



MSI's Marketing Mix Modeling Initiative Progress



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MSI Marketing Mix Model Initiative Progress Report

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What is a marketing mix model (MMM)?

First introduced in the 1950s along with the 4Ps of marketing by Prof. Jerome McCarthy.

The variation in brand performance measures should be explained by price, product, place (distribution), and promotion.

MMM determines how much impact is driven by each of the 4Ps and forecasts the future impact of altering or optimizing the marketing mix.

Begin with sales being the DV and extend to measure profits and ROI.



What is MMM?

Promotion

- Channel 1
- Channel 2
- Channel 2

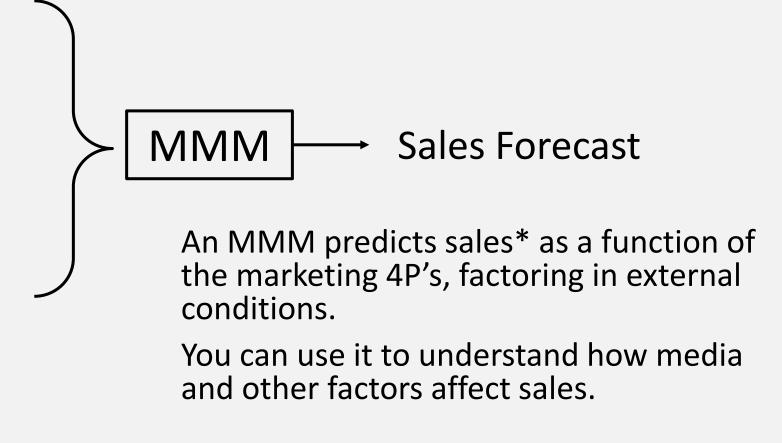
Price

Product

Place (Distribution)

External conditions

- Economy
- Weather
- Holidays



*or other brand performance measures

Marketing vs Media Mix Models



Entries in the table are elasticities.

Elasticities are the responsiveness of sales to a change in each variable.

E.g., if the price elasticity of demand is -2.6, a 1% increase in price leads to a 2.6% decrease in demand.

Absolute value>1 → elastic

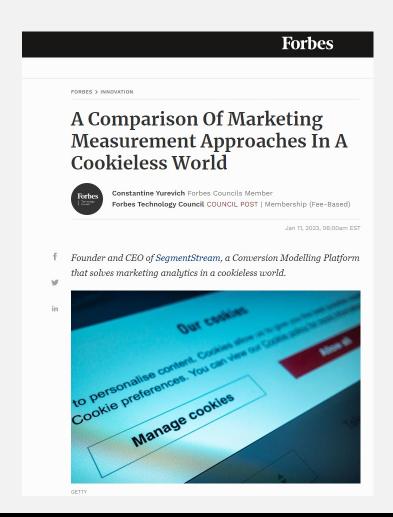
Absolute value<1 → inelastic

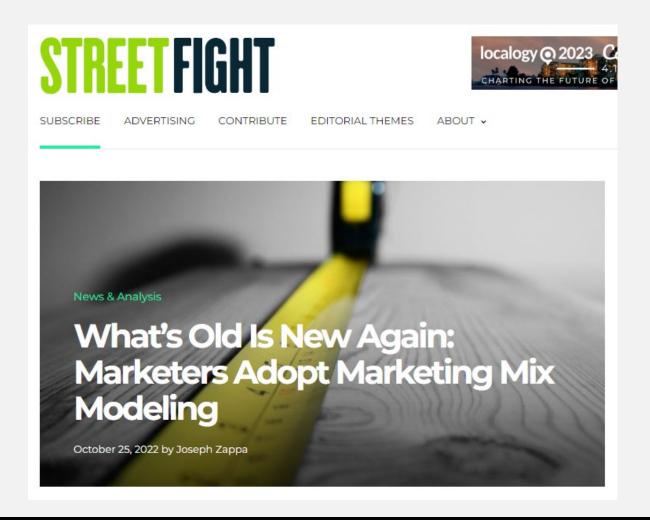
	Typical Elasticity	Range	
Price	-2.6	-2.5 to -5.4	
Personal selling	0.35	0.27 to 0.54	
		0 to 0.3	
Advertising	0.1	New products higher	
Distribution	0.6 to 1.7	S-shaped	
Product innovation	>0	Higher for radical	
Price promotion	-3.6	-2 to -12 (short run)	
		0 (long run)	

See Table 3 in Hanssens, Dominique M., and Koen H. Pauwels. "Demonstrating the value of marketing." Journal of Marketing 80, no. 6 (2016): 173-190.

