

EXPERT PAPER

Production cost management methodology

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Abstract

Production cost management is one of the most crucial factor of a successful company, in this paper I show a methodology how can we track variable costs, what kind of analytical tool can we have if we want to understand the variances of the production cost versus different baselines. In this methodology the reasons of the variances can be caused by some external circumstances, like inflation and due to some operational issue, like variable cost productivity. This methodology can help to understand key drivers of cost differences, and can help to measure the efficiency of manufacturing function within the company in case of functional company structure, especially at mass-production processes.

Key words: cost management, variance analyses, drives, reporting

Introduction

There are several ways to improve competitiveness, but one of the most obvious to improve processes with using fewer resources. There is an obvious statement that a more efficient resource-usage means more capacity or less unit cost, which results higher profitability-level on long term. Because of the previous reasons measuring the efficiency of a given enterprises can be crucial in such an industry, where - because of the increasing competition – cost productivity can be one of the most important factor. This cost management view on different processes has several practice in Hungary, the following paper give a general overview about a useful production cost management methodology, which can be useful especially in case of functional organization-structure, where the manufacturing function got daily or weekly schedule (short-cycle business), and where the mass-production process is not very complex from technology point of view.

One of the most important goal of a cost management methodology is to support every management decision in the operating and planning period with different type of analyses. Practically it means an efficient cost management system collect information and data from different processes of a given enterprises, then filtering relevant data into a transparent structure, which can managed with an efficient information system. In the following page I would like to describe a simple controlling model for analysing variable cost productivity after some basics theories of analyses of variances. In the second part of the paper I give an example to show how this theoretical model can be utilised in practice.

Results and discussion

Analyses of variances in cost management

The most well-known controlling tool is the analysis of actual result versus a baseline or versus an operating plan. While the main goal of every cost management system to give

information about the actual results versus the expectation for the management or for the shareholders, variance-measuring is the key tool in analysing of variable cost productivity.

Main goals of measuring and analysing of variances are the followings (Maczó and Horváth, 2001):

- determine the variances between the actual and expected results,
- identifying the root causes of the variances, which secure an ongoing field to learn business-processes for the management,
- support decision-making of the management,
- give continuous feedback for the planning process, which can help a lot to focus on the expectations of the further periods,
- support to reach the business goals.

Comparing of different data can happen in several dimensions, there are three main categories, which are most common in different controlling systems: dynamic, static, actual versus plan. Static models compare data at a given date, so it can help to compare two similar enterprises, or two similar business unit. Actual versus plan comparing shows the actual business performance versus the management/shareholders' expectations. Dynamic comparing tools provide variance analysis for a given period, or for between two exact dates, so they help to understand the performance and the development of the business compared to previous periods. As we analyze the variable cost productivity, we would like to understand if the business uses less or more variable resources than in the past, so this model would be a dynamic model.

There is an important factor which should be highlighted if we evaluate any comparing model: for a proper analysis we have to compare „apple-to-apple”, so we need to pay attention on the structure and the content of the analyzed data, if they are properly comparable or not.

Variable cost productivity

The main concepts of this cost management methodology to collect different types of variable cost separately for two given period, then we can compare them with different calculation, identifying the key drivers of the variances.

Identifying of variances

With a simple subtraction we can calculate the variance of the two periods by major cost categories, as we have declared previously.

- $VC1 = DM1 + L1 + OVC1$ - The variable cost of the current year (VC1) equal with the sum of direct material (DM1), labour (L1) and other cost (OVC1).
- $VC2 = DM2 + L2 + OVC2$ - The variable cost of the current year (VC2) equal with the sum of direct material (DM2), labour (L2) and other cost (OVC2).
- $DVC = VC1 - VC2$

Identifying the key drivers of variances

While controlling focuses on measuring the management performance, it is important to evaluate what are the key drivers of the cost variances. There are several reasons behind the variances, some of them are controllable for the management, some of them not. In this model we assume a functional organization, where we measure the performance of the production efficiency in the given enterprise. From production or manufacturing point of

view we can identify three factors, which cannot be influenced by the management of the manufacturing:

- volume of the production,
- product mix of the production,
- unit cost of the different resources (inflation).

