



Strategic Audit of Global Transaction Operations:

Maximizing Yield & Minimizing Operational Risk.

Kaggle dataset: Sales transaction of a UK-based e-commerce (online retail) for one year

Agenda

- Project Overview
- Market Risk Audit
- Customer Loyalty & Model
- Product Efficiency & Profitability
- Strategic Roadmap



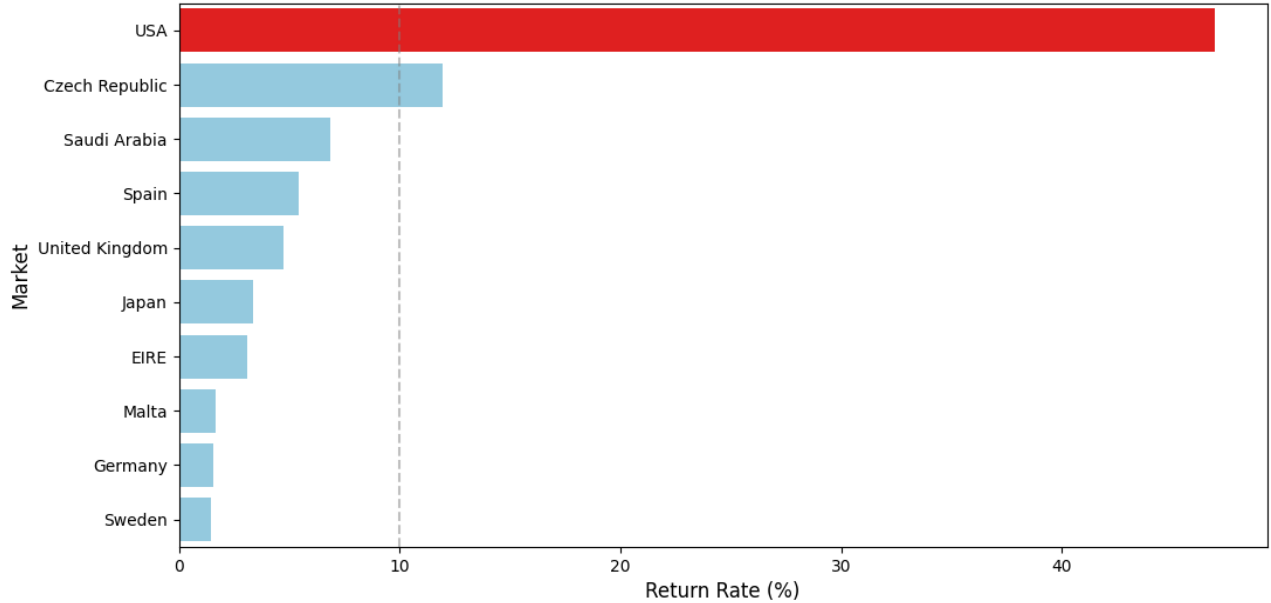
Section 1: Project Overview

- **Key Finding:** The dataset reveals a Global Wholesale Empire, it's a high-volume B2B operation with deep brand loyalty (70%+ retention).
- **E-commerce as a growth channel:** E-commerce enables businesses to expand market reach through cost-effective and efficient distribution, supporting overall business development.
- **Shift in consumer behaviour:** Online shopping via computers and smart devices has transformed how people purchase goods, with home delivery becoming the norm.
- **Dataset context:** The dataset covers one year of sales from a UK-based online retailer selling gifts and homewares globally, serving both individual consumers and small businesses purchasing in bulk.

Section 2: Market Risk Audit

(The USA Leakage)

Operational Risk: Return Rate % by Country (Strategic Leakage)



Key Finding:
USA is a high-risk outlier with a 46.9% return rate, while core markets like the UK and Germany show stability (under 5%).

Analysis Methodology (What I Did): To evaluate the true health of our international markets, I engineered a multi-step audit pipeline:

- 1. Isolated Gross Revenue:** Aggregated all positive transactions to establish a baseline for market potential.
- 2. Quantified Total Refunds:** Filtered and summed negative transaction values to identify "Revenue Leakage."
- 3. Calculated Return Rate %:** Established a ratio of refunds to gross sales to determine the operational efficiency of each territory.

