



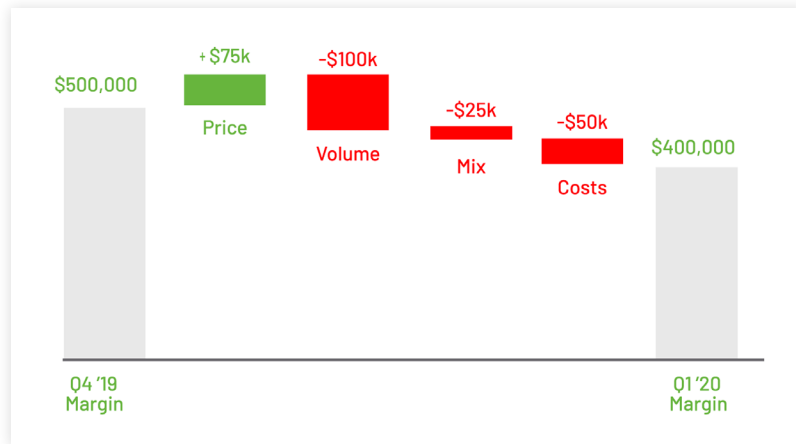
GUIDE

A Practical Guide to Price / Volume / Mix Analysis Insights

Un-box the drivers of margin changes and stabilize profits
by creating your business-specific price/volume/mix model.

The challenge: reliable, repeatable, rapid PVM analysis

For decades, Price/Volume/Mix (PVM) Analysis has been used in commercial reporting to provide key performance indicators (KPI) at the corporate level when comparing two time periods. An example:



Fun Fact: PVM analysis is also commonly referred to as variance analysis, margin bridge, or revenue bridge. The old timers will call these bridges a walk.

The main purpose of PVM analysis is to provide a high-level overview view into the past, and to break down the change in revenue or margins into some key components or categories. The categories are used to highlight and help explain how much of the overall change in revenue or margins was caused by, e.g. the implemented price changes, versus changes in total costs, versus the impact from change in volumes, versus changes in currency fluctuations or other effects, comparing two different time periods.

The key question for the CFO and commercial team:

- What were the drivers for change in margins versus last quarter or year?

For pricers, the high-level analysis mainly confirmed the trends that they experienced and had expected to show up in such a highly aggregated report. Pricers did not place much attention to these reports because these corporate level reports did not unveil new findings. They did not have the needed level of granularity within each category. Instead, a report is more of a container for different effects, and these reports also lacked capabilities to drill-in and slice the business into more granular/lower levels,

The models at hand were unable to accurately decompose the business in a meaningful way due to:

- The fairly complex calculations in combination with large datasets
- Limited ability to 'drill-in' to increase the transparency
- Failure to identify inconsistencies across different business slices

These challenges made it hard or impossible for the pricers to leverage the PVM reports as a valuable source to identify price or margin leakages as a basis for better pricing decisions.

Key questions for the Pricing team and their management that were left unanswered:

- Did we achieve what we planned to achieve?
- What are the areas where we fell short and what was the root cause?

In this guide, we will share specific PVM use cases and the leading practices on how to address these use cases most effectively. To illustrate, we will use the Vendavo Margin Bridge Analyzer. Since it is a SaaS solution, it is robust, flexible, and scalable for any enterprise.

While there is no "easy button" or "click-to-fix button" for B2B industry and customer business-specific pricing processes, the purpose of this guide is to provide pricers with a valuable tool set to take PVM analysis to the next level by leveraging enhanced capabilities to gain detailed contextual insights drive action and thus improve your profitability.



How to gain actionable insights?

- 1 Data-richness of available dimensions, attributes and measures
- 2 The drilling dimensions and the drilling path
- 3 Defining your business-specific PVM Model
 - ▶ The 'Cost Effect'
 - ▶ The Interaction between Volume and Mix
 - ▶ The Exchange Rate Effect
 - ▶ New-/Non-repeat Business Effect
 - ▶ Impact of changes in List Price on Revenue
- 4 Peer benchmarking
- 5 Leading Practice Examples
- 6 Derived actions from a PVM analysis
- 7 Conclusion

1 Data-richness of available dimensions, attributes, and measures

Broadly speaking, the key data used for analysis starts with characteristics describing products, customers, and transactions. The level of detail of these characteristics (all waterfall elements) will determine the level of granularity in your analysis.

- a. This data-richness is essential to being able to decompose the impact of specific and more granular 'cost' drivers and their impact to changes in margin.
- b. It provides the users more flexibility to slice and dice the data and benchmark different business areas side-by-side.
- c. It enables new use cases for your analysis:
 - i. Benchmarking performance where target guidance was made available and used, versus where it was not followed/used, and compare it with the performance of your business without target guidance.
 - ii. Separating specific business transactions and show the margin impact in a separate category, e.g. new product introduction.

For a highly aggregated view, i.e., a global commercial report with key metrics, a dataset that has only a very few number of columns, such as date (day or month), product, customer, currency, unit of measure, quantity, total revenue and margin (for margin-based model) would be enough for the calculation of main effects.

However, to support the pricer to do a meaningful analysis, i.e., to identify under performing business areas based on more granular breakdown of the 'containers' of 'Total Costs' or 'Mix', down to a level where he/she can quickly pinpoint the root-cause for margin variation, an enriched dataset is required and should include:

- Geographic, product, and customer hierarchies
- Sales channel, customer (customer type, industry, class) and product attributes (e.g. plant), and other relevant market or segment attributes
- Transaction attributes (pricing, contract or order type, pricing currency,...)
- Additional price adjusters, i.e. rebates, customer discount, customer surcharges, and/or more detailed cost elements such as fixed and variable costs, logistic and warehousing costs, etc.

To enable pricers to do a meaningful and in-depth PVM analysis, a dataset should be enriched with 25 to 100 most relevant dimensions or attributes and have 5 to 10 Price, costs, price adjustment and margin measures.

2 The drilling dimensions and the drilling path

Enabling drill-through and into all relevant business dimensions is a critical component to get to the level of granularity needed to draw the right conclusions based on the PVM analysis outputs. All the levels that you include in the drilling path at the same time are a key component of the match criteria.

As you drill through, such as from Total aggregated business view through:

Region ► Country ► Sales Channel ► Customer Industry ► to the Customer Level

You want to assess the impact of change in price, costs, volume and mix on the margin across two time periods at this specific/same customer. If your path also includes product level, you want to assess the changes of all the different categories, plus their interaction and impact on margin for the exact customer and product combination within a selected customer industry, channel, country and region.

