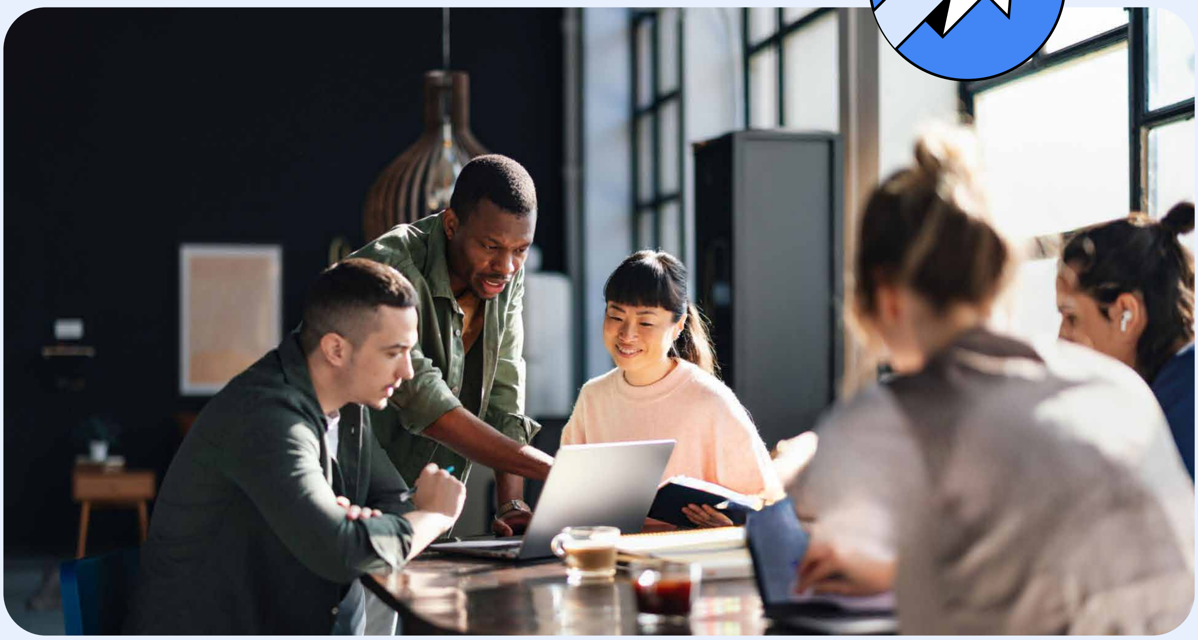
Think with Google

Meridian Self-starter Guide for CMOs



Why MMM is more important than ever

Investing the next marketing dollar has arguably never been harder. Increasing competition, intense scrutiny on marketing budgets, the rapidly changing media landscape, and evolving privacy regulations present significant challenges for marketers.

CMOs globally face the demanding task of making confident, data-driven budget allocation decisions that deliver consistent revenue growth.

One of the most valuable solutions to navigate these decisions is Marketing Mix Models (MMMs). These sophisticated statistical analyses are designed to measure the impact of marketing activity on bottom-line sales (or other meaningful business KPIs), providing answers to crucial questions such as:

- "What is the ROI of my online video campaigns?"
- "How much of my marketing budget should I invest into digital media?".
- "How can I maximize my ROI by optimising my marketing mix?"

Unlike more granular attribution methods that concentrate on individual customer journeys, MMMs adopt a wider, aggregated perspective that does not rely on individual data. MMMs also account for the interplay between different channels. For instance, an MMM might reveal that online video advertising indirectly amplifies the effectiveness of online search campaigns.

