

Having projection on boom and crisis

To design controlling to withstand volatility!

Dream Car of the “Ideenwerkstatt” at the ICV 2013

With practical knowledge and examples from the following companies



Lufthansa

hansgrohe

TRUMPF



In cooperation with



INTERNATIONAL PERFORMANCE
RESEARCH INSTITUTE

HORVÁTH & PARTNERS
MANAGEMENT CONSULTANTS

Contents

Management Summary	IV
Preface.....	V
1 Introduction: The world is becoming more volatile!	1
2 Defining and categorizing volatility	3
3 Recognizing volatility, predicting future developments	9
3.1 How can we measure volatility?	9
3.2 How can we predict future developments?	14
4 Managing companies in volatile environments.....	17
4.1 Coordinating strategy, performance management systems and performance measurement with one another	17
4.2 Creating versatility.....	18
4.3 Setting up resilience management.....	20
5 Managing the performance of companies in volatile environments.....	25
5.1 Aligning controlling with the demands of increased volatility.....	25
5.2 Management Controls.....	26
5.3 Organizational Controls.....	32
5.4 Staffing and Cultural Controls	35
6 Design recommendations for volatility-proof corporate performance management	37
6.1 “New” tasks for the manager resulting from increased volatility	38
6.2 “Existing” tasks for the manager which have to be intensified.....	39
6.3 “New” tasks for the controller resulting from increased volatility	40
6.4 “Existing” tasks for the controller which have to be intensified.....	41
7 Recommendations of literature to start with volatility.....	45
8 Used literature	47

Management Summary

The world is becoming more volatile. This insight comes not only from the world of science but also that of business. There are enough examples of this: severe ups and downs on the markets for raw materials and stocks or ever-shorter product lifecycles. As first advisors to top management, controllers must recognize this and consider the impacts of **volatility** when it comes to the performance management of companies.

Before you can react to increased volatility, you first have to quantify it. To do so, you must answer three questions: What should be measured, how does the **height of the fluctuations** change and how great is the **degree of the fluctuations**. Of those, the first is the most important one. To answer it, you need to understand the causes and causal effects of the drivers of volatility for a company. However, volatility does not have the same impact on all companies; it can have many shapes and causes. It is absolutely vital to carry out a **volatility analysis which is tailored to suit the specifics of your company**. Yet, measuring volatility is not an end in itself: The underlying intention is to develop volatility indicators which give early warning of changes. This, in turn, should improve the pool of information available for management decision-making.

At the **strategic level**, creating the ability to change (versatility) and introducing resilience management are suitable approaches to countermanding increased volatility. **Versatile companies** can adapt their cost and earnings structures rapidly to new or continuously changing circumstances. This goes beyond the basic concept of flexibility to what is seen as flexibility of a higher order. However, not everything can be mastered with the help of a high degree of versatility: In times of high volatility especially, unpredictable events and developments can threaten a company's business. **Resilience management** should enable companies to reduce the negative effects of such unforeseen events.

Corporate performance management in volatile environments should focus on three key abilities, known as the *triple-A* of Agility, Adaptability and Alignment, which enhance classical management control with organizational, cultural and staffing aspects. **Agility** describes the ability of a company to adapt to short-term market fluctuations. **Adaptability** is the ability to react and to adapt to structural market changes in a timely fashion. Generally, these two key qualifications can be achieved by adapting and developing the classical management control systems of planning and performance measurement.

Alignment is seen as the target-based alignment and coordination of global, decentralized corporate structures. Changing tools also give rise to modified or completely new processes in controlling. Additionally, increased volatility requires even closer cooperation between the manager as designer and decision-maker and the controller as business partner.

Both manager and controller face new challenges as a result of increased volatility. Existing tasks must be further developed and at times intensified and refocussed. One essential prerequisite for the success of volatility-proof performance management is a cultural shift in the **cooperation** between **manager** and **controller**. More than ever, the controller must take on and live the role of business partner.

Preface

The aim of the "**Ideenwerkstatt**" (Dream Factory) **of the International Controller Association (ICV)** is to systematically observe the field of controlling and recognize major trends. From this, the Dream Factory develops the "dream cars" of the ICV, thereby making a major contribution to ensuring the ICV is seen the leading voice in the financial and controller community. Ideas and findings are transformed into concrete, working products in ICV work groups or other project groups. Members of the Dream Factory are renowned representatives of the field of controlling from the corporate world and academia.

This year we present the third Dream Car Report of the "Ideenwerkstatt". In 2010 and at the beginning of 2011, the Dream Factory tackled the issues of "**Green Controlling**" as an answer from controllers to the increasing ecological orientation of the economy. The trigger for choosing the theme in 2011 and 2012 came from the finding that the work of the controller often does not lead to the desired **behavior effects** among recipients of controlling services, namely managers. Approaches from psychology can provide explanations and solutions here, which in turn help avoid incorrect decisions being made in the company.

We always strive to tackle the most relevant, innovative topics and thus to provide the controller community with important stimuli. Our third report is dedicated to the topic of "**Volatility**". Volatility is becoming an increasingly dominant factor in business. It strikes increasingly often both in all aspects of the business environment and in companies themselves and those strikes are becoming increasingly serious and increasingly unexpected. What can managers and controllers do about this?

Hence, we ask the question, "How can we design our controlling to withstand volatility?"

The members of the core team of the "Ideenwerkstatt" are:

- Prof. Dr. Dr. h.c. mult. Péter Horváth (Horváth AG, Stuttgart, Chairman of the Supervisory Board; International Performance Research gGmbH, Stuttgart, Managing Partner)
- Dr. *Uwe Michel* (Horváth & Partners Management Consultants, Stuttgart, Member of the Board)
- *Siegfried Gänßlen* (Hansgrohe SE, Schiltach, Chairman of the Board; International Controlling Association e.V., Gauting, Chairman of the Board)
- Prof. Dr. *Heimo Losbichler* (FH Oberösterreich, Steyr; International Controller Association e.V., Gauting, Deputy Chairman of the Board; International Controlling Group ICG, Chairman of the Board)
- *Manfred Blachfellner* (Change the Game Initiative, Innsbruck)
- Dr. *Lars Grünert* (TRUMPF GmbH + Co. KG, Ditzingen. Member of the Management Board)
- *Manfred Remmel* (manfredremmel strategieconsulting, Vienna)
- *Karl-Heinz Steinke* (International Controller Association e.V., Gauting, Member of the Board)
- Prof. Dr. Dr. h.c. *Jürgen Weber* (WHU - Otto Beisheim School of Management, Vallendar)
- *Andreas Aschenbrücker* (International Performance Research gGmbH, Stuttgart, Research Fellow)

This year we have also complemented the considerations and consultations of the participants throughout with real-world examples in the form of expert interviews:

- Deutsche Lufthansa AG
- Hansgrohe SE
- TRUMPF Werkzeugmaschinen GmbH

We would like to take this opportunity to thank the interview partners once again for their willingness to support the work of the "Ideenwerkstatt" of the International Controller Association ICV with their real-world experience.

For their support in compiling this Dream Car Report, the "Ideenwerkstatt" would like to thank *Andreas Kirchberg* (Dipl.-Wirtsch.-Ing.) and *Daniel Mönch* (Dipl.-WiWi.) (both of Horváth & Partners Management Consultants, Stuttgart).

Our special thanks go to *Andreas Aschenbrücker* (Dipl.-Kfm. Dipl.-Sportwiss.) for his editorial efforts for this report and for his coordination of the core team.

We hope you enjoy reading this report and that you gain new impetus for your daily work in controlling.

Best wishes,



Siegfried Gänßlen



Prof. Dr. Heimo Losbichler

representing the Board of the International Controller Association ICV



Prof. Dr. Dr. h.c. mult. Péter Horváth



Dr. Uwe Michel

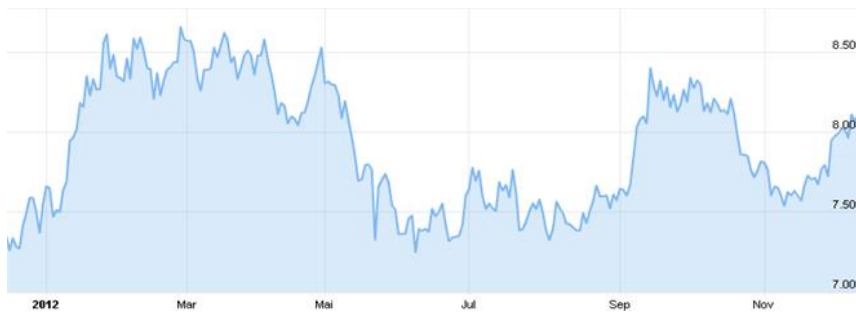
representing the "Ideenwerkstatt" of the International Controller Association ICV

1 Introduction: The world is becoming more volatile!

At the beginning of this year, the front-page headline of DER SPIEGEL (German periodical) on the expected economic development for 2013 ran, "Generation Uncertainty" (cf. *Hawranek, Hesse & Jung 2013, p. 58*). Norbert Reithofer, head of BMW is quoted as saying, "I don't know how 2013 is going to go." Wolfgang Reitzle, head of Linde, expects low growth combined with severe turbulence on the markets. "It has never been so difficult to give accurate predictions for the future economic development as it is today," he said.

Generation Uncertainty = lower growth, more frequent turbulences

There is much proof for this development to be found, with examples shown here being fluctuations in the price of copper in 2012 (see Figure 1) and the shortening of product lifecycles based on the example of the Golf (see Figure 2).



http://www.finanzen100.de/rohstoffe/kupferpreis-indikation-deutsche-bank_H1612608351_26263290/chart.html

Figure 1: Development of the price of copper in 2012.

The findings of quick poll by the Horváth & Partners CFO Panel in July 2012 indicate that the increased fluctuations which lead to volatility are being felt everywhere (Figure 3).

Volatility, the "new normal"

Volatility does not describe a trend but a phenomenon which, due to globalization and the networking of economies, has become the "new normal".

What do companies have to do to survive in such an environment? They must transform themselves into highly flexible systems. Reithofer wants to transform BMW into an "extremely flexible organism". Reitzle is working on creating a "high-performance organization" at Linde.

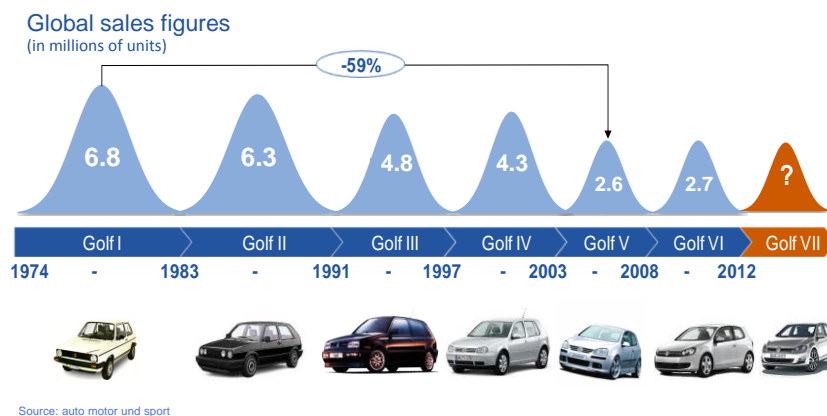


Figure 2: Product lifecycles of different Golf models (based on Losbichler 2012, p. 6).

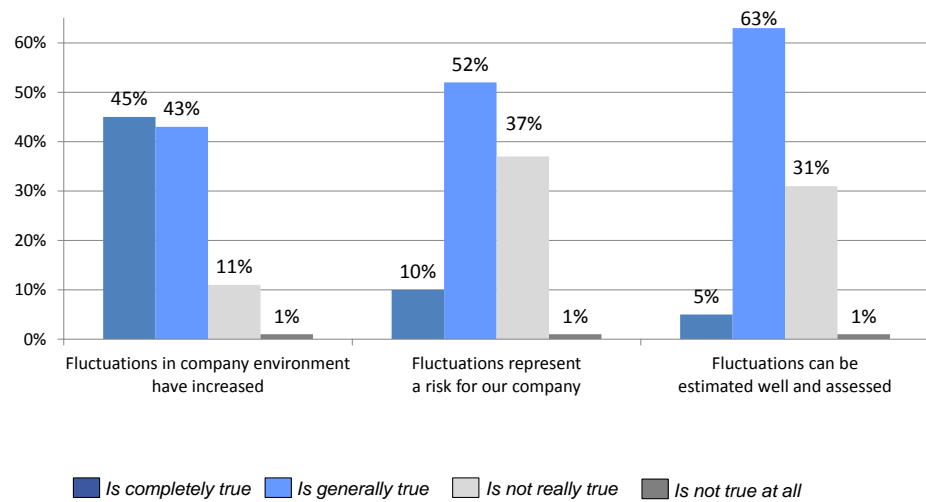


Figure 3: Results of the Horváth & Partners CFO Panel quick poll from July 2012.¹

Challenges for controllers

How do we manage a company in a volatile economy? What form should suitable controlling processes take. Which new instruments must controllers have in their toolkit? What degree of personal flexibility is expected of controllers themselves?

These are questions which we want to answer in our Dream Car 2013 and we will deal with them as follows:

- First, we substantiate what in many instances is the undefined term “volatility” (Chapter 2).
- Then, we see how to measure and predict volatility (Chapter 3).
- Next, we check which design options corporate management has in a volatile environment (Chapter 4).
- After that, we develop a system for performance management under volatile conditions (Chapter 5).
- Finally, we put together a set of design recommendations for the practical work of controllers (Chapter 6).

The findings presented here come from three sources: First, we tried to evaluate the plethora of literature on this topic; then, we collected practical know-how through expert interviews and case studies; last but not least, our team used those two platforms as the basis for elaborating the systems and the design recommendations which should lay the foundation for the future work of the controller community. We believe:

In a volatile environment, good controlling is more important than ever!

¹ For further information on the CFO Panel, please visit: <http://www.horvath-partners.com/CFO-Panel.89.0.html>

2 Defining and categorizing volatility

Volatility is a term which is currently experiencing its own inflation in publications from daily papers to specialist journals. Yet, it often remains unclear what the term really means.

As a result, it is necessary that we first substantiate the term. The word “volatile” or “volatility” derives from the Latin word “volatilis”, which means fluctuating, swift or fleeting. The Oxford English Dictionary describes volatile as “liable to change rapidly and unpredictably” and gives synonyms as inconstant and erratic, while the German dictionary Duden describes it as the magnitude of fluctuations in e.g. prices, stocks or markets. The term was first coined by statisticians, who used it to describe the degree of fluctuation δ at the point in time t of an observed value y . Its ratio is generally (see *Comin & Philippon 2005*, p. 168):²

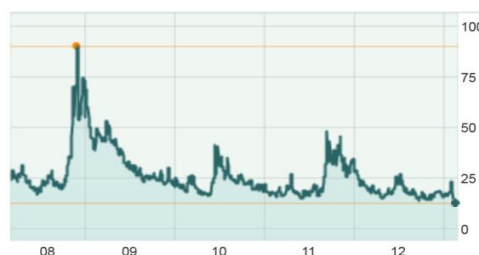
$$\delta_t = \sqrt{\frac{1}{2n} \sum_{i=-n+1}^n (y_{t+i} - \bar{y}_t)^2}$$

δ_t volatility at time t
 $2n$ time frame
 y observed parameters
 \bar{y} estimator of trend against which a fluctuation is measured

Since then, the term has become especially widespread in the field of finance as a description of fluctuations in the prices of stocks and securities. The Volatility Index (VIX) is known as the “fear gauge of Wall Street” because it shows unrest on the stock market.

