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Research Report: ZLC-2011-18
Linking Financial Planning to Demand Planning
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Linking Financial Planning to Demand Planning

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Summary:
In this thesis, we identify and analyze the variables that impact bottom-up financial forecasting using volume forecast, both from a modeling standpoint, calculating revenues using demand forecast quantities, and an integration standpoint, aligning the planning calendars of the demand forecast and financial forecast processes. We use the insights, gained from the analysis, to make appropriate recommendations for setting up a bottom-up financial forecasting business process and for monitoring its performance. Finally, as a logical extension to the ideas presented in this thesis, we recommend ways in which the bottom-up financial forecast may be used as the basis for reconciling the financial and operational plans within an organization.

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KEY INSIGHTS

1. There are two types of variables, modeling and integration, that impact the bottom-up financial forecasting (BUFF) process by either directly affecting the calculation of the financial forecast from the demand forecast or by introducing a dependency between the bottom-up financial forecasting process and demand forecasting process.
2. With the well crafted reconciliation process and the use of statistical simulation tools, bottom-up financial forecast, can be a remarkably useful tool for looking at the differences between actual and targeted figures at lower levels of the organization, subsequently being more accurate in identifying the causes for the differences.

Introduction

Most organizations have two planning processes that run concurrently within their firm. On the one hand, they have a demand planning process that estimates the number of units of each product they would sell during the planning period. On the other hand, they have a financial forecasting process that estimates the revenues they would make during the same planning period. Ideally, these two processes should be integrated, given the strong relationship between their outputs, i.e., the revenues made by an organization in a given period are a function of the units sold by them. In reality, these processes are executed in silos and their outputs, more often than not, do not agree with each other.

In this thesis we explore ways by which the process of financial forecasting may be linked to the demand planning process by deriving the financial forecast from the volume based demand forecast, thereby creating operational and financial plans that are realistic, achievable and in synchronization with each other and the overall business goals of the firm.

Business Scenarios

In order to formulate a basis for the analysis, we have identified different ways in which the sponsor organization sells goods or services to its customers. These business scenarios, describe the majority of the company's business and the complexity

associated with each of these distinct forms of business transactions arises from changes: in who the customer is (internal or external), the price applied to the transaction (contract, spot or transfer), the currency in which the transaction is carried out, the discount and payment terms offered on the transaction.

Forecasting Variables

Further, in the context of the identified business scenarios, we classify all the variables that impact a financial forecast into two major categories: Modeling variables and Integration variables.

The variables can impact BUFF in one of two ways:

1. By affecting the calculation of the financial forecast from the demand forecast. All such variables are referred to as modeling variables.

2. By introducing a dependency between the bottom-up financial forecasting process and demand forecasting process. All such variables are referred to as integration variables.

Modeling Variables

Modeling variables directly affect the calculation of the financial forecast. The identified modeling variables are Price, Customer, Currency, Discount and Collection Period.

We studied each modeling variable to understand the issues it raises vis-á-vis BUFF. For example:

Price - A key insight here is, trying to achieve greater precision in financial forecasting by applying the relevant price to a given bucket of demand entails the risk of losing precision in the demand forecast at lower levels of aggregation. The idea is to find an appropriate balance of the precision gained by using the right price and the precision lost in forecasting at lower levels of aggregation.

Integration Variables

Integration variables affect the execution of the bottom-up financial forecasting process by introducing a dependency between BUFF and demand forecasting process. These dependencies need to be addressed for BUFF to be executed successfully. The identified integration variables are Forecast Quantity, Forecast Level, Forecast Frequency, Actual Sales and Planning Calendar.

Here are a few insights we have developed based on the integration variable analysis:

Forecast Quantity - if an organization uses a rolling forecast process, where the demand forecast for a given month is frozen ahead of the month, a constrained forecast is always available as an input for the bottom-up financial forecasting process. However, if the organization is flexible enough to revise its demand plan for the current month because of business factors like volatile demand fluctuations, then a dependency between the planning calendars of both processes may arise. Such situations, however, are an exception rather than the rule.