The match criteria for your PVM analysis, comparing two different time periods, are defined by your hierarchical drilling dimensions. To ensure consistent PVM analysis results, when drilling through the different levels of all defined business dimensions the margin impacts of the different model categories are calculated on the lowest level of your drill-through path and summed up for aggregation on higher levels. With this determination of the match in mind – combining all hierarchical business dimensions including the lowest level for 1:1 comparison across two time periods to run the margin/revenue change impact computation – what is the appropriate level for comparison?

This very much depends on your business, the structures, the hierarchies and attributes that you have in place for managing your portfolio and customers, and the purpose of your specific PVM analysis.

For Example: A product description level analysis would serve your needs in a scenario where you have multiple different SKUs for the same product, e.g. depending on the plant or supplier, but fulfilling the same purpose and at same level of quality. In some cases going one level up in your product hierarchy, e.g. on product sub-group or group level, might serve the need, especially if there is no regular cadence in product purchase on product level and hence the chance of a 1:1 match across two different time periods on product level would be very low.

The entire path including the very last dimension determines the lowest/ most granular level that you can drill through and at the same time determines the 1:1 match criteria for PVM computation.

3 Defining your business-specific PVM model

Different functions in your organization, and the various stakeholders in different parts of the business have very specific needs. Anyone responsible of a P&L will want their own view.

As an example, the organizational setup and the go-to-market process or channels in one region might be very different from other regions or the structure in the product portfolio, as the number of levels in the product hierarchy, product attributes, product value drivers, etc. might vary from one business unit to another.

To leverage the insights from the PVM analysis, and use it effectively across your organization, to create value, it is essential that users can easily set up and adjust the PVM model to suit their specific business needs. Some examples in increasing levels of granularity:

- a. The 'cost effect'
- b. The interaction between volume and mix
- c. The exchange rate effect
- d. New-/non-repeat business effect
- e. Impact of changes in list price on revenue

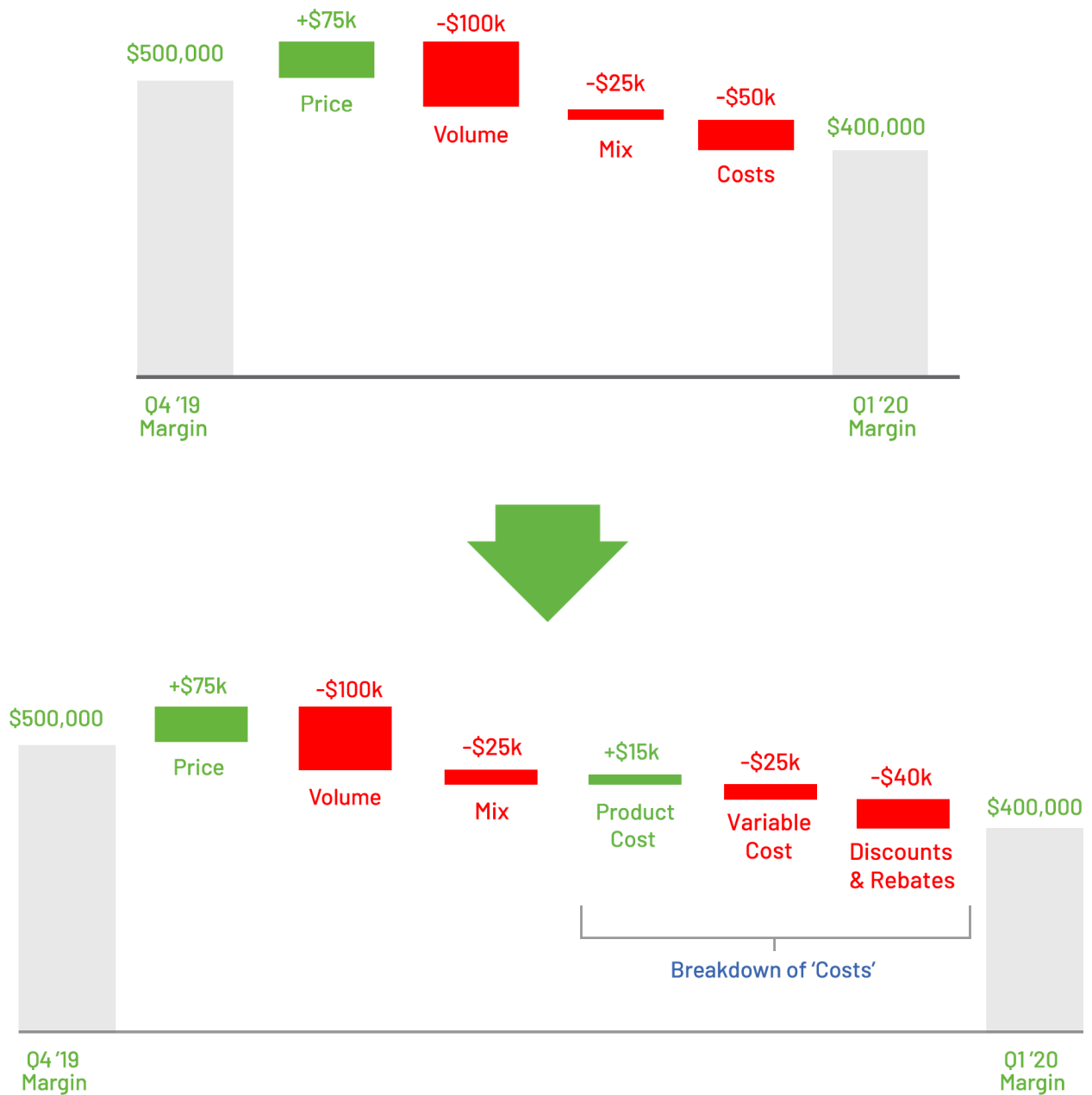
A. The 'Cost Effect'

Un-boxing the black box of 'Total Costs': Imagine a scenario where product costs went down but overall 'costs' have increased and the cost effect on aggregated level shows a negative margin impact. Why is this? There might be multiple explanations for it:

- i. Variable costs might have increased?
 - ii. Marketing and Sales changed the customer rebates?
 - iii. Payment Term Costs or Freight Costs contributed negatively to the 'Total Costs'?
- ... and each of these might cause an unfavorable and negative cost effect versus past period.

