Market Mix Modeling On Ad Creative

Brand HBA
Ad Quality & Effective Insights

Case Study

ABX Advertising Benchmark Index

BLA Bottom-Line *Analytics*

1

Forward

- Destination
- Defining Long-Term Ad Effects (LTAF)
- Model Architecture
- Review of Media Spend
- Media Mix Model Results
- Results and Insights
  - Decomposing Sales
  - Role of Advertising and It's Components
    - Ad Spend
    - Ad Creative
    - Long-Term Ad Effects
  - Marketing Variance (Due-to)
  - Marketing ROI & Assumptions
- Implications & Lessons

Destination

In this analysis, we will be applying predictive modeling in order to determine the relative importance, for Brand HBA, of three media effects. These are:

- The impact and <u>importance of media spend levels over the short-term</u> (<=1 year)

- The <u>impact of media creative or message factors</u> according to ABX copy scores in the short-term. We will be testing the hypothesis that ABX copy test scores predict sales outcomes, when used as a multiplier towards media spend.

- The <u>importance and impact of advertising long-term effects (LTAE),</u> if any. We will apply our proprietary methods for testing and measuring long-term ad effects, as we define them on the next slide.

Defining Long-Term Ad Effects

- This exercise will be a media-mix model. An important and different component of our models is a derived long-term ad effect variable.   LTAE are thus defined as follows:

  - _Long-Term Ad Effects (LTAE)_, _are the incremental sales generated from customers who were initially acquired via media/advertising messages, over the lifetime of that customer. These sales are attributed through repeat purchases and revenue streams generated by these customers over their lifetime with a brand. Once a customer has been acquired, LTAE reflects the value that these customers generate over their lifetime as a customer._

References:

Leslie A. Wood, David F. Poltrack, Measuring the Long-Term Effects Of Television Advertising, Journal of Advertising Research, June 2015

Ataman, Van Heerde, Mela, Building Brands, Marketing Science, Nov.-Dec, 2008

Ataman, Van Heerde, Mela , The Long-term Effect of Marketing Strategy on Brand Performance, Emory University Zyman instititute of Brand Science, 3 July 2006
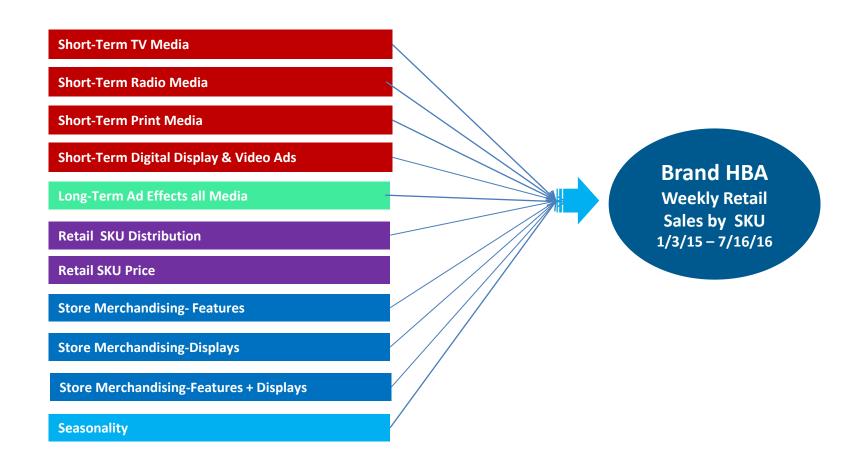
Model Architecture, Brand HBA Brand HBA

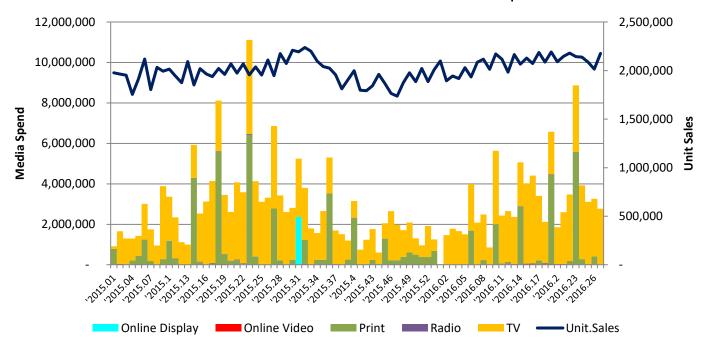Below reflects our inputs formulating the model for predicting HBA Brand weekly sales.