In the world of corporate enterprise, the term “volatility” is generally used to characterize fluctuations or the susceptibility to fluctuations of a wide range of very different factors.

Volatilitäts-Index (VIX)



Der Volatilitätsindex VIX ist auf den tiefsten Stand seit 2007 gefallen, als die Finanzkrise die Märkte in Aufruhr versetzte. Der mit offiziellem Namen als "Chicago Board Options Exchange Volatility Index" bezeichnete Index fiel auf 13,25 Punkte. Das ist so wenig wie zuletzt im Sommer 2007. Die danach aufziehende Finanzkrise hielt die Märkte in Atem, und der VIX stieg bis ins Frühjahr 2008 auf mehr als 45 Punkte. Der VIX gibt die erwartete Schwankungsbreite des breit gefassten amerikanischen Aktienindex S&P 500 wieder, daher wird er auch als das „Angstbarometer der Wall Street“ bezeichnet. Ist dieses hoch, weist das auf einen sehr unruhigen Markt hin, niedrigere Werte hingegen lassen auf eine Entwicklung ohne starke Kursschwankungen schließen. Ermittelt wird diese erwartete Schwankung anhand von Optionspreisen auf den S&P 500 über 30 Tage. Mit „Call-Optionen“ verschaffen sich Investoren das Recht, aber nicht die Verpflichtung, Wertpapiere zu einem bestimmten Termin zu einem vereinbarten Preis zu erwerben. Put-Optionen geben Investoren Verkaufsrechte. Aus den Preisen, die Anleger für „Calls“ und „Puts“ zu zahlen bereit sind, lassen sich Absicherungskosten auf steigende beziehungsweise fallende Kurse ableiten. Das Volatilitätsmodell kalkuliert dann die Wahrscheinlichkeit zukünftiger Kursschwankungen auf Grundlage der Optionspreise. Der VIX gibt keinen Aufschluss darüber, ob die Kurse steigen oder fallen. Aber es herrscht eine entgegengesetzte Korrelation. Fällt die Volatilität, dann steigt in der Regel der S&P 500.

Frankfurter Allgemeine Zeitung 13.1.2013

**Volatility (lat. volatilis):
fluctuating, swift,
fleeting**

² For a detailed description, please see Chapter 3.1

At the “Ideenwerkstatt”, we want to define volatility as follows:

“Volatility describes the occurring and expected degree and frequency of fluctuation of external and internal parameters which are relevant for companies and whose patterns can be difficult to predict.”

Volatility can be characterized as a specific temporal state of systems. In order to describe systems – such as a company or its logistics department – in terms of volatility, we need three dimensions (see Figure 4):

- How can the system states be predicted?
- How does the system change over time?
- How many system elements are there and how are they connected?

Predictability of system states	Certainty	Risk	Uncertainty
Change in systems over time	static	dynamic	volatile
Number of system elements and how they are connected	simple	complex	highly complex

Figure 4: Description dimensions of systems and events.

Companies are characterized by risk/ uncertainty, volatility, complexity

A company or its component parts is characterized by a specific constellation of the three dimensions.

- Future system states cannot be predicted with certainty; they can only be given probabilities (= risk) or they cannot be predicted at all (=uncertainty).
- The system does not remain statically unchanged but rather it changes dynamically. We are unable to recognize change patterns in turbulent situations. This is possible in part for volatility.
- Number and interconnectedness of system elements is complex to highly complex.

In a nutshell, this means that volatility involves uncertainty and/ or risk and high complexity. However, these dimensions are often not clearly delineated in literature and in business practice; indeed, their definitions often overlap.

When it comes to a company and its environment, volatility can be categorized according to various criteria (see Figure 5):

- There are various levels at which volatility originates (“specificity”).
- The degree to which volatility can be influenced can vary.
- The dimensions of how to shape volatility can lie in the real economy or in financial management.
- The possible measures to shape volatility can lie in the creation of versatility (“flexing”), in resilience management (“cushioning”) or in monitoring and early recognition.

Impact levels	National economy	Industry	Company	Company element
Ability to influence	None		Moderate	
Measures	“Flex” (versatility/ flexibility)	“Cushion” (resilience)	“Monitor”	
Action levels	Real economy		Financial management	

Figure 5: Levels of categorizing volatility and its various states.

In the business world, it is important to differentiate between external and internal corporate volatility, the latter being where the source of the volatility lies within the company. The causes and effects of internally induced volatility can be seen in the example of the automotive industry:

- The development of the automotive markets and technological development, especially that of drive trains, are very difficult to predict. Errors in judgement, e.g. in the importance of combustion engines in comparison to hybrid and electric engines, can be massive drivers of volatility.
- Quality problems in production lead to complex and costly recalls with considerable impact upon capacity. Not only is it not possible to predict these, repetitions lead to image problems and falling demand.
- A product lifecycle strategy which doesn’t fit market patterns or unforeseen delays in new product development due to technical problems increase the risk that what you offer is no longer what the customer wants. This leads to deviations from planned market targets.
- Delivery bottlenecks from upstream suppliers, for example due to production problems arising from higher reject rates or bottlenecks in raw materials, can cause volatility in production. Production management is interrupted and you can no longer meet the production schedule.

Internal corporate volatility in the automotive industry

A Look at the Real World

The predictability of future business development – A comparison

At this point we would like to draw a comparison of the predictability of the future business development and the principle possible actions for the three companies who have cooperated with us on this study, *Lufthansa*, *Hansgrohe* and *TRUMPF*.



The situation at *Lufthansa* necessitates they focus on mid-term planning

Traditionally, demand in the airline industry is heavily determined by the economic climate. When it comes to mid-term planning, this is one of the most intensively observed economic determinants, whose development is predicted by numerous institutions which invest a considerable amount of time and money in doing so. The forecasts, however, are uncertain and are subject to regular revisions. Changes in the flights offered by competitors are much easier to predict in the airline industry as any orders for airplanes take many years to complete and are well known. What is not so easy to predict, however, are the planned services of third parties and the planned changes in seating configurations of competitors. It is possible to use changes in the overall market offerings together with expected changes in demand to also draw conclusions about changes in pricing levels. However, due to the uncertainty of the predictions and the influence of other factors, these can fluctuate greatly. One factor which is difficult to forecast is the development of the price of kerosene. The cost of kerosene constitutes a major element of the total costs and has a direct impact on prices through the use of surcharges on the transportation prices. Other major factors which influence prices are state regulations (for example, the introduction of the flight tax in 2010) or the development of airport fees.

In the short term, the possible actions for adapting services to changing demand conditions in aviation are rather limited, especially because "air travel" is not a service which can be stored. Hence, most adaptations are seasonal changes or measures for managing reservations.



Volatility has a comparatively strong impact on *Hansgrohe* but there are many and varied potential actions they can take

As a producer of consumer goods, it is far more difficult for *Hansgrohe* to predict the development of their future business. Rapid shifts from boom to slump in different regional markets ensure a high degree of volatility in their incoming orders. Additionally, short-term orders and cancellations are par for the course. Above all, the increasing international connections involved in major projects make those aspects of their orders very risky.

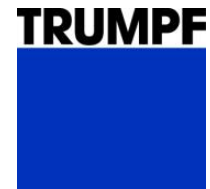
On top of those aspects, changes in the demand structure take place in different economic phases. While premium products are in high demand when the economy prospers, price is often more important than quality in times of economic downturn. Shifts in the importance of business segments are no rarity. A further uncertainty factor comes in the form of state regulations, especially import-export provisions. These are often passed with no advance notice and at times lead to completely different market situations. In 2011, for example, Argentina demanded that imports be balanced against exports of equivalent value, but what should a Swabian manufacturer of bathroom equipment do with tons of Argentinean beef?

Compared with the airline industry, *Hansgrohe* has to survive in the face of more serious effects of volatility but it also has more possible actions in its armory. The company can stockpile during times of crisis and dispose of those stocks when the economy booms again. Production capacities can be made more flexible through the use of hybrid plants or working time accounts, while postponement can be introduced as a reaction to regional changes in legislation. A more flexible sales channel system (e.g. via local sales agents) can also enable the company to shift risks and the effects of fluctuations to the next stage of the value chain. This approach should be treated with caution as good sales partners can be a key success factor in the forthcoming boom.

Volatility means TRUMPF faces the challenge of making production capacities more flexible

The volatility affecting the mechanical engineers *TRUMPF* has its main impact on incoming orders. In the same way as for the aviation industry, the main driver of fluctuations is overall economic development. One would expect that it should be easy to predict the demand for investment goods as it takes a long time from order to delivery. After all, in contrast to the consumer goods market, customers do not decide overnight to invest millions in new machinery. To a great extent, the volatility of incoming orders is inherent to the system: high flexibility and short delivery times are seen as a sign of quality and make your company stand out among the competition. However, greater flexibility and shorter delivery times also mean that customers only make their investment decisions at the last moment so they themselves can react flexibly to booms and crises. Hence, long-term production planning is not possible.

The main actions *TRUMPF* can take are making production more flexible, especially with the help of working time models. In this context, it is important to have good relationships with suppliers as this is the only way to ensure that fluctuations in demand are compensated for.



3 Recognizing volatility, predicting future developments

3.1 How can we measure volatility?

If we want to measure the volatility that a company, an industry or an economy is exposed to, we have to answer three fundamental questions:

- The volatility of which **economic parameter** (base value) should be measured (marked in green in Figure 6)?
- How does the **height of fluctuation** change in times of high or low volatility of the chosen variable (marked in yellow in Figure 6)?
- How great is the **degree of fluctuation** of the volatility, i.e. with what frequency does the parameter shift between times of low and high volatility (marked in orange in Figure 6)?

Three questions on measuring volatility

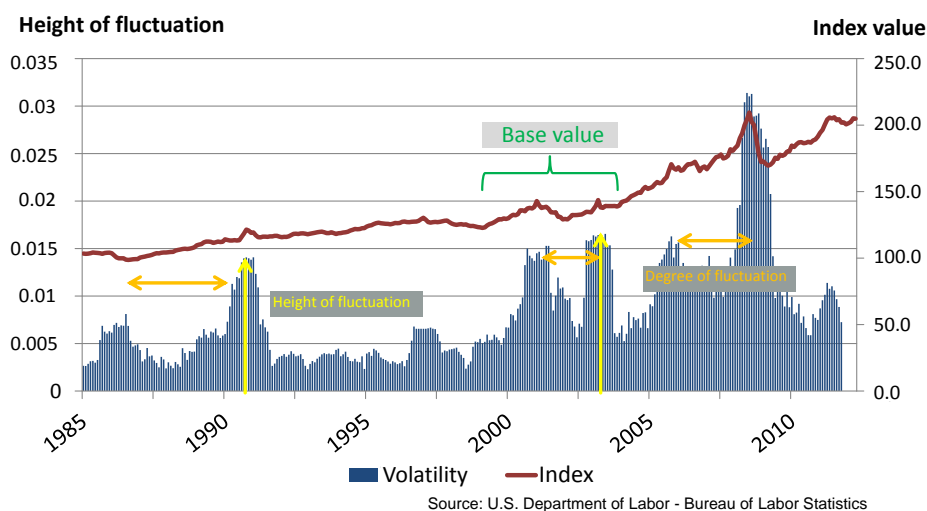


Figure 6: Graphic representation of the relevant parameters for measuring volatility based on the example of the price index for industrial goods in the USA.

As described in Chapter 2, there are many different types and causes of volatility. Accordingly, the first step is to choose the economic parameter whose volatility is to be measured. At corporate level, in particular, volatility is often described as a subjective, qualitatively perceived phenomenon of accelerated change, without ever operationalizing the concept. However, this broad definition of volatility encourages us to oversimplify the perceived effects.

The decisive factor here is to carry out a company-specific analysis of relevant indicators instead of developing one all-encompassing measurand. We believe the most suitable way to do this is to expand on Porter's "Five Forces Model" (Porter 1983) to include influences from the environment and the economy, as shown in Figure 7 "The Seven Forces Model" for analyzing volatility (see Horváth 2012).

Which economic parameters should be measured?

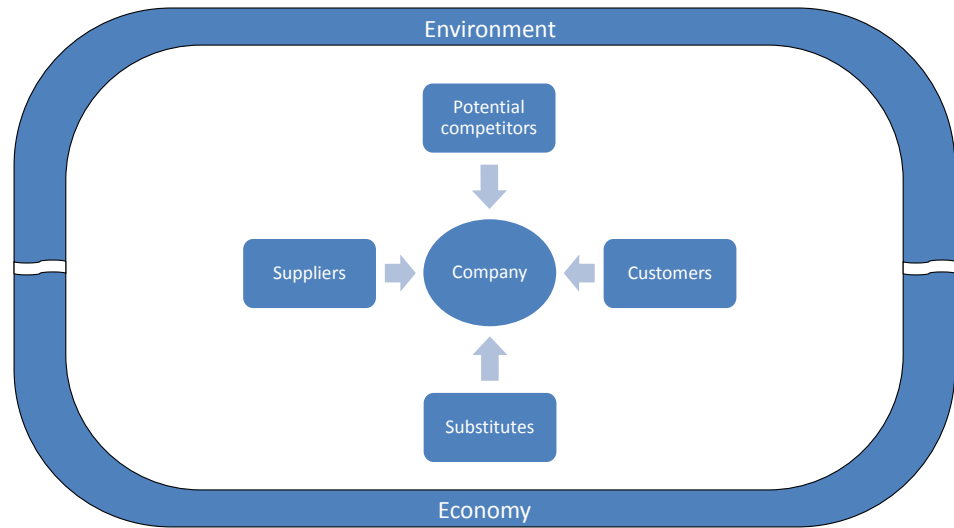


Figure 7: Seven Forces Model for analyzing volatility (based on Porter 1983).

Seven Forces Model for identifying volatility indicators

The generic model presented here can be used to identify those volatility indicators which are relevant to a specific company. This is necessary as it enables us to draw sophisticated conclusions about the development of volatility and its influence on controlling. We should also take the effects of developments on higher economic levels into consideration (cf. the categories of the specificity of volatility in Figure 5).

This can be shown using the example from mechanical engineering depicted in Figure 8. In mechanical engineering, fluctuations in turnover are mainly caused by changes in incoming orders, which in turn are heavily dependent on economic developments, i.e. the overall economic situation. One possible indicator of this is, for example, gross domestic product. As the American market is very important for certain segments of the mechanical engineering industry, the gross domestic product of the USA and the exchange rate of the US dollar should also be monitored.

