TECHNICAL UNIVERSITY OF KOSICE

Katarína ČULKOVÁ

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MEASUREMENT OF LOGISTIC, FINANCIAL AND MARKETING PERFORMANCE

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Foreword

The sense of business existence is wealth creation. It presents the tool for evaluation of invested capital, when the „engine“ presents the money, as certain system, similar to the living organism. It assumes symbiosis of interests, coalition of all stakeholders and balance of their interests. Due to the existence of the business, there is necessary satisfaction of all participants. When the balance of business organism is damaged and interests of several stakeholders are not met, there is threat of coalition decline and company bankruptcy.

As mentioned, company is the tool for evaluation of owners' capital, invested as money or as the capacity and sources. It presents characteristics of the company, expressed by theory of value management. The demand of owner – to receive risk correspondent evaluation of the invested capital – is mainly legitimate as demand, when creditor obtained paid interest for money borrowing or when employee obtained wage, correspondent to his work. Every owner expects the profitability, correspondent to the risk. Profitability, similarly as risk of investments presents alternative costs of capital. When profitability of equity is over alternative costs of capital, it means situation, when company creates value for the owners.

The publication presents evaluation of value creation from the view of logistic and financial performance.

Košice, 7.3.2021

Authors

CONTENT

1

CHARACTERISTICS AND HISTORICAL DEVELOPMENT OF PERFORMANCE MEASUREMENT

Monitoring the performance of manufacturing companies has long been and still is often in the concept of financial indicators. The reason is the custom and trust in financial indexes as single reliable and universal measure of business characteristics. Single monitoring of performance is nothing new or special modern. Company Jakob Fugger and sons had established one of the first known systems for performance measurement yet in 15th Century, which dealt with mining of raw materials, business and financial transactions. Its offices were mostly in previous kingdoms, therefore the company needed single system, including whole Europe, which could be a tool for mutual informing to "upwards", which means to Augsburg, where family Fugger lived, as well as to "down", which means to individual organizations. Fugger needed exact and reliable system for evidence and control of business transactions and information system for transition of internal and external business information (Arnošt, 2017).

Fugger's methods had been very revolutionary, since he did not work only with accounting, but also he used non-financial information for performance evaluation. Actually, he considered them as considerable base for the decision. Using of main accounting book had been also in other businesses and almost in unchanged way it is using until present time. However, fact that also other, non-financial information are important for successful management of the company had been considered only several centuries later.

With the forming of the Industrial Revolution in the eighteenth century, the essence of business has also fundamentally changed. It presented not only "simple business" with anything. Typical business of this time was factory. Factories had been new idea due to the producing of great volumes, but only of few types of products. Competition had been understood as prices competition. Pressure to the low final

price of product caused that costs following had been new, probably redesigned part, important for the management of business performance. From the information view it means that standard accounting and reporting had been extended by detail accounting analysis of costs and their disintegration to budgeting units and individual products. Differences in costs and final price of product presented in this time proper differentiation factor that provided business success. But price presents only one of various factors, influencing business success.

Change of marketing environment that slowly started in the late fifties of the last century and that is still continuing and gaining dynamics, leads to the fact that low costs are far from the decisive factor of business success. Constant increasing of competition, globalization, growing demand of "pampered" clients, lead to the need of rapid innovation of products, finding of new, more effective ways of communication not only with clients, but also with subcontractors. Consequently, such situation demands finding of more qualified and creative people, which area able to produce new ideas and to realize them. Further important aspect means automatization of production, not only by the way of human work saving, but also due to the providing of maximal quality and repeating of production. Searching of performance in present modern business is therefore not possible to make only with considering of financial indexes of performance (Arnošt, 2017).

1.1 Definition and characteristics of business performance

One of the basic assumptions for long-term existence of the company is its performance, which had been considered by number of authors, which mention in their publications more about how to evaluate and manage the performance, not how to describe the performance. Limitation of performance is very complex and problematic. We will illustrate several definitions of the idea from various authors:

- performance from broad perspective is defined as "final test of any organization".
- Ability to produce during certain period file of goods and services (Souček, 2005).

- Idea of performance is defined also by Hindl, Holman and Hronova (2003) as "Ability of the company to evaluate invested capital."

The problems are researched also by Pavelková and Knapková (2005), according which performance includes all areas of business activities, which must be united with goal to provide long term prospering perspective of the business. But there is necessary to underline that performance does not have equal importance for all subjects, connected with business. Performance must be evaluated from the view of shareholders, as well as from the view of other subjects (stakeholders), from which the most important are employees and clients. Most definitions are the same that performance measurement are related to the process or connected activities of performance evaluation in the business unit. Differences or areas that had to be specified, rise in aspects, which activities include the process of performance.

We see the term performance very often, mainly in number of human activities. Theory of performance is orientated to the individual, as well as performance of machines, equipment, organizations or companies. There is not existing unique definition of performance. Literature offers number of definitions for performance measurement. Generally, it can be defined as "process of quantification of efficiency and effectivity" (Neely et al., 1995). Several authors orientate performance definition to more detail aspects, as for example: „measuring of performance orientates and coordinates decision activities of knowledge workers, which company delegated to decision about responsible suggestion, monitoring and evaluation of coherent and complex performance measurements" (Atkinson et al., 1997) or „measuring of performance means analysis of effectiveness and effectivity during given task doing. All evaluation are connected to the goals achievement" (Mentzer and Konrad, 1991).

1.2 Business performance in relation to the strategy and goals of the business

Determination of business vision and strategy is in present heavy competition fight very important to survive of any business. There is necessary to observe number of principles and fundamentals to create competition strategy. Such principles present base for any strategy creation. Process of strategy creation and its realization is

possible to include to several steps, while the most important step is certain single determination of strategy (Šmída, 2007).

There are two basic and important sources for creation of strategy – human capital and financial sources. Company should define its strategy in balance with long-term goals that are vital for its existence: profit creation, ability to satisfy market demands in long term, etc. After taking a certain approach to the strategy, company must realize that there is necessary to provide the strategy would be permanently achieved by employees. There is therefore principal not to underestimate phase of strategy implementation (Havlíček, 2011; Charvat, 2006).