Process Design Considerations

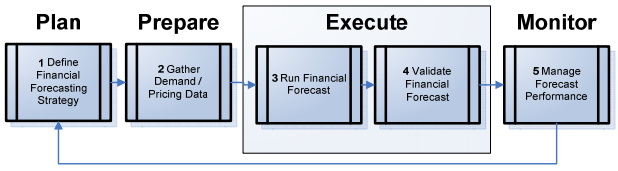
We further highlight the various issues thrown up by each of the forecast variables vis-à-vis setting up a bottom-up financial forecasting process. These issues need to be addressed satisfactorily for BUFF to be efficient and effective.

An example of design considerations we have identified can be represented by the analysis of Price.

Using demand forecast quantities at an stock keeping unit (SKU) level will result in a significant loss of precision vis-à-vis forecast accuracy, which will impact the overall accuracy of the BUFF. On the other hand, performing financial forecasting at a higher level of aggregation will also impact the accuracy of the financial forecast because of the inability to apply the most accurate price to a specific bucket of demand. One way of approaching this problem is to forecast revenues at the level where demand differences vis-à-vis customer / country group begin to emerge. Once revenues are calculated at the product line level, using a planned price for that level, they could be allocated to lower levels of product aggregation by the proportion of original sales forecasts (or other possible rules).

Process Flows

The general design of the BUFF, applied to any scenario, consists of four major phases: *Plan, Prepare, Perform, and Monitor*. There are five major tasks to be done: Define Financial Forecast Strategy, Gather Demand / Pricing / Other Data, Run Financial Forecast, Validate Financial Forecast, Manage Forecast Performance. This process design is effective and straightforward, and therefore can be applied at any organization that embarks on the mission of creating a BUFF process.



Based on the generic process flow structure presented above, further is an example of the detailed process flow design analysis we have developed for the first scenario, where the organization has a manufacturing facility in Europe that sells goods to internal customer (another business unit) within the same legal entity.

Plan Stage

The objective of this scenario is to demonstrate a bottom-up financial forecasting process for an "intra-company transfer of goods". The steps within this stage are as follows:

- Define forecast objective
- Define target forecast accuracy
- Define forecast level
- Define forecast frequency
- Establish planning calendar

Prepare Stage

The steps executed during this stage of the BUFF process are as follows:

•Demand forecast data, broken down by necessary criteria, has to be identified by the BUFF process within a source-of-truth database and subsequently extracted for further use.

•Actual internal transfers that have occurred have to be extracted from source-of-truth database.

•Transfer pricing data has to be entered from the source-of-truth database maintained by the organization.

Execute Stage

The steps during this stage are as follows:

1. Run Financial Forecast

•Apply the right transfer price based on the data from company rule-book database.

•Generate projected revenues.

•Generate projected revenue collection by applying different collection periods to buckets split by customer type.

2. Validate Forecast

•Validate the forecast and communicate it to relevant stakeholders within the organization in a format most appropriate for the forecast objective.

Monitor Stage

The forecast performance should be compared to desired accuracy. Certain statistical and simulation tools can be used within the BUFF to shed light on the magnitude of uncertainty of the final result as well as point out the sources of this uncertainty among the underlying variables.

Reconciliation

To be able to perform the reconciliation between the operational and financial plans, the planners from the respective functions need to translate their plans into a common unit to ensure an "apples-to-apples" comparison. For example, either the operational plan which was originally in units needs to be translated to monies or the financial plan which was originally in monies needs to be converted into units. BUFF allows the operational plan to be restated in monetary value.

With BUFF in place, the reconciliation process must do the following:

•Place the forecast figures from BUFF and the financial plan side by side and observe the differences.

•Implement a strategy to deal with the difference. The way to reconcile the difference could be to:

a) Modify the financial plan or the operational to reduce the difference to zero.

b) Ensure that the difference is tracked across planning periods and is reduced to zero by modifying one of or both the plans.

Conclusions

In our opinion, Bottom-Up Financial Forecasting cannot replace Top-Down Financial Forecasting as the sole method to forecast revenues at the firm / business unit level. This is because Top-Down financial forecasting delivers the highest degree of accuracy for projected revenues at a firm level. It may be the best available approach to predict a firm's financial performance in a given period and issue guidance to stakeholders accordingly.

Bottom-up Financial Forecast however, can be a remarkably useful tool for looking at the differences between actual and targeted figures at lower levels, subsequently being more accurate in identifying the causes for the differences.