What if the model could provide you with a detailed breakdown of the main adjusters and cost elements right away?

With the additional insights you can derive from the more granular breakdown in your PVM model, the analysis outputs help to pinpoint the specific driver for margin variation very efficiently.



Decomposing the cost effect 'container' and breaking it into further categories, directly linked to specific waterfall adjustments, makes the PVM model more insightful and actionable!

B. The Interaction between volume and mix

Change in volume has an impact on the portfolio mix when aggregated up to a higher level on your business hierarchies. Understanding the interaction of change in volume versus all resulting changes in contribution on a different level of aggregation along your business hierarchies is key to drawing the right conclusions about the overall impact volume had on your business.

In general, the volume effect represents the effect of revenue/margin change due to changes in volume with an assumption of unchanged prices/margins across the comparison periods.

When the PVM model does not have a separate 'Mix' effect, the volume component becomes the container for:

- Impact that the change in quantities had on the revenue or margins
- Carries any change in revenue/margin caused by changes within the portfolio

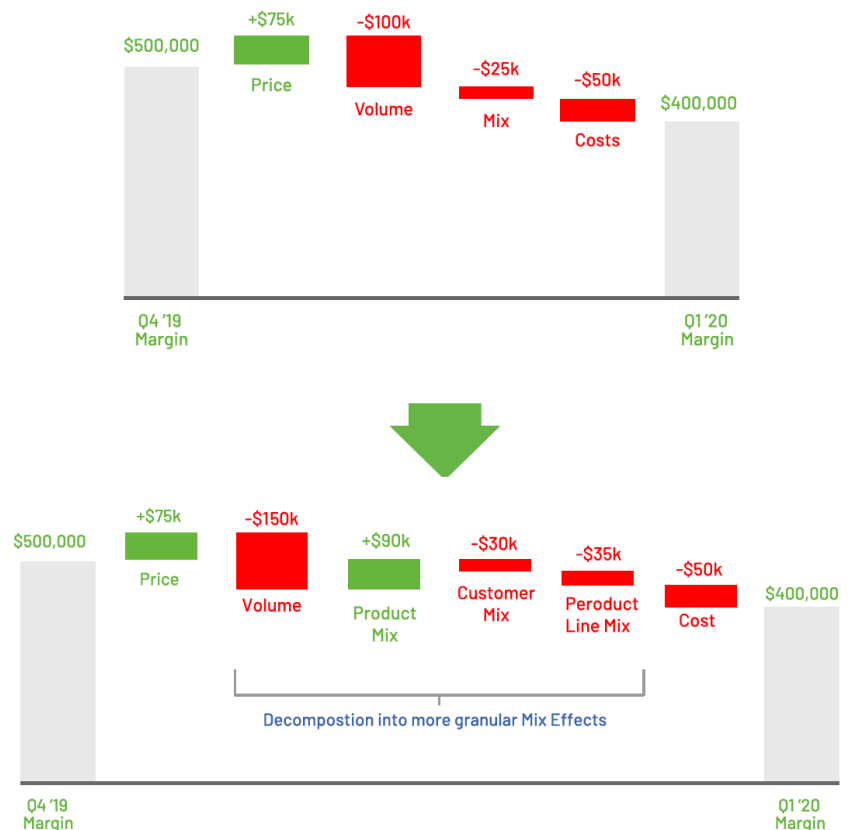
Both of these changes are represented in the volume effect.

When the PVM model does include a mix effect, the Volume effect is decomposed further into a computed/'adjusted' Volume effects with discrete mix effect's.

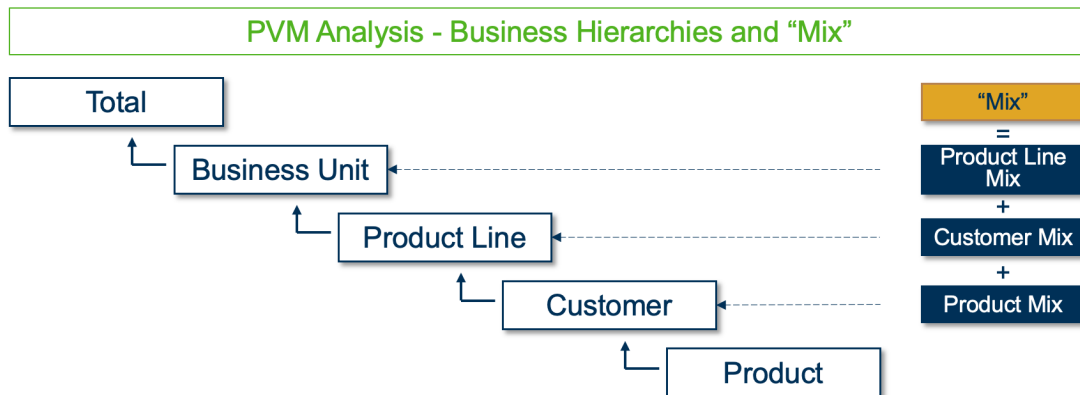
The goal is to separate the impact of change in total volume on revenue/margin (volume effect) and the impact of change in relative contribution on an aggregated level at the relevant business hierarchies (mix effects).

- The mix effect represents changes in the portfolio of selected mix dimensions and how such change affected your revenue or margin.
- Mix effect is the sum of changes in relative contributions at a given level of aggregation.

Example: Product mix on aggregated customer level = change in product portfolio, i.e. change in purchased quantities across same set of products at a same customer.



- Mix effect = change in relative contributions occurs at all levels in your business hierarchy when aggregating on different level (see picture below)



Example: An unplanned purchase of huge quantity in a product by one customer typically contributes nicely to the volume effect. If the price of this product is comparable low versus all other products purchased by this customer, this purchase - causes a change in product mix at the customer level - to have a negative impact to the change in revenue or margins.

To get a full overview of 'Mix' on top of the product mix at customer level, the changes that need to be considered are:

- The change in relative contribution of all customers on aggregated product Line level.
- The change in product portfolio = product line mix on business unit level.

Mix is typically nothing you can control and is very hard to manage pro-actively (if at all). However, it can increase the transparency on the impact some of your strategic decisions had on the mix and related impact on revenue/margin, e.g., to quantify the impact of a big global account that you acquired (or lost), or the impact on product mix driven by a new plant that you took into operation.