Strategy is connected inseparably with performance and it has basic influence to the performance. Performance measurement in the company in relation to the strategy and goal of the business is illustrated by Figure 1. Connection of strategy and individual goals to the performance is very important from the view of performance measurement. In connection to the idea – what is not measured, cannot be managed – except of others there is applied that when we want to manage, we must know, what we want to manage and what we want to achieve, mainly what is our aim (Beran, 2012; Kaplan et al., 2010; Petrova, 2011).

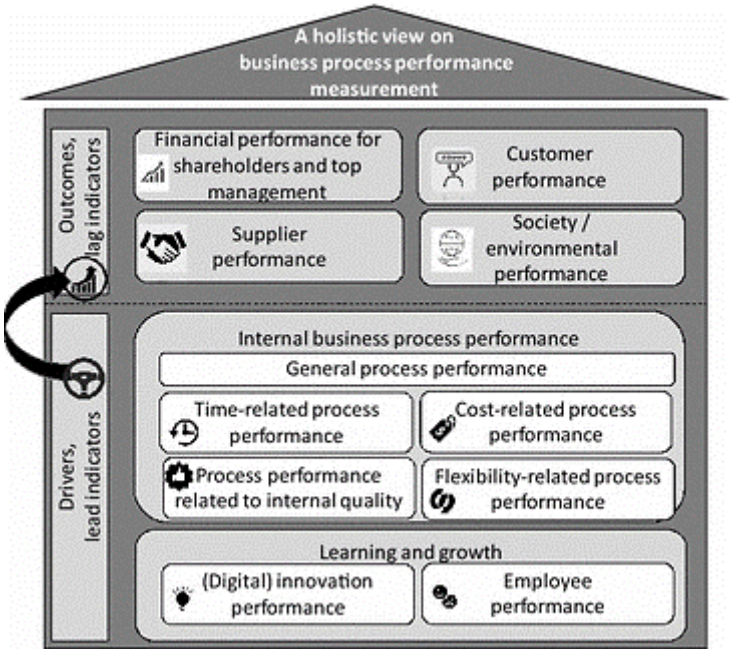

Figure 1. Measurement of performance in relation to the strategy and goal of the business

Source: own processing according Wagner, 2009; Kaplan et al., 2010

1.3 Business performance in relation to the employees

Next basic aspects of performance are employees. Employees belong to the key elements, participating at the business performance. By their active role, employees are participating at the creation of single product or service, but also at support processes. Due to the mentioned there is necessary not only to find able employees, but also to keep them and use appropriately their potential to remove all problems, leading to decreasing of employees' performance (Uceň, 2008).

1.4 System of management of business performance

Figure 2 schematically illustrates system of performance management in the company. Overlapping cycles in the middle of the figure are correspondent with basic element of business system, which are people, technique and information, unifying by the way of circle presents then whole company. By similar way also other elements are registered, as for example similar systems from the surrounding that are illustrated as suppliers and clients. The arrow illustrates behavior of business system, which present main process from performance planning as partial process and activity to performance execution, review and analysis.

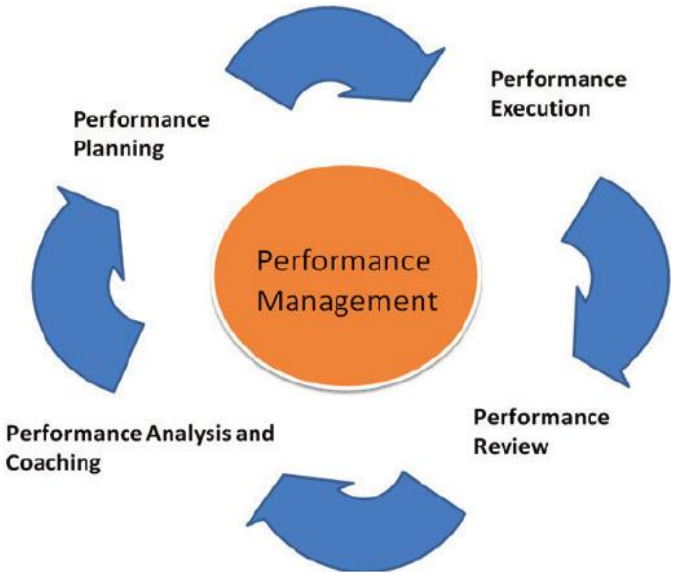

Figure 2. Main stages of performance management
Source: own processing according Giannopoulos, 2015

Management of business performance means maximization of outputs of business activity with present minimizing of consumed inputs. From the view of the company, in which performance management is done, there is information process, which means process of obtaining, elaboration and reporting of information. To manage the business cannot be done without measurement, therefore there is necessary to assume that between information for management prevailingly numerical indexes will be considered, with financial and non-financial character.

From the view of content there is possible to see own process of performance management as process of four phases. In the frame of the phases repeating there is possible to identify goals and possible ways for their achievement, to decision about concrete ways of determined goals realization and own realization (many times connected with reorganization of present business system).

Realization is connected with ongoing control, connected with evaluation, how the company succeed in achievement of determined goals. In case new determined goals are achieved, the whole system of management is repeated. In case of not achieved goals, new measurements are found how to additionally fill approved goals, with concrete way and consequent process of such measurements realization.

Figure 3 Perspectives of the company

Source: own processing according Veyrat, 2016

Process of performance management was from the view of its form limited as information process. The reflection of such way presents summary of various or less

formalized and automatized processes for data obtaining, their processing to the way of information and communication of such information. Considerable part of any information system is meanwhile systems of performance measurement, since we can manage only something we can measure. Except of information view to the performance (internal process perspective), there is necessary to consider also financial perspective, customer perspective and employees perspective (Figure 3).

1.5 Case study – A leading discount brokerage

A large discount brokerage had integrated several acquisitions successfully over the previous 10 years, fueling fast growth, and its newest acquisition was poised to increase the company's revenues by 50 percent. The new CEO and CFO wanted to connect their strategy to day-to-day operations more effectively – particularly when it came to meeting the changing expectations of customers for more digital and self-service offerings. They also wanted to better understand profitability by each client segment, product, and geography.

