

Impact of tariff-driven price increase on The Company results

Analytics Team presentation



Disclaimer

This presentation uses adjusted figures for confidentiality purposes.
Analytical approach and insights remain directionally accurate.

Agenda

- Problem statement
- Success metrics
- Assumptions
- Exploratory Data Analysis
- Features
- Difference-in-Differences analysis
- OLS Linear Regression analysis
- Conclusions
- Next Steps

Problem statement

Business context

- The Company imports +70% of its cookware catalog
- New tariffs increased product costs, forcing price increases

Leadership question

- What was the impact of tariff-driven price increases on company results?
- Did higher prices protect margin or erode revenue?

Decisions to be made

- How much of tariff costs should be passed through to customers?
- Which categories or products can absorb price increases?

Success metrics

Key metric

- Margin %

Secondary metrics

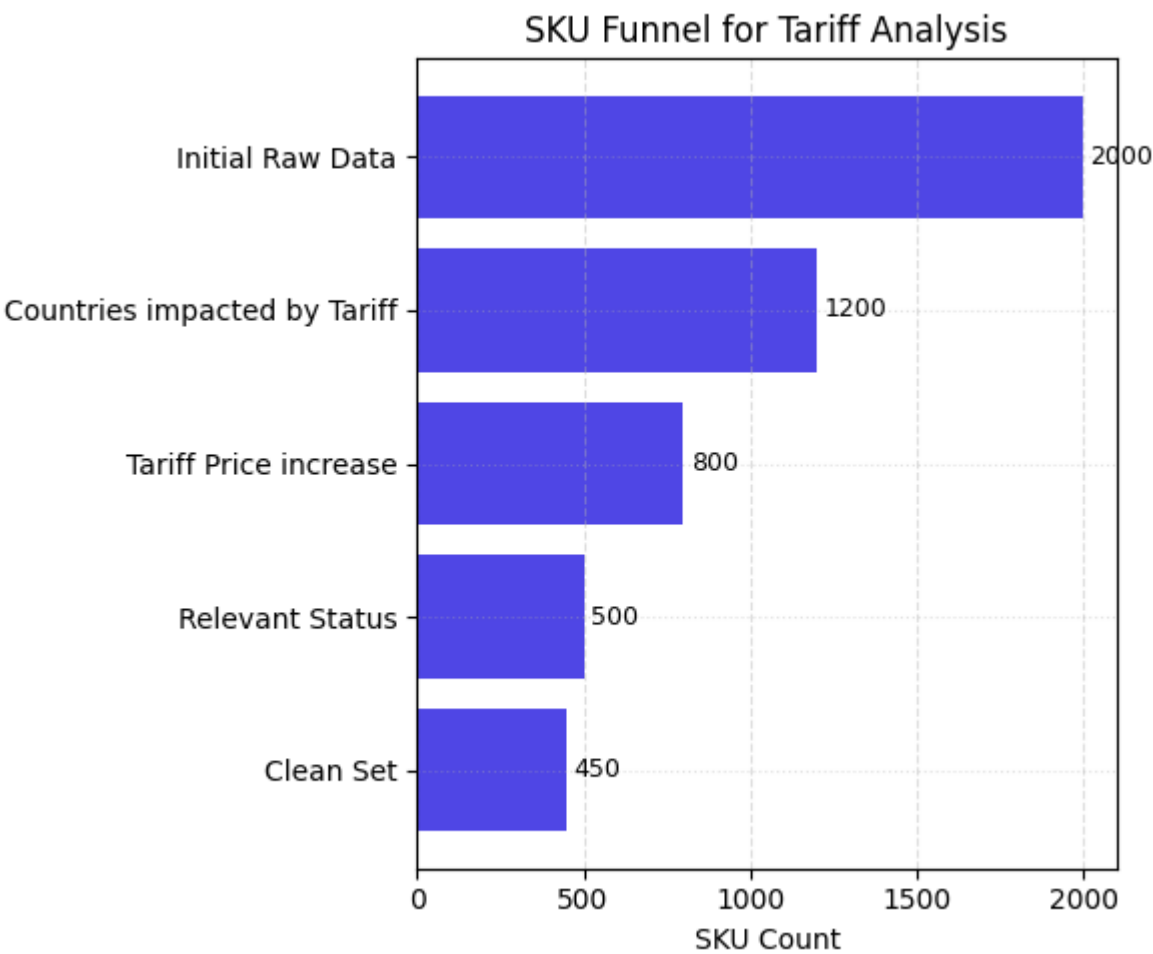
- Revenue
- Units sold
- Customer retention