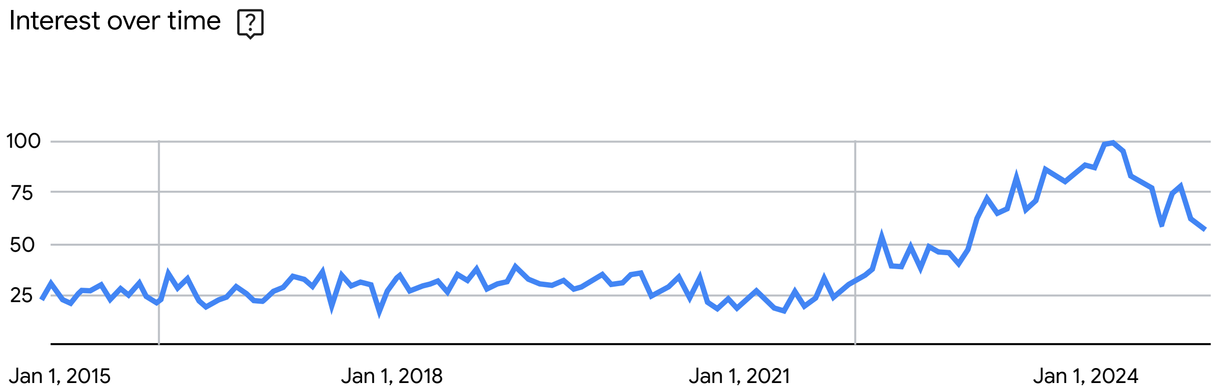
Critically, MMMs also include non-marketing factors that affect sales performance. This includes economic changes which can influence consumer spending; competitive actions, like new product introductions, which can affect a brand's market share; seasonal variations that lead to demand shifts throughout the year; and other external factors like weather or news events.

Because of MMM's comprehensive approach, it's no surprise that MMMs have become an increasingly popular solution for marketing decision makers. According to a study by the Boston Consulting Group in EMEA, 76% of companies already rely on MMM for cross-channel budget allocation[1].

1 BCG, Measurement Landscape Survey, UK, n=452, Fielded Jan 27-Feb 15, 2025

We are entering what can only be described as a renaissance – the roaring 20s of MMM! This surge in popularity isn't just about wider adoption; it's fueling innovation. New MMM approaches and methodologies are emerging to tackle today's challenges and business questions, including Meridian. In this exciting time for MMM, marketers should consider how they can adopt or evolve their MMM approach to unlock deeper insights that will guide their next phase of growth.

We are entering the roaring 20s era of MMMs



Approaches to MMM: in-house vs. third party

In the past, advertisers have traditionally worked with a third party measurement firm to build and update their MMMs. Today, the landscape is more varied, with a growing number of advertisers choosing to build and maintain their MMM internally. Some advertisers also opt for a hybrid approach, partnering with a third party for initial development while maintaining control over data and ongoing updates.

The growth of in-house MMMs reflects advertisers' desire to increase flexibility, reduce reliance on external vendors, and gain a more granular understanding of their marketing ROI. In-house MMM development allows advertisers to customize the model to their specific needs, adjust the model frequency as needed, and integrate it with their own data and reporting systems.

Each approach brings advantages and trade offs. Marketers must evaluate their internal resources, budget, and reporting needs to determine the best fit.

Introducing Meridian: Google's Open-Source MMM Powerhouse

Meridian is Google's open-source solution for building and customizing Marketing Mix Models (MMMs). Designed to address the need for privacy-safe and comprehensive measurement in today's complex media landscape, Meridian empowers advertisers to gain deeper insights into their marketing performance. It features methodological innovations for improved accuracy and actionability, offers richer data inputs including YouTube reach and frequency and Google query-volume data, and enables cross-channel budget optimization. By providing transparency and control, Meridian allows marketers to tailor their MMMs to their specific needs and drive better business outcomes.

Meridian methodology & capabilities

Meridian is a Bayesian MMM incorporating years of Google research on modeling methodologies. It includes innovative methodologies to address three challenges:

1. **Improving MMM accuracy via calibration** in line with **modern measurement** best practices.

2. **Improving upper video measurement via Reach and Frequency modeling**. This approach helps advertisers identify their optimal reach and frequency levels for video channels, rather than relying on potentially outdated industry benchmarks.