Why are MMMs becoming important - Privacy regulations and walled gardens







Why are MMMs becoming important - Innovation and digitization are accelerating



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ADOBE USES AI TO SPEED UP **MARKETING MIX MODELING**

Process that takes months is reduced to weeks, becoming practical for more marketers and potentially helping prove

By <u>Jack Neff.</u> Published on October 06, 2022.



Exploring Marketing Mix Modeling (MMM) and Conversion Lift Experiment (CLE) blending The Alshaya Group/H&M Case developed by Deloitte







Developing and disseminating best practices for the design, validation and use of MMM to increase trust and ensure marketing spend is as effective as possible.

Panel – Industry Leaders



airbnb – Sam Barrows, Zhiying Gu, Linsha Chen

AstraZeneca – Matt Gray

AT&T – George Wu, Rob Cederbaum, Linette Mookanamparambil, Michael Guber

Citi – Tony Michelini

Coca-Cola – Greg Pharo

Colgate-Palmolive – Agustin De Dios Iglesias, Sandipan Sinha, Helen Wolf

Dell – Saleel Gadgil

Domino's – Hanna Wilder, Samuel Sokolowski, Pierre Gardan

FiServ – Mike Anderson

Google – Tina Daniels, David Kaul, Stephen Mangan, Casey Cowgill

Kantar – Satya Menon, Patrick Moriarty

Marketing Attribution – Ross Link

Meta – Neha Bhargava, Jessica Nguyen

Netflix – Wayne Huang, Asaf Davidov

Neustar – Michael Schoen, Marc Vermut, Emiko Seale

Nike – Shaun Desmond, Matthew Hanlon, Matt Kane

Pernod Ricard – Karen Chisholm

Pinterest – Uri Weg

Sequent – Jim Spaeth, Alice Sylvester

UHG – Martyn Crook

Vanguard – Kristin Federico, Jing Wang, Russ Messner

Wayfair – Rob Corbin, Scott Collins, Carter Noordsij, Connor Richmond, Suki Lau

Panel – Academic Leaders





Ron Berman, U. of Pennsylvania



Elea Feit, Drexel



Dominique Hanssens, UCLA



Alice Li, The Ohio State



Mitch Lovett, U. of Rochester



Carl Mela, Duke

3 Phases



Phase I: What is current MMM practice?

We are here

Phase II: What makes for a good MMM?

Phase III: A processes for certifying MMM pipelines

Phase I: Scoping current MMM practice



Formed academic and industry panels with deep expertise Introduced the initiative at the 2023 MSI Annual meeting

Dyadic industry/MSI interviews

Academic group produced a paper on the scope of the initiative

Joint meeting of both academic and industry panels

- Refined priorities
- Collected user cases
- Developed specific objectives to focus in the next two phases
- Follow up with a broader set of MSI partners

Stakeholders



Data providers provide data used in MMM

Designers design and build MMM models

Users use MMM evaluate and optimize marketing spend across channels

Investors make decisions about marketing investments (and often don't know much about MMMs)



What issues are important today?

Data

Accuracy

Frequency, latency & agility

Granularity, across geography, time and channel Panel Interest

Adjusting to changes in ad tech

Lack of variation, e.g. a new channel with no history

New data: sentiment, creative quality, media attention

Optimizing marketing spend using MMMs
Panel Interest

Marginal versus total ROI

Efficiency versus effectiveness

Training investors to use MMM

Why data granularity?



AGGREGATION BIAS IN PRICE ELASTICITY						
Parameter	Model	ε<−1	-1 < ε < 0			
Promoted Price Elasticity	Store					
	Retailer Store-Group	₽	↔			
	Retailer	-	↔			
	Market Multiplicative	-				
	Market Additive	44	111			
	Hybrid	NA	NA			
Regular Price Elasticity	Store					
	Retailer Store-Group	₽	☆			
	Retailer	₽	☆			
	Market Multiplicative	-	⇧			
	Market Additive		1			
	Hybrid	NA	NA			

Source: Nielsen DMC1 synthetic data tests

from Aggregation Bias Test Summary, Ross Link, Marketing Attribution LLC, 2023

The level at which we can track varies by marketing channel

User

Market

Nation

But we know that aggregating data can lead to bias in estimated elasticities

Developing a scorecard



Develop a MMM "scorecard" to be used for self-evaluation

We may collect self evaluations to study the industry

Standard		Evaluation
Data	 Accuracy validation Geo granularity Channel granularity Sufficient variation in inputs 	
Model Features	Model includes: - Diminishing returns to advertising - Time-decay Model pipeline includes: - Regular re-estimation cadence - Validation by simulation - Out-of-sample validation - Comparison to industry benchmarks	
Optimization	- Equalizes marginal ROI across channels - Guardrails against extreme extrapolation	