Assumptions

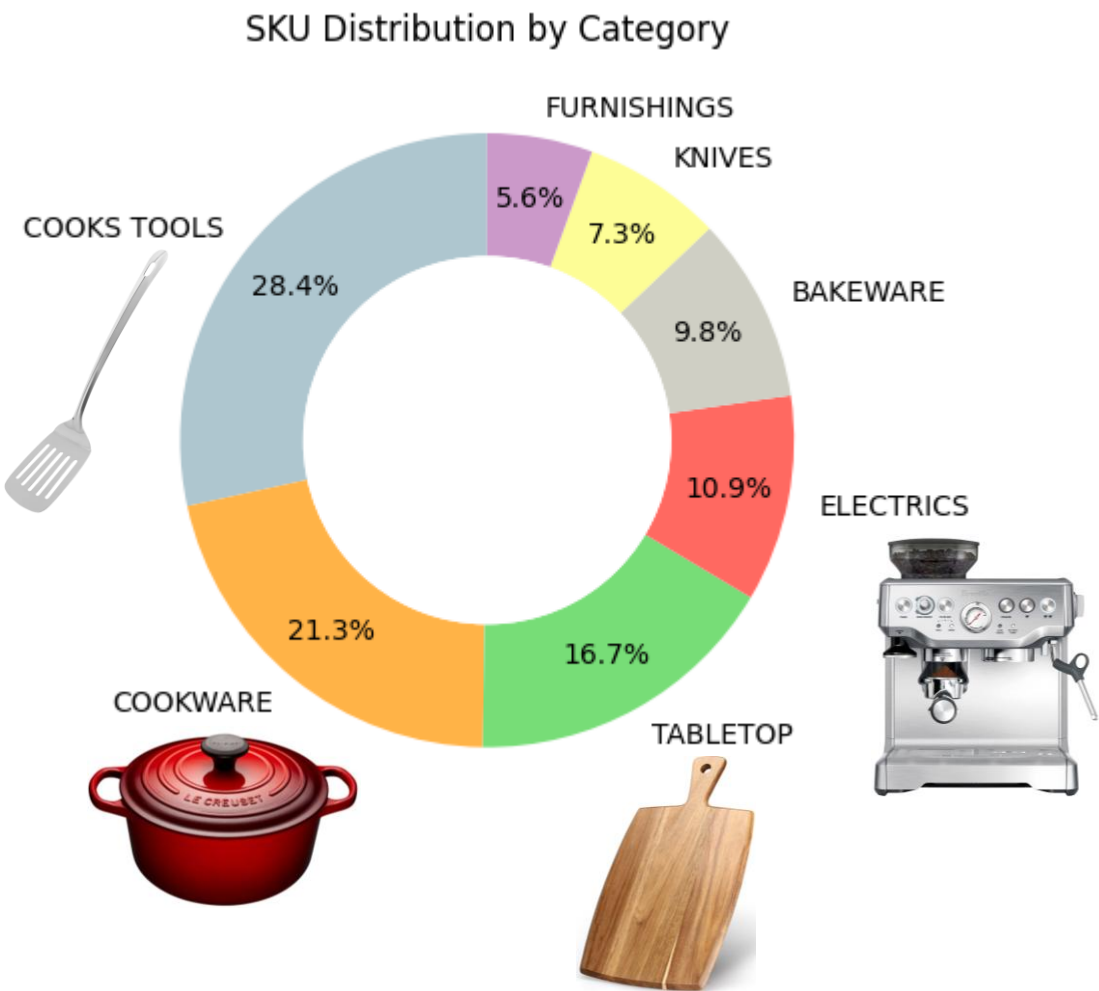
- Results apply to tariff-impacted categories, not the full catalog
- Tariff timing is exogenous to short-term demand trends
- Customer price sensitivity is stable within segments over the analysis window