The company rolled out strategic performance measurement to accomplish three key goals. First, it translated strategic objectives into outcomes so it could measure using a limited number of key performance indicators.

Second, these KPIs were cascaded down to all functional areas – such as marketing, technology, operations, and other supporting functions – by creating drill-down views of the metrics, thus linking strategic goals to operational-level actions and performance. Dashboards were aligned by using a common language: for example, using the same definitions and parameters to calculate the metrics across different business units and functional areas.

Finally, KPIs were designed to better evaluate client segments. In the past, the company understood revenue, but costs were more difficult to calculate and allocate as there were many common costs spread across the organization. The new set of KPIs allowed leaders to allocate costs more precisely to determine the true profitability of business units and client segments.

2

MEASUREMENT OF LOGISTIC PERFORMANCE

At the logistic level the necessity of performance analysis was firstly presented by Bowersox and Closs (Green et al., 2008), which mentioned that measurement of logistic performance is constructed from the methodology of sources analysis for logistic activity and its main goals to monitor and manage logistic operations. After this initial step, analysis of logistic performance had become important task in area of managerial research. In spite of the attention of researches, there is only slow approximation from the view of methods and achieved results. As mentioned by Robb et al. (Robb, et al., 2008), regarding logistics is dealing with management of physical, information and financial flows, there is generally considered as the main determinant of company performance. However, concrete solutions, mainly while speaking about performance analysis, are still in period of experts and academic workers study.

In the literature there is number of work, connected with logistics performance and organization performance, for example Larson et al. (Larson et al., 2007), emphasizing that performance of logistics activities can have influence to the organization performance. Those authors in the study, made among leaders about influence of logistics performance to the business results found that great number of managers sees impact of logistics performance by the way of better performance of consumer service, lower stocks level and cost optimizing.

Because logistics contributes considerably to the organization performance, several studies searched influence of logistics activities performance and logistics solutions to the total performance of the company (Rosová et al., 2020, Wegsoova et al., 2019). Some authors, for example Zhou and Benton (2007), searched connection between logistics solutions and distribution performance from the view of services reliability, resulting that solution, connected with distribution and information sharing have direct influence to the performance. Also Green et al. (2008), dealt with relation between logistics solutions and organization performance in big number of

USA companies, resulting that logistics solutions have positive influence to the company performance, mainly to the supply speed and flexibility, but also to the market performance that has influence to the sales growth and profitability of the company. Roth et al. (2008) searched basic conditions and performance of prominent world organizations and found out that information Technologies and logistics contribute to the increasing of sales and profitability. Exactly said, information and communication Technologies increased sales and logistics increased profitability of organizations. Chow et al. (1994), which dealt with analysis of goals, solutions, skills and managerial performance in supply chain, found out that logistics solution positively influence logistics performance from the view of quality and services, distribution and effectiveness.

According to de Kluyver and Pearce (2006, p. 4), the ultimate goal of strategy is "long-term, sustainable superior performance." Such superior performance now depends on the ability of a manufacturing organization to become a fully integrated partner within a supply chain context (Cooper et al., 1997), thus all but requiring that manufacturing organizations adopt a supply chain strategy. Such supply chain strategies focus on how both internal and external business processes can be integrated and coordinated throughout the supply chain to better serve ultimate customers and consumers while enhancing the performance of the individual supply chain members (Cohen and Roussel, 2005).

Examples of business processes that must be integrated include manufacturing, purchasing, selling, logistics, and the delivery of real-time, seamless information to all supply chain partners. Managing at the supply chain level requires a new focus and new ways of managing (Lambert et al., 1998). Manufacturing managers must learn to communicate, coordinate, and cooperate with supply chain partners (Gammelgaard and Larson, 2001).

For this book we adopt the Larson and Halldorsson (2004) "unionist" perspective on the relationship between logistics and supply chain management. This perspective hold that supply chain management incorporates logistics as a key supply chain focused function (Council of Supply Chain Management Professionals, 2007).

Organizational managers are asked to focus attention and resources directly on supply chain functions such as logistics to bolster the competitiveness of the supply chains. The managers are, however, ultimately judged on the marketing and

financial performance of their organizations. Does a supply chain focus lead to improved logistics performance, which, in turn, results in improved organizational performance? It is our purpose to answer that question. Building on the works of Schramm-Klein and Morschett (2006), and Bowersox et al. (2000), we theorize a logistics performance model with logistics performance as the focal construct and supply chain management strategy as antecedent and marketing performance (sales and market share growth) and financial performance (return on investment and profit growth) as consequences.

2.1 Methodology of logistic performance evaluation

During obtaining of information about performance and their consequent interpretation, there is necessary to know for whom, from which point of view the performance will be measured and interpreted. Approach to the performance is directly connected to the relation of interesting group to organization, relations of individual groups between themselves and mainly on their preferences (Fibírová and Šoljaková, 2005).

Not only owners and managers are interesting about performance of the company, but also for employees, business partners and market environment generally (Vegsoová et al., 2019). Various interests of stakeholders are reflected also in formulation of strategy and strategic goals. Therefore, in case of not possible to measure performance of the company from various points of view individual users, the best is to measure and evaluate in relation to the strategic goals of the company (Wagner, 2009).

Importance of performance measurement is emphasized by whole row of reasons of measurement. Wagner (2009) in his contribution mentions two following most important reasons of performance measurement:

- comparing,
- objectifying.

Although performance measurement is developing from the character of the society, there is possible to find common backgrounds, which must be regarded at the creation of the process and realization of performance measurement, mainly:

- Understanding of necessity to change performance,
- Necessity to connect performance to determined goals,
- Measurement of performance must fill certain demands.

Supplier – customer relations

Supplier – customer relations present cooperation between supplier and consumer. Main reason why companies choose their suppliers is that it presents base for creation of constant supplier – customer relations. Those relations are adapted according Commercial Code, secured according the agreement. Position of the company at the market presents priority factor that influence those relations. Main dominant of relations is to create optimal conditions for cooperation between two companies from the view of economic, as well as factual view, while needs of the society should be effectively provided. Only profitable relation presents base for the next cooperation (Nenadál, 2008).