In case of a functional organization structure manufacturing get production schedule from sales or supply-chain department daily or weekly, so in this case volume and mix are an independent factors. If we extract this consideration from the view of manufacturing current market demand is an independent factor as well, not calculating with any inventory consideration.

Volume and mix impact

In this paper I cannot give a detailed description about volume and mix impact calculation, I just highlight the key steps of it:

- Calculating unit cost by product, by main cost categories (unit cost equals sum of material-, labour- and other unit cost): $dm_0 + l_0 + ovc_0$
- Calculating production unit variance by product $q_1 - q_0$
- Calculation volume impact by product: $(dm_0 + l_0 + ovc_0) * (q_1 - q_0)$
- Add together volume impacts by product to get the whole volume and mix impact

$$\Sigma(q_{i1} - q_{i0}) * (dmi + li + ovc_i)$$

Inflation impact

Measuring of inflation impact is also a detailed and complex calculation, but we can easily assume that there are several ways to calculate impact of increasing or decreasing input prices. The most general statement that we can get the inflation impact if we multiple the unit price variance ($p_1 - p_0$) with the consumption quantity (q) of it the given year, and we sum up them together.

$$\Sigma(p_{i1} - p_{i0}) * q_i$$

Source of data are the booked invoice in the given period.

Variable cost productivity

If we can calculate the impact of the uncontrollable drivers of the variance (volume, mix and inflation impact), we can easily determine what is the controllable part as a residual value. The controllable part is the result of the different management actions and decisions, that show how productive is the management of the production. This residual value is measurable if we can calculate vol/mix and inflation impact, and if we can set up a target for this numbers on different assumptions. This residual value shows the efficiency of management decisions, which with we can evaluate how productive the manufacturing function in the given period versus a previous one. In my interpretation this residual value is the variable cost productivity.

Obviously we can find several other reasons which can have impact on variable cost variances, and which are not controllable for sure, but in a simple production process we

can assume, that most factor are controllable by different management decisions. Further investigation can evaluate in which industries can we use this simple approach appropriately, and which one are more complex for this simple model.

Reporting structure in variable cost management methodology

Based on the previously described model we can develop a reporting structure in which production cost are visible versus different baselines. In this paper I just highlight crucial parameters of the information system and the main report of this methodology.

There are some preconditions to apply this cost management methodology; the main factors are the followings:

- management accounting system in which the given enterprise collect its cost by cost centers and cost categories,
- proper unit cost (standard- and actual cost) calculations with which we can calculate volume and mix impact,
- proper system to track incoming invoices for inflation calculation.

These preconditions are not available in every company, but if a company use a quiet developed ERP system, there should be tools to manage them.

The outcome of the reporting structure is a table, where we can easily track variable cost by cost element in every cost centres versus the baseline. For baseline there are two major period what we can apply: same period of the previous year, or same period if the operating plan. After the previously described calculations – which can happen is some back-up table - we can identify the root causes of the variances, and at the end of the calculation we get the cost productivity by major cost element. In practice we can use this approach for every cost-centres, and we can develop the measurement if we can identify more detailed cost category structure.

Table 1: Variable cost productivity report

Cost Center	Actual YTD \$ Value	Base YTD \$ Value	Variance	Volume	Mix	Inflation	Productivity
Total Dir.Mat							
Total Variable C&B							
Total Overhead							
Total Cost							

Behind this main report there are several other opportunity for reporting if have well-developed ERP system and if we follow this methodology, the most interesting can be the following:

- inflation tracking by main materials,
- volume and mix impact by products,
- actual unit cost versus standard unit cost.

The detailed description of these reports can be a subject of another paper.

Conclusions

The previously described production cost management methodology showed some analytical tool to measure variable cost productivity. Obviously this general model can be applied in a simple production structure, where there are not so many drivers behind the

previously mention factors, which can have significant impact on the cost. If there is an industry, which has much more complex production structure, we can develop this model with identifying and quantifying more variance.

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