Exploratory Data Analysis

20% of Catalog selected for analysis

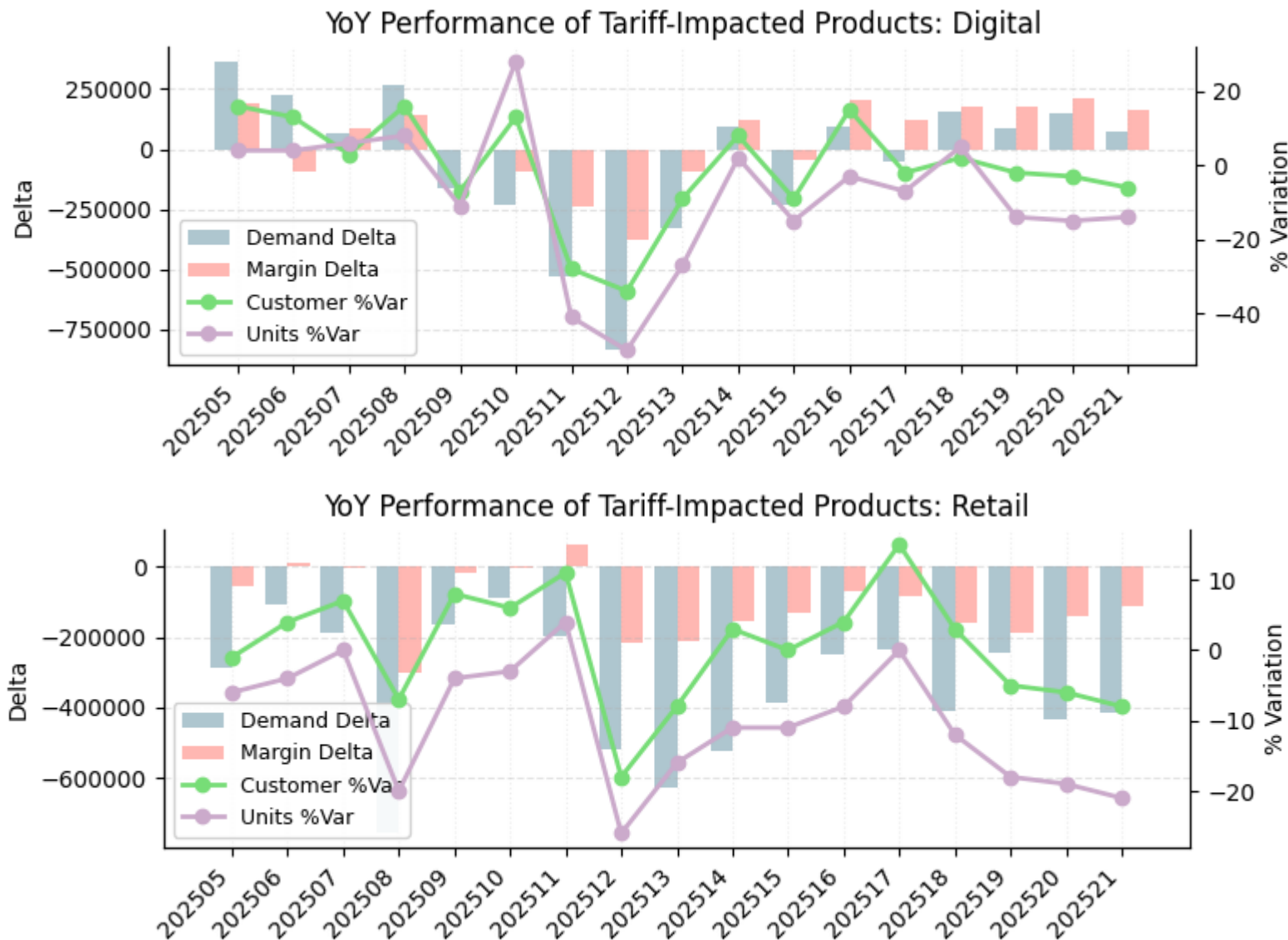


SKU mix: 50% low-priced, 30% mid-priced, 20% premium



Exploratory Data Analysis

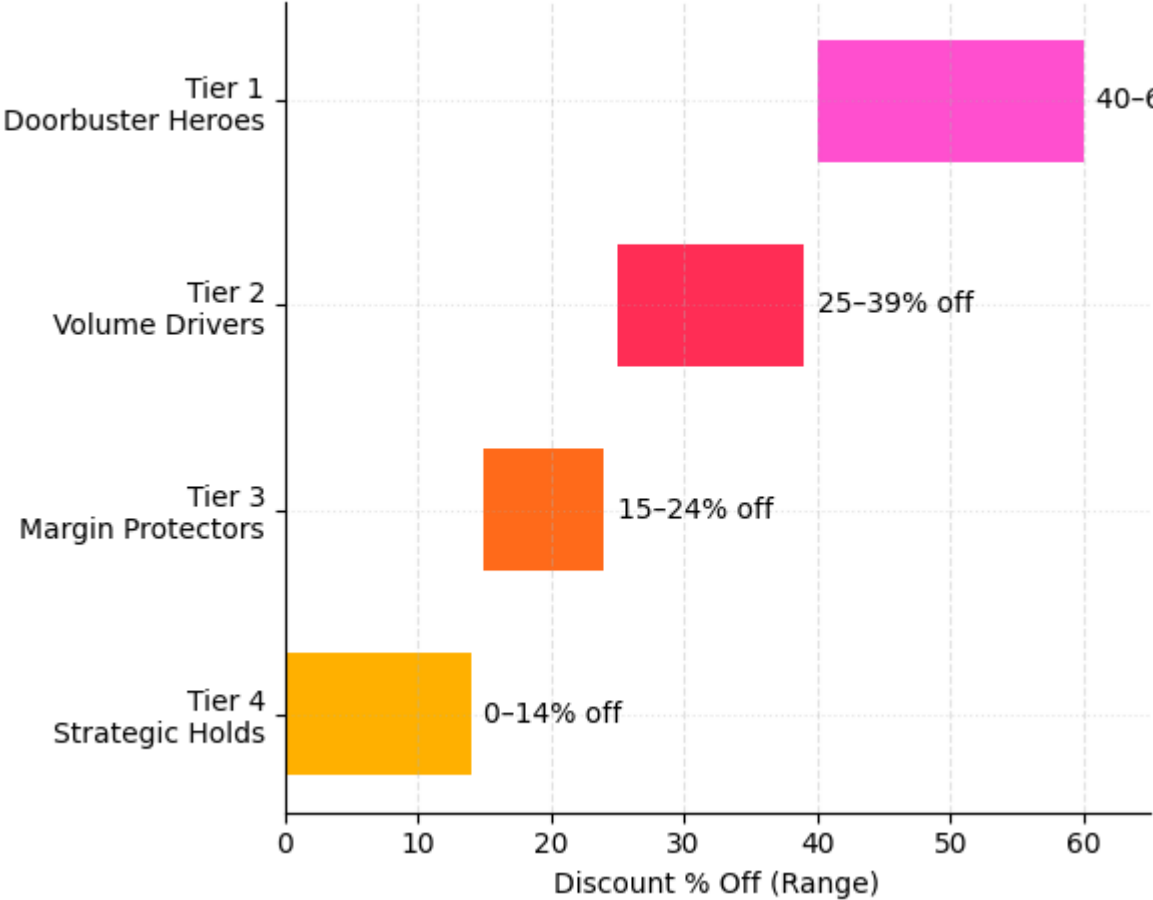
- The post-tariff period shows a structural shift in demand, margin, customer and units
- Channel-specific performance differences suggest structurally different margin dynamics