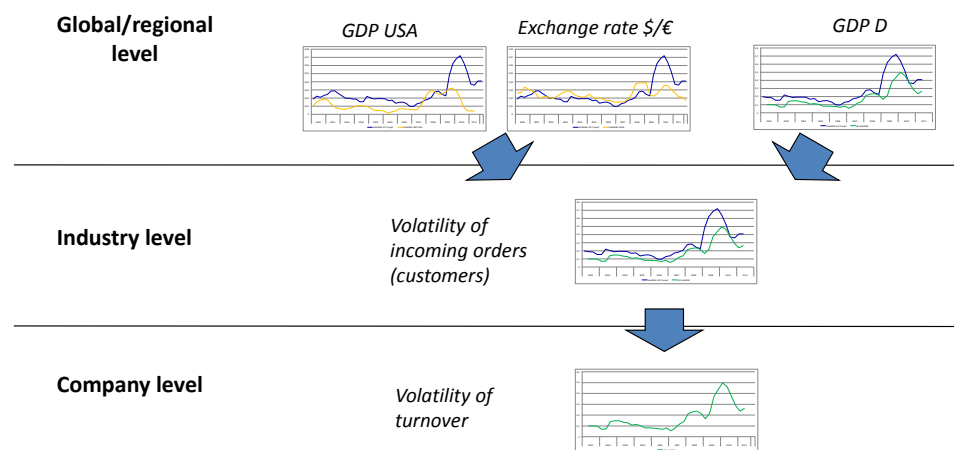


Figure 8: Example of chain of effects of developments on different levels of observation.

There are two basic ways of calculating the height of the fluctuations.

One possibility is to determine a trend value and then calculate the deviation from this trend. In this case, the **height of fluctuation** is the standard deviation of the observed parameter to the previously calculated trend value (cf. *Comin & Philippon 2005*, p. 168). The time frame to be used for the trend calculation must be chosen carefully; if the time frame is too large, changes in the trend will be interpreted as the cause of volatility. If, however, the time frame used is too short, economic fluctuations will be misinterpreted as the trend. This leads to the calculated height of the fluctuations being too low. It is not possible to recommend one single optimal length of the time frame for calculating the trend as it has to be adjusted to suit the respective parameter.

An alternative is to calculate the volatility with the help of methods from time series analysis. In the past two decades in particular, the development of GARCH and EGARCH models has led to new possibilities for a precise estimation of volatility. Their use, however, requires a well-developed understanding of mathematics (for an in-depth understanding, please see *Schmelzer 2009* or *Stier 2001*).

How does the height of the fluctuations change?

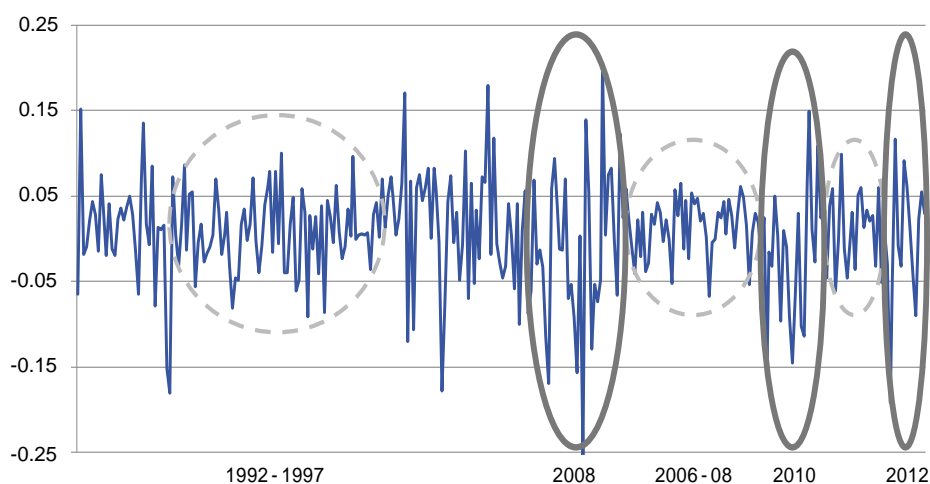


Figure 9: Influence of the choice of base value on the volatility calculation (own depiction based on data from German stock index DAX).

The **degree of fluctuation** of volatility describes the frequency with which there is a shift between times of higher and lower volatility. This can be calculated with little effort by viewing the progress of the parameter in graphical form. Figure 9 shows the monthly yield development of the DAX from 1988 to 2012. It can be seen that the frequency with which there is a shift from high to low volatility has increased. It is possible to calculate the exact frequencies underlying a parameter with the help of a spectral analysis, which breaks down the depiction of time intensity into one of frequency intensity. This, in turn, can be used to calculate the frequency of different intensities (for details of the spectral analysis, see e.g. *Neusser 2011*).

How high is the degree of fluctuation?

The explanations given above are limited to the basic approaches to calculating the volatility of an indicator. What has not been taken into consideration so far is aggregations of different volatility drivers. To do so, we can use simulation techniques, such as the Monte Carlo simulation (see real-world example *Lufthansa*).

A Look at the Real World



Bandwidth planning at Lufthansa AG

The idea of bandwidth planning at Lufthansa arose from the need for a simulation tool for integrated mid-term planning. The goal was to develop a model which is able to quantify beyond a five-year horizon the influence of the most important exogenous factors which affect the passenger air travel business.

Passenger air travel is seen one of those industries which is subject to particularly strong earnings volatility. The main causes for this are the fluctuations in global economic growth (measured in GDP) which have a high correlation with the demand for air travel, the foreign currency exposure associated with global ticket sales, and the great influence of the price of kerosene on fuel costs.

Here we can observe that airline companies invest heavily in new aircraft in times of growth in order to be able to secure a share of the predicted market growth. These investments have a very long production lead time, especially for large aircraft, which can lead to time lags between the economic necessity for capacities and their actual availability. As a rule, this creates overcapacities and the associated pressure on sales prices. These aspects, together with ad-hoc events (e.g. volcanic eruptions), lead to strong fluctuations in ticket revenues and hence in the bottom line. Moreover, the determinants named here are also intrinsically linked to one another, which can lead to a greater or a lesser impact.

The structure of the bandwidth model is based on the P&L structure and the cash flow statement which is derived from it. The first step is to investigate the impact of the aforementioned factors on the individual positions of this structure. In a further step, these structures are then cross-linked in line with the known correlations or aggregated at P&L level, respectively. The following diagram shows the model structure.

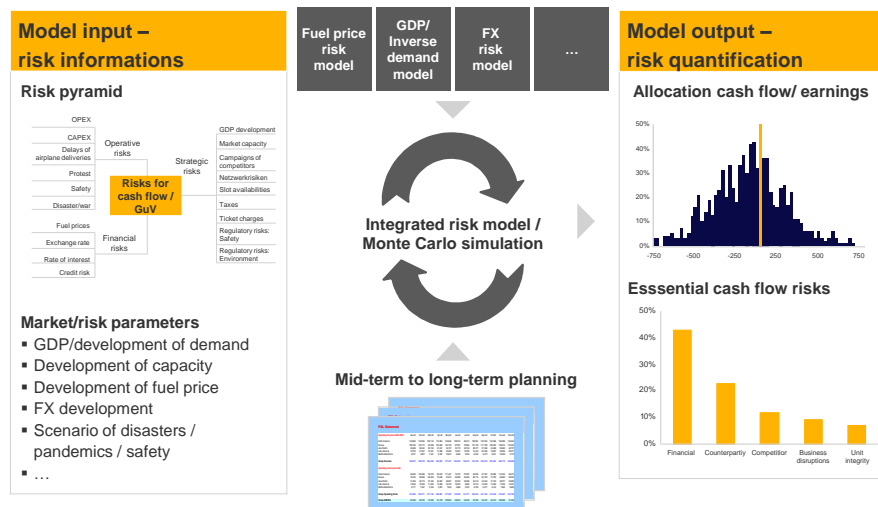


Figure 10: Schematic portrayal of risk and planning processing in the simulation model.

After the simulation, the results give insights into the correlation between costs and earnings based on fluctuating determinants for overall business. Based on this, it is possible to compare the magnitude of the impact of the different factors on the P&L and cash flow. This creates the possibility for informed discussion about uncertainty, volatility and probabilities in business.

Overall, bandwidth planning makes it possible improve the quality of the mid-term planning process. By applying new premises which are valid for the planning cycle, plausible base data is available at the beginning of the process (planning before further measures). Instead of working through the individual planning steps one by one, results which can form the basis for discussion are available right from the beginning of planning. Potential variations can then be calculated almost in real-time, making it possible to assess the magnitude of any required actions. This speeds up the decision-making process in top management and creates a platform for making decisions based

on quantitatively proven information. Alongside the technical result, the project provides insights into the calculation and behavior of sensitivities and the possibility to influence them.

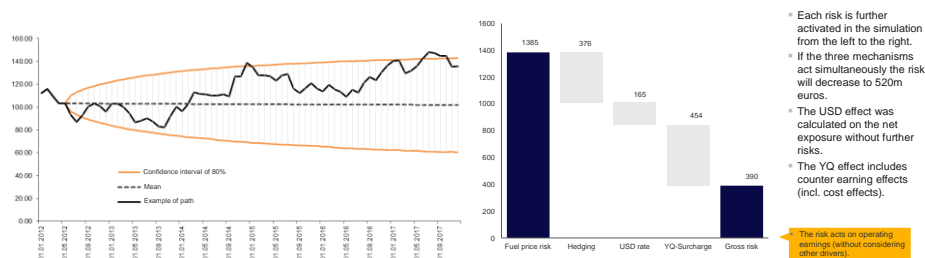


Figure 11: Input bandwidth and risk assessment of individual factors on the fuel price risk.

Similarly, this model can be used to assess changes in the premises of the initial parameters quickly in terms of possible effects on P&L and cash flow and to derive any need for action from the results. In this way, this model was used to break down the effects of a potential serious escalation in the Euro crisis into their individual component parts; the results were then used to prepare potentially necessary counter-measures. Likewise, competition scenarios can be analyzed, for example in terms of their impact upon the development of earnings. And let us not forget the learning effects of dealing with risks and volatility, of assessing them in quantitative terms, of the in-depth discussions of causal effects and sensitivities. Special emphasis should be placed here on the comprehensive verification of the inverse demand functions for the individual markets which takes place when setting the model up.

These possibilities of calculating ad-hoc the impacts of changing determinants directly enable controlling to provide information in real-time about current and other possible situations (scenarios) for mid-term planning. Confidence intervals and probabilities for exceeding or falling short of specific target values can be determined by varying uncertain determinants. The findings on the correlation between costs and earnings based on fluctuating determinants for overall business or on special performance indicators help top management to apply the correct management stimuli as the important criterion of uncertainty has become transparent.

Thus, the main benefit of the project is controlling's improved ability to provide information between and during planning phases. However, this method, which in principle can be applied to other decision-making problems, places high demands upon controllers and managers. They need to have a good understanding of the business model, have a statistically adequate data pool, and have a clear understanding of the model and how to run the model.

3.2 How can we predict future developments?

Measure volatility to derive the basis for decision-making

Measuring the volatility which influences a company due to internal or external causes is not an end in itself: The underlying intention is to obtain information which can support the management in running the company and improve the basis for decision-making. As shown in Chapter 3.1, we can only calculate the past volatility of a parameter with ease, yet this is usually an unsatisfactory basis for decision-making, especially when we consider that volatility only provides information on the height of fluctuations but not on the actual direction of those fluctuations.

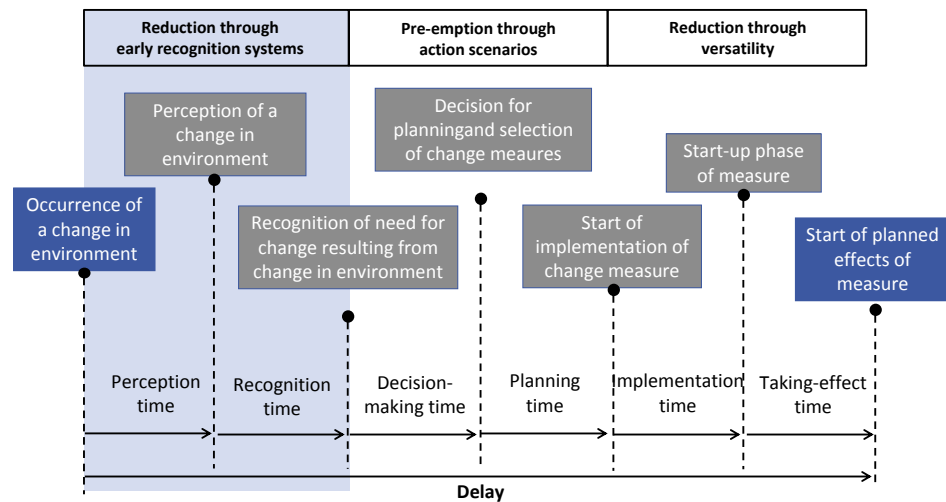


Figure 12: Time gained through early recognition – faster reaction due to less time required to see and recognize change (based on Wiendahl et al. 2005, p. 56).

Early recognition of opportunities and risks

Information about future developments is especially important in volatile times. Once companies are affected by strong changes in their environment, opportunities and risks are often recognized too late or the reactions to perceived events take longer (cf. Horváth 2011, p. 339). One possibility to react to this danger lies in implementing an early recognition system, which should help companies to recognize potential dangers and those which already exist, as well as opportunities, early enough to initiate suitable measures as reactions to them (cf. Weber & Schäffer 2011, p. 411).

The effect of early recognition is shown in Figure 12. If environmental changes are perceived earlier and lead to a company recognizing the need for change, that company can shorten its reaction times.

One form of early recognition is early indicators. As their name suggests, these give indication of future developments and changes in a company and its environment (cf. Bea & Haas 2009, pp. 316). Early indicators are indicators which show the development of an observed phenomenon in advance. One example is the approval of mortgages which gives ten months advance notice of the development of housing construction. It is important to note that early indicators are separate from coincident indicators and lagging indicators (see Figure 13).

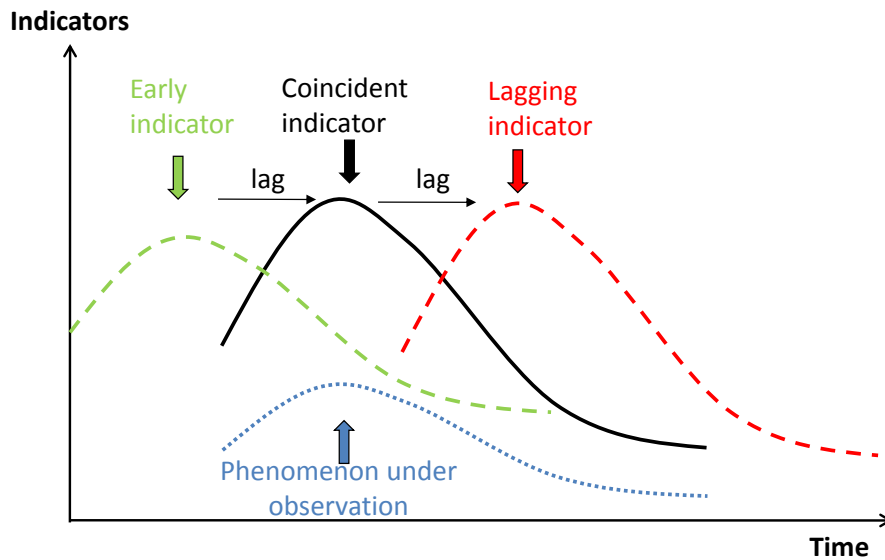


Figure 13: The connection between early, coincident and lagging indicators (based on Krystek & Müller-Stewens 1993, p. 80).