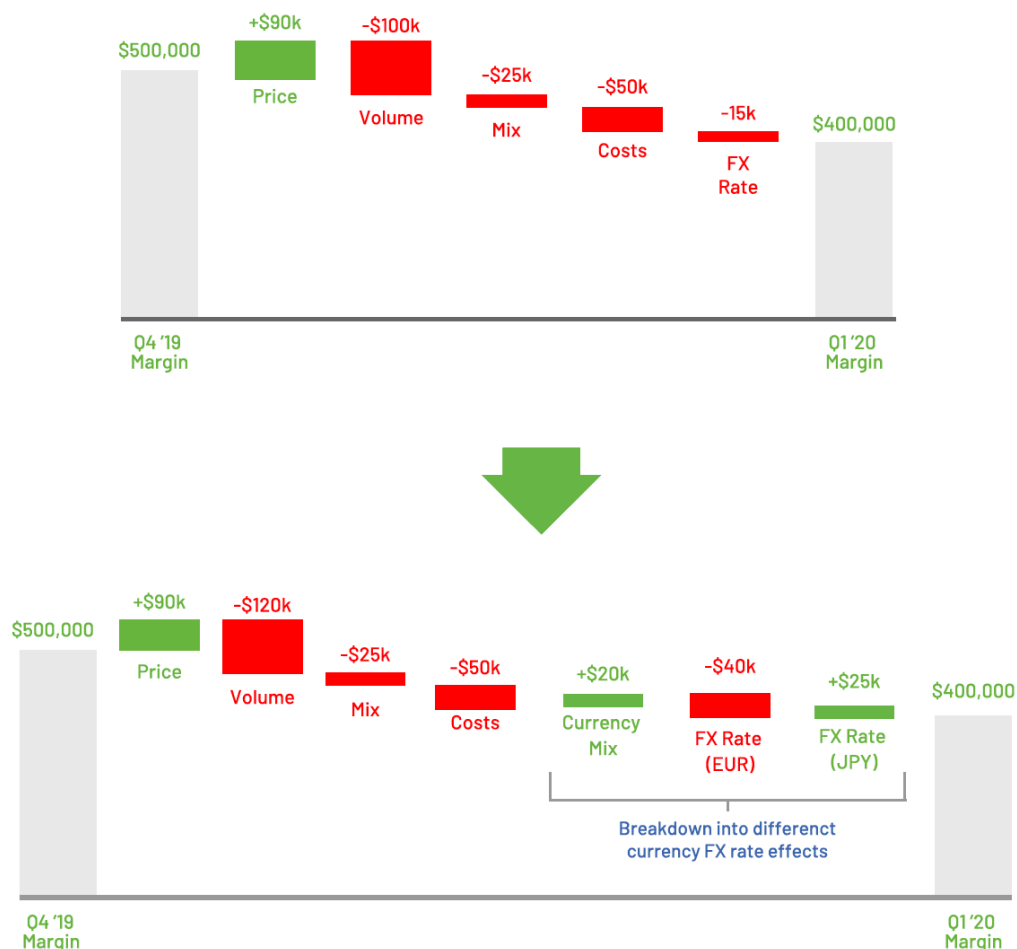
C. The exchange rate effect

Decomposing the exchange rate effect, somewhat of a 'blackbox', into the different currencies or group of currencies enables more strategic volume re-allocation in some industries or businesses, to benefit from regional currency fluctuations.

In some industries and businesses, where volumes get allocated and shipped to different regions and sold in multiple local currencies, currency fluctuations play a critical role.

Being able to assess the impact driven by changes in exchange rates by different currencies and using these insights for a strategic re-allocation and shipment and sales. In this way you can make the shift to of higher volumes in regions with more favorable exchange rates and unlocks new 'playbooks' to capture additional profits for these businesses.

You can attain a higher level of granularity by unboxing the 'Mix' into different mix effects to help identify trends and better understand the drivers for revenue/margin variation.



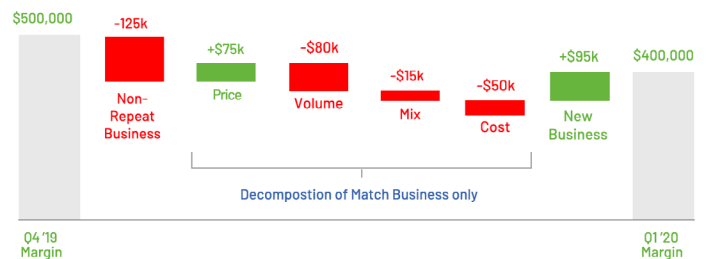
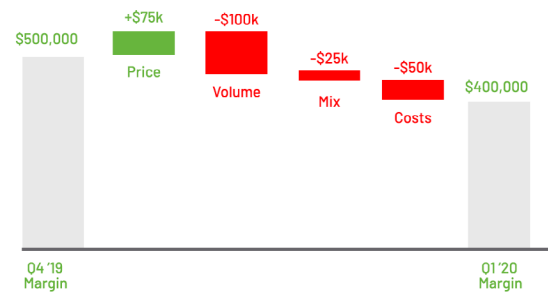
D. New/Non-repeat business effect

Comparing and assessing price levels or volumes in one period versus another on a very granular level, e.g., on the customer + product level, typically only makes sense if there is a purchase for that customer + product in both time periods. Only if there is a 1:1 match will the decomposition into all the different categories provide you with solid and relevant insights.

Separating the revenue/margin related to 'Match Business' from the non-repeat and new business is essential to get reliable outputs from your PVM analysis.

It enables you to put the focus on the business that is comparable and as a result the decomposition into the distinct categories, and their impact on change in revenue/margin, becomes much more relevant.

The more granular you get, the more specific you need to be about what is considered as a match in your PVM analysis.



In a model without separation of new/non-repeat business, related revenue/margin goes into the volume effect, or if decomposed further, also into the mix-effect. The volume and mix effect values are skewed, as they are carrying related revenue/margin delta coming from 'non-match' business transactions.

Enhancing the PVM Model by separating the 'non-match' from the 'match' business transactions makes Revenue/Margin changes transparent, that accrued on most granular level, e.g. on customer + product level.

By focusing on the decomposed effects in the matched business, the model provides you with reliable results and enables pricers to draw the right conclusion and take corrective actions from the PVM analysis.