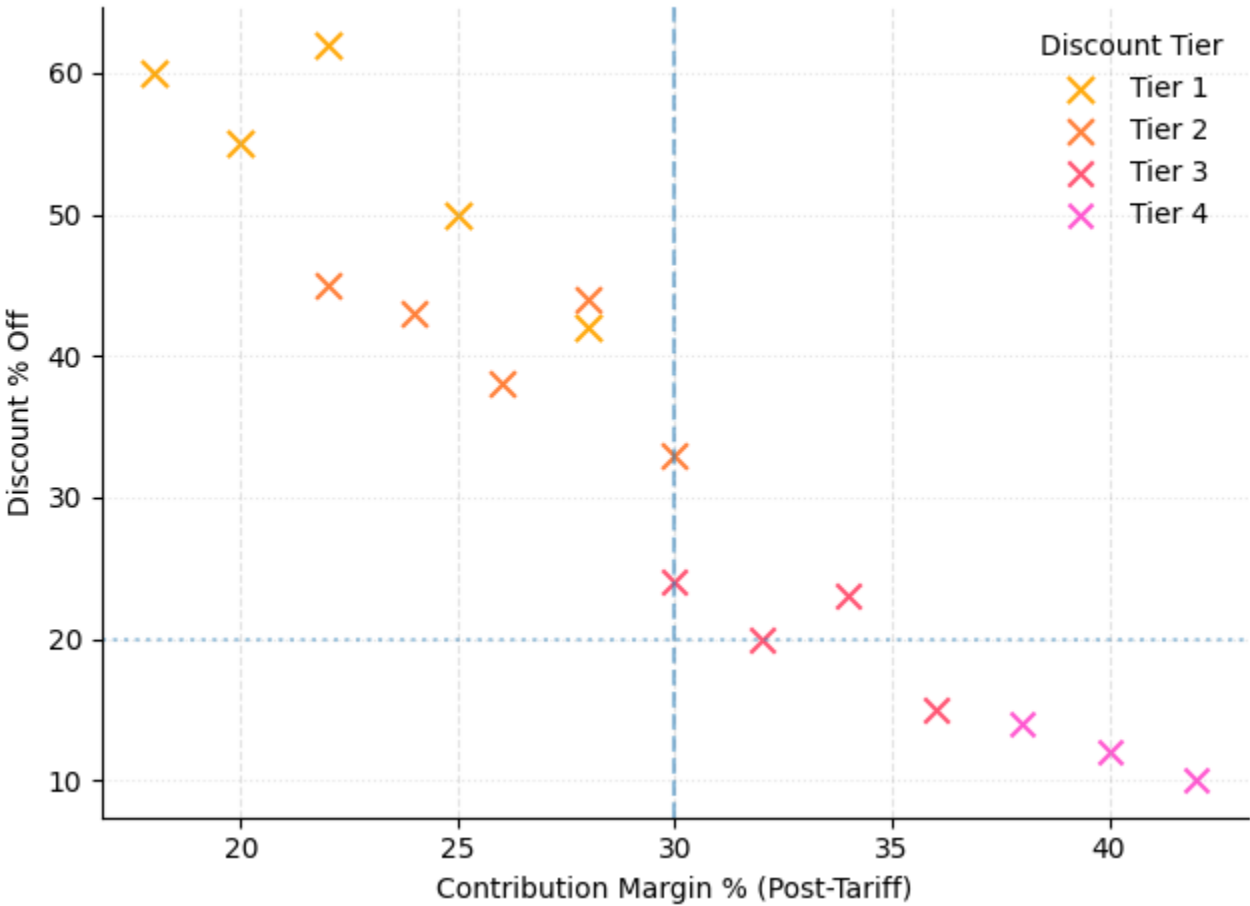
Exploratory Data Analysis

Discount depth clearly correlates with margin outcomes, as promotional intensity changes realized margin

