trend for Sales and Demand (Quantity) including seasonal variations
    - In the next 6 months, the seasonal trend indicates a initial drop and increase later in Sales and Demand

2) Europe Consumer sub-segment: Stabilizing trend for Sales and Demand (Quantity) including seasonal variations
    - In the next 6 months, the seasonal trend indicates a drop in Sales and Demand