3. Improving lower funnel measurement with **research-informed bias correction by leveraging Google Query Volume.**

Here is why these innovations are exciting:

Calibration with Incrementality Tests and Time-Bound Priors

The integration of incrementality tests within MMM offers a significant advancement in understanding media performance dynamics. By incorporating incremental Return on Ad Spend (ROAS) as a prior tied to specific time periods, the model can adapt to shifts in media effectiveness. This approach acknowledges that strategies evolve, and yesterday's performance isn't necessarily indicative of today's results. Traditional MMMs often averaged performance over extended periods, potentially blurring the impact of recent changes. This calibration enhances accuracy and responsiveness to evolving media landscapes.

Reach and Frequency: Unveiling the Nuances of Exposure

Transitioning from cost and impression-based inputs to Reach and Frequency metrics in MMM marks a pivotal shift. Impressions alone can obscure the true nature of ad exposure. For instance, 100 impressions could signify 100 unique users with single exposures or 20 users with five exposures each.

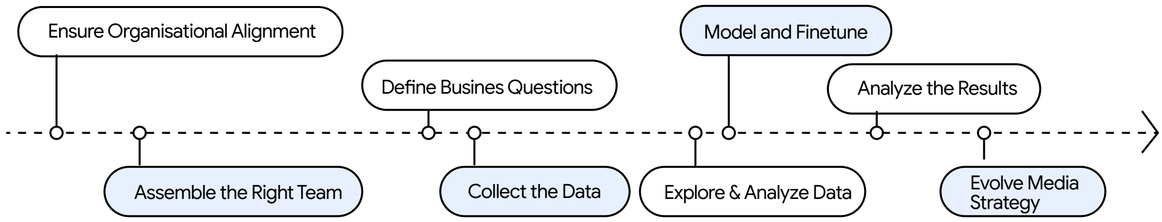
These scenarios likely yield different outcomes, yet impression-based models might treat them as equivalent. Google's research underscores that Reach and Frequency inputs enhance model fit and ROI accuracy, enabling marketers to strategize based on optimal reach and frequency levels rather than extrapolated guesses from impression-based data.

Fair Representation of Search: Integrating Consumer Intent

Accurately modeling search within MMM necessitates recognizing its dual nature: a blend of 'push' advertising and 'pull' consumer behavior. Google Query Volume reflects consumer interest and brand awareness, potentially influencing both paid and organic search clicks. Omitting this factor can skew ROI estimations, especially for brands with strong correlations between paid search and outcomes. Incorporating Google Query Volume into MMM ensures a fairer representation of search's contribution, accounting for the interplay of brand interest and ad exposure.

The evolution of MMM doesn't stop with these enhanced features. Open-source architecture empowers customization and adaptability. Marketers can integrate select features into their preferred modeling packages, fostering a tailored approach. The inclusion of graphic outputs aids in interpreting results and informing data-driven decisions. This transparency and flexibility enable marketers to take ownership of their MMM processes, fostering a deeper understanding of media effectiveness and ROI.

How to implement Meridian in-house



Before building your MMM, it's crucial to lay the groundwork for success. This starts with securing organizational alignment. A successful MMM program requires strong cross-functional collaboration, especially between Marketing and Finance. Secure buy-in from key stakeholders by clearly demonstrating how the MMM will address their specific needs, such as optimizing marketing spend for Marketing and understanding competitive impact for Finance. A C-level sponsor can be instrumental in driving adoption and ensuring MMM insights are used to inform strategic decision-making.

Once you have stakeholder alignment, it is imperative to assemble a team with a balanced mix of expertise: Data Science, Econometrics, Business Intelligence and Marketing. Data scientists with econometrics experience will ensure the model is reliable and well-designed, while stakeholders with business and marketing expertise will provide crucial context and data for a meaningful MMM.

When the right team is in place, you can focus on defining the business questions that will determine the model scope. This will help ensure the right model design and actionability of results. It’s worth mentioning that an MMM is not a silver bullet of measurement, and for more tactical questions (e.g., How will a change of creative messaging impact my revenue?) a different measurement solution such as an Incrementality Test will be a better fit. Once you collect a full list of business questions, you can map them to the right measurement tool. These are some common questions that can be best answered by MMM:

Questions MMM can answer

1. What was the sales contribution (online and offline) attributable to each media channel?
2. What was the Return on Investment (ROI) for each marketing channel? How should budgetary allocations be optimized across channels to maximize ROI?
3. What is the optimal allocation for the next Marketing Pound?
4. In the event of a required marketing budget reduction of X%, which channels should be prioritized for decreased investment?
5. How does the execution strategy of channels such as YouTube (e.g., campaign objective, frequency, creative quality, or targeting parameters) influence their performance?
6. Is a price adjustment warranted? If so, how much can we increase the price?
7. What is the impact of competitor advertising activities on our brand performance?
8. What is the incremental revenue generated by promotional activities?