- Short-Term TV Media
- Short-Term Radio Media
- Short-Term Print Media
- Short-Term Digital Display & Video Ads
- Long-Term Ad Effects all Media
- Retail SKU Distribution
- Retail SKU Price
- Store Merchandising- Features
- Store Merchandising-Displays
- Store Merchandising-Features + Displays
- Seasonality

Brand HBA
Weekly Retail
Sales by SKU
1/3/15 – 7/16/16

Brand HBA Retail Sales and Ad Spending
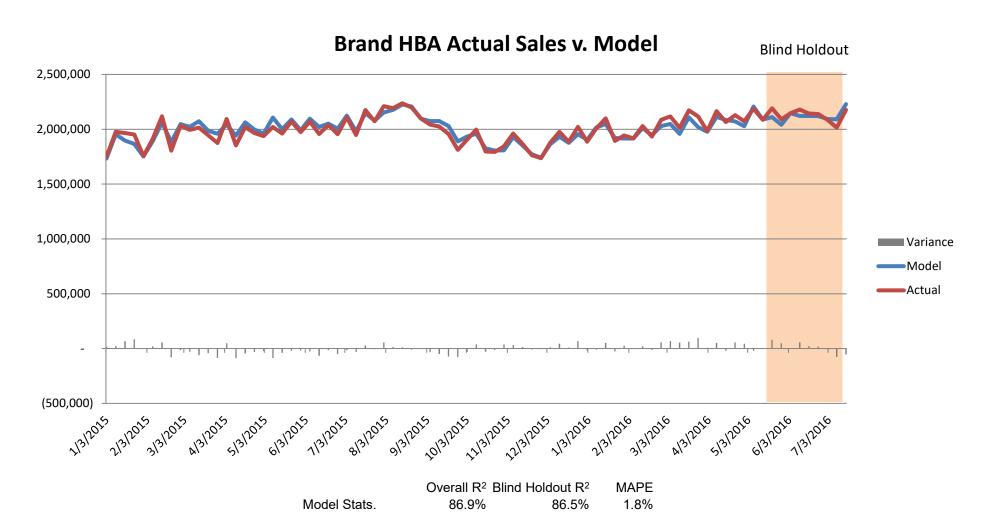
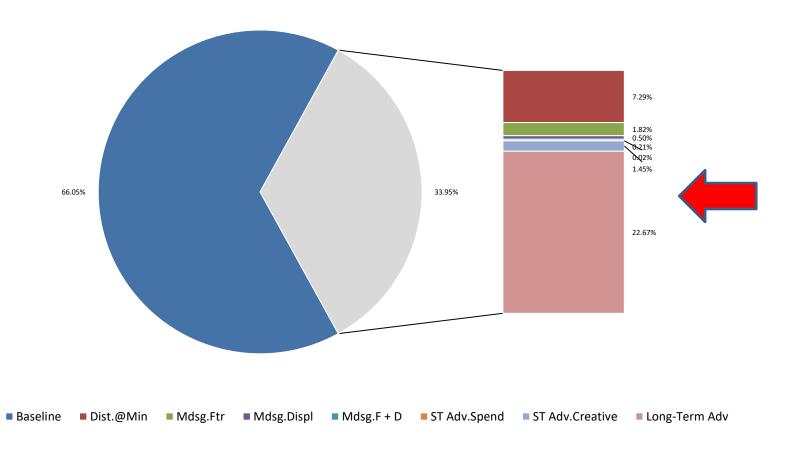For Year ending 7/16/16, Brand HBA generated $1.027 Billion in revenue and 106.4 million units, on $138 million of total ad spend.

We employed a 10% data holdout to validate the model's ability to predict. Overall results excellent.

Brand HBA Actual Sales v. Model

Blind Holdout

Legend:
- Variance
- Model
- Actual

Model Stats.	Overall R^2	Blind Holdout R^2	MAPE
	86.9%	86.5%	1.8%

7

For Brand HBA, Long-Term ad effects among the highest seen, at 15X of the Short-Term Media Impact.

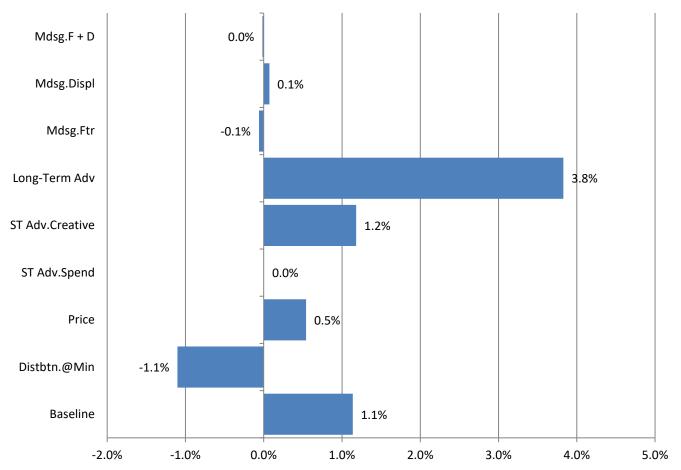Incremental Contributions to Total Brand HBA Sales