Four-Tier Discount Architecture

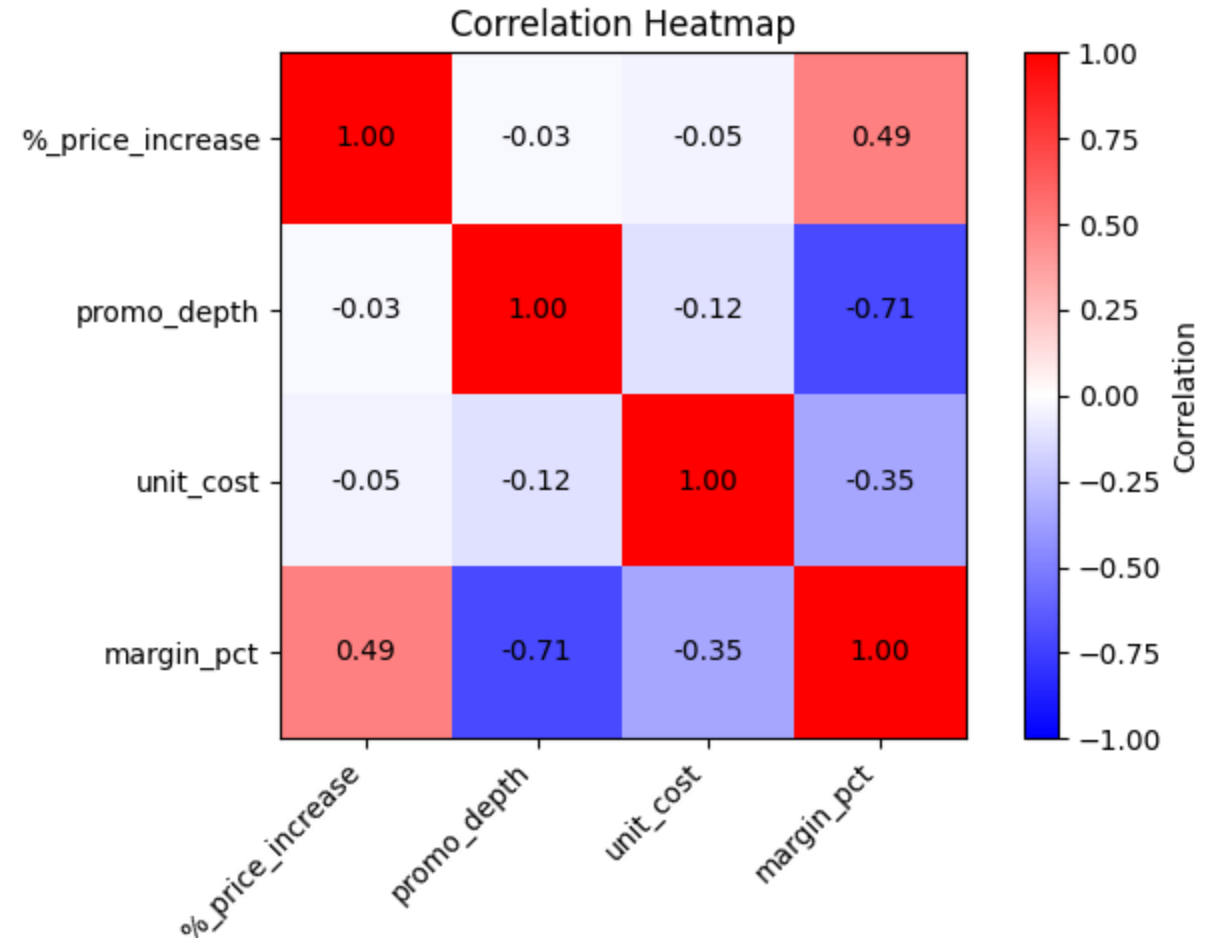


Contribution Margin % vs Discount Scatter



Exploratory Data Analysis

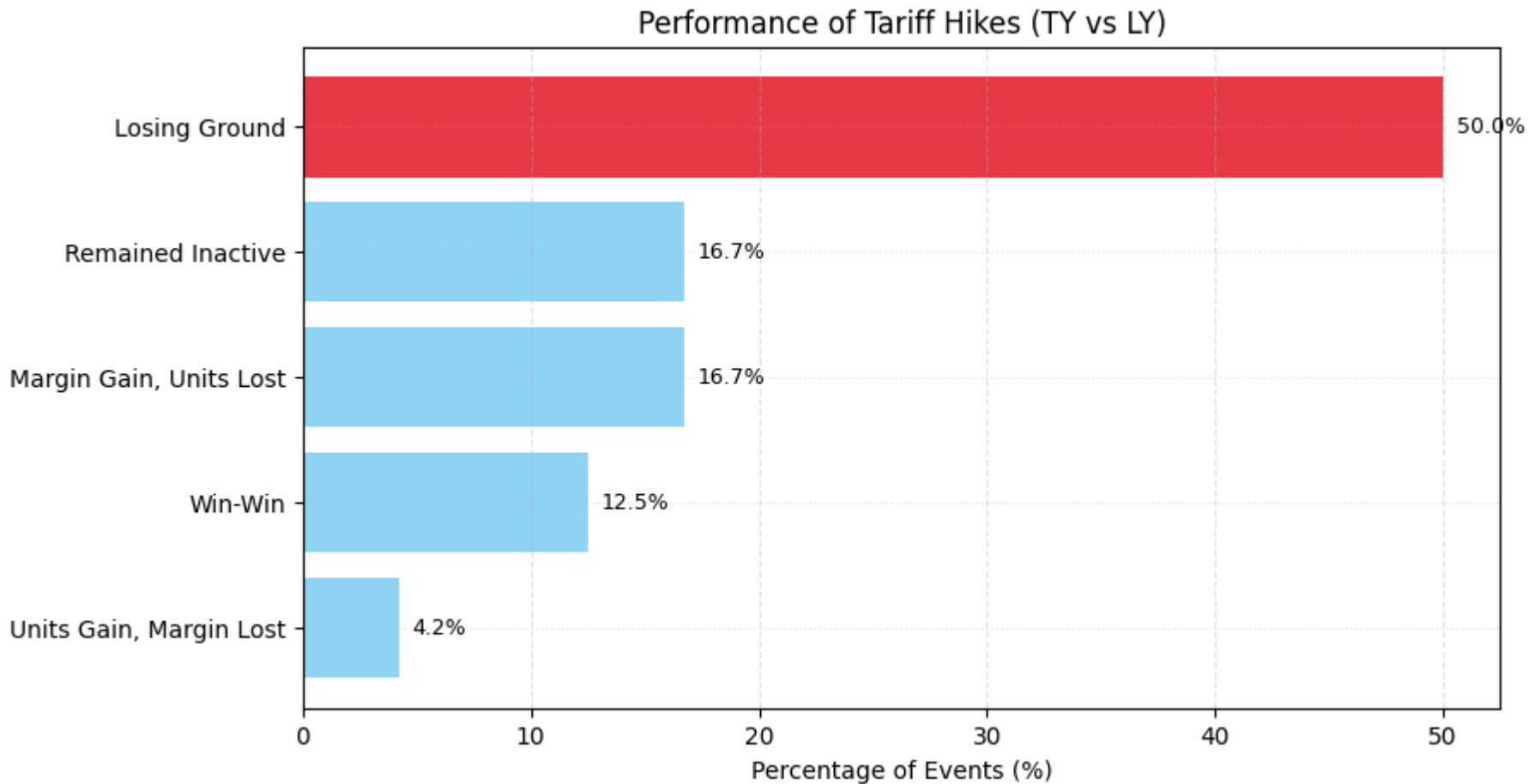
- Price increase ↔ Margin % ($\approx +0.49$): The positive relationship is moderate, suggesting pricing alone is insufficient to protect margin
- Promo depth ↔ Margin % (≈ -0.71): Dominate margin outcomes as the main driver of margin erosion
- Unit cost ↔ Margin % (≈ -0.35): Higher unit costs significantly limit the upside of price increases
- Low correlations among price increase, promo depth, and unit cost, signaling they could act as independent margin drivers



Exploratory Data Analysis

Half of tariff-driven price increases resulted in a net deterioration of both units and margin, while true win-win outcomes were relatively rare

Given this dispersion in outcomes, the next step is to understand why some price increases succeeded while others failed



Features

Feature	Category	Description
percentage_price_increase	Pricing	% change vs pre-tariff baseline
pormo_depth	Pricing	% discount off list price
unit_cost	Cost	Baseline unit cost
product_category	Product	Cookware, appliances, tools, etc.
product_tier	Product	Premium vs value positioning
Sales_channel	GTM	Online vs retail
Seasonality	Time	Month / holiday effects
post_tariff_indicator	Treatment	0/1 flag for tariff period

Difference-in-Differences (DiD) — Causal Impact on Margin %

Did tariff-driven price increases cause a margin change? (by product tier)

Component	Description
Data Structure	Weekly SKU-level data from January 2024 – June 2025
Features Included	sku_id, week, margin_percent, product_tier, treated_indicator, post_indicator
Product Tiers	Value-tier: price < \$40 Premium-tier: price ≥ \$40
Tier Dummy	1 for Premium-tier SKUs, 0 for Value-tier SKUs
Treatment Group	SKUs with price increase in March–June 2025 due to tariff
Treatment Indicator	1 if SKU had a price increase in post-tariff window (treated), else 0
Control Group	SKUs with no price change during the same period (used as baseline)
Pre-Tariff Window	March–June 2024 — used as baseline (same calendar period, same promo season)
Post-Tariff Window	March–June 2025 — period of tariff-induced price changes
Post Indicator	1 for observations in March–June 2025, else 0 (March–June 2024)

Difference-in-Differences (DiD) — Causal Impact on Margin %

Did tariff-driven price increases cause a margin change? (by product tier)

$Margin_{\{i,t\}} = \beta_0 + \beta_1 \cdot Post_t + \beta_2 \cdot Treated_i + \beta_3 \cdot Premium_i + \beta_4 \cdot (Post_t \times Treated_i) + \beta_5 \cdot (Post_t \times Treated_i \times Premium_i) + \varepsilon_{\{i,t\}}$

