

Exploratory Data Analysis Insights

Uncovering key patterns in sales, inventory, and profitability to drive strategic business decisions and operational efficiency.



Summary Statistics Overview

-52K

Minimum Gross Profit

Indicating potential losses
from high costs or heavy
discounts

274.5

Max Stock Turnover

Some products sell rapidly
while others remain stagnant

\$7,499

Maximum Actual Price

Premium product offerings
significantly above mean of
\$35.64

\$257K

Peak Freight Cost

Extreme variation suggests
logistics inefficiencies

Critical Data Anomalies

Negative Gross Profit

Minimum of -\$52,002.78 indicates selling products below cost due to heavy discounts or pricing errors.

Extreme Profit Margins

Minimum of $-\infty$ suggests instances where revenue is zero or lower than total cost, creating unsustainable losses.

Zero Sales Products

Some products purchased but never sold, indicating slow-moving or obsolete stock causing inventory inefficiencies.

Data Filtering Strategy

Exclusion Criteria

To enhance reliability, we removed:

- Gross Profit ≤ 0
- Profit Margin ≤ 0
- Total Sales Quantity = 0

This ensures analysis focuses on profitable, active transactions.



Correlation Analysis Insights

Purchase vs. Sales

Weak correlation (-0.012) between purchase price and sales dollars indicates price variations don't significantly impact revenue.

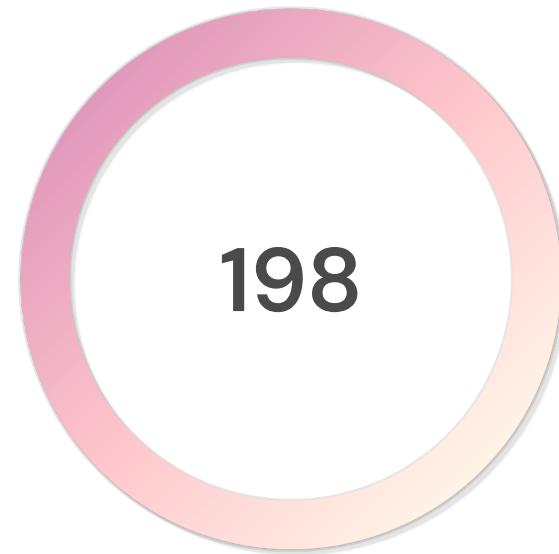
Inventory Efficiency

Strong correlation (0.999) between purchase and sales quantity confirms efficient inventory turnover.

Pricing Pressure

Negative correlation (-0.179) between profit margin and sales price suggests competitive pricing challenges.

Promotional Opportunities



Brands Identified

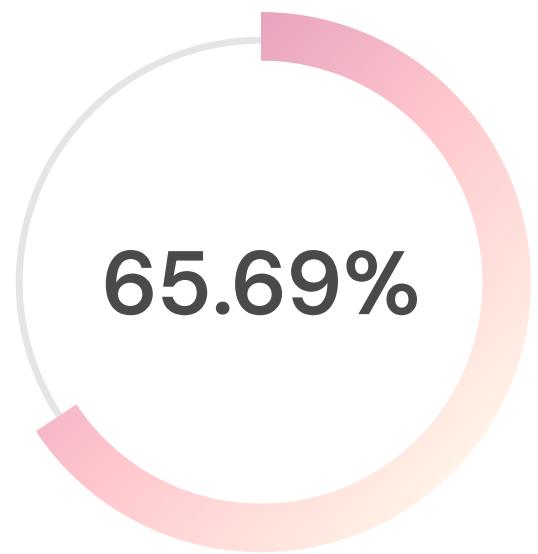
Lower sales but higher profit margins

These 198 brands could benefit from targeted marketing, promotions, or price optimizations to increase volume without compromising profitability.

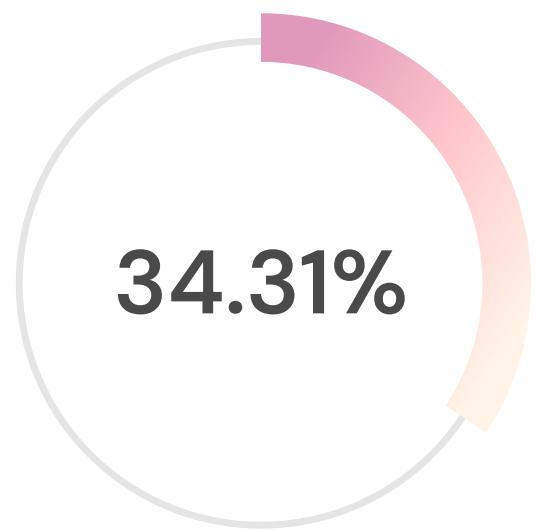
Strategic opportunity to boost revenue while maintaining margins.