Relations between suppliers and customers are divided two four periods:

1. Pre-preparation phase – connected with development of new supplier. Companies are mutually compared and connected without any business relation.
2. Preparation phase – connected with samples sending for order realization.
3. Development phase – cooperation between companies is reflecting in agreements about supplies, while there is repeated purchase and by this way knowledge of the company is increasing.
4. Long-term relations phase – business relations are stable. Important part of this phase is to orientate to the casual dependence and to analyze situation with supplier).

2.2 Logistics Performance and Supply chain management (SCM)

Logistics can be done by supply chain management that presents philosophy of flows management through chains and nets, which is based on the information and data change (EDI) between various business subjects (Lambert, 2004). SCM deals with administration of whole chain from producers and suppliers through sellers to final consumer. The goal of SCM is:

- To increase speed of transaction of data exchange in real time.
- To increase sale by effective implementation of clients demands.
- To decrease stocks.

SCM presents coordination of financial flow with aim to satisfy client from the view of supply chain and integration and application of organization units that create supply chain.

2.2.1 SCM types

SCM types are different due to the ownerships, stocks allocation, strength of material, legislative and information relations and rate of the final products marketing. Table 1 illustrates the basic types.

Table 1. SCM types

SCM types	Characteristics	Advantages/disadvantages
Supply chain according EDI	Chain is based on electronic change of information between companies.	+ regulation of capacities using, + planning of greater batch production, - Price control - Known cost calculation between companies
Lean supply chain	It presents chain, orientated to the cost minimizing, achieved by stocks minimizing.	+ stocks minimizing + automatization - sensibility to the reliability
Agile supply chain	Chain is based on the activities with clients.	+ timely supply + short period of planning + flexible supplies

Leagile supply chain	It presents hybrid chain that recognizes three ways how to provide proper products from the view of price for final client.	+ demand stability + knowing of clients demand + receivables division
Demand chain	Chain can be characterized by the way that dominant company defines its receivables to suppliers several periods ahead.	+ optimizing of production batch + production in ahead

Source: own processing

2.2.2. Elements and indexes of logistics performance of the company and supply chains

Elements of logistic performance include broad scale of indexes. Such elements and indexes are divided in expert literature to various groups. The approaches to the categorization of logistics performance elements and supply chains are as follows:

Schulte approach

According to Schulte (1994) optimizing of logistics performance with its components is goal of every logistics activity, while logistic performance has two components:

a) logistics services,
b) logistics cost.

Elements of logistics services that the client sees as logistic performance are:

- Supply time,
- Supply reliability,
- Supply flexibility,
- Supply quality.

Second component of logistics performance presents logistics cost that can be divided to five cost groups:

- Cost of management and system,

- Cost of stocks,
- Cost of stocking,
- Cost of transport,
- Cost of manipulation.

Schulte (2014) presented approach of logistics indexes structure to following groups:

- Structured and frame indexes that are concentrated to the tasks extend (for example transport volume per period), capacity of given area (for example number of employees) and cost (for example cost of production logistics).
- Indexes of productivity, serving for measurement of employees' productivity and technical equipment by the way of quantitative indexes (for example number of elaborated orders per employee), time indexes (for example time, necessary for acceptance of shipment to the stocks) or derived indexes of capacities using (for example transport vehicle using).
- Economic indexes, which give information about logistics cost for achievement of individual logistics performance, related to the performance unit (for example distribution cost per clients order. They present rate of cost and revenue indexes (for example rate of cost per order elaboration), while providing review of efficiency of stocking in logistics.
- Quality indexes by the way of rate values (for example rate of delayed delivery to total number of deliveries) or time indexes (average time of supply) that express level of goals achievement and reflect quality of logistics performance.

Krauth approach

Krauth et al. (2005) define frame of indexes and gives emphasize to the extent of logistics performance measurement. This frame has two main dimensions – point of view and period, in which indexes are illustrated in Figure 4.

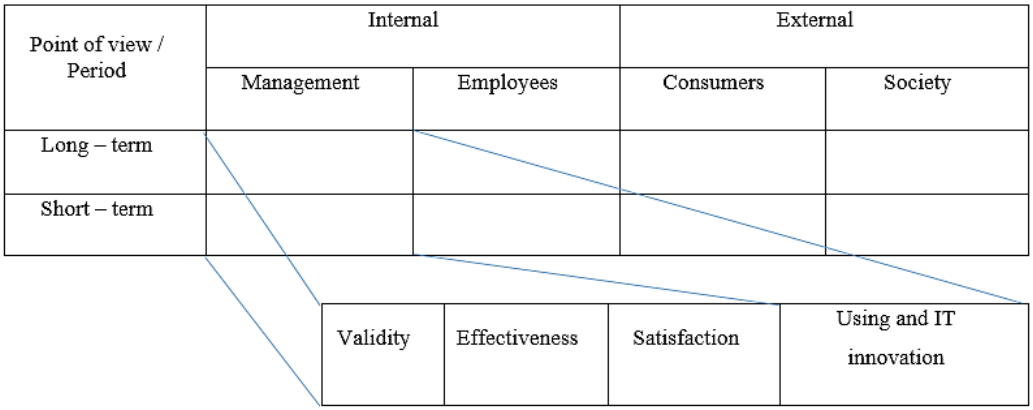

Figure 4. Classification of indexes

Source: own processing according Krauth (2005)

First dimension „Opinions of the parties" or also „Point of view" include two groups – internal and external measurements. From the internal point of view, there are ideas of management and employees in the frame of the company. External point of view includes perspectives of consumers and the company. Dimension of the opinions of the parties is motivated by argument that conflicts are many times orientated to the goals of various parties. With goal to achieve effective expectation of interested parties the needs and wishes of the most important parties must be measured. The example of such scenario is price of logistic services. Leadership wants to have higher prices, which would lead to the higher profit, desire of consumers is orientated to lower prices, employees have no direct interest of prices, but rather working conditions and finally company is more interested of total economic climax.