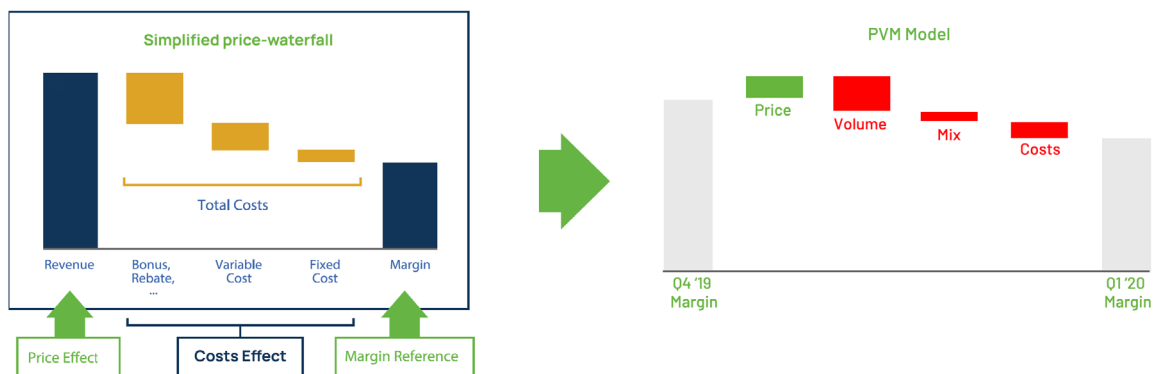
E. Impact of changes in list price on revenue

In businesses, specifically in the distribution Industry, where revenue is a function of the supplier list price, a PVM analysis can be used to provide better transparency on all the different drivers for change in revenue/ margin.

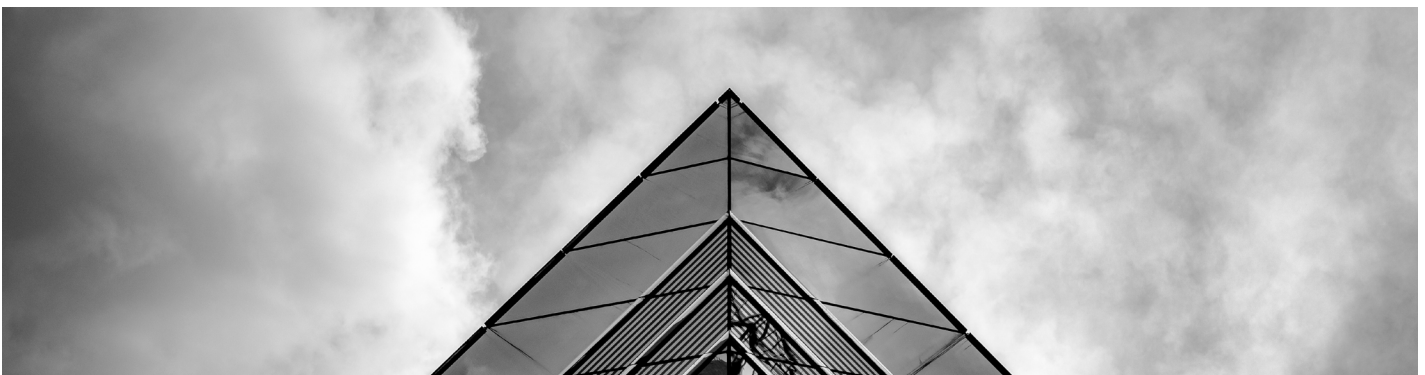
Understanding the impact of the various price adjustments and the interaction between list price change versus other on-and/or off invoice adjustments and their impact on gross or net revenue helps to refine your pricing strategy and protect both, your top and bottom line.

It enables you to assess the impact of your supplier's list price changes on your organization's revenue in the context of volume, mix and other price adjustments such as regional or market price adjustments, or customer-related discount effects.

The margin model in all the examples in this chapter was set up in a way that it used base and current margin price points from a price waterfall as the anchors to build out the PVM chart or margin bridge, and referenced to the revenue price point, to calculate the price change effect from one period to another.



Applying the same logic and allowing the user to select and map different price points to the PVM model, i.e. using different price points for the "margin" and for the "revenue" reference, provides full flexibility and enables new use cases.



By selecting different price points from the waterfall, e.g. using list price as the reference to calculate the price effect and the invoice price as the anchors for “margin” provide full visibility on the impact of list price changes alongside other relevant change effects or categories across different time periods:



Allowing the user to select and map different price points to the PVM model, i.e. using different price points for the “Margin” - and for the “Revenue” reference, provides full flexibility and enables new use cases!

A pre-requisite to enable the selection of different price points for setting-up different PVM models is, that the underlying dataset has all the required measures, and that these are all maintained and populated for all the rows or transactions in your dataset.

Data quality is key, especially if you want to decompose the 'Total Costs' into specific price adjustments or cost elements for a more granular breakdown in your PVM model.

Depending on the purpose of your PVM analysis and model, it might make sense to include/add filters to the dataset to ensure that the analysis outputs and suggested actions are on the spot and derived from meaningful and solid data, focused on just the subset of data that 'qualifies' for this specific analysis.

Example: If you choose to set-up a PVM model and run a PVM analysis looking into the impact of the change in list price on your organization's revenue (example above), you would want to filter out any rows or products that do not have a list price in the dataset.

4

Peer benchmarking

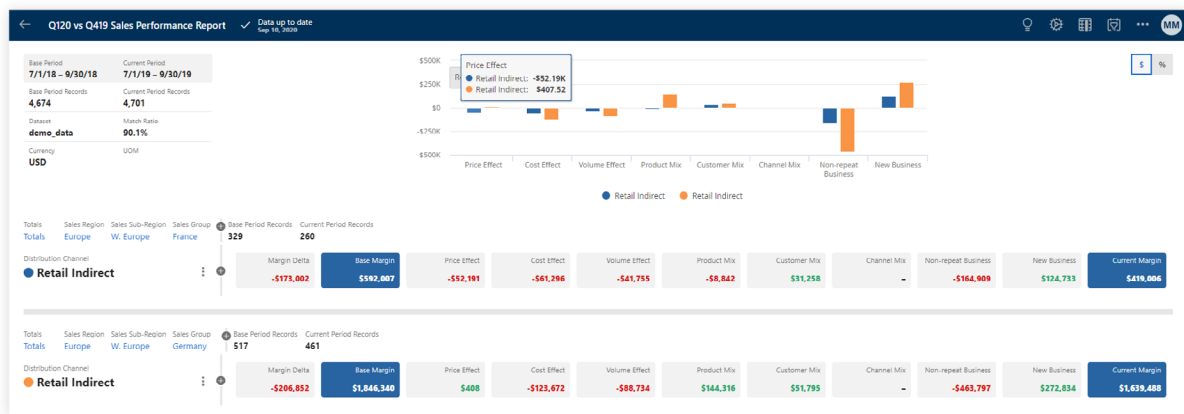
Despite similar patterns or trends, e.g. within a country, market, sales channel or groups of customers, there are always exceptions, both in a positive and in a negative direction.

