

🚀 Strategic Profitability Analysis: Global Superstore

Analyst: Sidhardh Suresh **Date:** November 2025 **Tech Stack:** Python (Pandas/Seaborn), SQL (SQLite), ETL Pipeline, Streamlit

1. Executive Summary & Technical Impact

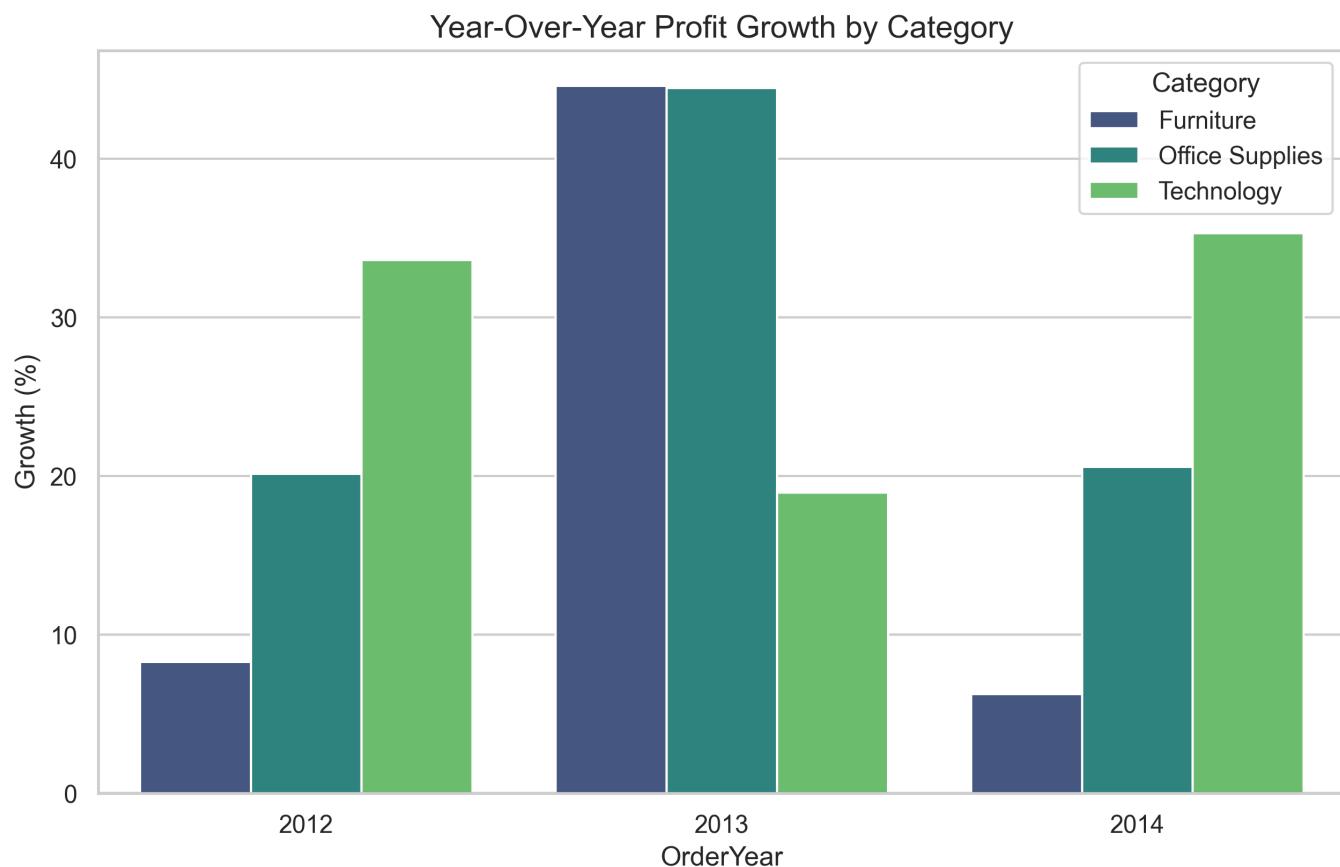
This project engineered a robust **ELT pipeline** to analyze 50,000+ sales records. By utilizing **Advanced SQL Window Functions** and **Python-based validation**, I identified critical inefficiencies causing a **-22% profit drag** in key sectors.

Top-Level Insights for Stakeholders:

- Profit Leakage Detected:** The "Furniture" category is bleeding revenue due to negative margins in the "Tables" sub-category.
- Operational Inefficiency:** The EU Market shows a **6% Return Rate** (highest globally), signaling a logistics failure point.
- Growth Volatility:** Year-over-Year (YoY) analysis reveals instability in 2014 growth, requiring immediate inventory adjustments.