However, early recognition using indicators has a particular inherent difficulty which is that of identifying those indicators which lend themselves well to early recognition. The first step is to use theoretical considerations as the basis for mapping the phenomenon and its particular connection and to show the direct correlation between them. This can be done, for example, with the help of network analyses, as show in Figure 14 for the influence of change in companies and environment on the logistics department of a company in the chemicals industry. During this step it is important that weak signals are also always integrated, for example the opinions or comments of relevant key persons. The premise underlying this is that change and upheaval always originates from people who voice their opinions and intentions in public. However, caution is advised when considering weak signals as they should not trigger unrest or knee-jerk actions.

**Challenge:
Deriving early indicators**

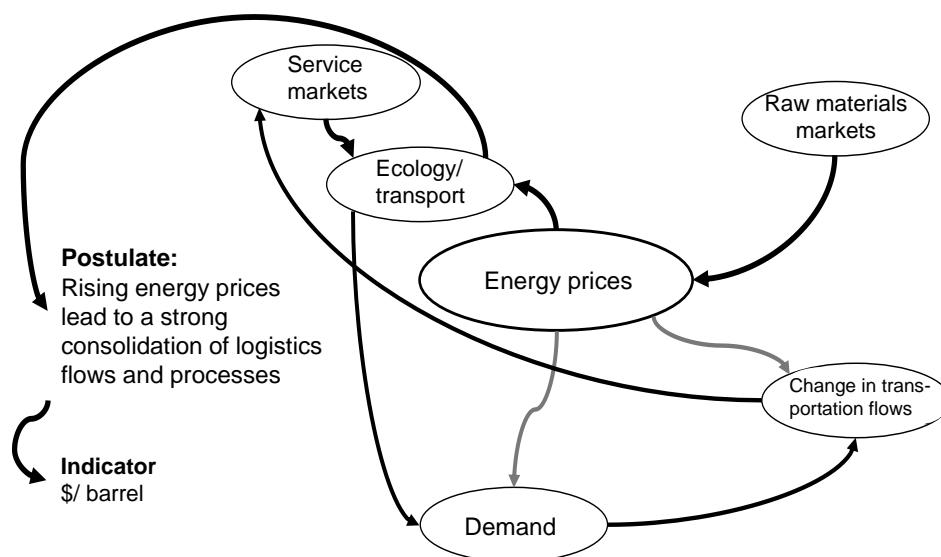


Figure 14: Deriving early indicators with the help of a network analysis (Falter & Michel 2000, p. 501).

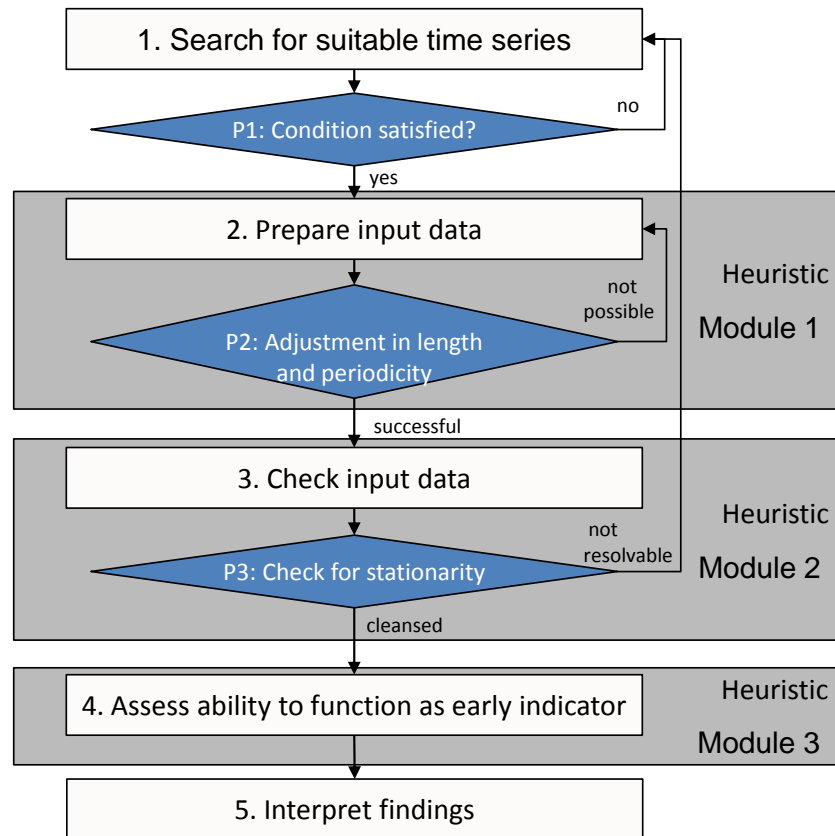


Figure 15: Vertumnus heuristic to check suitability of an early indicator.

Check the suitability of early indicators

The second step is to check possible identified indicators for their suitability. This can be done in a precise mathematical way using methods of time-series analysis. The research project “Vertumnus” investigates change in value networks and has developed a heuristic which enables us to determine the early recognition characteristics of indicators with little effort but sufficient accuracy (see Figure 15). The underlying thinking here is the evaluation of the cross-correlation between the time series of the indicator and that of the parameter being observed. This measures the correlation between the values of two time series for different time shifts or lags. Time shifts or lags are necessary because they enable us to assess the indicator’s ability to function as an early indicator.³

³ For further information on the Vertumnus Project and available publications, please see: www.vertumnus-projekt.de

4 Managing companies in volatile environments

4.1 Coordinating strategy, performance management systems and performance measurement with one another

As defined in Chapter 2 volatility describes the degree and frequency of fluctuation of external and internal economic parameters which are relevant for companies. As a result, it is vital when managing a company in a volatile environment to consider different scenarios of the causal effects of market parameters as part of strategy development and implementation. The important influence of the market parameters on business development is also documented in the real-world examples given earlier in this publication.

It is necessary that we integrate three aspects into decisions on corporate management and strategic orientation (cf. *Hansen et al.* 2009): economic cycle – competitive situation – future orientation.

- Current and expected developments of the **economic cycle** must be used as the basis for decision-making for mid- and long-term decisions. In doing so, the company's own market behavior should be continuously adapted to the market situation.
- The **competitive situation** must be taken into account by considering all the players on the market. It is important to assess how our own company is affected by volatility in relation to how the competition is affected.
- Additionally, all decisions should be influenced by a **future orientation**. Decisions should be based on information containing predictions concerning the future development of supply and demand.

The strategic orientation of its company and its performance management and measurement cannot be considered independently of one another. As shown in Figure 16, strategic orientation determines the performance management systems of a company. These, in turn, exert considerable influence on performance measurement.

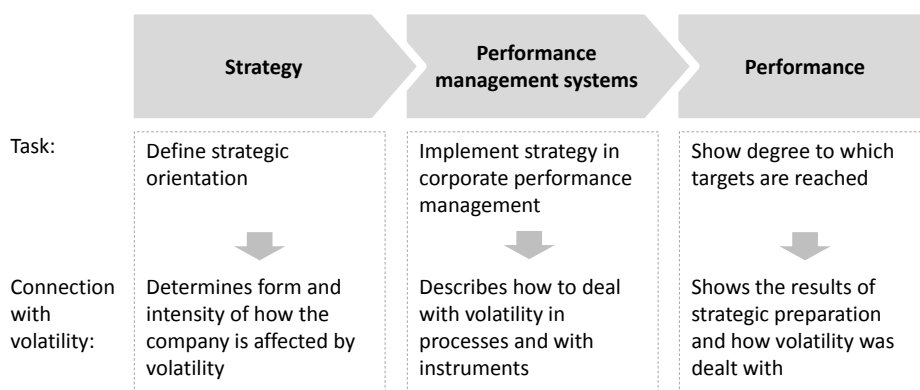


Figure 16: Strategic orientation and managing volatility influence corporate performance.

Consider market parameters in strategic orientation

Answers to high volatility: Versatility and resilience management

There are three objectives behind adjusting the strategic orientation of a company to encompass volatility:

- Recognize change early,
- Create versatility and flexibility, and
- Create resilience.

The early recognition of change is a basic element of the first two objectives.

It is important to consider the correlation between strategy, performance management and performance if strategy adjustments need to be made due to changing internal and external conditions. As shown in Figure 17, findings from the performance management systems and performance measurement are needed for those adjustments. In particular, companies should try to compensate for signs of negative effects on earnings by adjusting and adapting strategic orientation and the performance management systems. It is vital that performance reflects how the company is affected by volatility relative to the market.

Linking strategy, performance management systems and performance measurement to one another is essential for successful corporate performance management in volatile environments.

In the following chapter, we would like to show the scope for design which versatility and resilience management offer to corporate performance management in volatile environments.

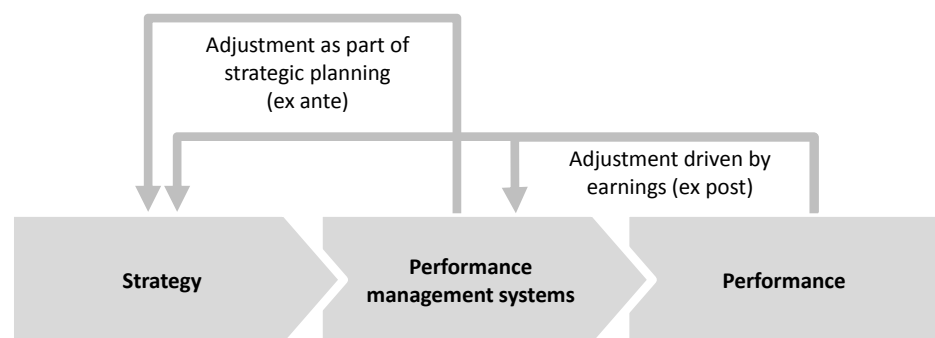


Figure 17: Possibilities to prevent negative effects on earnings by adjusting strategic orientation.

4.2 Creating versatility

The characteristic of versatile companies, i.e. those that are able to change, is that they:

“can adapt the structures of their organization and their resources permanently to changing conditions in the short-, medium- and long-term”.

(Westkämper & Zahn 2009, p. 11)

The goal of versatile companies is to be able to react to changes in challenges caused by volatility as quickly as possible. Versatile companies can adapt their cost and earnings structures rapidly to new conditions despite difficulties in predicting the changes and the speed of those changes.

In this context, it is important to differentiate between versatility and flexibility: Flexibility is the ability of an organization to adapt to changed determinants (influencing factors) quickly but with low costs.

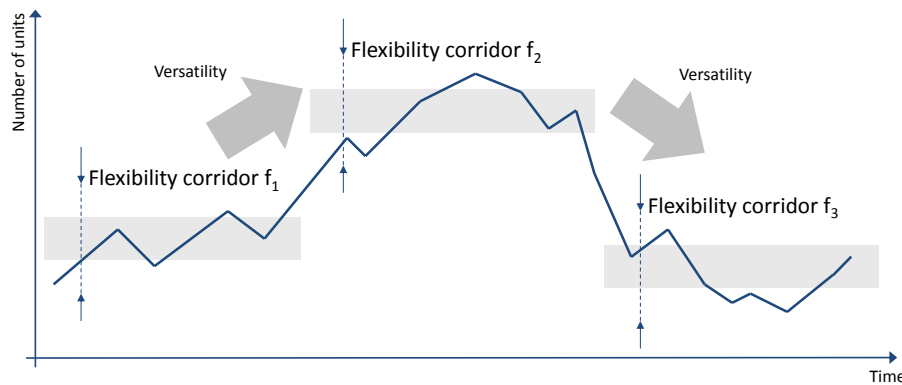


Figure 18: Differentiation between versatility and flexibility (Zäh, Möller & Vogl 2005, p. 4).

The **flexibility** of a system is determined as early as in its planning stages. The bandwidth of possible adjustments is called the flexibility corridor. The problem here is that maintaining larger flexibility corridors generally causes higher costs (see Nyhuis, Reinhart & Abele 2008, p. 24).

Versatility expresses itself in that companies can utilize change facilitators to bring about organizational and technical changes in order to be able to shift from one flexibility corridor to another (see Figure 18).

Change facilitators oppose the increasing pressure of change which arises from changing determinants, known as versatility drivers (see Löffler 2011, p. 32). Table 1 lists the primary change facilitators and examples of the use in corporate practice.

Versatility is flexibility of a higher order

Table 1: Primary change facilitators (based on Nyhuis, Reinhart & Abele 2008, p. 28).

Change facilitator	Description	Examples
Universality	Dimensioning and design of an element in terms of different conditions	Multiple production variants on one machine, broad training and skills base of employees
Mobility	Mobility not limited by location	A machine on rollers is more mobile than a fixed installation
Scalability	Expansion and reduction of technical, spatial and staffing aspects	Working time models to adjust available capacity
Modularity	Design of standardized, interchangeable elements	Modular, interchangeable arms for industrial robots to extend functionality
Compatibility	Ability to network means of production (materials, media, energy)	Uniform software interfaces to link performance management systems

Challenge for the controller: Assessing versatility

Creating **versatility** always requires investment and costs money. Accordingly, we should aim for the most economically justifiable degree of versatility rather than the maximum degree possible. This requirement is a clear indicator that creating versatility also causes new demands upon controlling; these become particularly clear when we look at the process of versatility shown in Figure 19. This is based on the fundamental idea that creating versatility is not a one-off event but a continuous process.

According to *Horváth, Isensee & Seiter* (2011, pp. 179), the demands upon controlling can be summarized in the following four points:

- Carry out environment analyses to identify versatility requirements (also versatility drivers) in the company's environment
- Assess economic viability of and prioritize versatile solutions with procedures from investment accounting and methods of scenario analysis
- Support early recognition of needs for adjustment by providing suitable early recognition systems
- Manage the change process by organizing partially autonomous company units, e.g. by linking traditional budgeting with concepts like the balanced scorecard to operationalize strategic targets.