Being able to benchmark positive peers against other customers or products across any dimension of your business is very powerful, i.e. bringing concrete examples to the table to challenge the status quo and learn from your existing peers.

Think about a scenario where you were able to recover increased costs by adjusting prices accordingly and at the same time were able to recognize margin gains from selling higher volumes.

If this worked well in one country for a specific customer type or group, but the trend went in an opposite direction in other countries, this might be worth a more detailed review and discussion with the sales executives and marketing team involved. If you can implement actions directly from your PVM analysis to replicate what helped to drive this favorable move or provoke change in other countries with similar customer groups, then price/volume/mix analysis becomes an effective solution to capture additional revenue and margin opportunities.





This peer benchmarking use case opens up new use cases and addresses the needs of other stakeholders and roles within your organization.

Now PVM analysis outputs can provide relevant and easy to use insights for account managers who look at out- or underperforming customers within their territory, or sales directors who look at the top five and bottom five customers in terms of margin delta from one period to another. They can even compare the different drivers or categories and their impact on the margin variation.

The PVM analysis outputs with peer benchmarking provides increased transparency and can be used as a very powerful solution for regional or country leaders. These reports can be used for regular performance reviews and as a starting point to spot areas that need a more detailed assessment. This peer benchmarking example opens new use cases that beckon the need for other stakeholders and roles within your organization to utilize PVM analysis.

Leveraging PVM analysis outputs in a comparison view - using peer benchmarking across all categories that drive margin variation - is very powerful and addresses the needs of different stakeholders within your organization, e.g. regional & country level executives or sales reps.

5 Leading practice examples

In the previous chapters we described key concepts and provided options with additional practical guidance on how you can enhance your business-specific PVM model to increase the level of granularity. In this chapter, we'll examine best practice examples which we have collected from our customer base across different industries.

When you apply these concepts and create your own and very business-specific PVM model, you should select and combine different PVM model options that fits your specific analysis needs or reporting purpose.

Different stakeholders have different PVM model and analysis needs. As a result you typically would prepare different 'flavors' of a common PVM model or create different models, with different level of granularity for different purposes.

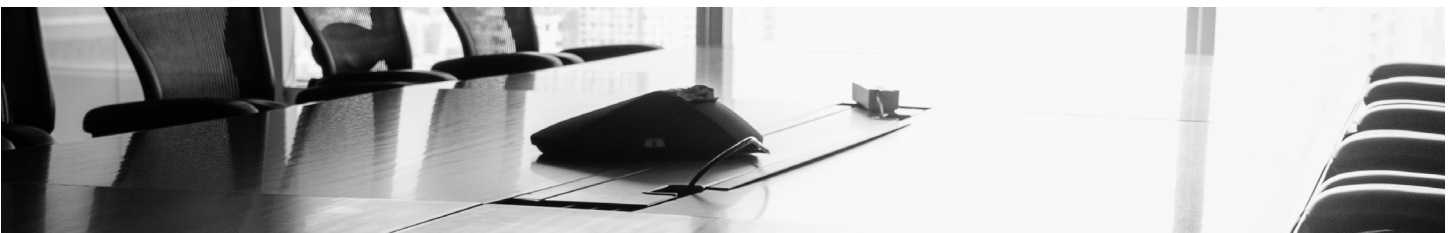
It is important to understand that there is no 'right' or 'wrong' model. The guiding principle always is to create a model that fits the needs of individual stakeholders to:

- - Get relevant information from the PVM analysis
- - Quickly gain actionable insights

This will help you make better pricing decisions, most efficiently.

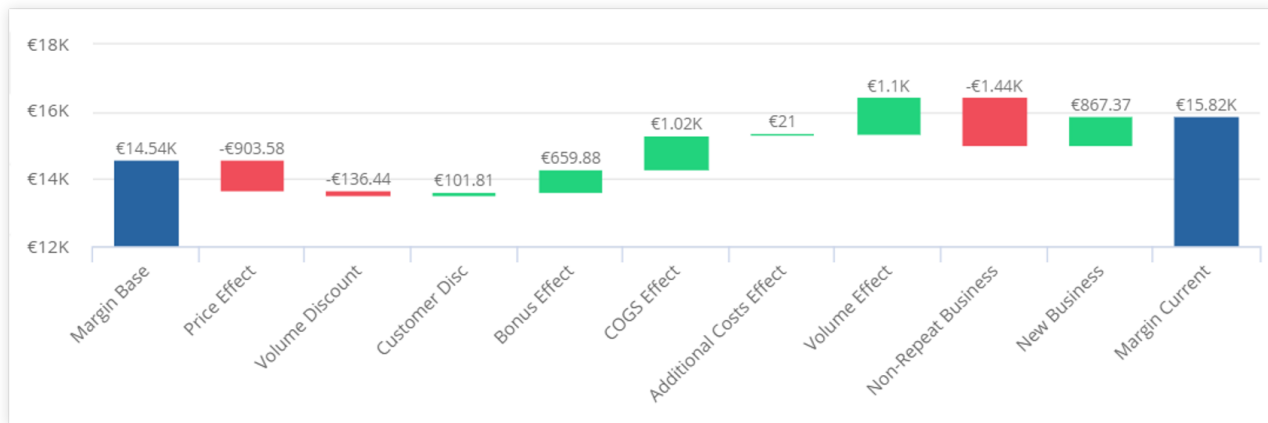
These examples show a combination of different model options/effects and should help you to review and potentially enhance or refine your own PVM model:

- a. Cost separation
- b. Mix separation
- c. Exchange rate effects grouped by pricing currency
- d. List price changes and related impact on customer invoice price
- e. Assessing and benchmarking different categories that impact change in revenue/margins across sales sub-regions