Second frame is "Time horizon", in which the indexes are used. According this frame there are existing short time and long-term indexes that are analogical with operative and strategic final points of measurement dimensions. Short-term indexes are many times recorded weekly and daily and long-term indexes are measured during long term time horizon, which means months and quarters.

Richter approach

Richter (2008) understanding of logistic performance is from the view of perspectives, when strategic indexes of the company can be divided as follows:

- Financial perspective – assumed priority can be service of target segments with profit – to maximize sales and to support proper growth possibilities. The basic data are meanwhile accounting and reports.
- Human sources perspective – assumed priorities is observing of stable employees, development of their abilities and creation of proactive business culture.
- Consumers' perspective – its assumed priority is orientation to the specific segments, implementation of correspondent marketing mix by proper programs.
- Perspective of internal processes – followed in individual processes individually.

System of indexes provides then total view of the business performance from various perspectives. The base is continuity of individual perspective to the business strategy and their mutual influencing. Indicators can be meanwhile suggested according available information and there is necessary to adapt them in accord with strategy choice and preference of business management.

Similar structure is mentioned in expert literature, when The Foundation for Performance measurement illustrates six dimensions of performance parameters:

- Competitiveness,
- Financial performance,
- Quality of services,
- Flexibility,
- Using of sources,
- Innovation.

Fugate approach

One of the possible approaches for understanding of logistics performance measurement is illustrated at Figure 5, developed by Fugate, Mentzer and Stank (2010), which reflects mutual dependence of logistic effectiveness, validity and

difference in the frame of logistics performance and total organizational performance.

This model and view of the logistics performance is supported by various authors, which see logistics performance as multidimensional function of effectiveness, utility and differentiation that can be followed up at the same time (Davis and Pett, 2002; Horváth and Partners, 2001).

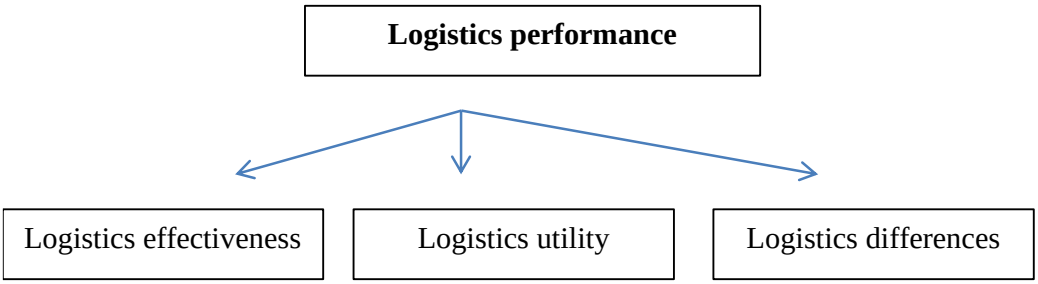

Figure 5. Model of Logistics Performance according Fugate

Fugate et al. (2010) elaborated and summarized in their study knowledge, obtained from discussions and contributions of various authors and made metric categorization for elements of logistics performance that is illustrated by Table 2.

Table 2. Metric categorization of definitions

Effectiveness
1. Rate of used sources against the result (Mentzer and Konrad, 1991).
2. Internal operation of logistics is better expressed by certain rate of inputs to real value
of outputs (Van der Meulen and Spijkerman, 1985).
3. Measure of invested means using (Fugate et. al. 2010).
Utility
1. Extend of achieved goals of logistics operation (Mentzer and Konrad, 1991).
2. Ability to achieve ahead determined goals, for example satisfaction of clients demands
in critical areas – products guarantee, availability at the stock (Langley and Holcomb, 1992)
Difference
1. Comparing of logistics activities results with competition (Langley and Holcomb, 1992)
2. Precedence in comparing with competition (Fugate et. al. 2010).

Source: Mentzer and Konrad, 1991

2.3. Relation between effectiveness, utility and difference

One of the logistic performance definition speaks about „level of utility, effectiveness and difference, connected with realization of logistic activity“ as mentioned higher, as

well as mentioned in publication Cameron (1986). Companies, dealing with logistics performance should try to be perfect in those three dimensions.

According higher mentioned definition there is assumed that level of results is achieved in any dimension, and by this way, total logistics performance is increased. This means according this definition company could achieve highest possible logistics performance, when all three dimensions are at the highest level. However, this is against theories that effectiveness and utility is in a conflict with business goals. For example Mahoney (1988), Davis and Pett (2002) receivables that there is difference between effectiveness and utility, which means that given organization is effective and useful, but cannot be useful and at the same time effective. One of the reasons of high number of researches that are made in area of effectiveness and utility is, this area presents very important and practical problems. Conflict between mentioned ideas is based on the possibility that the base of logistics performance definition is three dimensions (Vahrenkamp, 2007).

2.4. Review of approaches to logistics performance measurement in the company and supply chains

Presently available literature provides number of systems, supporting measurements and evaluation of logistic performance, single either in single company, or in supply chains. However, they have common goal, mainly to present certain tool, by which not only top management could find shortages in various areas, but also they can help to orientate the business to better results and higher market competitiveness.

On the other hand, there is necessary to know often difficulty of such approaches that means sophisticated implementation and therefore establishment of certain measurement and evaluation system of logistic performance need not to guarantee success of the business. When considering that, performance is not only one metric method, but it consists of great volume of dimensions, there is useful to combine several metrics in the system of performance measurement. In domestic, as well as in foreign literature we met number of approaches and methods, applied in logistics performance measurements.

The most often used approaches are:

- Balance Scorecard
- Key Performance Indicators
- Capability Mature Model Integration
- EFQM Model Excellence.

2.4.1. Logistics performance measurement by Balanced Scorecard

Balanced Scorecard tries to make balance rate between financial and non-financial indexes; indicators of consequence and reason, formal and factual indicators, formal and social indicators, strategic and operative indexes, internal and external indexes (Kaplan and Norton, 2010). With aim as higher mentioned, the company is evaluated from four perspectives, as illustrated by Figure 6.