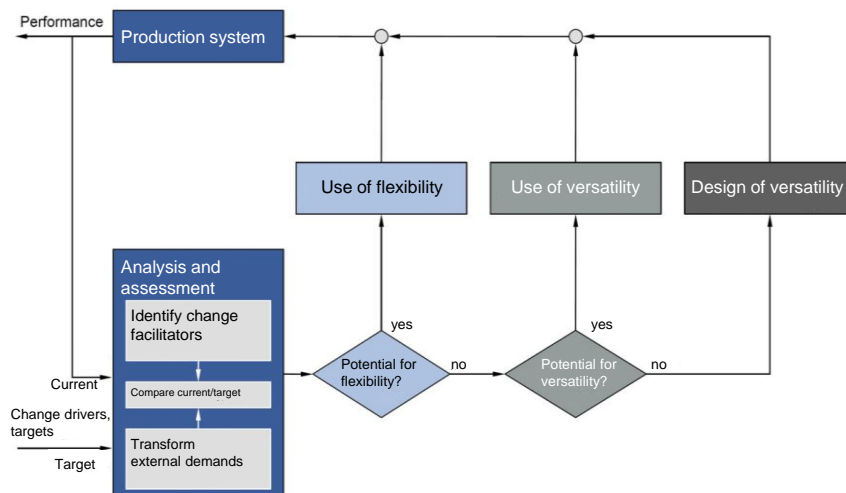


Figure 19: Multi-level control loop of versatility (Nyhuis, Klemke & Wagner 2010, p. 11).

4.3 Setting up resilience management

Not all events which influence a company can be mastered with the help of great versatility; it is in times of high volatility, especially, that unforeseen events and developments can become threats to a company's business.

The aim behind resilience management is enable companies to reduce the negative effects of such unforeseen events. Alongside a company's ability to adapt, this should also strengthen its resilience.

Resilience is “the ability to also deal with unexpected and life-threatening events and developments robustly and constructively and [...] even be able to derive organizational skills from them from which in the future [...] the willingness to change and the necessary versatility can be summoned quickly and when needed.”

(Pedell and Seidenschwarz 2011, p. 153)

Five main tasks for resilience management can be derived from this definition:

- Recognize vulnerable functions and processes,
- Avoid life-threatening events,
- Create provisions against the consequences of such events,
- Execute crisis management should such events arise, and
- Create competitive advantages by learning from dealing with life-threatening events.

The five main tasks of resilience management

Recognizing vulnerable functions and processes is the fundamental prerequisite for successful **resilience management**. Functions and processes of companies become more vulnerable the greater their successful completion depends on external influences, e.g. the actions of business partners, (cf. e.g. Svensson 2004). It is only when vulnerability is recognized before life-threatening events occur that measures can be initiated in time to keep the effects on the company to a minimum. Examples of life-threatening events include the loss of suppliers due to natural disasters (tsunami in Japan in 2011) or the collapse in sales for German industry in 2008/2009 (financial crisis).

Companies should build up a **situational awareness** of all the factors which influence the resilience of their company. This comprises the current and expected future company environment, its available resources, the expectations of the stakeholders, and the positive and negative effects of different types of possible crises. One possibility for developing such an awareness is to question the main internal and external key figures, such as executives, shareholders, customers or suppliers, in semi-structured interviews (see McManus et al. 2007, p. 6).

The findings can then be used to derive crisis scenarios and to analyze the consequences should they occur. Additionally, if the extent to which the company is prepared for the crisis scenarios, these can be shown and evaluated in a vulnerability matrix, such as in Figure 20.

Naturally, not all **life-threatening events** can always be accurately predicted and influenced at an early stage. Measures must also be taken to counter the occurrence of events which are seen as impossible. Alongside the desire to become flexible and versatile (see Chapter 4.2 for further details), the following aspects are particularly suitable for fostering the resilience of a company:

- Alongside flexibility of structures and processes, the company should also foster the flexibility of its employees. Employees must learn general resources to be able to react quickly to changes (see Weick & Sutcliffe 2010, p. 77).
- The introduction of postponement in all departments helps to increase the company's room for maneuver. Processes should be redesigned so that the lead-time for decisions is shortened and they

can be taken later but with a better information base (see *Sheffi* 2006, p. 213-226).

- When it comes to the financial management of a company, resilience can be increased through liquidity reserves (see *Pedell & Seidenschwarz* 2011, p. 153) or by reducing fixed costs (see *Westkämper & Zahn* 2009, p. 17).

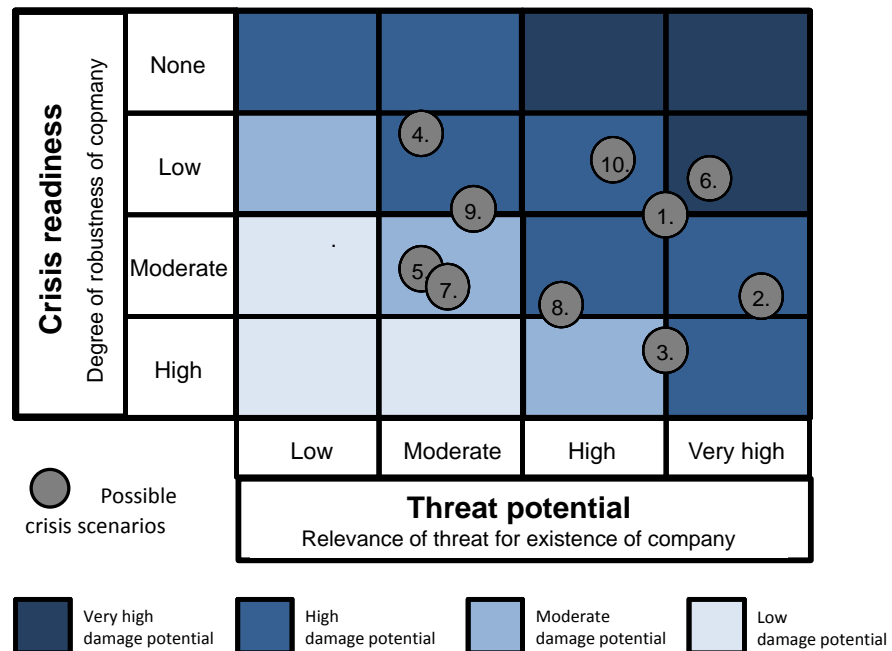


Figure 20: Vulnerability matrix (see *McManus et al.* 2007, p. 14).

Challenge for the controller: Show the benefits of resilience management

As a rule, the **effects** of good resilience management **on earnings** can be seen in avoiding costs incurred through unexpected events. These, however, are not really shown in traditional financial statements as they only show those costs and revenues which actually happened. It is all the more important, but more difficult, to show the competitive advantages which arise from increased resilience as it is only in this way that incentives can be created for investing in measures of resilience management.

Resilience management creates a **competitive advantage** because it makes a company capable of reacting flexibly on the market. Quick and committed actions can send a positive impression of the company and the brand to the market, especially in times of crisis and disruptions to business (see *Sheffi* 2006, p. 252).

It is the task of controlling to identify and analyze the effects of vulnerability as part of resilience management. Once again, the particular importance of early recognition systems must be emphasized here. Additionally, it is the job of controlling to justify investments and measures of resilience management: They must show the competitive advantages which will be created. Naturally, the economic viability of possible investments and measures must also lie within the remit of controlling.

A Look at the Real World

How do large German companies deal with increased volatility?

An extract from the SPIEGEL article "Generation Uncertainty" (see *Hawranek, Hesse & Jung* 2013, p. 58-60)

The example of BMW

The question is [...] no longer how great uncertainty is, but rather how companies deal with this uncertainty.

BMW boss Norbert Reithofer is changing his company into an extremely flexible organism. The aim is to ensure the auto manufacturer does not face serious danger from black swans, i.e. rare and highly unpredictable events.

What happens, for example, when sales collapse by 20 percent within one year? Most companies nosedive into the red. They lay off staff and cut investments. Later on, they emerge weakened from the crisis. This is what Reithofer wants to prevent for BMW, which is why he has agreed an anti-crisis program with his works council.

At first sight that sounds like he simply wants to ban economic slumps, but it does have a sound basis: In the future, the working time of BMW staff will fluctuate more strongly in line with sales. Employees will continue to receive their agreed wages. But overtime will be credited to their working time accounts – or debited if production levels are cut.

In the one extreme, BMW can use a three-shift system to produce cars round the clock in its factories; the other extreme would be that the company can close its plants completely for up to five weeks without a single worker losing their

job or even a part of their wages. In such a case, the workers would have to use up their annual holiday during this time. This is the price they must pay for job security in times of economic slump.

The agreement offers the automobile manufacturing group several advantages. It does not have to spend any money on compensation or welfare plans to be able to lay off staff in times of crisis; and when the recovery kicks in, BMW still has its qualified personnel on board.

The factories of the automobile group should also become as flexible as its workers. If demand changes, assembly can be shifted rapidly from SUV to sedan or vice versa. Exchange rate fluctuations and import duties should also have little impact on BMW in the future. This is why the company from Munich, Germany, is expanding its plants in America and China and building a new production facility in Brazil.

The BMW boss initiated many of the preparations for such worst-case scenarios in 2012, the best year in the history of the company. That is also part and parcel of good corporate management: In such booming times, the willingness to embrace change is particularly low while inertia is especially high. Reithofer says, "That requires a great deal of effort."

A Look at the Real World

How do large German companies deal with increased volatility?

An extract from the SPIEGEL article "Generation Uncertainty" (see *Hawranek, Hesse & Jung* 2013, p. 58-60)

The example of Linde

Wolfgang Reitzle runs the technology group Linde in a similar way. The president and CEO says no longer could they approve a five-year plan and then believe the company would actually finish up there as they could in the past. "That doesn't work anymore." Today, companies need "a completely different type of flexibility".

One contributing factor is that different parts of the company are managed in completely different ways. In growth regions it is important to go on the attack and invest a lot, while cost-cutting is the name of the game in stagnating markets.

And all the time everything must become even better, even faster, even more efficient. The "High Performance Organization" program was barely completed when Reitzle

initiated HPO II, under which up to EUR 900 million should be saved in the next four years. In management some people are starting to qvetch. Just when everything is going so well, why should we become even better, even leaner?

Reitzle cannot understand this attitude. In his opinion, on the one hand, the group has to give itself the elbow room it needs to take over a competitor like the US company Lincare, for which Linde paid around EUR 3.6 billion, should a favorable opportunity present itself. On the other hand, the company has to work with early warning systems to "also be prepared for the worst". Ideally, a company cannot be seriously threatened by a crisis, regardless of how surprising it may be. Or as Reitzle says, Linde is then "bulletproof".

5 Managing the performance of companies in volatile environments

5.1 Aligning controlling with the demands of increased volatility

A suitable framework for meeting the challenges of volatility to corporate performance management is to introduce a *management control system* (MCS). An MCS serves as an instrument of corporate performance management in the implementation of a company's strategy. It should support corporate players to make those decisions which will enable the company to reach the targets it sets. An MCS enhances classical management control with organizational, cultural and staffing aspects (see *Chenhall* 2003, p. 129).

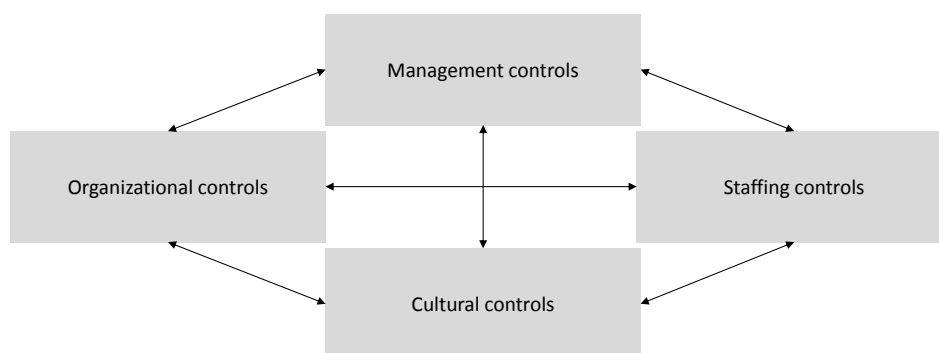


Figure 21: Four possible areas of a management control system (based on *Malmi & Brown* 2008; *Anthony & Govindarajan* 2007).

Figure 21 shows the possible design of a management control system (MCS). This design will be used during the rest of this report. Generally, an MCS should be tailored to suit the specific characteristics of each individual company (see *Merchant & Van der Stede* 2007, p. 15).

Simply introducing an MCS is not enough for controlling in a volatile environment. Due to the changing demands and need for information, new or more highly-developed controlling tools are required.

Controlling must focus on three key abilities, known as the *triple-A* of **Agility** - **Adaptability** - **Alignment** (based on *Lee* 2004). *Agility* describes the ability of a company to adapt to short-term market fluctuations. *Adaptability* is the ability to react and to adapt to structural market changes in a timely fashion. *Alignment* is seen as the target-based alignment and coordination of global, decentralized corporate structures (see *Losbichler* 2012, p. 8-9).

Generally, the first two key qualifications of agility and adaptability are determined by **management controls**. These are seen as the classical "steering systems" which can be broken down roughly into planning and performance measurement. Existing instruments should be expanded to include flexible and dynamic elements such as the rolling forecast. Alongside changing tools, this means controlling also needs modified or completely new processes.

Alignment in a company is especially influenced by means of **organizational controls**. It is their task to direct the behavior of employees. On the one hand, the company must define how specific tasks are to be executed (regulations and methods); on the other hand, employees must assume

Corporate performance management in volatile environments with Management Control Systems

**Success factors:
Agility –
Adaptability –
Alignment**

responsibility for their own actions (governance structures) (cf. *Malmi & Brown* 2008).

A meaningful implementation of modified controlling processes under the auspices of management controls is only possible if organizational changes take place at the same time. The organization itself must be able to adapt to the current conditions in order to meet the increased volatility head on. There is a distinct and growing trend towards the centralization of controlling services in the form of shared service centers or factory approaches (centers of excellence/ centers of scale).

Triple-A controlling can only be realized if the staff themselves also adapt. Changed instruments and processes and a changed organization have effects upon corporate culture and the role which employees must play in the company. **Staffing controls** should empower an organization to use its personnel policy to increase its ability to adapt. It is above all in controlling that we have seen significant change here recently. Increasingly, controllers are being regarded as the business partners of management and as drivers of change. **Cultural controls** manage how changes are communicated and implemented. This makes a pivotal contribution to changes being accepted and lived by employees.

5.2 Management Controls

In order to successfully deal with increased volatility, the management require additional information which goes beyond the used today. The ability to predict the time, direction, strength and length of the next fluctuation represents an advantage for the management which creates real value. Under the auspices of **management controls**, this need for information is satisfied by further developing the classical management control systems. Here, we differentiate between planning and performance measurement, including reporting.

Modern planning and budgeting

The ongoing changes prevalent in a volatile environment require companies to make frequent adjustments to plans and budgets. However, these should not happen too frequently or planning will lose its underlying orientation function for employees. The company's management must find a balanced key solution. The International Controller Association ICV recommends a "modern budgeting" approach. This can be described in terms of three characteristics: simple – flexible – integrated (see *Internationaler Controller Verein* 2012, p. 17, 20).