Industry benchmark elasticities



Collect estimated elasticities across industries and media channels

This can be published (in an aggregated form) to facilitate industry benchmarking

N	larketing Effort	Sales Elasticity	
Marketing Effort		Sales Elasticity	
	TV	[]	
	Broadcast Radio	[]	
	Print	[]	
Media	Streaming Video	[]	
	Streaming Audio	[]	
	Social Media	[]	
	Search	[]	
Pricing	Promotional Price	[]	
	Regular Price	[]	
Distribution		[]	

Industry comparison ranges e.g. 25-75 %-tiles





Provide ways for member companies to validate their MMM pipeline using MSI expertise

Build credibility within the organization

Identify opportunities for improvement

Develop the skills of internal teams

Set standards for data and analytics providers





Get involved!

Any MSI member company can join the MMM initiative, where you can

- Work with other companies to set guidelines and standards
- Meet academics who are interested in innovation
- Benchmark your advertising performance against others

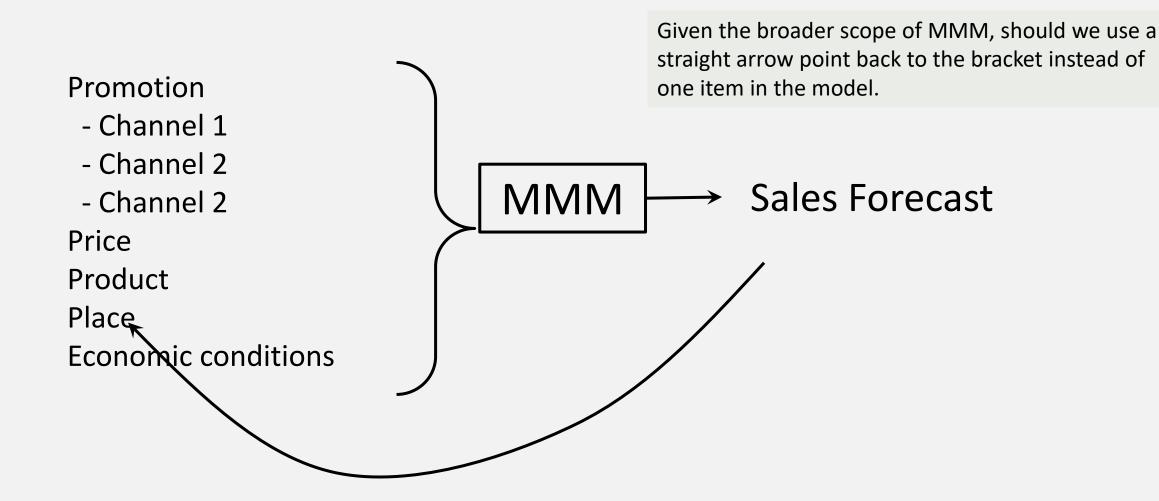


Backup

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Use cases





Benchmark elasticities from academic work



TABLE 3
Response Elasticities Summaries

	Typical Elasticity	Range	Drivers (+)	Organic Growth Driver?
Advertising	.1	0 to .3	Product newness, durables	Minor
Sales calls	.35	.27 to .54	Early life cycle, European markets	Major
Distribution	>1	.6 to 1.7	Brand concentration, high-revenue categories, bulky items	Major
Price	-2.6	−2.5 to −5.4	Stockkeeping unit level versus brand level, sales versus market share, early life cycle, durables	Minor
Price promotion	-3.6	−2 to −12	Storables versus perishables	No
E-word of mouth	Positive	.24 (volume) .42 (valence)	Low trialability, private consumption, independent review sites, less competitive categories	Possibly
Innovationa	Positive	Ň.A.	Radical versus incremental innovations	Major
Brand and customer assets ^a	.33 (brand) .72 (customer)			Major

aOn firm value.

Source: Hanssens (2015). Notes: N.A. = not applicable.



Networking Break

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Upcoming Events:



Webinar:

 5/9 – Ensembling Experiments to Optimize Interventions Along the Customer Journey | Yicheng Song, University of Minnesota

Workshop:

• 5/16 – The Customer-Base Audit | Peter Fader, University of Pennsylvania

Workshop:

• 5/23 – Digital Customer Engagement | Wendy Moe, University of Maryland

Book Series Webinar:

• 5/30 – Power and Prediction: The Disruptive Economics of Artificial Intelligence | Avi Goldfarb, University of Toronto

Webinar:

 6/27 – Regulating Privacy Online: The Economic Impact of the GDPR | Samuel Goldberg, Stanford University

In-Person Event:

Fall 2023 – MSI Accelerator | New York, NY

Register Now at msi.org/2023-calendar-of-events/