These questions will inform and determine the necessary input variables and structural design of an MMM. For instance, to effectively address question #7, granular data for executional or creative elements will need to be systematically collected and integrated as model inputs. Hence, this is an integral step of laying the groundwork for an in-house MMM.

Once you have a list of business questions signed-off by all the cross-functional stakeholders, you can start fueling your model with high-quality data. A robust MMM requires comprehensive data covering a significant period, ideally 2-3 years. If your business has a long purchase cycle or wishes to analyze the longer term impact of media on sales, you may want to collect 4-5 years of data. This data should cover all meaningful business drivers and must be aligned with the list of business questions. The data required for an MMM typically includes:

Variables for MMM

Marketing Activities:
Detailed data on all paid, earned, and owned media channels, including spend, impressions, clicks, etc.

Sales or Revenue Data:
Granular sales data (daily or weekly) to track the impact of marketing efforts.

External Variables:
Data on factors like seasonality, weather, economic conditions, competitor activities, and pricing changes that can influence sales.

Promotions:
This can be represented as depth of price cut or volume of discounted goods sold

CRM:
emails sent

Loyalty:
Can be represented by CRM activities if you track Loyal customers (e.g. # customers signed up to Loyalty program or # emails sent to loyalty segment)

Any major step changes in strategy or hurdles that could have impacted revenue: e.g. dummy variable for a week with website downtime or supply chain disruption

Distribution:
E.g. # of stores opened or POS

For more tips on data collection, **see this handbook.**

Gathering MMM data can be time-consuming, but Google MMM Data Platform data feed can significantly streamline the process. This free tool provides all advertisers granular, MMM-friendly data for all your Google campaigns. Learn more about how it can save you time and effort here. You can also take advantage of streamlining the data collection process using Google Cloud Services.

Once you align on your Meridian scope, you can move on to the most exciting step - modeling! You can find a detailed Meridian User Guide here.

When you have a stable model in place - it's time to get analysing the outputs. Since MMM is a blend of art and science, this step requires inputs from your Media Team to help interpret the results: e.g. not all impressions are created equal and it's crucial to contextualize your ROIs within the media landscape to make the right budget allocation decisions.

Meridian Implementation: Your Roadmap to Success

Forge a Unified Vision: Ensure organisational alignment, secure buy-in from key stakeholders in Marketing and Finance, and establish a C-level sponsor for program success.

Set Expectations: Assemble a balanced team with expertise in MMM and manage expectations for time and resource commitment.

Fuel Your Model with Data: Gather 2-3 years of comprehensive data, including marketing activities, sales, external variables, promotions, CRM, loyalty programs, and any major strategic shifts.

Scope Research Questions: Define the key questions you want Meridian to answer, such as ROI of your media mix, channel effectiveness, and budget optimization strategies.

Model Building and Analysis: Follow the Meridian User Guide for model building and leverage your media team's expertise to interpret results and contextualize ROIs.

Evolve your Media Strategy: Use Meridian findings to optimise budget allocation and future campaigns, and iteratively improve your media mix ROI with each model refresh.

Pro tip: engaging stakeholders to create buy-in

Whom:

any stakeholder who may be using the model and / or has insight into possible drivers of sales.