Simplicity in planning is driven by shortening the planning process and making it leaner. The volatile environment and the dynamic markets make long-term forecasts and budgets difficult. The planning process must be designed in lean and efficient manner. The amount of time saved in this way for the planning process means the planning phase can start later, which in turns means the information available is more up-to-date. One way this can be achieved is by rigorous top-down orientation of the process of *frontloading*.⁴

**Modern planning
and budgeting:
simple - flexible -
integrated**

⁴ „*Frontloading*“ describes a step which takes place before the actual planning process in which planning targets are derived from corporate strategy and discussed at the different management levels. Ideally, the frontloading process should be coupled with a commitment or with the targets which are set (see *Kieninger* 2012, p. 13).

Planning should concentrate on the main planning characteristics and the degree of detail in the planning should be reduced. The motto here is “focus on the essentials”.

The **more flexible** a plan is, the easier it can be adapted to unforeseen developments. This is especially valid for short-term planning as, if necessary, this must also be adjusted to cope with smaller fluctuations. This can be achieved by means of a rolling planning, for example, in which it is usual to update the plan every quarter for the next twelve months. In this way it is possible to take new developments into consideration every three months (cf. *Rössli & Bunce, 2012*).

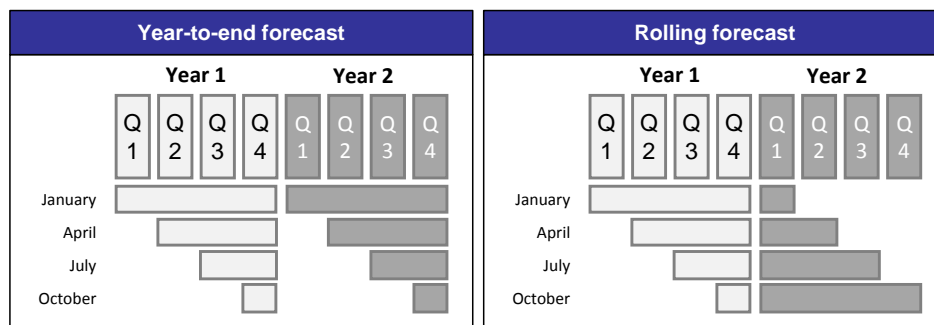


Figure 22: Comparison of traditional and rolling forecast (see Gleich, Schentler & Kornacker 2012, p. 37).

In modern performance management, forecasting supplements planning and budgeting, although the year-end forecast should be developed into the (partial) rolling forecast (see Figure 22). Having a rigid forecast until the end of the respective year is no longer appropriate under today's volatile conditions. A rolling forecast satisfies three main requirements:

- It acts as an early warning system,
- It makes the budget more flexible in dynamic environments, and
- It reduces the cost of budgeting if the process is designed appropriately.

A further possibility of making planning more flexible is to “freeze” budgets or parts of budgets. These are subsequently “unfrozen” one-by-one during the budget period depending on performance. At the beginning of a period, for example, a business unit is only approved the use of 50% of its allocated marketing budget (i.e. 50% is frozen). The remaining part is only released (unfrozen) after a specific target which is compatible with the budget is reached. In the case of the marketing budget, this might be when at least 40% of the annual turnover target is reached by the middle of the budget period.

This approach makes it possible for corporate management to also cut or reallocate budgets during the current planning period. Naturally, this possibility would also exist with the budget freeze but this approach creates clear reasons which everybody involved can understand.

**Supplement to
planning and
budgeting:
(partial) rolling
forecast**

Methods of scenario planning focus attention on the future

In order to focus attention on the future, it is also necessary to enhance existing planning and budgeting tools. Alongside contingency planning, above all the introduction of scenario planning, including scenario techniques and scenario analysis, is a suitable means of fulfilling the "prediction function". Scenario planning is supplemented with sensitivity analyses and the introduction of simulation tools.

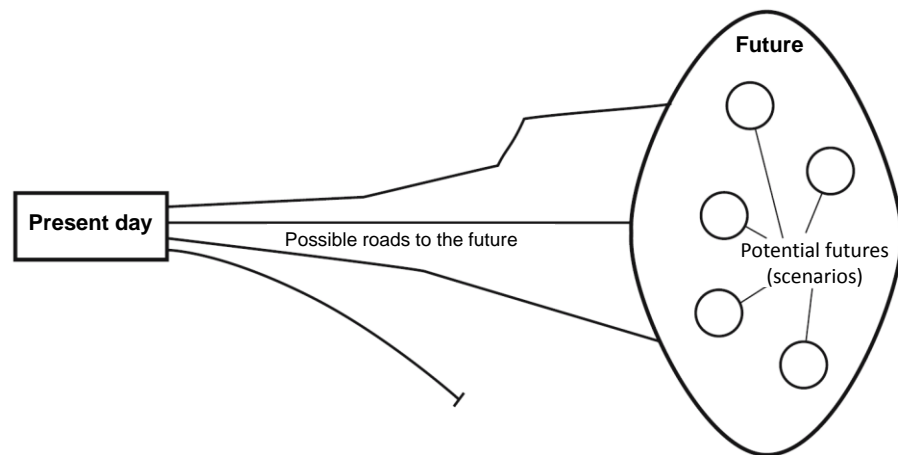


Figure 23: Basic idea underlying the scenario technique (Hahn 2006, p. 14).

Utilize information from planning and budgeting in strategic orientation

During a stronger and longer-lasting fluctuation, under certain circumstances the necessity for adjusting mid-term or even long-term planning might arise. This is not triggered by short-term changes in the market conditions but rather by a more fundamental structural change, for example brought about by regulatory changes. Only those companies which are able to adapt rapidly to the new conditions will survive such changes. In extreme cases, this can also mean changing the underlying strategic orientation of the company. What is needed is to **integrate** strategy and the planning systems. The earlier recognition of changes resulting from a more flexible planning system can also lead to faster reaction times for the company at the strategic level.

It is important to note that more flexible planning raises the speed with which a company reacts. The time between perceiving the volatility and incorporating it in the company's planning can be reduced significantly.

Performance measurement

A modern system of planning and budgeting enables a company to reduce the time between perceiving a change and incorporating that change in the company's planning. Additionally, performance measurement systems enable the reduction of the time between the beginning of a fluctuation and when it is perceived in the company. Only when volatility is recognized early and its extent is assessed accurately can appropriate measures be taken to deal with it.

The intention underlying the introduction of a performance measurement system is to integrate a feedback system into the company which enables it to check the degree to which targets are reached (cf. *Green & Welsh, 1988*). As companies should not only set their targets in line with their own position but also in relation to the market and their competitors (cf. Chapter 4.1), target achievement is also directly affected by market fluctuations. This must be taken into consideration when setting targets and above all when measuring and evaluating them (see Figure 24). Absolute targets should be

supplemented with selected relative ones which expand the internal view to include external developments.

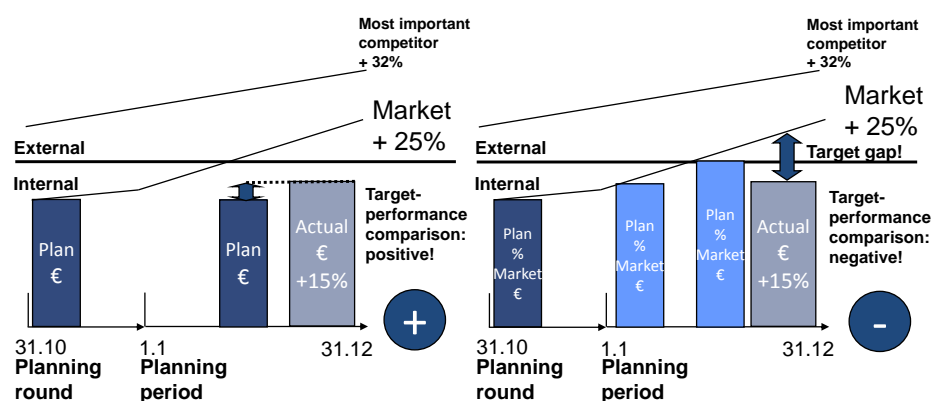


Figure 24: Measuring target achievement relative to market development (see International Controller Association ICV 2012, p. 70).

In order for them to be able to react early, it is absolutely vital for companies in volatile environments to integrate volatility indicators into their performance measurement systems. When doing so, each company must decide for itself which indicators are suitable as early indicators; for example, developments from outside the company's own industry may serve as adequate early indicators for their own industry but in order to make those indicators "useful", i.e. to enable the feedback process, targets must also be defined for them. This, in turn, makes it possible to draw conclusions from the comparison between target values and current performance and to initiate appropriate measures (cf. *Stoi, Große & Walde 2012*).

Expanding performance measurement requires the provision of information with greater speed and frequency. Additionally, the need for ad-hoc information must also be satisfied, while the ability to analyze and forecast must be improved as a whole. To do so, controlling makes use of new tools.

Reporting

Reporting is affected by the changing conditions within controlling. The increased need for information means that management must be provided with tailored reports and those reports must come in shorter reporting cycles. The demand for a faster provision of information up to ad-hoc reporting is a significant challenge for the reporting processes of a company. Other trends include the presentation of top KPIs in standardized management cockpits or self-service evaluations based on uniform company-wide data pool.

Due to increasing volatility the amount and types of information needed by recipients are rising and changing. "Classical" reporting, these days widespread and consisting of extensive, paper-based report files, cannot satisfy these needs either quickly enough or fully. Accordingly, there is a trend towards leaner versions of this inflexible report format. Increasingly, it is being replaced with online-based solutions with flexible evaluation possibilities for management; this concept is being taken all the way to mobile reporting. One major reason for the increased acceptance of this approach is the growing numbers of managers equipped with new technologies such as tablet PCs. Mobile reporting frees the provision of information from the constraints of location and ensures the information

Supplement performance measurement with volatility indicators

Challenge for reporting: increased and continuously changing need for information

suits the precise needs of the recipient. Users can access the information at any time and analyze, expand or share it with other users.

The integration of early indicators into performance measurement discussed earlier also adds to the tasks of reporting. The goal is to find a way of using so-called “weak signals” (cf. Chapter 3.2) to collect, analyze and provide management with information.

The demands arising from increased volatility necessitate the development of new or enhanced controlling instruments, which in turn leads to the necessity for controlling processes to evolve and the controlling organization to adapt.

A Look at the Real World

TRUMPF



Case study *TRUMPF*: Short-term corporate performance management in volatile markets

At *TRUMPF*, short-term corporate performance management means managing performance over a period of 3-18 months. The methods used enable *TRUMPF* to be well prepared for the demand cycles typically prevalent in the investment goods industry.

Process of internal sales forecasting at *TRUMPF*

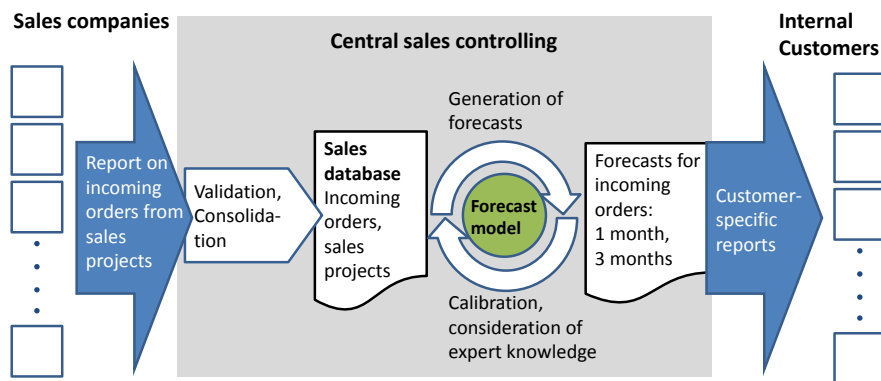


Figure 25: Internal forecasting process at *TRUMPF* for predicting incoming orders.

In-house at *TRUMPF*, forecasts for incoming orders are created based on ongoing sales projects (see Figure 25). These forecasts are based on feedback from current projects from all subsidiaries worldwide. The data is validated by central sales controlling and consolidated in a database for use as a data pool for internal forecasts. These are then presented monthly to the management as consolidated reports. At the heart of these reports are predictions for order entries for the following month and the following three months.

Additionally, *TRUMPF* also works with forecasts from external partners. These forecasts are based on a model which uses historical data to derive functional correlations between global economic developments and incoming orders at *TRUMPF*. As incoming orders at *TRUMPF* typically lag behind economic cycles by 8-12 months, a good understanding of this connection can lead to very dependable predictions over this period. The model is supplemented with long-term forecasting methods to create even longer-term predictions.

The data garnered from the internal and external forecasts is taken into consideration in all planning processes, such as sales and production planning, in the generation of financial forecasts, and in the annual business planning process.

All the economic parameters relevant for *TRUMPF* continue to be monitored by controlling and the current status is prepared monthly for executive management in the form of so-called economic activity cockpits (see Figure 26).

	Indicator	Source	Focus market	Date (incl.)	Current Status		Trend**	
					prev. month	actual	prev. month	actual
internal	Sales Forecast		Global					
	External trend		TRUMPF					
external	PMI	Purchasing manager	Global	Oct. 2012	●	●	→	→
	Sit. Eval.*	IFO	GER	Oct. 2012	●	●	↓	↓
	Business Expansion*	IFO	GER	Oct. 2012	●	●	→	→
	OECD Comp.	OECD	Global	Aug. 2012	●	●	→	→
	Business Confid.	OECD	Global	Sept. 2012	●	●	↓	→
	Consumer Confid.	OECD	Global	Sept. 2012	●	●	→	→
	ZEW	Finance experts	Global	Oct. 2012	●	●	↑	↑

*Capital goods industry, **Trend ≠ Variation current status

Figure 26: Economic activity indicator cockpit at TRUMPF.

TRUMPF reacts to emerging signs of larger downturns in economic activity with comprehensive earnings improvement programs (EIP), which receive significant support from controlling. The aim of these programs is to adapt cost structures and cash flow in the short term to reduced incoming orders and revenue in order to prevent losses and maintain the company's financial power, liquidity and healthy equity ratio. At the same time, TRUMPF tries to continue all important endeavors and projects to uphold the company's ability to react quickly when the economy recovers. The most important EIP measures are:

- Adjustment to capacity: By making adjustments where capacity is flexible, the company tries to react to changes in capacity utilization.
- Optimization of materials costs: The materials cost structure is analyzed and optimized in terms of short-term cost-cutting potentials.
- Reduction in costs of supplies: Timely, open and fair negotiations with suppliers lead to reductions in supply costs.
- New prioritization of projects: The project portfolio is re-prioritized based on cost-benefit and payback analyses.
- Evaluation of assessments: Ongoing and planned investments are analyzed again in terms of cost-benefit, payback period and cash effect and, if necessary, re-prioritized or deferred.
- Reduction in stocks and receivables: The SYNCHRO philosophy enables TRUMPF to significantly reduce stocks in production. In times of crisis, these efforts are intensified and the company adheres strictly to the principle of produce-to-order. Receivables management is also implemented as a standard process and is intensified in times of crisis.