Vendor Concentration Risk

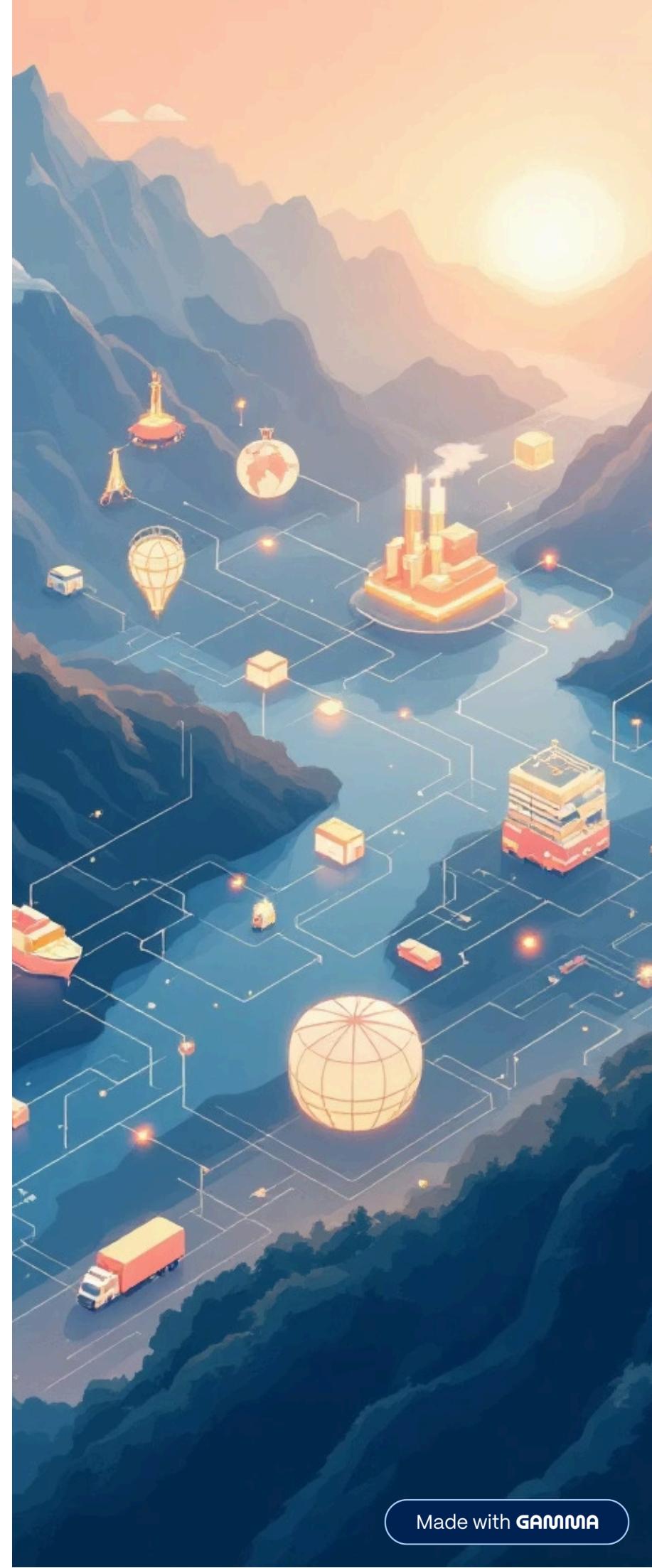


Contribute majority of total purchases

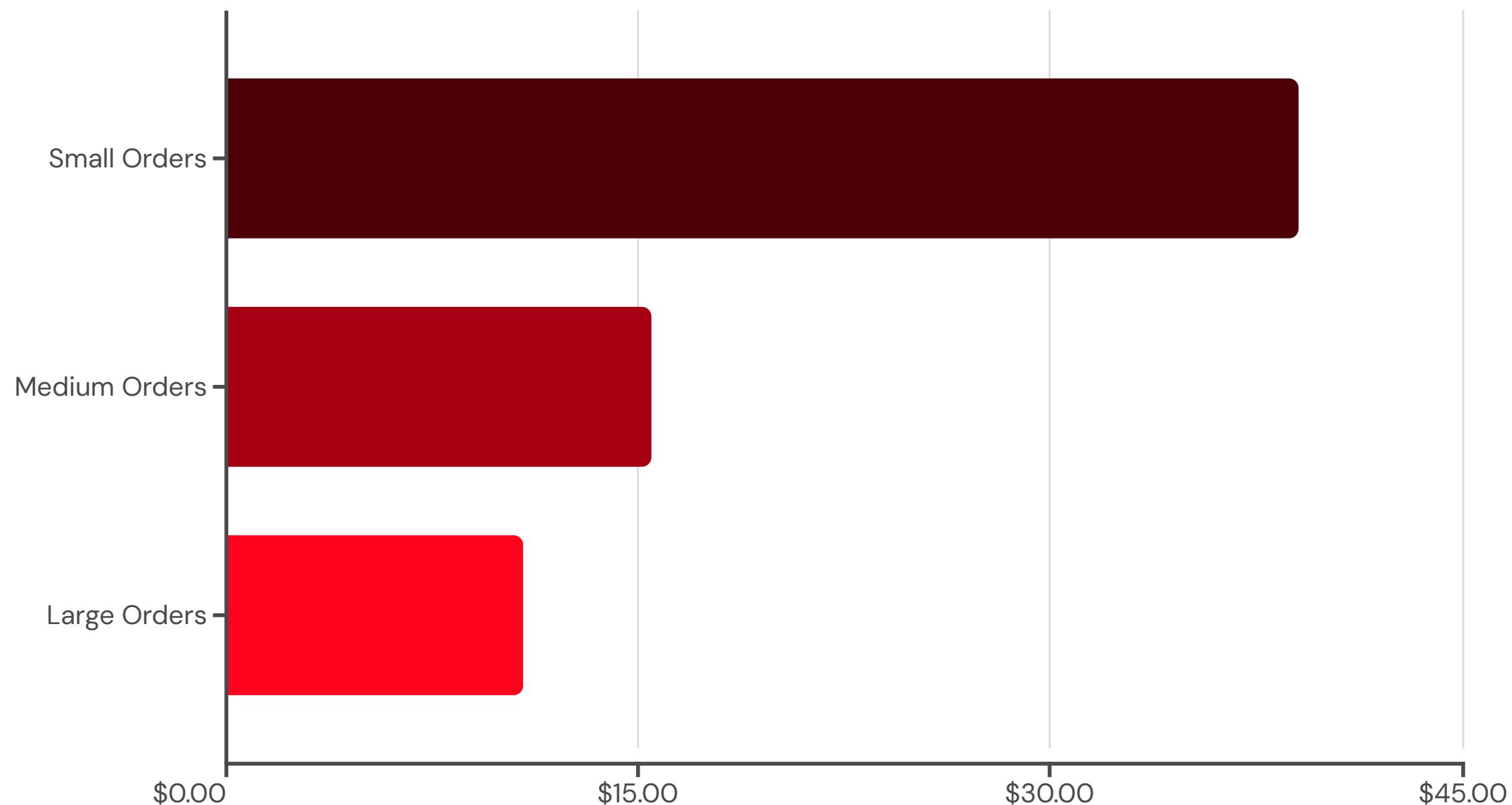


All other suppliers combined

- Risk Alert:** Over-reliance on few vendors may introduce supply chain disruptions. Diversification needed to mitigate risk and ensure business continuity.



Bulk Purchasing Advantage



Vendors buying in large quantities receive **72% lower unit cost** (\$10.78 vs. \$39.06). Bulk pricing strategies encourage larger orders, increasing total sales while maintaining profitability.

Inventory Management Challenge

\$2.71M

Unsold Inventory

Total capital tied up in slow-moving stock

Slow-moving inventory increases storage costs, reduces cash flow efficiency, and affects overall profitability.

Action needed: Identify vendors with low turnover for better stock management.



Strategic Recommendations

01

Optimize Pricing

Re-evaluate pricing for low-sales, high-margin brands to boost volume without sacrificing profitability.

02

Diversify Vendors

Reduce dependency on few suppliers to mitigate supply chain risks and ensure business continuity.

03

Leverage Bulk Buying

Maintain competitive pricing through bulk purchasing advantages while optimizing inventory management.

04

Clear Slow Inventory

Adjust purchase quantities, launch clearance sales, or revise storage strategies for slow-moving stock.

05

Enhance Marketing

Improve distribution strategies for low-performing vendors to drive higher sales volumes.