Figure 6. Balanced scorecard perspectives

Source: own processing according Kaplan and Norton, 2010

1. Financial perspective: Financial area informs about impacts of business strategy realization on the economic result of the company.
2. Consumers' perspective: The subject of this view is successful operation at the market with aim to achieve determined financial goals.
3. Perspective of internal business processes: dealing with basic processes in the company that must be under control to be successful at the market.
4. Perspective of learning and growth: including development of goals and indexes to support learning and growing of organization.

These perspectives are only some recommendations and must be adapted for various sectors and various companies. Concept Balanced Scorecard needs not to be related to the whole company, but also to some of its areas. Such area can be also logistics. BSC areas must be always in accord with strategy of the whole company. Since companies have different strategy, BSC is different from classical systems of indexes that are conceived without regard to the business specifics. Balanced Scorecard of the logistics can be further divided to BSC of purchase logistics, BSC of production logistics, and distribution or reverse logistics (Vahrenkamp, 2007). Siepermann (2003) tried to implement Balanced Scorecard to logistics. He selected as strategic goals in his publication increasing of consumers satisfaction and decreasing of logistics cost. After processing of goals to four perspectives, there was constructed scheme, mapping relations between goals, determined for the given areas (Siepermann, 2003).

2.5. Key Performance Indicators

Key performance indicators (KPI) are quantitative indexes that inform about important, calculated economic data of the business. They serve for business performance measurement, in either individual areas or enabling simple and wholesome illustration of complex structures and processes that can be also used as planning control tool (Parmenter, 2010). KPI can be divided to two categories and to basic and rate indexes. Basic indexes present absolute numbers that can be real indexes only in comparing with other data. Rate indexes express the rate between at least two indicators.

Parmenter in his book distinguishes three types of performance indicators:

1) KRI – Key Result Indicators – informing about success of given business,
2) PI – Performance Indicators – informing what is necessary to do,
3) KPI – Key Performance Indicators – informing what is necessary to make for dramatic increasing of performance.

Typical example of relations between those criteria according Parmenter (2010) is similarity with onion (see Figure 7). Total state of the onion is characterized by external peel. After peeling of external peel, we obtain more information. The individual peels represent various performance indexes, when the middle present key performance indicators.

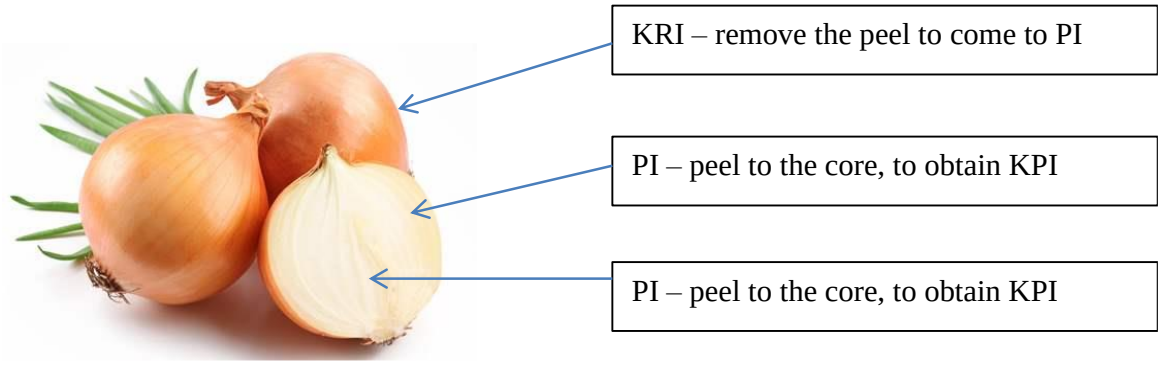

Figure 7. Types of performance indexes „onion model“
Source: own processing according Parmenter, 2010

2.5.1. Key results indexes

Parmenter (2010) speaks that KRI are many times changed by KPI. Those indexes include satisfaction of client, net profit before taxation, profitability of clients, satisfaction of employees and return on capital employed. KRI give information about doing of the business subject, when the measure is result of number of business activities and gives idea of business orientation to the future in accord with strategy and vision. KRI provide information for those that are not part of everyday management. KRI are registered in long-term period (monthly or quarterly) against KPI that are verified more often (daily or weekly). Among KRI and real indexes of performance belong according Parmenter (2010) whole row of supporting performance indexes, which complement KPI. KRI are different from other measurements since they have influence to results reporting. The consequence is division of performance metrics for organization administration (directorate) and for the leaders of the company (management). Maximal 10 metric is given to directorate, given in readable form. Management should work with combination of 20 KPI and KRI metrics.

2.5.2. Performance indexes

Performance indexes present information what to do to balance goals of individual business units with total business strategy. As mentioned by Parmenter (2010), PI are between KRI and KPI, including profitability and increasing of sale at main 10% clients, net profit of key productions and number of employees, participated at the program of improvement. Marr (2012) mentions that proper key indexes can help any organization to determine, if it is orientated to the success, or if it goes the wrong way. The problem of number of managers is that they want to find immediately „the proper way" without following and registering of performance indexes. KPI provide illustration what to do, to increase performance of business dramatically. Proper determination of such most critical measures according to Parmenter (2008) lead to present and future success of organization. KPI is not something new for organizations, majority KPI are considered in organizations. Companies that have as one of their goals to be „profitable in the sector", must orientate their KPI to profit and tax measurements. If KPI do not have some value, there must be a way how to define and measure them. There is no useful to determine KPI, such as: „to generate the biggest volume of returning clients," without regarding new and existing clients Parmenter (2010) defines seven characteristics of KPI:

1) non-financial metrics (not expressed in monetary units),
2) measured repeatedly (for example daily),
3) top management together with general director deal with them,
4) understanding of the metric adaptation in case,
5) responsibility of the team and individuals,
6) significant impact (for example influencing of majority of main critical success factors),
7) positive impact (for example external using influence other metrics of performance).

2.6. EFQM Model Excellence

EFQM Model Excellence presents generally model, applied in all types of organizations. Model assumed that organization can obtain the best results only if external clients, own employees would be maximally satisfied, together with surrounding respecting. To achieve mentioned, organization must manage its processes perfectly, must have properly determined policy and strategy and must have elaborated system of all sources and partnerships management.

