

Promotion ROI

Do discounts pay for themselves? Measuring what 79,340 promotions actually bought back.

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Project context and my contribution

A harder public file: 387 stores, 899 products, two years of receipts, and no shelf prices, no costs, no promotion flags.

The normal price was reconstructed from each product-store's price history, then validated against a second retailer where true discounts were recorded: -0.11% price bias, 85% of real promotions found.

My role

Data Science × FP&A

- **Reconstruction & validation:** a base price the study can defend, proven against ground truth before use
- **Event design:** each promotion billed against its own quiet weeks, including the dip after it ends
- **Honest refusals:** half a million thin promotion-weeks skipped rather than guessed
- **FP&A verdict:** results stated as margin per dollar of discount, the number a budget owner can act on

A promotion budget spent on faith

01

Nobody knows which promotions pay

The calendar rolls forward each year because it always has, measured return per promotion does not exist.

02

Mechanics and discounts conflated

Displays, leaflets and price cuts run together, so nobody can say what each lever actually adds.

03

The halo claimed, never measured

"Promotions bring people in" ends every debate, as an assertion, not a number.

What a dollar of discount bought back

Across two years and every promotion the file can baseline, each \$1 of discount destroyed about \$0.20 of gross margin at assumed costs.

The scale, stated up front: 79,340 promotion-weeks read out of 905,938, \$217k of discount given, -\$42k of margin back. The rest were too thin to baseline honestly, so they are refused, not guessed.

65.1% of promotions came back margin-negative, and 11.1% were guaranteed losers that could not have paid even if the discount had been free.

-\$0.20

margin per \$1 of
discount, at assumed
costs

65.1%

of 79,340 promotions
margin-negative

11.1%

guaranteed losers,
cost-free

Each promotion against its own quiet weeks

A self-controlled event study: a promotion week is compared with the same store-product's own quiet weeks in the surrounding ± 8 , and the dip in the week after is charged to the promotion that caused it.

01

No seasonality model

Comparing July to the surrounding weeks needs no December, counts and sums, not forecasts.

02

Thin data refused

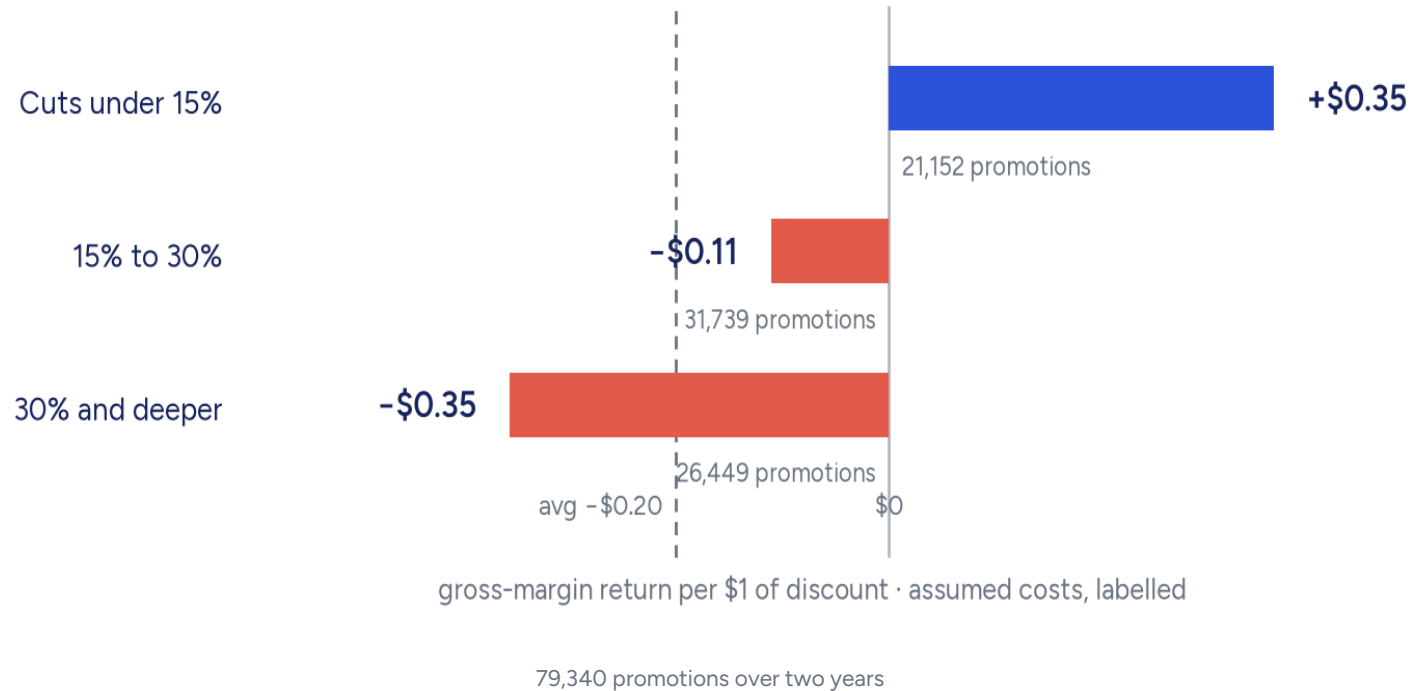
Roughly half a million slow-mover promotion weeks skipped: their gaps could be stockouts, and a baseline built on gaps is fiction.

03

Every number decomposable

Any promotion's verdict traces to the transactions behind it, no hidden steps.

Depth decides: shallow pays, deep burns



Cuts under 15% earn +\$0.35 per dollar; cuts of 30% and deeper burn -\$0.35.

The calendar does not need to shrink, it needs to get shallower.