Strategic Understanding

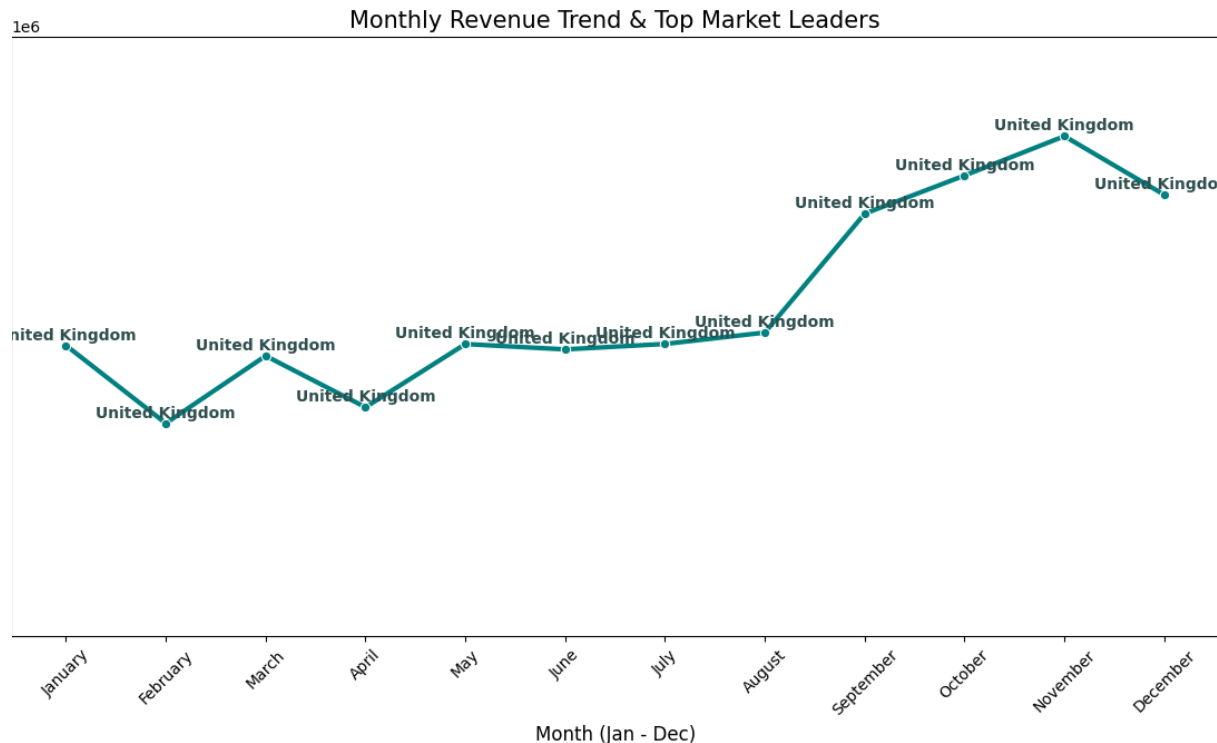
The data reveals that the USA is currently our most significant operational bottleneck.

With a 46.9% return rate, nearly half of our logistical efforts in the US are essentially “unproductive labour.”

Cause & Effect (POV Analysis)

- **The Cause:** Potential issues in US customs clearance, localized product quality mismatches, or high shipping damage rates.
- **The Effect (Supply Chain POV):** Over-utilization of warehouse staff and shipping resources for products that eventually return to inventory.
- **The Effect (Financial POV):** Severe erosion of Net Profit. While the USA shows “Sales”, the high “Netting Error” means we are likely losing money on every US transaction once shipping costs are factored in.

Section 3: Sales Trends & Market Leaders



Key Finding:

The business has extreme Seasonality, peaking in November (\$7.8M). The UK remains the anchor market, but regional leaders like Japan and France fluctuate in performance throughout the year.

Analysis Methodology: To identify the “pulse” of the business,

I performed a chronological time-series audit:

- **Chronological Sorting:** Transformed raw date strings into ordered monthly periods (Jan–Dec) to visualize growth.
- **Geographic Layering:** Identified the “Market Leader” for each month to see if our growth is dependent on a single country or a diversified global base.