When:

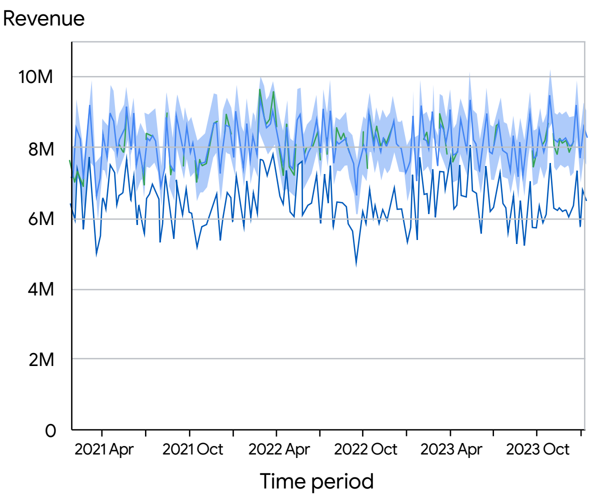
- **Before** designing the model:
  - Collect a list of possible factors that influence sales
  - Discuss data requirements and data availability
  - Secure commitment to provide the data
- **During** modeling:
  - Confirm initial results make sense and reflect stakeholders understanding of the business
  - Ask for insights that can help calibrate the model
- **After:**
  - Review the final model results and engage in contextualizing in strategy
  - Discuss how results can be used to drive business objectives

Interpreting and activating Meridian Insights

MMM result	How to interpret	Relevant context
Baseline revenue/sales	Revenue or sales that would have occurred anyway and are not driven by paid media.	Ask measurement and media partners for insights. Mature markets with high brand awareness should have a higher baseline vs growth markets with lower brand awareness.
% Contribution per Channel	% revenue or sales driven by a marketing channel (also known as effectiveness).	This may not necessarily align with the share of investment per channel; some channels are more effective than others.
Channel ROI	Return on investment for a marketing channel (also known as efficiency).	Calibrate with incrementality studies. If channel ROI is soft, explore whether the execution could be optimised. Keep in mind that ROI can appear higher for channels with very low investment, and ROI can appear softer for channels with high investment. For this reason, it's important to review both % contribution and ROI per channel.

Do you have your first model built in Meridian? Congratulations! Let's dive into the results and what they mean for your business. One of your first outputs you will see is how closely Meridian can estimate your sales from the inputs you provided. Expected and actual sales lines should be fairly close, but they will never be identical. It is hard to understand whether a model did a good job estimating sales from the graph alone, which is why model fit metrics are important. R-squared shows the proportion of variation in sales that is explained by the model. Anything higher than .80 is considered to be pretty good, although oftentimes you should be able to achieve an even better fit, like .90 or above, provided high quality and comprehensive data is available for the model. MAPE shows mean average percent error. It is normal for all models to have some error and is nothing to be alarmed by.

Expected revenue vs. actual revenue



Note: The baseline represents the expected revenue without any media execution. The shaded blue area represents the 90% credible interval.

Model fit metrics

Dataset	R-squared	MAPE	wMAPE
All Data	0.93	1%	1%

Note: R-squared measures the amount of variation in the data that is explained by the model. The closer it is to 1, the better the model fit. MAPE measures the mean absolute percentage difference between the expected and the actual. The closer it is to 0, the better the model fit. wMAPE is MAPE weighted by the actual revenue.

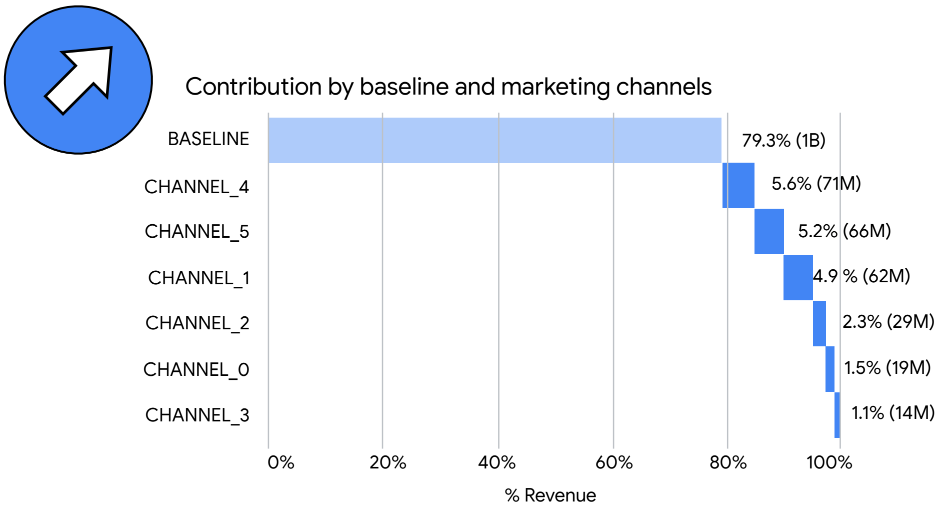
Here are two things that are especially insightful from this view:

- **Baseline sales:** this is the revenue that you would end up with if you were to cancel all media and marketing activities, in the short term. This is the first glimpse of the actual value media and marketing bring to your organization!

- **If your model is missing a factor**: you might see more pronounced gaps between actual and expected sales during periods where there may have been a factor present that affected your sales. Sometimes these differences are seen in recurring intervals, suggesting that a factor was not a one off but occurs periodically. This is a signal that a model can be improved if the missing factor is identified and added to the model.

The contribution view is going to give a much sharper image of your media performance. Here you can not only visually see that only a portion of your sales is in the baseline and you need your media channels to drive the rest, but you can always quantify these effects. This can be a powerful insight to share with CFOs when they propose reducing the marketing budget for short-term cost savings. In this example, revenue would decrease 20% without paid media.

And to make matters even worse, 20% drop in revenue is only the short-term result of canceling media investment. Media is required to sustain and grow baseline and without it, the baseline erodes, meaning an even larger share of sales would be lost in the long term.



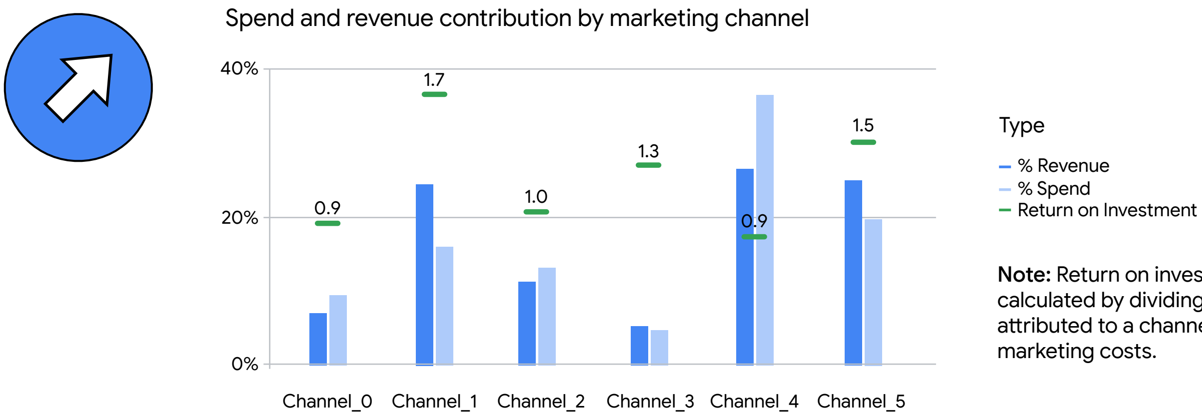
Note: This graphic encompasses all of your revenue drivers, but breaks down your marketing revenue by the baseline and all channels.

Besides changing the perception of media investment as a cost center and helping the CFO see it as a source of revenue, the contribution shows the relative importance of channels in driving sales by showing the share of sales each channel is responsible for. Contribution is a function of both investment levels and profitability, so it is not the best view to decide which channel is most profitable in driving sales.

Channel profitability is best learned from the ROI slide like this one, which shows **historical ROIs** by channel. Here we have a share of revenue and share of investment shown as bars and the resulting ROIs.