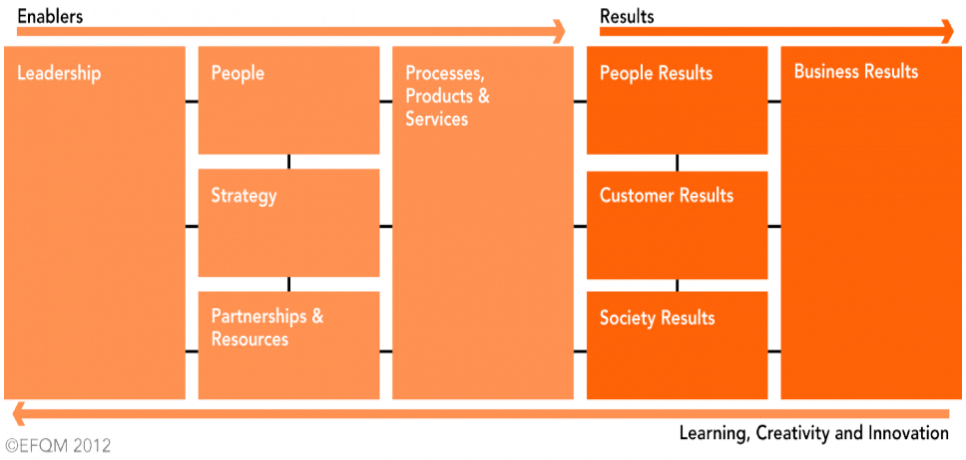

Figure 8. EFQM model

Source: Nenadál, 2009; EFQM 2010

This is connected with culture and approaches of leadership at all levels (Nenadál, 2009).

Any criteria is first of all defined and consequently divided to system of so-called orientation points, which present certain recommendations for organization (EFQM 2010):

- Leadership: Excellent leading personalities developing and enabling achievement of mission and vision.
- Policy and strategy: excellent organizations apply their vision and mission, orientated to the interesting parties that consider market and sector of the business.
- Workers: Excellent organizations manage, develop, use and release total potential of their workers at the level of individuals, team and organization.

- Partnership and sources: Excellent organizations plan and manage external partnership, relations with suppliers and internal sources that support policy, strategy and effective acting of processes.
- Processes: Excellent organizations suggest, manage and improve processes by the way in total extend to meet needs of clients and interesting parties. At the same time, they create increasing value.
- Consumers – results: Excellent organizations achieve excellent results with regard to their clients.
- Employees – results: Excellent organizations achieve excellent results due to their workers.
- Society – results: Excellent organizations achieve excellent results with regard to the society.
- KPI: Excellent organizations achieve the best results with regard to key elements of policy and strategy.

The model enables to estimate areas for improving in the organization and yet to use strengths of the organization better. The results must be repeated, searched from the view of their adequacy and effectiveness.

Model Excellence EFQM is rather simple, but is application is sophisticated. Top management must understand its principle. The model should be the tool of qualitative management and success, but it must be applied any time. Any manager during his activity must apply individual elements that are complexly structured in the model. Organization can use the model for its internal need without showing any value at the national or European level (Nenadál, 2009).

2.7. Evaluation of the logistics performance in the company

Development of measurement and evaluation of logistics performance in the company is influenced by determinants of the logistics and extend of its metric. The important is also systematic view – connection to all logistics processes in the logistic system of the company.

Measurement and evaluation of logistics performance of the company means activities that should provide actual, exact and objective information about

operation of individual logistics process with aim the processes would be operatively managed with goal to fill determined logistics goals and demands.

Total performance of logistic system is influenced by performance of logistic processes of the company. Measurement and evaluation of logistic system of the company should be gradually part of logistic performance management (Rosová, 2010).

Management of logistic processes performance, measurement and evaluation of logistic system performance should present continual process that could help to achieve the goal and synergic effect (Vidová, 2009; Vidová and Červeňan, 2002).

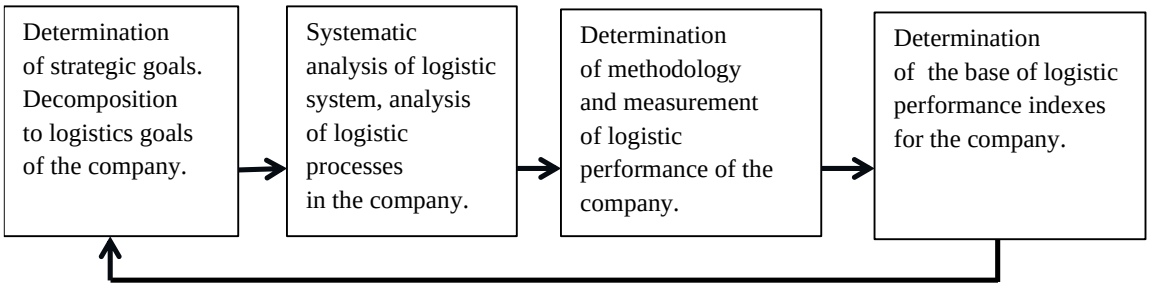

Figure 9. Continual process of measurement and evaluation of logistic performance
Source: Rosová, 2010

Traditional way how to evaluate performance of the company is to evaluate its ability to achieve demanded financial indexes (turnover, profit or market rate). The company has good performance when it achieves planned financial results (Foltínová and Kalafusová, 1998; Závadský, 2011. Among the highest weaknesses of traditional approach to evaluation of company performance is that financial indexes provide exact feedback to what measure the company achieved demanded performance. Those indexes evaluate therefore only yet realized performance. In spite of great afford of managers and their approaches there is no success in minimizing this weakness of traditional evaluation of company performance (Rosová, 2010; Závadský, 2005. According realized research of domestic and foreign literature there is possible to state there is any concrete methodology for measurement and evaluation of logistics system performance of the company.