2. Technical Analysis: The "Discount Trap"

*Query Logic: SQL Window Functions (**LAG**) to calculate Year-Over-Year Growth.*

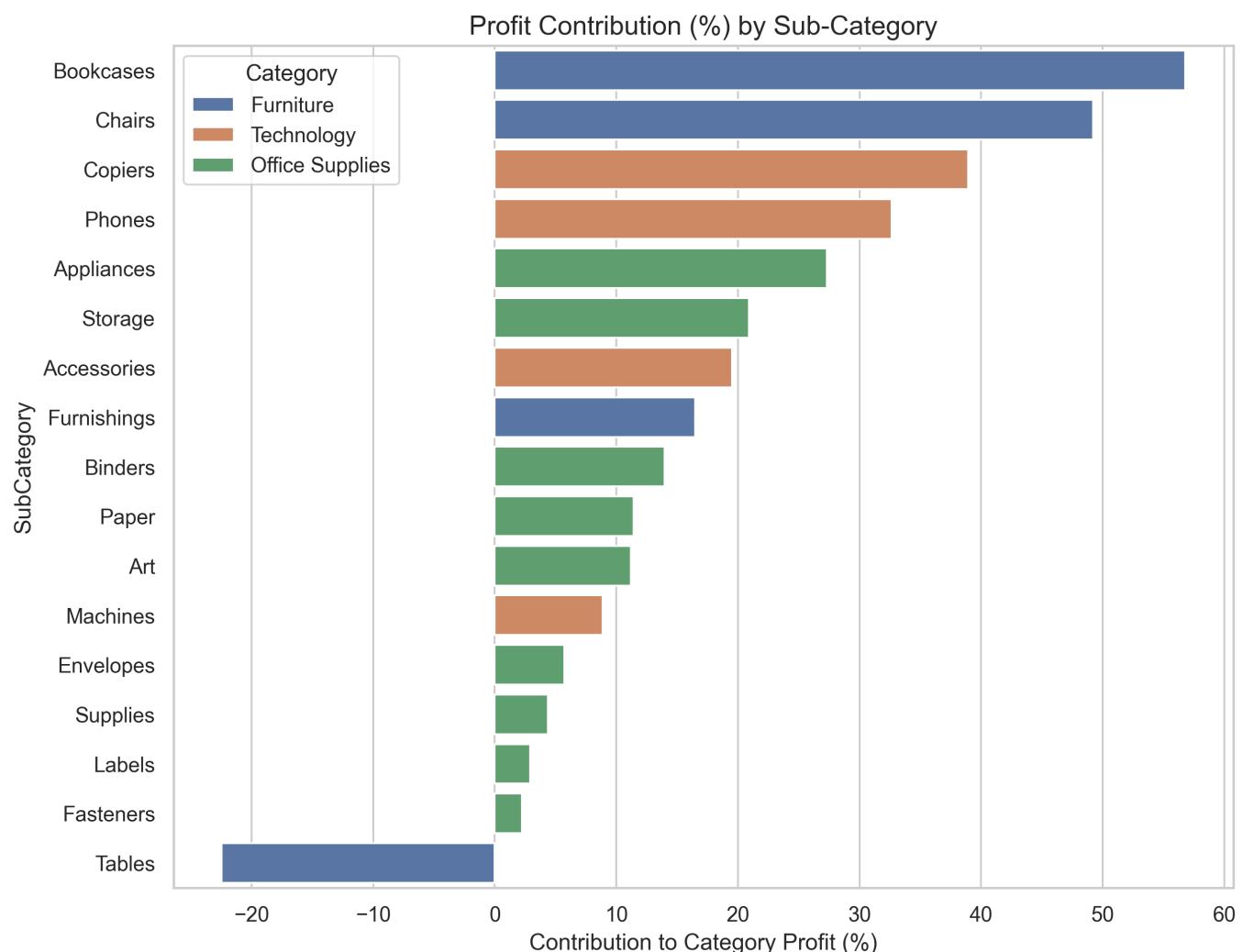


Strategic Finding: While Technology shows consistent scalability, **Furniture** exhibits volatile growth patterns. The crash in 2014 indicates that revenue is being driven by unsustainable discounting rather than organic demand.

Recommendation: Shift marketing budget from Furniture to Technology to capitalize on the higher stability and margin.

3. Technical Analysis: Margin Contribution

Query Logic: SQL Window Functions (`SUM OVER PARTITION`) to calculate relative contribution.