Finally, operative performance management of the TRUMPF subsidiaries is executed based on highly detailed monthly reports. The main sales indicators, P&L, operating earnings, balance sheet, cash flow and labor capacities are all reported. This detailed monthly information facilitates not only excellent short-term management of the subsidiaries and hence the entire company but also creates a high degree of permanent transparency and ensures very high quality reported data.

In addition to the monthly reporting, TRUMPF compiles a detailed quarterly report including forecasts for each of the last three quarters in the business year.

Changes in the performance management systems necessitate adjustments in the organization

5.3 Organizational Controls

The performance management systems in controlling extend beyond the classical management controls. When thinking about considering volatility in the alignment of performance management systems, it is vital to scrutinize the organizational controls.

This consists of:

- introducing clear governance structures and ensuring consistency through the use of company-wide, homogeneous standards and regulations,
- increasing efficiency by consolidating resources and standardizing output values and service regulations, and
- developing the role as business partner by means of a clear focus on providing support for analyses and the decision-making process.

The **governance structure** of a company defines the reporting lines and areas of responsibility, sets up decision-making bodies and regulates coordination loops. Regardless of whether these structures are laid down in writing or simply lived informally, they influence the ability of an organization to react to volatility. One goal must be to design the organization to suit the specific volatility of the industry. To do so, there must be clarity concerning existing governance structures; transparency helps identify weaknesses and carry out adjustments.

Similar to clear governance structures, **regulations and methods** create transparency and facilitate the standardization and monitoring of procedures. Having said that, strict regulations reduce the flexibility of the company. The challenge here is to find the right balance between rules which bring order and over-regulation which cripples the company. In a volatile environment it can be necessary to make short-term adjustments to regulations. Short approval procedures provide additional help as they make it possible to react flexibly despite the existence of regulations.

In companies today we often see a strong trend towards decentralizing the controlling organization. Individual departments, sub-groups or business units have acquired strong controlling skills and created isolated, stand-alone solutions.

A company-wide comparison, e.g. as part of a benchmarking, of the size or performance of the controlling organizations often brings large differences to light. Significant deviations from internal or external best practices are the rule not the exception and it is rare to find a consistent organizational model has been developed for the entire controlling organization of a company.

An optimized controlling organization reflects the business model of the company. The business model, and hence ideally also the performance management model, is the primary determinant of the controlling organization. If, for example, a company has two divisions which are fundamentally different and whose performance is managed according to different performance indicators, controlling must be aligned organizationally with both divisions.

This can be shown clearly using the example of communications companies. For many years the mobile communications sector was a growth market. The goal of controlling was to focus on increasing market share and on acquiring new customers. In contrast, the focus of controlling in the landline communications sector, a saturated market, was on cost control and on cost-saving potentials.

Many companies set up **competence centers** in the fields of business intelligence, business analytics and predictive analytics. Another strong trend is to bundle reporting in reporting competence centers, often called reporting factories, or to expand to controlling shared service centers.

However, in no way does this mean outsourcing controlling functions to third parties. Centralizing functions in internal **shared service centers** increases the standardization of processes. From then on these are carried out at fewer locations in the company, making it simpler to implement company-wide process changes. Additionally, these measures can reduce fixed costs, thus making it easier to iron out extremes in capacity utilization (cf. *Schäffer & Botta, 2012*).

The centralized execution of transactional processes leads to economies of scale and hence to increased efficiency. This effect is strengthened by bundling the handling of ever-larger data quantities ("big data") and expertise in new tools and methods. Additionally, center of excellence solutions increase the quality of the individual functions. The central reporting factory secures the identity of the KPI definitions and prevents uncontrolled growth in reporting volume. This creates the organization with "one version of truth".

Centralizing certain controlling tasks in centers of excellence supports the other controlling functions. This reduction in workload creates flexibility and contributes to improved control over volatility. The operative controllers become more specialized as the time-consuming, non-value adding processes of data compilation and report generation are almost completely taken out of their hands, thus making it possible for them to concentrate on analyzing, interpreting and commenting on the information they receive. This can create tangible value for the company.

Organizational controls are necessary to establish certain standards in the company and to enable centralized authority. Done properly, this enables management to adapt corporate procedures to changing conditions, yet it is important to keep an eye on the danger of overregulation otherwise a flexibly adaptable organization can become a crippled one. Such bureaucratic monsters are at a distinct disadvantage in a volatile environment.

**Increased
efficiency
through
controlling
shared services**

A Look at the Real World

hansgrohe

Case study *Hansgrohe*: Volatilityindicators@*Hansgrohe*

Volatility continues to grow, consistency has become a thing of the past. This influences both the necessary flexibility of corporate activities (business model) and the ability to plan that flexibility.

The global orientation of *Hansgrohe SE* results in many influences on future developments. Rapid shifts from boom to slump on the markets ensure continuous change, while short-term orders and cancellations are par for the course. This requires forward-looking planning and a high degree of flexibility.

There are many possible actions, for example production capacities can be adjusted to cope with fluctuations by means of automated procedures or flexible working hour accounts. Additionally, intelligent warehouse management helps to cushion and absorb fluctuations.

When it comes to planning in volatile environments, *Hansgrohe's* controlling departments already work with three different scenarios (worst case, base case, stretch case) and corresponding contingency plans. Additionally, budgets are frozen and the decision on whether to unfreeze them is not taken until after close scrutiny of the market. Feedback interviews with customers and country managers lead to new insights, which are processed monthly by controlling and coordinated with the board.

The knowledge from the countries is gathered through surveys of sales managers and at trade fairs, events and customer visits in the form of monthly country reports. Moreover, there are quarterly operations reviews. With the help of diverse volatility indicators, *Hansgrohe* has developed its own early warning system.

After listing, analyzing and correlating different external and internal information, it can be used to identify trends in business development and send signals. The early warning system consists of two cockpits and concentrates on incoming orders in the markets on the one hand and on a wide range of economic data from the global economy on the other.

The first part of the cockpit consists of a forecast for order development. External and internal indicators are used to predict the development over the coming months.

Hansgrohe has identified seven major markets and the predictions are very accurate. This instrument enables *Hansgrohe* to provide up-to-date data to sales, materials planning and production. It sends warning signals and makes faster reaction times possible.

If the forecast predicts a bad development for a country, i.e. there are signs of a downturn, talks take place between the board and the managing directors on how to countermand the trend and which suitable countermeasures should be initiated.

The second part of the early warning system is called the *economic activity cockpit*. In it the most important developments in the world economy are summarized and updated monthly. Additionally, the cockpit contains the most relevant indicators for *Hansgrohe* over a period of four years. This enables managers to gain a rapid overview of the current economic situation of a country.

5.4 Staffing and Cultural Controls

Performance management at the staffing and cultural level of an organization is based on the **personnel policy**, the definition of roles and the quality of **change management**.

Remuneration systems should motivate employees and raise their performance levels. In general, the goals of employees should match those of the company to a great extent. The goal of companies in volatile markets is to adapt completely to the prevailing conditions. In order to sensitize employees to their company's situation, a proportion of the variable remuneration can be linked with a performance indicator which expresses the volatility. Only when the indicator reflects the volatility will it motivate employees to deal appropriately with market fluctuations in the areas they are responsible for.

One example would be *orders on hand* as a possible basis for measuring variable remuneration influenced by volatility. Orders on hand is forward-looking and demands that measures be initiated as soon as a concrete case of volatility becomes visible. In contrast, the often used indicator *operating results* would be less suitable as it is purely historical and says little about the future ability of the company to react to volatility.

Another measure in need of mention is to make working hours more flexible. Using flexible working hour models, companies can create possibilities for evening out capacity utilization extremes. However, they should consider very carefully before initiating further-reaching measures such as changing dismissal regulations, using limited term contracts or hiring temporary staff. Even when the company can use these measures to reduce its fixed costs significantly during a crisis, there is a danger that valuable employees will look for a more secure job and leave the company. It is important to remember that recruiting and the induction of new staff after a crisis is very expensive. On top of that there is the company know-how and expertise that is either lost through high staff turnover or is not even built up at all.

The increased need for information, greater flexibility and the constant state of change require a change in what constitutes a controller. The controller must become much more of a business partner. His activities must be molded by proactive, analytical and forward-looking actions. In this role, the controller is a partner of the management, who he advises, and is a supporter and driver of the decision-making process. He is a proactive advisor to the management and other departments in the company. The modern controller possess extensive communication skills and an in-depth grasp of the business model and he works with scenarios and contingency plans. His goal is to make a contribution to the success of the company.

Volatility requires adaptability. This is irrefutably linked with change in companies. Managing communication and implementing changes is a decisive factor in how those changes are accepted and lived by employees.

Values and symbols create the framework for how change management is lived in companies. This begins with the selection of employees. A company in a volatile market should ensure it employs staff who are open to change and regard it as an opportunity.

The management also has an influence on how changes are perceived by employees. Employee participation in decisions about changes increases the transparency of the relevance and necessity for those changes. Joint events, also in times of crisis, at which the challenges facing the company and potential solutions are discussed openly strengthen team spirit. They can also serve symbolically as kick-off events for forthcoming change at which any remaining doubts are removed and momentum for the change is generated.

The role of controller as business partner is becoming more important than ever!

It is especially important to hold fast to corporate values in volatile times as it sends a signal to employees that there is a reliable anchor despite the changes. This security, together with good change management, can increase adaptability among employees.

6 Design recommendations for volatility-proof corporate performance management

Volatility requires even closer cooperation between the manager as designer and decision-maker and the controller as business partner.

Here, we must differentiate between two aspects of the work:

- What should the work of the manager and the controller focus on?
- Which tasks are “new” as a result of the volatility and which existing tasks carry more weight due to the volatility?

Once this is done, we see four different categories of demands upon the manager and the controller.

One essential prerequisite for the success of volatility-proof performance management is a cultural shift in the cooperation between manager and controller. More than ever, the controller must take on and live the role of business partner.

On the other hand, the manager must accept the controller as an equal business partner and share the challenges of performance management with him. Controlling is the birth child of that interaction!

Accordingly, the first and most important recommendation is:

Controllers and managers must accept the consequences of increased volatility and deal with them together!

Recommendation 1

This recommendation is important because more than ever volatility requires coordinated, high speed cooperation.

The following points should be noted:

- Shared understanding of the business environment and its volatility.
- Shared learning of the definition, categories and procedures for recognizing and measuring volatility.
- Shared understanding of the causal relationships arising from volatility.
- Clear definition of communication operative short-term and strategic long-term decision scenarios.
- Clear yardsticks for measuring the success of decisions made on the basis of volatility.

Based on this type of cooperation between controller and manager the company can make decisions arising from volatility which are successful, proactive and conform with company targets (cf. Chapter 5.4).

6.1 “New” tasks for the manager resulting from increased volatility

Recommendation 2

Consider volatility and its effects during strategic orientation!

Rising volatility requires a re-evaluation and adaptation of both strategy content and the strategy processes. The reason this is so vital is because corporate strategy acts as a compass for all processes and individual activities in the company. It must continue to preserve the uniqueness of the company.

The following four aspects must be clarified for strategy content:

- Which business environment do we find ourselves in concerning volatility?
- Which strategic opportunities and risks arise from the increasing volatility?
- To what extent and in which steps do we need to develop our business model?
- Which strategic scenarios do we want to develop proactively?

There are also four points to consider for the strategy processes:

- What degree of strategy flexibility do we want to achieve?
- What change do we want to make to the time frame of our strategy?
- With simplifications in the planning system and process do we want to combat the volatility?
- Is our strategy implementation process simple and flexible enough?

Considering and implementing these points will enable target-based performance management in volatile environments and the implementation of performance management in coordinated operative actions (cf. Chapter 4.1)

Recommendation 3

Set up a resilience management that enables you to cushion unexpected surges in volatility!

This recommendation is important because surges in volatility can occur unexpectedly despite sophisticated predictions.

Not all the consequences of unforeseen events can be compensated for through suitable provisions, such as a sufficient degree of versatility. The goal of resilience management is to empower the company to also deal with life-threatening events constructively.

What must be done?

- Prepare estimates on possible extreme values of key parameters (height, degree and frequency of fluctuation)!
- Analyze the impacts on critical functions and processes!
- Define responsibilities!
- Draw up contingency plans!
- Create an adequate equity cushion and build up reasonable liquidity reserves! Such a “risk buffer” means that not every sharp downturn in sales will threaten your existence.

- Carry out resilience checks in the form of scenario-based training seminars!

The underlying information must come from the controller. It is absolutely essential to set up an early recognition system. The controller must support the management in assessing the profitability of measures and investments for resilience management as their benefit is often not directly apparent. Indeed, in most cases there is no answer to the question, “What do we gain from this measure?”. Instead, the controller must prepare answers for the question, “How would not having this investment or measure harm us should a crisis arise?”.

Resilience management and controlling will not enable you to avoid surges in volatility, but you will be prepared for unforeseen events (cf. Chapter 4.3).

6.2 “Existing” tasks for the manager which have to be intensified

Develop the flexibility of your processes and systems into versatility!

Recommendation 4

Successfully implementing this recommendation is the basis for creating versatile structures and processes.

Here, we are not talking about “operative” fluctuations, such as weekly changes in incoming orders. Generally, a company can cope with those using the existing flexibility in the production and sales departments. Versatility is necessary for volatility at the strategic level: sustainable changes in the market situation, changed customer needs, or the introduction of new products with technical innovations. For these we need to find the optimal degree of versatility.

The more versatility we strive to achieve, the more the costs for that versatility will rise. Hence, it is necessary to strive for an economically appropriate degree of versatility. The controller must support the management in identifying where versatility is needed and in selecting versatile solutions for those needs.

The identification of where versatility is needed must be supported through the use of environment analyses. There are five critical areas which need to be designed to be versatile:

- Supply chain (especially reliability of suppliers, structure of stocks),
- Production system (especially versatility and mobility of production equipment),
- Employee deployment (especially working hour flexibility and employee qualification programs),
- Finance (especially setting up liquidity reserves and credit lines),
- Product portfolio (especially the possibility to react quickly to new technologies and trends).

Suitable change facilitators must be found for the identified needs for versatility to ensure those needs are satisfied. The controller must provide suitable methods for profitability analysis to ensure possible solutions can be assessed and prioritized. Procedures of both investment analysis and scenario analysis can be used here.

Selecting and implementing change facilitators can create the potentials for versatility. Now it is up to the controller to use suitable early recognition systems to identify eventual changes at an early stage.

The creation of versatility is a permanent task. Both manager and controller must work closely together on it to make sure there is a balance between ensuring survival and economic viability (profitability) (cf. Chapter 4.2).

6.3 “New” tasks for the controller resulting from increased volatility

Recommendation 5

Set up a system of volatility analysis tailored to the specific situation of your company!

An analysis of company-specific volatility is fundamental prerequisite for being able to consider adequately it in strategic orientation, corporate performance management and in the performance measurement of your company. It is absolutely essential to examine the specific situation of your company; there would be little value in transposing the results from other companies or even other industries.

Volatility is easy to recognize in many aspects of a company, for example as changes in incoming orders or the costs for raw materials. Generally, these phenomena are based on upstream changes, e.g. slumps in economic activity or changes in customer wishes. Sometimes the reasons for them are not immediately apparent.