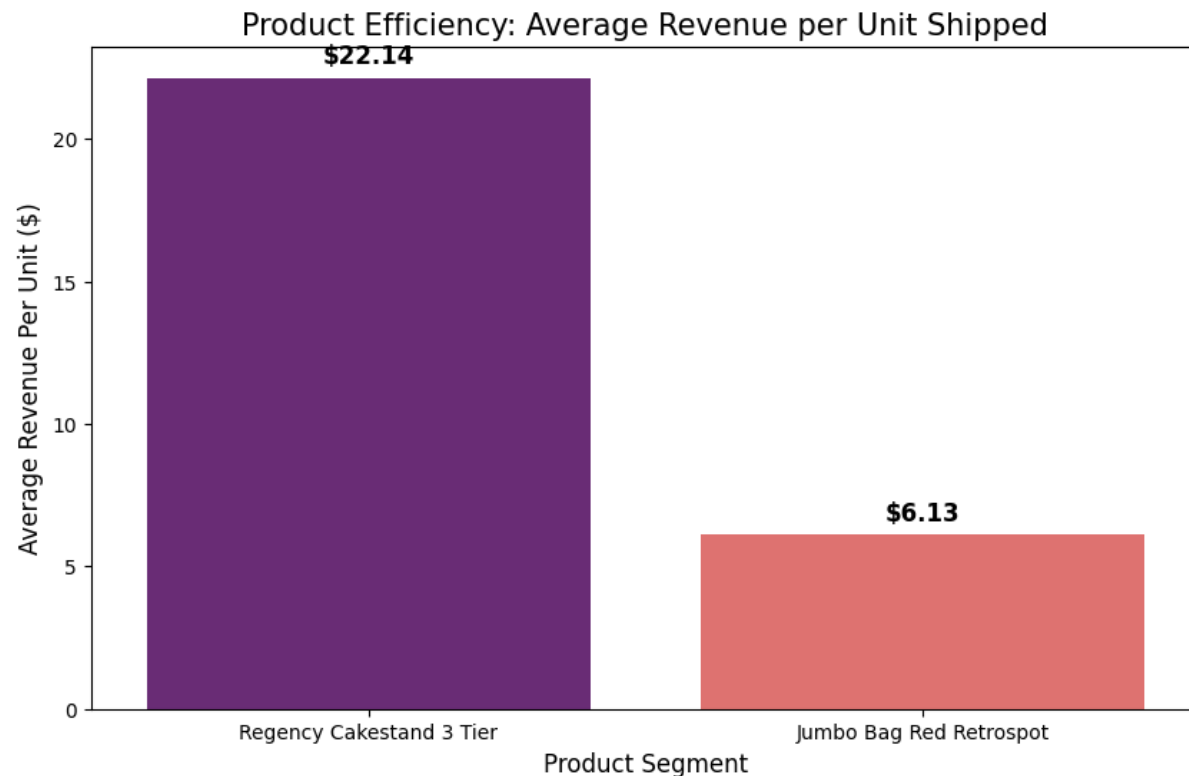
Strategic Understanding

The business exhibits extreme Q4 Seasonality. Revenue is stable in the first half of the year but experiences a massive lift-off starting in September, peaking in November (\$7.8M). This indicates a business heavily reliant on year-end wholesale procurement cycles.

Impact & Key Takeaways

- **The “Bullwhip Effect”:** Because sales double between February and November, our supply chain is under immense pressure in Q4.
- **Business Impact:** If we don't have enough stock of “hidden gems” products by August, we lose millions in potential Q4 revenue.
- **Recommendation:** To use the “february slump” for deep warehouse audits and maintenance, and begin peak-season inventory building no later than July.

Section 4: Product Portfolio Efficiency



Key Finding:

High-volume items like Jumbo Bags, have low margins, while “Hidden Gems” like the Regency Cakestand generate \$22.14 per unit.

Analysis Methodology:

Moved beyond “Unit Volume” to look at Revenue Density.

- Volume vs. Value: Compared our highest-selling items (Jumbo Bags) against our highest-yielding items (Regency Cakestands).
- Efficiency Metric: Calculated the average revenue per unit to see which products generate the most cash for the least amount of physical handling.