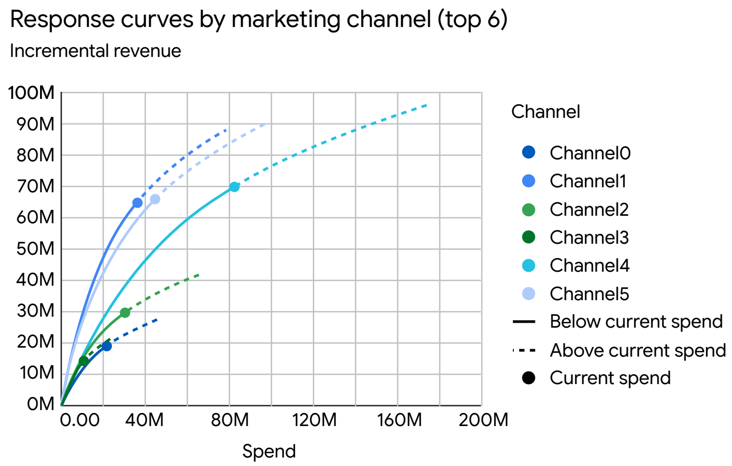
More profitable channels will drive a higher share of sales than their share of investment and vice-a-versa.

What is more, it is quite typical to see higher ROIs on channels that have low investment levels and lower ROIs on those with higher investment levels. The reason for this is diminishing returns.



Note: Return on investment is calculated by dividing the revenue attributed to a channel by marketing costs.

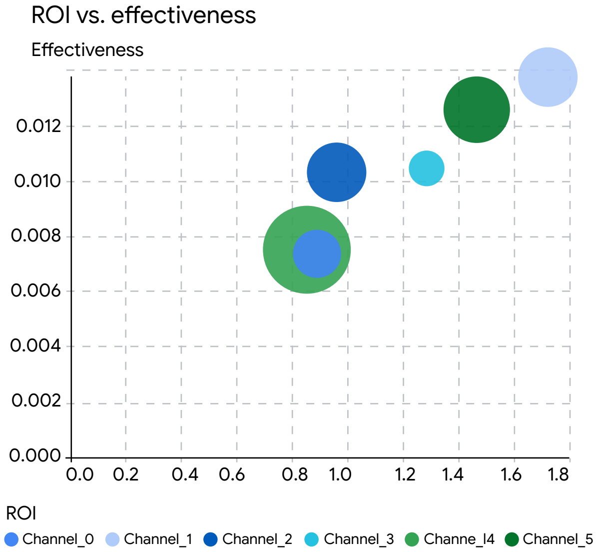
Diminishing returns in media means that at a certain point, spending more money or effort on a media channel doesn't give you the same increase in results as you got from your earlier spending. This relationship is well demonstrated by the response curves that plot media channel investment and the revenue generated at each point of investment. By examining the curves we can begin to understand each channel's potential for driving additional sales with increased investment. Response curves also help us calculate marginal ROIs, which are required for finding the best media mix to optimize sales and strategically expand (or reduce) budgets. Marginal ROI calculates the return on investment from the next unit of investment (insert your currency of choice here).



Note: Return on investment is calculated by dividing the revenue attributed to a channel by marketing costs.

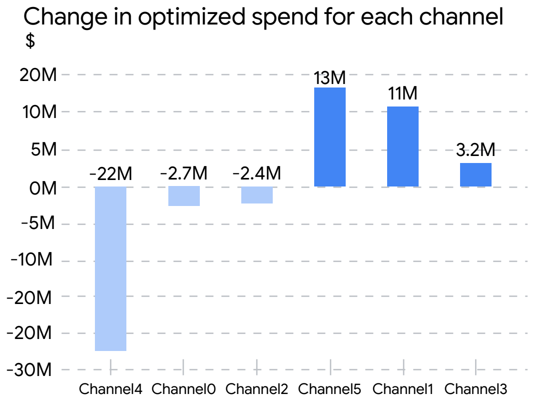
Knowing Marginal ROIs is critical for media optimization, but we need to consider the size of the channel. This insight can be inferred from the ROI vs effectiveness view, which shows ROI, effectiveness (or total revenue generated by each channel and the size of the investment).