Accordingly, the challenges here are:

- The main volatility drivers must be identified. The starting point for this can be the Seven Forces Model of volatility analysis.
- The identified volatility drivers must be placed in causal relationships with one another. Network analyses and the systematic use of knowledge from the specialist departments are particularly suited for this.
- The effects of the different drivers upon earnings must be assessed in order to judge how relevant they are.
- Links between changes in the volatility drivers and corporate earnings must be derived, for example with the help of sensitivity analyses.
- Early indicators must be derived for the most important drivers of volatility; the development of these indicators gives early warning of possible changes in your company's environment.

Analyzing volatility is a new challenge for the controller. He is predestined to take on this role in the company, in particular because he has access to all the necessary data and has the required methodological skills (cf. Chapter 3).

Track the effects of volatility using volatility indicators!**Recommendation 6**

To create volatility-proof corporate performance management it is not enough to identify the main volatility drivers and derive volatility indicators. Changes in those indicators must be made known to the relevant decision-makers.

The challenge for the controller is to provide target-based, tailored information to the management.

It is essential to integrate the identified volatility indicators – early indicators of the specific volatility which affects your company – in the performance measurement and reporting of your company.

It is particularly important to:

- Create new definitions for the volatility indicators you are going to use!
- Integrate the volatility indicators in your reporting system!
- Define threshold values which trigger ad-hoc information for the manager responsible!
- Inform the manager responsible promptly about currently expected effects of volatility!

Alongside the analysis of volatility mentioned before, it is necessary to integrate aspects of volatility into the existing processes and tasks of the controller (cf. the case studies from *Lufthansa*, p. **Fehler! Textmarke nicht definiert.**, *TRUMPF*, p. **Fehler! Textmarke nicht definiert.**, and *Hansgrohe*, p. **Fehler! Textmarke nicht definiert.**).

6.4 “Existing” tasks for the controller which have to be intensified**Modernize your planning and budgeting!****Recommendation 7**

Making your planning and budgeting flexible allows you to adapt the plans to changes in your company’s environment. This removes the danger that the plans you make continuously lose their importance due to high volatility.

Modern planning and budgeting is described by three characteristics: simple, flexible, integrated.

- Introduce “frontloading” to create a common understanding of the goals of planning! Make the planning process leaner in terms of both time and content: shorter planning cycles and less detailed information!
- Introduce rolling planning and a forecast to support it! Develop the forecast into a rolling one, if necessary. Of course, the simplifications mentioned in the previous point apply here as well.
- Focus your attention on the future by introducing scenario planning, sensitivity analyses and simulation tools, and integrate these findings into the strategy orientation and alignment processes of your company!

The existing processes of planning and budgeting must be refined and perfected to reflect the demands of volatility (cf. Chapter 5.2).

Recommendation 8**Expand your performance measurement systems to include relative targets and early indicators!**

The objective underlying this recommendation is to increase the speed with which changes are perceived and to include market developments in considerations on strategic corporate orientation.

Which possibilities are available here?

- Integrate the volatility indicators you identified during the volatility analysis in your performance measurement systems!
- Alongside absolute targets, also include relative targets in relation to market development in your performance measurement systems! This enables you to measure target achievement in comparison with your competitors.

Before changes can be considered promptly in modernized planning, you must first be able to see them early. To do so it is advisable to adapt your existing performance measurement systems (cf. Chapter 5.2).

Recommendation 9***Make your reporting leaner and more flexible!***

A lean and flexible reporting is necessary to master the more intensive provision of information to management induced by increasing change and to satisfy the continuously changing needs for information.

How can we do this?

- Give the managers the possibility to request individual information!
- Online-based solutions can provide management with flexible possibilities for evaluation and allow capacity for individual requests for information.
- Ad-hoc requests supply management promptly with up-to-date information to ensure a more intensive provision of information.

Alongside the further development of existing reporting processes, new sub-processes must be established. These make additional information available, especially reports about volatility indicators in early warning systems and the transfer of information about findings from the analysis of weak signals (cf. also Chapter 5.2).

Recommendation 10***Improve the efficiency and effectiveness of your controlling processes!***

Improving the efficiency of standard processes in controlling is not only a method of cutting costs; standardization, harmonization and automation are far more about freeing up resources. Due to the increased demands of a more volatile economy, those resources are needed to give the controller the capacity reserves necessary for additional analyses or for providing more intensive advisory services for management.

Which measures are necessary?

- Check the possibility of setting up controlling shared services! These bundle standard processes such as reporting together in competence centers with the aim of achieving greater standardization in processes and of creating economies of scale.

- Transfer the evaluation of big data or the use of more highly developed methods of analysis to specialized competence centers!
- Bundling specialist know-how and instruments for the topics of business intelligence, business analytics or predictive analytics creates a further contribution to increasing the quality of specialist analyses and to reducing the workload of other controlling functions.

It is important not to neglect the trade-offs which arise from this type of process improvement. Bundling expertise, standardizing processes and improving those processes by means of new tools can raise the efficiency of controlling. However, the decentralization associated with these measures also creates distance from controlling's day-to-day business, and the resulting need for coordination can make the overall process slower.

As a rule, it is always important to remember that as a rule process changes also have an impact upon the organization. Changes or adaptations to the controlling processes due to volatility may also necessitate a reorganization of controlling. However, this should not be carried out in isolation from changes to the organization of the company as a whole (see Chapter 5.3).

7 Recommendations of literature to start with volatility

General overview

Horváth, P./Michel, U. (Hrsg.), Controlling und Finance - Steuerung im volatilen Umfeld, Stuttgart 2012.

Zeitschrift für Controlling und Management, Volatilität, 56 (2012), Sonderheft 2.

Basic knowledge in mathematics

Hackl, P., Einführung in die Ökonometrie, 2. Aufl., München 2012.

Early recognition

Horváth & Partners (Hrsg.), Früherkennung in der Unternehmenssteuerung, Stuttgart 2000.

Resilience management

Pedell, B./Seidenschwarz, W., Resilienzmanagement, in: *Zeitschrift für Controlling*, 23 (2011) 3, S.152-158.

Weick, K. E./Sutcliffe, K.M., Das Unerwartete Managen. Wie Unternehmen aus Extremsituationen lernen, 2. Aufl., Stuttgart 2010.

Versatility

Westkämper, E./Zahn, E. (Hrsg.), Wandlungsfähige Produktionsunternehmen. Das Stuttgarter Unternehmensmodell, Berlin 2009.

Strategical controlling and management

Baum, H.-G./Coenenberg, A.G./Günther, T., Strategisches Controlling, 3. Aufl., Stuttgart 2004.

Corporate performance management in volatile environments

Gleich, R./Schentler, P./Kornacker, J., Eine moderne Planung und Budgetierung als Eckpfeiler eines zukunftsorientierten Controllings, in: Gleich, R./Mayer, R./Möller, K./Seiter, M. (Hrsg.), *Controlling - Relevance lost?*, München 2012, S. 17-47.

Internationaler Controller Verein (Hrsg.), Moderne Budgetierung, Gauting 2012.

Losbichler, H., Triple A Controlling - Die Unternehmenssteuerung, in: *Controller Magazin*, 37 (2012) 5, S. 4-9.

8 Used literature

- Anthony, R. N./Govindarajan, V.**, Management control systems, 12. Aufl., New York 2007.
- Chenhall, R.H.**, Management control systems design within its organizational context: findings from contingency-based research and directions for the future, in: *Accounting, organizations and society*, 28 (2003) 2, S. 127-168.
- Baum, H.-G./Coenenberg, A.G./Günther, T.**, Strategisches Controlling, 3. Aufl., Stuttgart 2004.
- Bea, F. X./Haas, J.**, Strategisches Management, 5. Aufl., Stuttgart 2009.
- Comin, D. A./Philippson, T.**, The Rise in the Firm-Level Volatility: Causes and Consequences, in: Gertler, M./Rogoff, K. (Hrsg.), *NBER Macroeconomics Annual 2005*, 20 (2006), S.167-228.
- Falter, W./Michel, U.**, Frühaufklärung und Risikomanagement für Unternehmen der chemischen Industrie, in: Dörner, D./Horváth, P./Kagermann, H. (Hrsg.), *Praxis des Risikomanagements*, Stuttgart 2000, S. 471-506.
- Gleich, R./Schentler, P./Kornacker, J.**, Eine moderne Planung und Budgetierung als Eckpfeiler eines zukunftsorientierten Controllings, in: Gleich, R./Mayer, R./Möller, K./Seiter, M. (Hrsg.), *Controlling - Relevance lost?*, München 2012, S. 17-47.
- Green, S.G./Welsh, M.A.**, Cybernetics and Dependence: Reframing the Control Concept, in: *Academy of Management Review*, 13 (1988) 2, S. 287-301.
- Hackl, P.**, Einführung in die Ökonometrie, 2. Aufl., München 2012.
- Hahn, D.**, Stand und Entwicklungstendenzen der strategischen Planung, in: Hahn, D./Taylor, B. (Hrsg.), *Strategische Unternehmensplanung — Strategische Unternehmensführung*, 9. Aufl., Berlin, Heidelberg 2006, S. 3-28.
- Hansen, H./Huhn, W./Legrand, O./Steiners, D./Vahlenkamp, T.**, CAPEX Excellence: Optimizing Fixed Asset Investments, West Sussex 2009.
- Hawranek, D./Hesse, M./Jung, A.**, Generation Unsicherheit, in: *DER SPIEGEL*, Heft 1, 2013, S. 58-60.
- Horváth, P.**, Controlling, 12. Aufl., München 2011.
- Horváth, P.**, Volatilität als Effizienztreiber des Controllings, in: *Zeitschrift für Controlling & Management*, 56 (2012) Sonderheft 3, S. 31-36.
- Horváth, P./Isensee, J./Seiter, M.**, Megatrends als Treiber der Zukunftssicherung des Controllings, in: Tiberius, V. (Hrsg.), *Zukunftsorientierung in der Betriebswirtschaftslehre*, Wiesbaden 2011, S.171-188.
- Horváth, P./Michel, U.** (Hrsg.), *Controlling und Finance - Steuerung im volatilen Umfeld*, Stuttgart 2012.
- Horváth & Partners** (Hrsg.), *Früherkennung in der Unternehmenssteuerung*, Stuttgart 2000.
- Internationaler Controller Verein** (Hrsg.), *Moderne Budgetierung*, Gauting 2012.
- Kieninger, M.** Die Unsicherheit beherrschen – Steuerungskonzepte für die volatile Ökonomie, in: Horváth, P./Michel, U. (Hrsg.), *Controlling und Finance - Steuerung im volatilen Umfeld*, Stuttgart 2012, S. 3-19.
- Krystek, U./Müller-Stewens, G.**, Frühaufklärung für Unternehmen - Identifikation und Handhabung zukünftiger Chancen und Bedrohungen, Stuttgart 1993.
- Lee, H.L.**, The Triple A - Supply Chain, in: *Harvard Business Review*, 82 (2004) 10, S. 102-112.
- Löffler, C.**, Systematik der strategischen Strukturplanung für eine wandlungsfähige und vernetzte Produktion der variantenreichen Serienfertigung, Heimsheim 2011.

- Losbichler, H.**, Triple A Controlling - Die Unternehmenssteuerung, in: *Controller Magazin*, 37 (2012) 5, S. 4-9.
- Malmi, T./Brown, D. A.**, Management control systems as a package - Opportunities, challenges and research directions, in: *Management Accounting Research* 19 (2008), S. 287-300.
- McManus, S./Seville, E./Brundson, D./Vargo, J.**, Resilience Management: A Framework of Assessing and Improving the Resilience of Organisations, 2007.
- Merchant, K.A./Van der Stede, W.A.**, Management Control Systems: Performance Measurement, Evaluation and Incentives, 2. Aufl., Essex 2007.
- Neusser, K.**, Zeitreihenanalyse in den Wirtschaftswissenschaften, 3. Aufl., Bern 2011.
- Nyhuis, P./Klemke, T./Wagner, C.**, Wandlungsfähigkeit - ein systemischer Ansatz, in: P. Nyhuis (Hrsg.), *Wandlungsfähige Produktionssysteme*, Berlin 2010, S. 3-21.
- Nyhuis, P./Reinhart, G./Abele, E.**, (Hrsg.), *Wandlungsfähige Produktionssysteme. Heute die Industrie von morgen gestalten*, Garbsen 2008.
- Pedell, B./Seidenschwarz, W.**, Resilienzmanagement, in: *Zeitschrift für Controlling*, 23 (2011) 3, S.152-158.
- Porter, M. E.**, Wettbewerbsstrategie: Methoden zur Analyse von Branchen und Konkurrenten, Frankfurt (Main)1983.
- Rööfli, F./Bunce, P.**, Die gefährliche Doppelnatur von Budgets und ihre Überwindung, in: *Zeitschrift für Controlling und Management*, 56 (2012) Sonderheft 2, S. 23-27.
- Schäffer, U./Botta, J.**, Hilfe, die Welt ist volatiler geworden! Implikationen für das Controlling, in: *Zeitschrift für Controlling und Management*, 56 (2012) Sonderheft 2, S. 8-12.
- Schmelzer, M.**, Die Volatilität von Finanzmarktdaten, Dissertation, Universität zu Köln 2009.
- Sheffi, Y.**, Worst-case-Szenario. Wie Sie Ihr Unternehmen auf Krisen vorbereiten und Ausfallrisiken mindern, Landsberg am Lech 2006.
- Stier, W.**, Methoden der Zeitreihenanalyse, Berlin, Heidelberg 2001.
- Stoi, R./Große, H.-W./Walde, A.**, Planlos zum Erfolg: Erfahrungen mit Forecasts als Führungsinstrument bei der B. Braun Melsungen AG, in: *Zeitschrift für Controlling und Management*, 56 (2012) Sonderheft 2, S. 16-22.
- Svensson, G.**, Key areas, causes and contingency planning of corporate vulnerability in supply chains: A qualitative approach, in: *International Journal of Physical Distribution & Logistics Management*, 34 (2004) 9, S. 728 - 748.
- Weber, J./Schäffer, U.**, Einführung in das Controlling, 13. Aufl., Stuttgart 2011
- Weick, K. E./Sutcliffe, K.M.**, Das Unerwartete Managen. Wie Unternehmen aus Extremsituationen lernen, 2. Aufl., Stuttgart 2010.
- Westkämper, E./Zahn, E.** (Hrsg.), *Wandlungsfähige Produktionsunternehmen. Das Stuttgarter Unternehmensmodell*, Berlin 2009.
- Wiendahl, H.-P./Nofen, D./Klußmann, J.H./Breitenbach, F.**, Planung moderner Fabriken, München 2005.
- Zäh, M.F./Möller, N./Vogl, W.**, Symbiosis of Changeable and Virtual Production. The Emperor's New Clothes or Key Factor for Success? in: Zäh, M./Reinhart, G. (Hrsg.), *1st International Conference on Changeable, Agile, Reconfigurable and Virtual Production (CARV 2005)*, München 2005.