Strategic Understanding

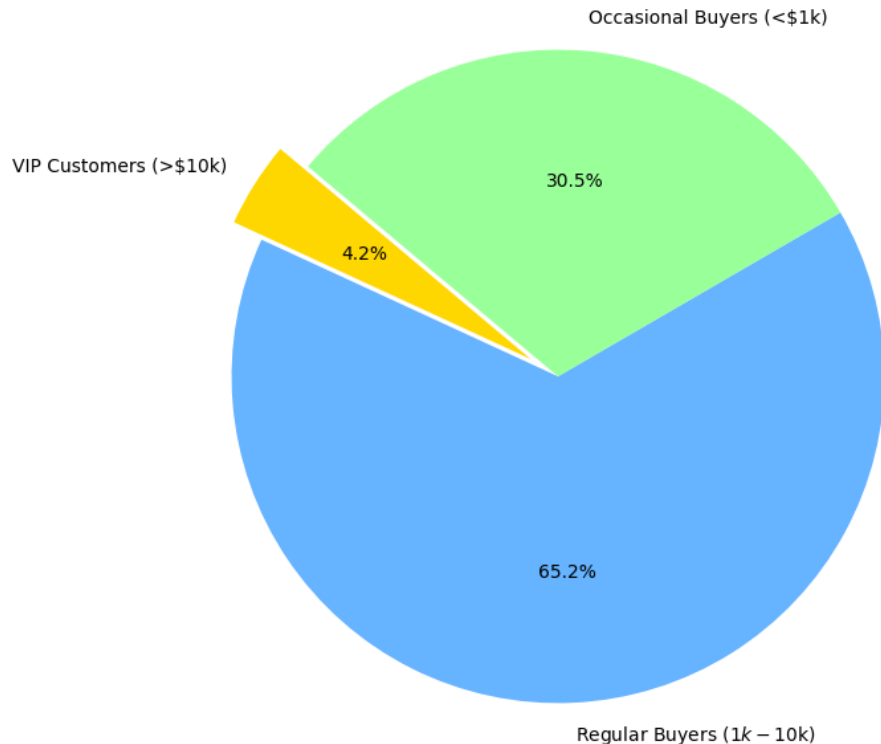
Volume Bias --- A lot of energy spent on shipping low-cost items that only generate ~\$6.00 per unit. Meanwhile, hidden gems product like the Regency Cakestand generate \$22.14 per unit — nearly 4x the value for the same shipment value.

Impact & Key Takeaways

- Logistical POV: High-volume/low-value items increase the cost-to-serve (more packing, more labour, more shelf space).
- Strategic Recommendation: Should prioritize the “Cakestand” category expansion to new markets. These hidden gems products allow us to enter a new market with lower shipping costs but higher revenue impact.

Section 5: Customer Loyalty - Retention

Customer Loyalty Segments (70.07% Overall Retention)



Key Finding:

We have a 70.07% Retention Rate and an average size of 282 items. This confirms a B2B or Wholesale business model, driven by 839 VIP “Big buyer” customers.

Analysis Methodology

To determine the stability, I audited the “loyalty”:

- Retention Calculation: Identified the percentage of customers who made more than one distinct transaction.
- Basket Analysis: Calculated the “Average items per order” to define the business model (Retail vs. Wholesale).

Strategic Understanding

The business is a Wholesale Powerhouse. With an average size of 282 items and a 70.07% Retention Rate, it's not about chasing new customers every day, it's focused more on serving to dedicated professional buyers (B2B).

Impact & Key Takeaways

- **The 839 “Big Buyers”:** Our VIP segment drives the core of our revenue. If we lose even 5% of these customers, the business takes a massive hit.
- **Key Takeaway:** Our strategy should shift from “Generic Marketing to Key Account Management.”
- **Recommendation:** Launch a VIP loyalty reward program for the top 800 customers.

Speaking Impact

This project wasn't just about refining my light SQL and Python soft skills. It's also about the realized value from the aspects of analyzing the revenue leakage, optimizing the operational impact which could maximize the revenue density per shipment and understanding the impact of expansion to new markets that guarantees high ROI.

Tools: Python (Pandas/Seaborn), SQL (Advanced Joins/Window Functions).
Domain Expertise: Financial Auditing, Supply Chain Risk, Market Segmentation.





Thank you

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