Component	Definition / Role
Outcome Variable	margin_percent – Weekly gross margin % per SKU
Main Effects	<ul style="list-style-type: none">- Treatment: 1 if SKU had price increase in 2025- Post: 1 if observation is in Mar–Jun 2025- Premium: 1 if SKU is premium-tier (price ≥ \$40)
Interaction Terms	<ul style="list-style-type: none">- Post × Treatment: Estimates tariff effect on value-tier SKUs (baseline group)- Post × Treatment × Premium: Captures how the tariff effect differs for premium SKUs

Difference-in-Differences (DiD) — Causal Impact on Margin %

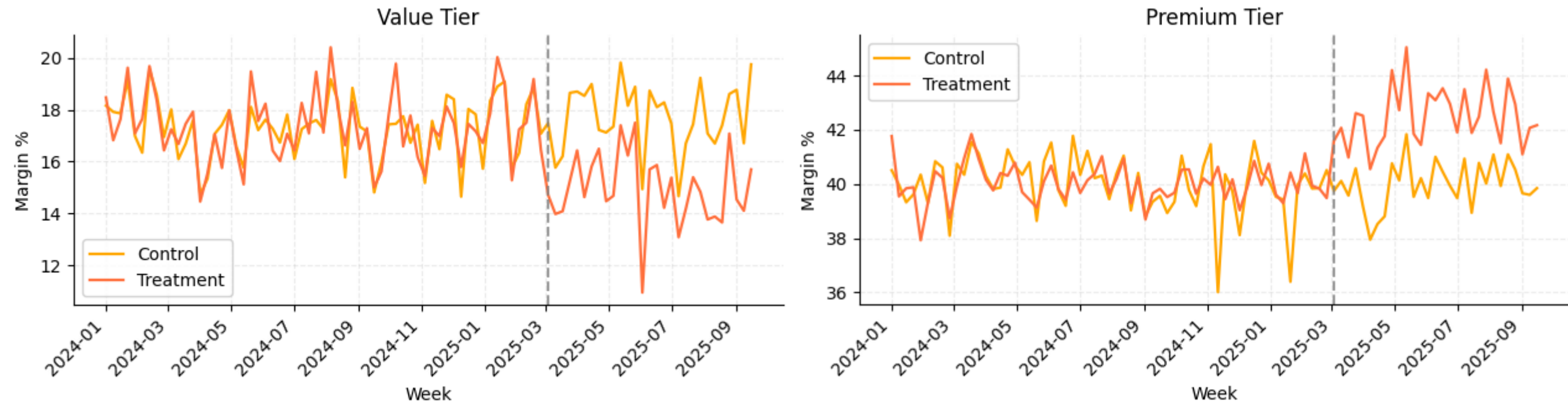
Did tariff-driven price increases cause a margin change? (by product tier)

Predictor	Coefficient	95% CI	p-value
Post (2025 Mar–Jun, Control)	$\beta_1 = 0.44$	(−0.72, +1.59)	0.07
Treatment (Baseline, pre-tariff)	$\beta_2 = 0.01$	(−1.32, +1.33)	0.994
Premium Tier (Baseline)	$\beta_3 = +21.39^{***}$	(+20.05, +22.72)	<0.001
Post × Treatment (Tariff Effect – Value Tier)	$\beta_4 = -2.99^{***}$	(−3.94, −2.04)	<0.001
Post × Treatment × Premium Tier	$\beta_5 = +6.97^{***}$	(+3.32, +8.63)	<0.001
Post × Premium (control group)	$\beta_6 = 0.47$	(−1.10, +2.03)	0.558

- Tariff Impact on Value-Tier SKUs : ~3.0pp drop in margin% after the tariff
- Tariff Impact on Premium-Tier SKUs: ~4.0pp gain in margin%, positive effect from tariff-driven price increase
- Premium-tier SKUs had ~21.4pp higher margins than value-tier products at baseline
- Non-significant pre-tariff differences show that treated and control SKUs were on similar paths before the tariff
 - Treatment (Baseline) → $\beta_2 = 0.01$, $p = 0.994$
 - Post (Control) → $\beta_1 = +0.44$, $p = 0.07$
 - Post × Premium (Control) → $\beta_6 = +0.47$, $p = 0.558$

Difference-in-Differences (DiD) — Causal Impact on Margin %

Did tariff-driven price increases cause a margin change? (by product tier)



Margin percent changed BECAUSE OF Tariff-driven price increases, but it had a divergent impact by product tier

OLS Linear Regression — Drivers of Margin Outcomes

How much does tariff-driven price increase affect margin, controlling for other factors? (product tier)