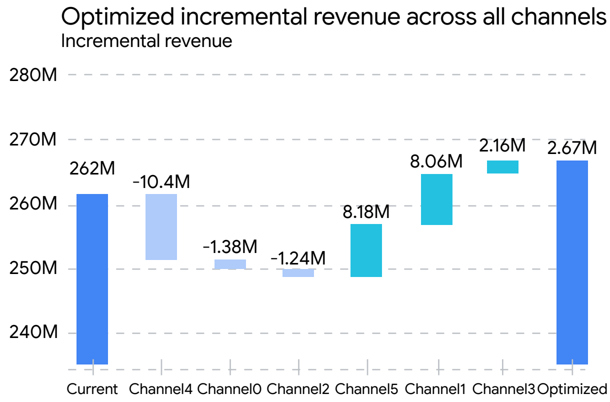
In this example, channel 4 commands the largest share of investment of all analyzed but also has a lower ROI then most channels. This makes channel 4 the most likely channel to donate budgets to other, more efficient channels.



Note: Effectiveness measures the incremental revenue generated per impression. A low ROI does not necessarily imply low media effectiveness: it may result from high media cost, as positioned in the upper-left corner of the chart. Conversely, a high ROI can coexist with low media effectiveness and low media costs, as indicated in the bottom-right corner of the chart. The diagonal section of the chart suggests that the ROI is primarily influenced by media effectiveness. The size of the bubbles represents the scale of the media spend.

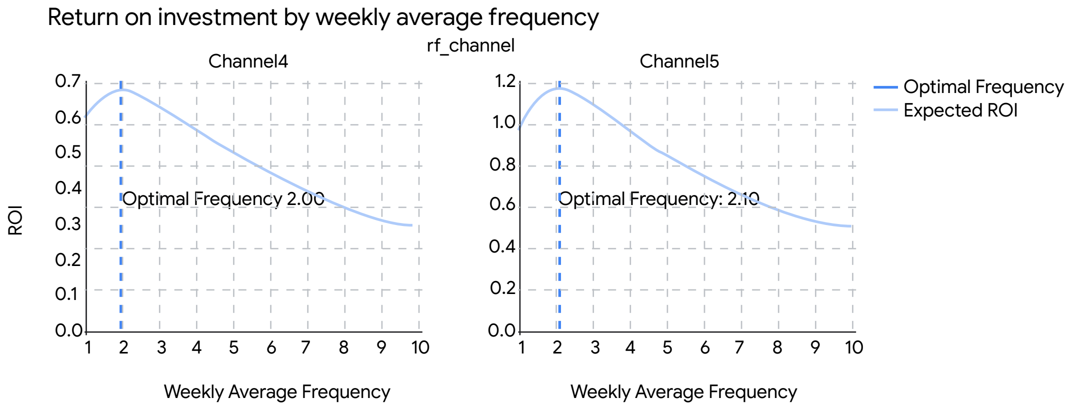
Now that you understand media channel performance and how they compare to each other in efficiency and effectiveness, you can begin to plan media budget optimizations to get the most out of your media mix. Meridian translates insights into budget recommendations and even shows how revenue would respond to the new media mix.





What is really exciting is that Meridian does not limit insights to how channels performed in the past and how to optimize investments, but it can also provide valuable insights into managing reach and frequency to get the most out of channel performance. Typically ROI is correlated with reach: as long as there are relevant audiences available who have not seen the ads yet, there is room to invest to reach these audiences. But Frequency requires a more nuanced approach: under-exposing and over-exposing audiences can significantly limit the channel's ROI.

By using Reach and Frequency from Google's MMM Data Platform as inputs, Meridian can pinpoint optimal frequency levels of each channel, which means that you do not waste impressions by over-exposing audiences who have seen the ad enough times.



Interpreting and acting on MMM insights is the most critical step in any MMM project. Incorrect conclusions can lead to wrong steps. Therefore, due diligence must be given to putting MMM results in the business context. As any model, MMM is an aide to judgement, and not the only source of truth to rely on The modern measurement playbook explains how MMM should be combined with incrementality tests and attribution for a more holistic view of media effectiveness. At the same time, business context matters too. Change in environment or other pillars of marketing such as price or distribution, can have an effect on media strategy. For example, pricing power requires media investment and sustaining sales with price increases calls for investment in brand building. More on this read Effectiveness Equation.

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