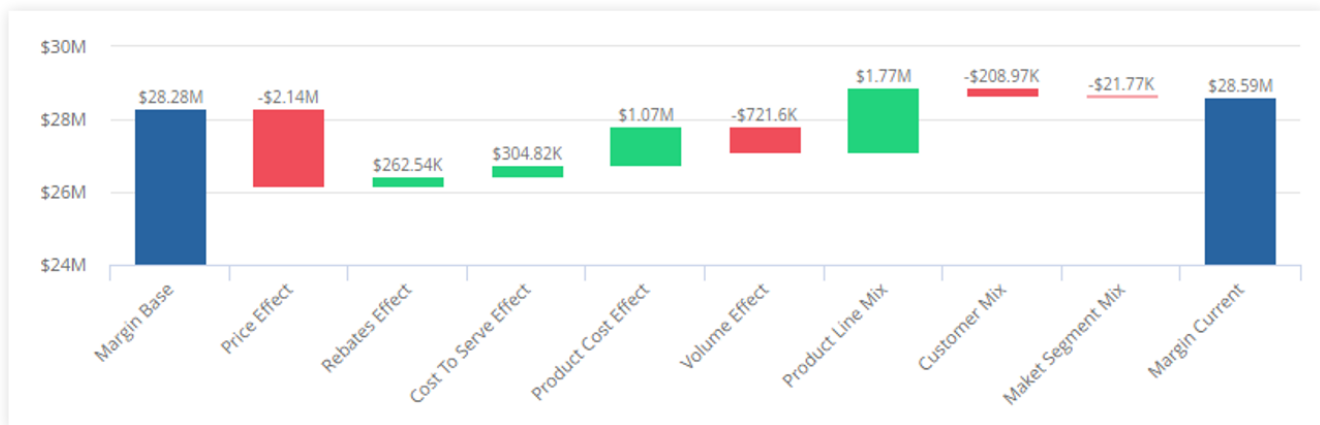
a) Cost separation

Separation of 'Total Costs' into granular discount, and COGS effect (Distribution Industry):