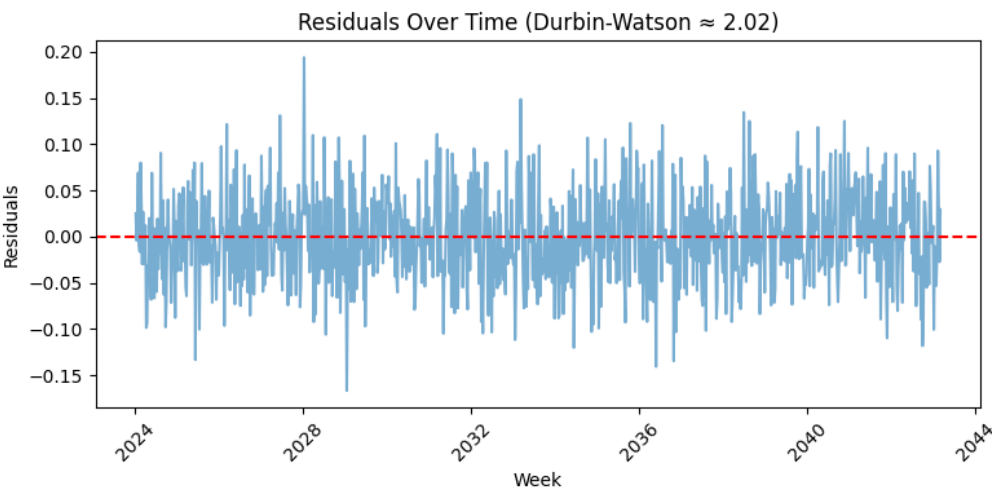
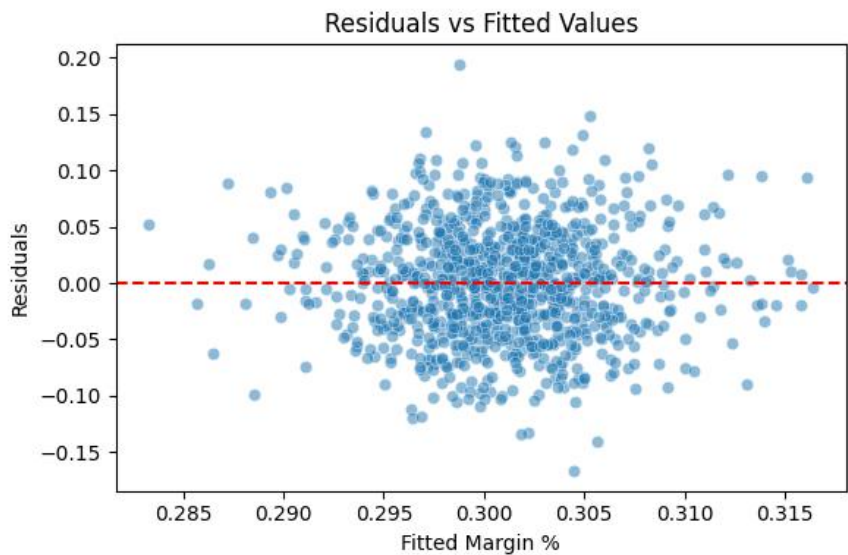
$$\begin{aligned} \text{Margin}_{i,t} = & \beta_0 + \beta_1 \cdot \text{PostTariff}_{i,t} + \beta_2 \cdot \text{PercentageIncrease}_{i,t} + \beta_3 \cdot (\text{PercentageIncrease}_{i,t} \times \text{PremiumTier}_i) \\ & + \beta_4 \cdot \text{PromotionDepth}_{i,t} + \beta_5 \cdot \text{UnitCost}_i + \beta_6 \cdot \text{PremiumTier}_i + \beta_7 \cdot \text{SalesChannel}_i \\ & + c \sum \beta_c \cdot \text{CategoryDummy}_{i,c} + s \sum \beta_s \cdot \text{SeasonDummy}_{t,s} + \varepsilon_{i,t} \end{aligned}$$

Variable	Description
PostTariff Period	1 if week is after tariff implementation; 0 otherwise
Percentage Price Increase	% increase in SKU price due to tariff (0 for control or pre-tariff)
Product Tier	1 = Premium SKU, 0 = Value SKU
Price Increase × Tier	Product of price increase and Premium dummy
Promotion Depth	% promotional discount in a given week (e.g., 0, 10, 20)
Unit Cost	Procurement cost of the SKU
Product Category	Categorical fixed effect (e.g., Cookware, Electrics, etc.)
Sales Channel	1 = Online sale, 0 = Retail sale
Seasonality	Time fixed effects (e.g., month or quarter dummies)

OLS Linear Regression — Drivers of Margin Outcomes

How much does tariff-driven price increase affect margin, controlling for other factors? (product tier)

- No systematic pattern.
- Residuals are scattered around zero, confirming Linearity
- No autocorrelation in residuals
- Residuals fluctuate randomly around zero across weeks, confirming Independence



Metric		Value	Interpretation
R-squared		0.983	The model explains 98.3% of the variance in margin percentage
F-statistic		8317.1	Regression model provides a stronger fit than a model with no features
F-stat p-value		< 0.001	The model is highly statistically significant overall

OLS Linear Regression — Drivers of Margin Outcomes

How much does tariff-driven price increase affect margin, controlling for other factors? (product tier)

Predictor	Coefficient	95% CI	p-value
Intercept (Baseline)	$\beta_0 = 0.2$	[0.18, 0.22]	<0.001***
PostTariff Period (Post)	$\beta_1 = -0.03$	[-0.05, 0.00]	0.07
Percentage Price Increase (Tariff %)	$\beta_2 = -0.20$	[-0.28, -0.12]	<0.001***
Price Increase × Premium Tier	$\beta_3 = 0.4$	[0.25, 0.55]	<0.001***
Promotion Depth (% discount)	$\beta_4 = -0.30$	[-0.35, -0.25]	<0.001***
Unit Cost (USD)	$\beta_5 = -0.0005$	[-0.0015, 0.0005]	0.3
Premium Tier (dummy)	$\beta_6 = 0.1$	[0.06, 0.14]	<0.001***
Sales Channel (Online)	$\beta_7 = 0.02$	[0.00, 0.04]	0.04*

- Post-tariff period saw a slight margin decline across all SKUs ($\beta_1 \approx -0.03$ pp, $p \approx 0.07$)
- For Value SKUs, each 1% price increase reduced margin% by ~0.2 pp ($\beta_2 = -0.20$, $p < 0.001$)
- For Premium SKUs, each 1% price increase increased margin% by ~0.2 pp (interaction $\beta_2 + \beta_3 = +0.40$)
- Premium SKUs had ~0.1 pp higher baseline margin than value SKUs, even after controlling for category and cost, channel and seasonality.