66.05%   33.95%

7.29%
1.82%
0.50%
0.21%
0.02%
1.45%

22.67%

■ Baseline ■ Dist.@Min ■ Mdsg.Ftr ■ Mdsg.Displ ■ Mdsg.F + D ■ ST Adv.Spend ■ ST Adv.Creative ■ Long-Term Adv

Current Quarter vs. Year-Ago

Performance shows Brand HBA gaining sales of +5.6%. Most of this growth can be ascribed to better ad creative and stronger Long-Term ad effects.

Brand HBA Current Quarter v. YA Variance Due-To

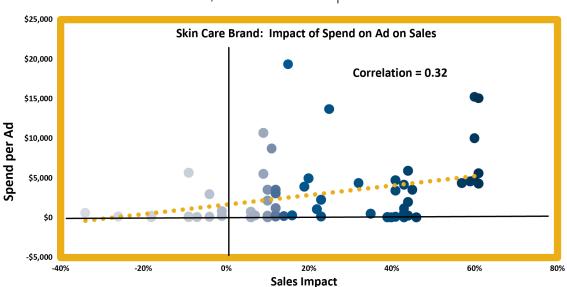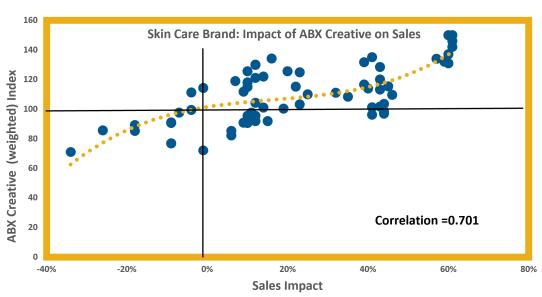| Category	Value
Mdsg.F + D	0.0%
Mdsg.Displ	0.1%
Mdsg.Ftr	-0.1%
Long-Term Adv	3.8%
ST Adv.Creative	1.2%
ST Adv.Spend	0.0%
Price	0.5%
Distbtn.@Min	-1.1%
Baseline	1.1%

ABX Index Correlates Better To Ad Spend.

Media Spend vs. Sales Impact

Advertiser finds that media spend correlates poorly with sale impact. Market mix model is inaccurate, and media spend is wasteful.

Skin Care Brand: Impact of Spend on Ad on Sales

Correlation = 0.32

Spend per Ad — Sales Impact

ABX Creative Scores vs. Sales Impact

Advertiser compares ABX creative scores against sales impact and finds a correlation of 70%.

Skin Care Brand: Impact of ABX Creative on Sales

Correlation = 0.701

ABX Creative (weighted) Index — Sales Impact

The ABX "CTA" Index for females was used to compare Sales Impact for this women's skincare product.

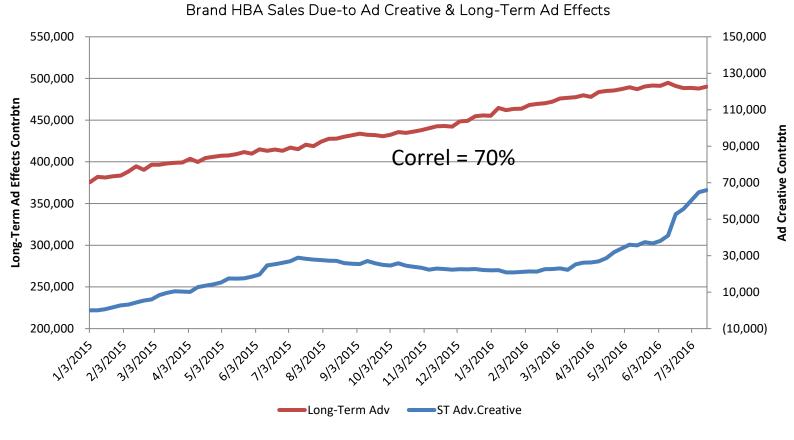**(Market Mix Models courtesy of Bottom-Line Analytics.)**