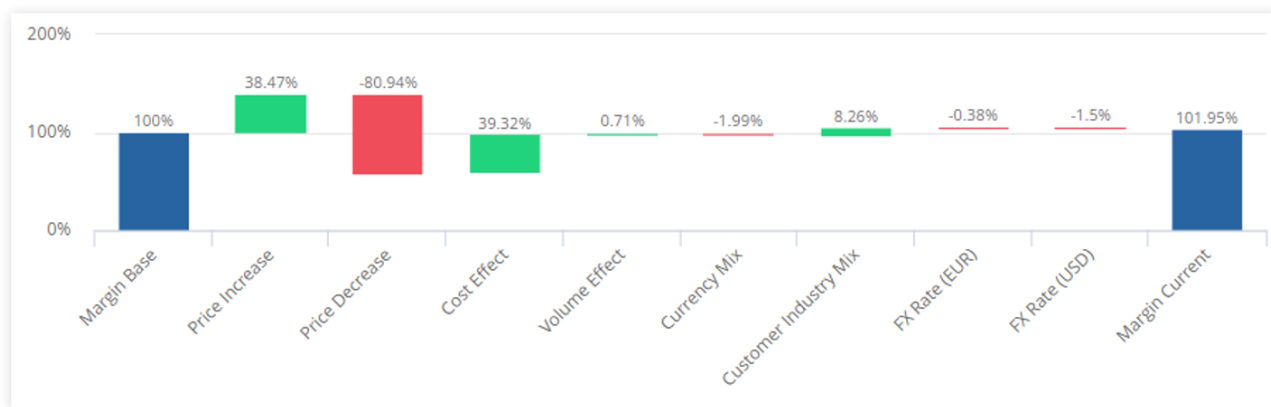
b) Mix separation

Separation of mix effect into customer mix effect and channel mix effect

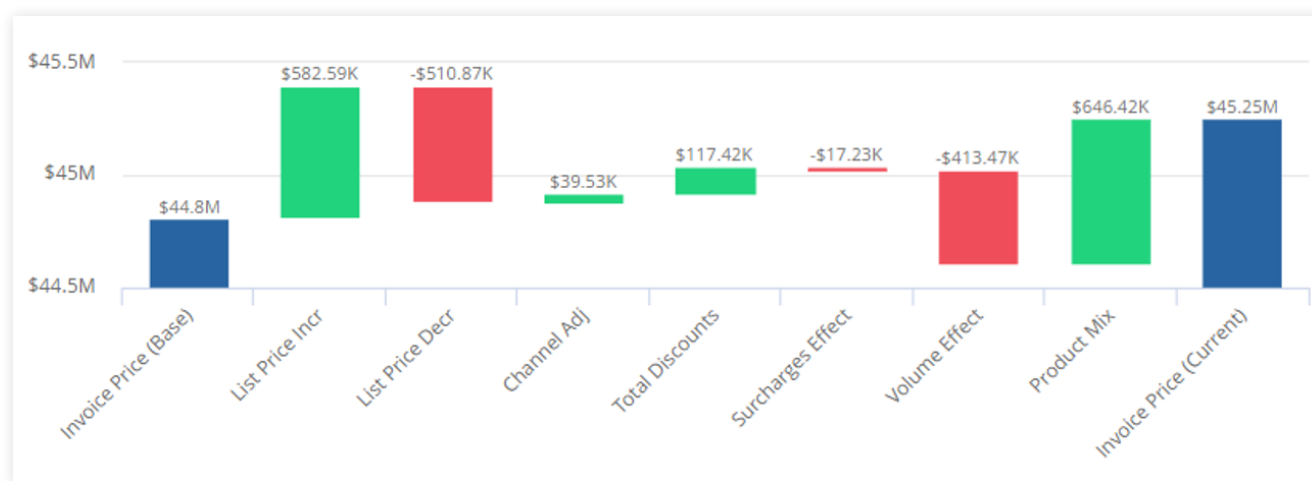


c) Exchange Rate Effects by pricing currency

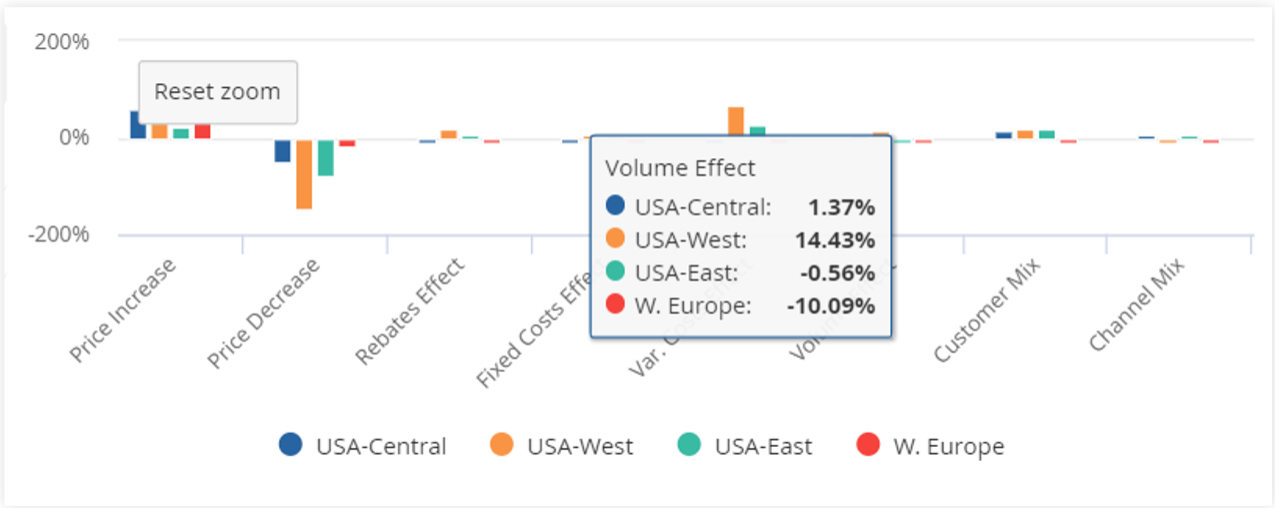
Separation of exchange rate effects by selected pricing currencies + currency mix effect



d) List Price changes and related impact on customer invoice price:



e) Assessing and benchmarking different categories that impact change in revenue/margins across Sales Sub-Regions:



6 Derived actions from a PVM analysis - PVM playbook examples

Actions derived from PVM analyses outputs, e.g. based on a comparison of organization's invoice data across two time periods, can be categorized into one of the following clusters of activities:

a. Learn from your positive peers - Replicate what worked well in other areas of your business (peer region, country, customer segment, product group, etc) and implement adjusted actions in comparable business scenarios.

An example might be an increase in product volume purchase in a specific customer or market segment in one region leading to a targeted marketing campaign in other regions to push product volumes there as well.

b. Refine your pricing policies - Pinpoint and drill into negative 'peers'/outliers by specific revenue or margin effects. Discover the root cause of unfavorable changes in revenue or margins and take corrective actions by implementing more granular policies or refining your approval process.

Examples could be situations where:

- Price decreases were much higher versus the relieve in costs
- Price increases did not compensate 1:1 for observed cost increases, and/or...
- Discounts or rebates given to customers equalize implemented product price increases, etc.

c. Engage with your customers - Understand reasons for changes in purchasing behavior leading to decline in revenue or margins.

An example might be discontinued product purchase or volume decline resulting in an unfavorable mix effect, e.g. product mix, branch or plant, or country mix.

It is business-critical to understand the drivers of that change at your highly valued customers, to stay on top of potential market trends, and to retain or regain the business of your valuable/profitable customers.

In the context of enhanced PVM analysis, i.e., a scenario where you compare different datasets to assess the effectiveness of implemented target price guidance, or to assess your organization's current performance against a forecast or plan, typical activities as a result are:

- Provide consultancy, support to pricers and sales, and/or put a pricing initiative in place to close identified gaps in target guidance or plan execution. Depending on discovered root cause, same activity clusters as outlined under a), b) and c) do apply.
- Update/adjust target guidance or forecast/plan in case of changed market conditions and identify potential new opportunities to close gaps in identified underperforming areas.

7 Conclusion

The times of giant and hard-to-maintain Excel files with time-consuming and error-prone calculations for "standard" PVM calculations are gone, as the need arises to have the flexibility to adjust the model per the needs of business unit leaders and other stakeholders.

A "one-size-fits-all" PVM Model is not enough to support the specific business needs of different stakeholder groups or regions, and to provide them with the required level of granularity and insights to easily pinpoint potential problem areas.

Empowering key users to build their own model through clicks, without coding, via a robust framework that delivers consistent results and enables validation of analysis outputs. Financial analysts and pricers can perform model refinements and calculation re-runs with ease. It lets them assess and benchmark results at any slice of the business nearly in real-time.

PVM reports now not only provide KPIs for the Chief Financial Officer and commercial teams, but also become a valuable source for all pricing stakeholders to:

- Monitor and track the impact of all the efforts of their pricing initiatives and implemented actions.
- Quickly identify market trends as well as underperforming business area, benchmark different/similar segments and to gain insights to pinpoint the root-cause.
- Identify and drill-in/'learn' from outperforming areas to try replicate in other areas.
- Assess current performance (actuals) versus forecast or optimized guidance scenario/plan to course correct where needed.

Together, these will serve to stabilize your business and further improve margins. **Reach out** to us to get a demonstration of our Margin Bridge Analyzer (MBA) Solution and to take you to the next level in your PVM analysis.





About the Author, Matthias Mueller

Matthias Mueller is a Pricing Transformation Entrepreneur and Senior Product Manager at Vendavo. He has over 20 years of B2B experience in both operational and strategic pricing. During the last 10 years at Vendavo, Matthias has helped customers across many industries to adapt and implement best practice pricing strategies and quickly ramp-up/enhance their analytical skills. He has also provided change management and value consultancy to rapidly drive outcomes across multiple pricing initiatives.



About Vendavo

Vendavo provides leading-edge pricing and sales solutions with embedded AI to empower global manufacturers and distributors to digitally transform their commercial operations in order to unlock value, grow margins and accelerate revenue. These Commercial Excellence solutions, combined with its award-winning value consulting services, enable Vendavo to deliver outcomes that are not only predictable, but unrivaled. That enables the most demanding B2B organizations to develop dynamic customer insights and optimal pricing strategies that maximize margin, boost sales effectiveness and improve customer experience.

Vendavo has headquarters in Denver, with offices in the UK, Germany and Sweden.

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