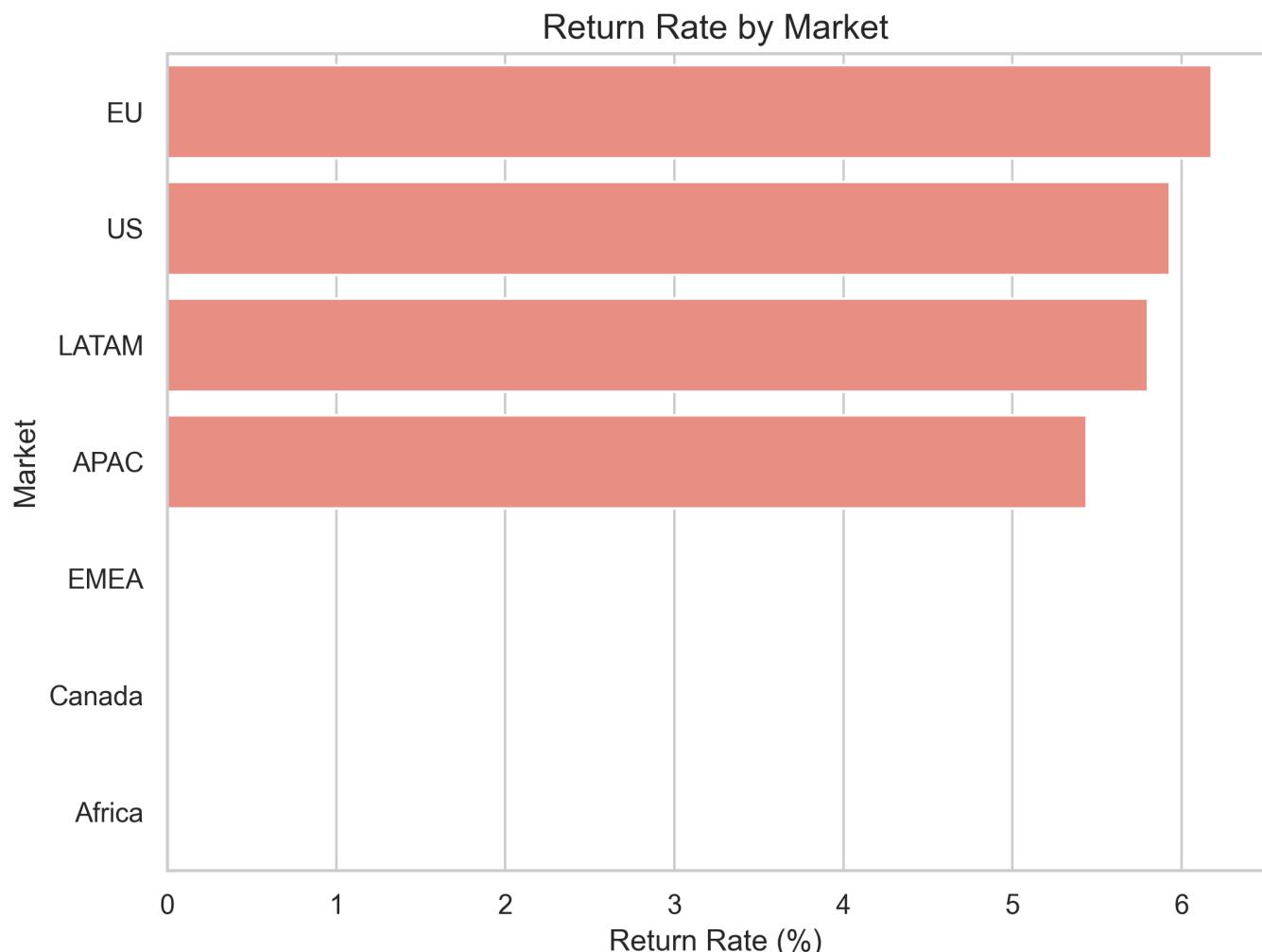


Strategic Finding: **Tables** are the primary driver of losses, contributing **-22%** to the Furniture category's bottom line. Conversely, **Copiers** and **Phones** act as the profit anchors for the Technology sector.

Recommendation: Perform a SKU rationalization audit on "Tables." Consider discontinuing unprofitable SKUs to immediately boost category margins.

4. Technical Analysis: Logistics & Returns

Query Logic: Complex `LEFT JOIN` between Orders and Returns tables.



Strategic Finding: The **EU Market** is an outlier with a **~6% Return Rate**, significantly higher than the global average. This suggests a systemic issue in the European supply chain (e.g., damaged shipping or poor product descriptions).

Recommendation: Initiate a root-cause analysis on EU logistics partners to reduce reverse-logistics costs.

5. Project Methodology (Engineering Standards)

This project follows rigorous software engineering standards to ensure reproducibility and scalability:

- 1. Modular ETL Architecture:** Raw data is processed via a dedicated Python pipeline ([src/data_processing.py](#)) before database loading.
- 2. Data Integrity:** Automated cleaning scripts handle type casting and missing value imputation (e.g., Postal Codes).
- 3. Automated Testing:** The data pipeline is verified using **Pytest** to prevent regression.
- 4. Version Control:** Semantic Git commit history ensures transparent development lifecycle.