Do: cap depth at 15% by default. On this file that turns \$127k of deep-cut discount from -\$44k into up to +\$45k of margin. Next page.

What a shallower calendar is worth

DEPTH	PROMOTIONS	DISCOUNT	MARGIN BACK	PER \$1	IF CUT UNDER 15%	SWING
Under 15%	21,152	\$25.0k	+\$8.8k	+\$0.35	as is	
15% to 30%	31,739	\$64.5k	-\$7.0k	-\$0.11	+\$22.7k	+\$29.7k
30% and deeper	26,449	\$127.5k	-\$44.2k	-\$0.35	+\$44.9k	+\$89.1k
The whole calendar	79,340	\$217.0k	-\$42.4k	-\$0.20	+\$76.4k	+\$118.8k

Read it as. Same calendar, same products, every cut held under 15%: the file goes from -\$42k to about +\$76k. Per \$1M of discount now spent on cuts of 30% or more, that is \$350k of burn stopped, and up to \$700k of swing. **Do:** cap depth at 15% by default; anything deeper needs a signature and a reason.

A ceiling, not a forecast: it assumes shallow cuts keep earning +\$0.35 when there are more of them. Half of it is still \$59k on this file.

The levers multiply, they do not add



extra units sold vs the same product's own quiet weeks

weeks 43–104 · pooled estimate

A price cut alone: +82%. Cut, leaflet and display together: +497%.

Behind the bars: 71,316 cut-only cells, 15,079 cut and leaflet, 3,839 cut and display, 3,579 with all three.

In margin per dollar, advertised promotions returned $-\$0.26$ against $-\$0.17$ for quiet ones. Exposure sells units; it does not rescue a deep cut. **Do:** advertise the shallow ones.

Where a promotion sits beats how deep it cuts

LEVER	WHERE	EXTRA UNITS	CELLS	READ IT AS
Leaflet	Front page	+410%	6,051	the slot that works
Leaflet	Back page	+384%	452	nearly as good, rarely used
Leaflet	Interior page	+104%	22,281	where most promotions sit
Display	Store front	+306%	233	best spot, almost never used
Display	Rear end cap	+214%	6,377	the workhorse
Display	Front end cap	+193%	2,846	strong
Display	In-shelf	+113%	5,356	barely more than a cut alone

Read it as. A front-page feature lifts units four times more than an interior page, and a store-front display three times more than the shelf. Yet most promotions sit in the cheap slots: 22,281 interior-page cells against 6,051 on the front page. **Do:** give the front page and the end caps to the shallow cuts. The deep ones already lose money, and exposure makes them lose faster.

Two categories' deep cuts are the whole loss

CATEGORY	PROMOTIONS	DISCOUNT	MARGIN BACK	PER \$1	DEEP CUTS: DISCOUNT	DEEP CUTS: MARGIN	PER \$1
Pasta	46,641	\$97.9k	-\$25.0k	-\$0.26	\$53.8k	-\$23.1k	-\$0.43
Pasta sauce	24,909	\$102.5k	-\$19.3k	-\$0.19	\$70.2k	-\$20.2k	-\$0.29
Pancake mixes	2,266	\$4.4k	+\$0.6k	+\$0.15	\$1.2k	-\$0.4k	-\$0.36
Syrups	5,524	\$12.2k	+\$1.3k	+\$0.11	\$2.1k	-\$0.4k	-\$0.19

Read it as. Pasta and pasta sauce cuts of 30% or more: \$124k of discount, -\$43k of margin, which is the entire loss of the file. The two small categories pay for themselves. **Do:** stop the deep cuts on pasta and sauce first. Change nothing else and the calendar breaks even.

“But promotions bring people in”, measured

3.3 million baskets read. Credit every promotion with the entire rest of every basket it appears in, the most generous reading possible, and the verdict barely moves, because 91.6% of that halo is extra baskets, not richer ones: shoppers who were coming anyway.

-\$0.20

own-product return per \$1, at assumed costs

-\$0.15

with every defensible halo credited

30.5%

of extra baskets would have to be brand-new trips just to
break even

Three moves, and what they are worth on this file

1 · Cap depth at 15%

From -\$42k to about +\$76k on the same calendar: a \$119k swing at the ceiling, \$59k at half. Anything deeper needs a signature and a reason.

2 · Stop pasta and sauce deep cuts

Those cuts are the whole loss: -\$43k on \$124k of discount. Stop them and the calendar breaks even with nothing else changed.

3 · Give exposure to shallow cuts

Front page +410%, end caps +193% to +214%, against +82% for a cut alone. Advertised deep cuts burn -\$0.26 per dollar. Put the best slots on the cuts that earn.

What this study cannot see

Supplier funding

Not in this file. A deep cut that a supplier pays for can be a win for the retailer. On your data it enters as a line per promotion, and every verdict is recomputed net of it.

Other aisles

The file carries four categories. Halo into other aisles is invisible and not estimated. Inside the visible aisles, 92% of the halo was extra baskets, not richer ones.

Coverage

79,340 promotion-weeks read out of 905,938. The thin ones are refused, not guessed, so the verdict leans toward products that sell every week.

Costs are assumed

Labelled wherever money appears. The one verdict that survives any cost argument: 11.1% of promotions sold more units for less money, a loss at any cost.

Key lessons learned



Depth is the decision

Not whether to promote, but how deep: the same calendar, shallower and better placed, changes sign.



Generosity wins arguments

Granting the objection its best case, the full-basket halo, and still holding the verdict ends the debate.



The uncomfortable number stays in

Most of the apparent halo is an artefact; reporting that honestly is what makes the rest of the study believable.

Interested in what your data can support?

One export, one fixed scope, one fee agreed up front, and every figure checkable by your own team.

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