OLS Linear Regression — Drivers of Margin Outcomes

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- Promotions Erode Margin Quickly. Each 1% discount lowered margin% by ~0.3 pp ($\beta_4 = -0.30$, $p < 0.001$)
- Margin is more influenced by pricing and promotions than cost levels ($p = 0.30$)
- Digital channels may slightly boost margins through direct selling ($\beta = +0.02$, $p \approx 0.04$)

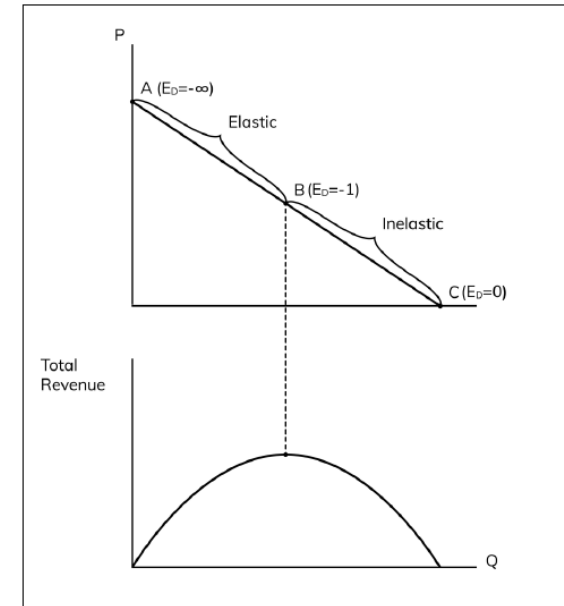
For each 1% tariff-driven price increase, margin fell by ~0.2 pp for Value-tier SKUs and rose by ~0.2 pp for Premium-tier SKUs, even after controlling for other factors

Conclusions

- For Premium-tier products, Tariff-driven price increases raised margins by ~4 pp overall, supported by strong pricing power (each 1% price increase adds ~0.2 pp to margin). They can sustain or improve margins under cost shocks and should be prioritized for price pass-through strategies
- For Value-tier products, Tariff-driven price increases reduced margins by ~3 pp overall, driven by high price sensitivity (each 1% price increase cuts margin by ~0.2 pp). They are vulnerable to margin erosion when prices rise and require careful management.
- DiD identified the causal effect of tariffs by tier, while regression quantified how margin shifts varied with price increases and business controls. Both models confirmed this pattern across methods.
- Pricing strategy should adapt to tier-specific customer behavior. Differentiated pricing strategies will maximize profitability and customer retention in the face of external shocks like tariffs.

Next Steps

- Conduct Price Elasticity Analysis to estimate demand sensitivity to price changes by tier or category to inform future pricing decisions beyond margin impact
- Formalize a process to run causal impact analyses on all significant pricing actions post-strategy implementation to continuously validate and refine models
- Analyze how competitors responded to tariffs (e.g., matched price hikes, held prices steady)
- Assess whether customers shifted from premium to value SKUs (or vice versa) in response to price changes
- Include prior inventory positions to distinguish margin pressure from supply chain factors



Thank You!

Appendix - Difference-in-Differences (DiD)

$$\text{Margin}_{\{i,t\}} = \beta_0 + \beta_1 \cdot \text{Post}_t + \beta_2 \cdot \text{Treated}_i + \beta_3 \cdot \text{Premium}_i + \beta_4 \cdot (\text{Post}_t \times \text{Treated}_i) + \beta_5 \cdot (\text{Post}_t \times \text{Treated}_i \times \text{Premium}_i) + \varepsilon_{\{i,t\}}$$

$\text{Margin}_{\{i,t\}}$: Margin percentage for SKU i at time t

β_0 : Baseline margin for a value-tier (intercept)

$\beta_1 \cdot \text{Post}_t$: Change in margin after the tariff date, affecting all SKUs

$\beta_2 \cdot \text{Treated}_i$: Baseline margin difference between tariff-impacted SKUs and control SKUs before the tariff

$\beta_3 \cdot \text{Premium}_i$: Baseline margin difference between premium-tier and value-tier SKUs before the tariff

$\beta_4 \cdot (\text{Post}_t \times \text{Treated}_i)$: Causal impact of the tariff on margin for value-tier treated SKUs, beyond general time effects

$\beta_5 \cdot (\text{Post}_t \times \text{Treated}_i \times \text{Premium}_i)$: Incremental tariff effect for premium SKUs, capturing how the tariff impact differs between premium and value tiers

$\varepsilon_{\{i,t\}}$: Random noise not explained by the model

Product Tier	Causal Tariff Effect
Value	β_4
Premium	$\beta_4 + \beta_5$

Appendix - OLS Linear Regression

$$\begin{aligned} \text{Margin}_{i,t} = & \beta_0 + \beta_1 \cdot \text{PostTariff}_t + \beta_2 \cdot \text{PercentageIncrease}_{i,t} + \beta_3 \cdot (\text{PercentageIncrease}_{i,t} \times \text{PremiumTier}_i) \\ & + \beta_4 \cdot \text{PromotionDepth}_{i,t} + \beta_5 \cdot \text{UnitCost}_i + \beta_6 \cdot \text{PremiumTier}_i + \beta_7 \cdot \text{SalesChannel}_i \\ & + c \sum \beta_c \cdot \text{CategoryDummy}_{i,c} + s \sum \beta_s \cdot \text{SeasonDummy}_{t,s} + \varepsilon_{i,t} \end{aligned}$$

$\text{Margin}_{i,t}$: Margin percentage for SKU i at time t

β_0 : Baseline margin for a value-tier SKU, in the pre-tariff period, with no price increase or promotion, in the reference category, season, and channel

$\beta_1 \cdot \text{PostTariff}_t$: Average margin shift after tariffs, affecting all SKUs equally

$\beta_2 \cdot \text{PercentageIncrease}_{i,t}$: Effect of a 1% price increase on margin for value-tier SKUs

$\beta_3 \cdot (\text{PercentageIncrease}_{i,t} \times \text{PremiumTier}_i)$: Incremental effect of price increases for premium-tier SKUs

$\beta_4 \cdot \text{PromotionDepth}_{i,t}$: Effect of a 1% deeper discount on margin

$\beta_5 \cdot \text{UnitCost}_i$: Effect of higher unit cost on margin

$\beta_6 \cdot \text{PremiumTier}_i$: Baseline margin difference between premium and value SKUs

$\beta_7 \cdot \text{SalesChannel}_i$: Margin difference by sales channel

$c \sum \beta_c \cdot \text{CategoryDummy}_{i,c}$: Controls for category-specific margin differences

$s \sum \beta_s \cdot \text{SeasonDummy}_{t,s}$: Controls for seasonal demand and promotional cycles

Product Tier	OLS LR Tariff Effect
Value	β_2
Premium	$\beta_2 + \beta_3$