Improving Ad Creative has also helped boost the large gain from Long-Term Ad Effects.
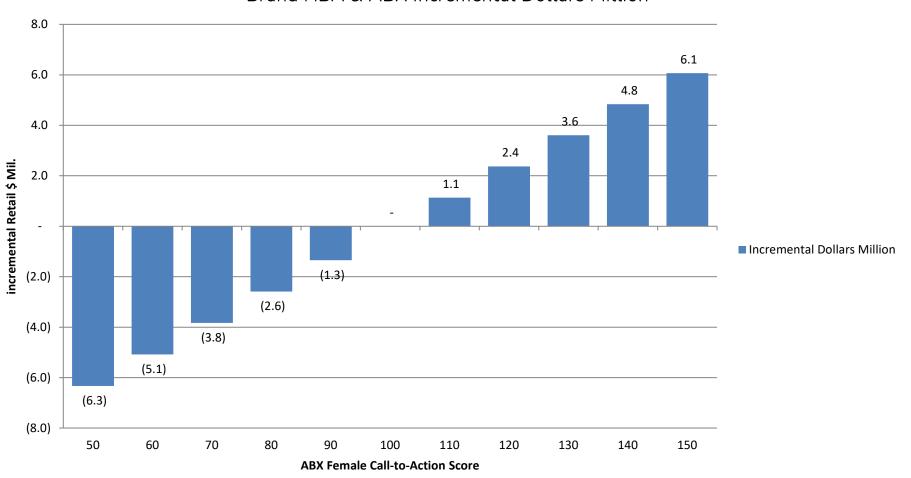
Brand HBA Sales Due-to Ad Creative & Long-Term Ad Effects

Correl = 70%

Legend: ▬ Long-Term Adv ▬ ST Adv.Creative

There is a direct link between ABX Scores and Revenue.

Brand HBA & ABX Incremental Dollars Million

Incremental Retail $ Mil. (y-axis)

ABX Female Call-to-Action Score (x-axis)

Legend: ■ Incremental Dollars Million

Data points:
- 50: (6.3)
- 60: (5.1)
- 70: (3.8)
- 80: (2.6)
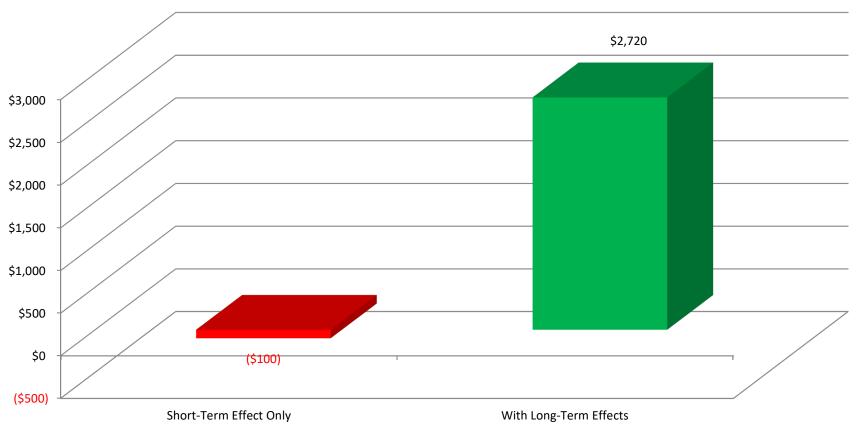- 90: (1.3)
- 100: -
- 110: 1.1
- 120: 2.4
- 130: 3.6
- 140: 4.8
- 150: 6.1

The financials of advertising dramatically change from -$100K to 2.7 million dollars!

Brand HBA Annual Ad Net Returns

$2,720

Short-Term Effect Only — ($100)

With Long-Term Effects

* Assumes 20% EBITDA/Sales Margin

Implications and Lessons

- <u>Long-Term Ad Effects (LTAE)</u> are the key to positive ROI on advertising spending. For Brand HBA, this is among the highest LTAE found and equates to about 23% of annual sales; and was 15X the short-term ad effect.

- Brand HBA's current retail sales growth is quite strong, with over +5.6% gain versus the prior year.

- Along with <u>Stronger Ad Creative</u>, The LTAE was a major driver of quarterly growth versus the prior year. In the case of Brand HBA, improved ad creative was a major driver of improved LTAE.

- We found a significant correlation between ABX Female Call-to-Action scores and the sales lifts of individual ads. Our findings reveal that the impact of ABX scores represents a proxy measure for ad creative quality and likewise is a far more significant driver of sales than the actual spending levels behind each Brand HBA ad.

- The very high returns on Brand HBA is suggests under-investing.

- The only negative for Brand HBA for the quarter was due to declining distribution and availability on some SKUs.

Contact Information

Diane Light Waight
VP Business Development
ABX Advertising Benchmark Index
323.794.3891
diane@adbenchmark.com

Gary Getto
President
ABX Advertising Benchmark Index
347.443.8869
gary@adbenchmark.com

Michael Wolfe
Principal
Bottom-Line Analytics LLC
678.314.8446
mjw@bottomlineanalytics.com