Table 3 Short review of methods for evaluation of logistics performance in the company

Methods	Characteristics	Type	Measure of subjectivity
Logistic audit	-standardized evaluation and project process, orientated to the logistic functions of the business system management. -the goal is to provide management comparing material of logistic situation in the company and to show potential for possibilities of changes in logistic activities with aim to achieve logistic effectiveness. -the result is definition of tasks for changes in logistics, leading to increasing the performance and enabling increasing of competitiveness. -flesh analysis	Qualitative method	Subjective
Multi criteria evaluation of logistic performance	-need of sufficient volume of real information, incoming to the decision process. -priority is method, resulting in acceptance of decision according calculated utility of objects, incoming to decision process. -at the decision there is necessary skill helping to select evaluation criteria, providing the best information for decision. -AHP method, RAL models.	Qualitative and quantitative methods	Subjective
Logistic controlling	-advisory staff function, analyzing momentary state of the logistics system and confronting logistics goals of the company. -obtaining, processing and providing information, navigating management system by proper direction. -running of the process in accord with six periods and correspondent tools are available for any process.	Quantitative method	Objective

Source: own processing according Rosová, 2010

2.8. Case study – Measurement of logistics performance in the production company

Suggestion for problem solution by proper method through following process:

- At the creation and finding of method and methodology there will be resulting from the principles, necessary for providing of effective results:

1. Systematic approach, which means understanding of the structure as the system and how to suggest it,
2. Approach of abstraction, which means neglecting of the secondary aspects, target orientated detail,

3. Principle of structuring, which means to find such redundant illustration that will observe the unit with specific marks,
4. Principle of continuity,
5. Principle of hierarchy, which means system has a hierarchy, when its individual elements are structured according level of ranking. The same level of management has also elements with similar level of structure,
6. Principle of modularity, which means characteristics of those parts, to which the system is decomposed. At the lowest level of strongly internally connected subsystem, downward, the connections are smallest.

- Application of empiric approach during finding and suggestion of problem solving, during this period there is real possibility to lean on heuristic approach.
- Regarding of individual specifications that have character and characteristics of the problem.

Measurement and evaluation of SCM performance is made at the horizontal level in the frame of logistic net that present supplier – company – consumer (from left to right), which means to evaluate performance across SCM. Measurement and evaluation of logistic performance in SCM will be through:

- Individual participants of SCM,
- By logistics indexes.

Defined indexes are according to type of measurement and metric. Indexes are part of three dimensions:

- Level of measurement,
- Frequency of measurement,
- Competition point of view.

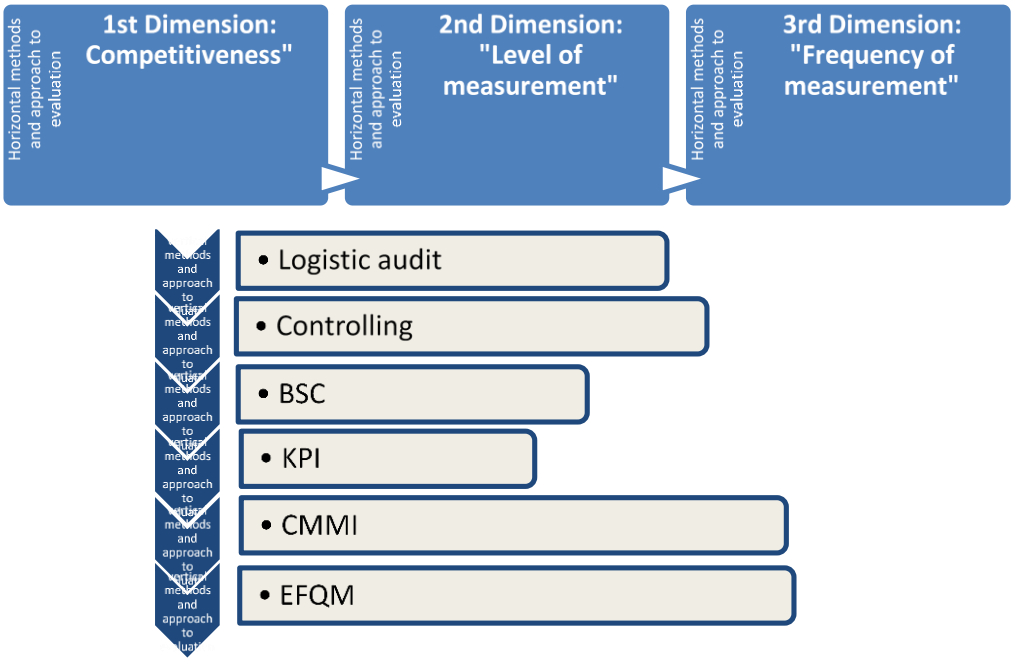

Figure 10. Vertical and horizontal Logistics Indexes in SCM

Source: own processing according Griffis, 2007

1. dimension: „Competition point of view“

Innovative products are more different from common products; therefore, they need different system of measurement. Innovative products demand more sensible systems of measurement. Margin points of dimension present effectiveness and measure.

2. dimension: „Level of measurement“

Second dimension is „level of measurement“, identifying strategic orientation of the measurement. Two marginal points are strategic and operative level.

3. dimension: „Frequency of measurement“

In this dimension, marginal points are presented by monitoring and diagnostic. The indexes that are followed not so often are registered as diagnostic and indexes that are followed daily are registered as monitored.

Those dimensions can be illustrated as 3D measurement by the cube at Figure 8-10. The Figure illustrates examples of logistics indexes and their place in 3D.

Suggestion of methodology for logistic performance evaluation in the company and its individual chains

Evaluation of logistic net participants generally

To evaluate and measure logistic performance in the frame of SCM can be done through consumer, supplier and company. As during the evaluation and measurement of the logistic performance of the company we are interesting about quality, productivity, cost, etc., also in this case we are interesting of logistic indexes. Fourteen defined logistic indexes are placed in 3D cube according type of measurement and view of observer. Indexes are part of three dimensions: level of measurement, frequency of measurement and competition point of view.

Strategy – Strategic are lead organization during decision at the highest level (3-7 years, vision, etc.). This area helps to observe „way towards main goals."

Operative – area of operative is based on managing process, providing fluent operation of production cycle.

Monitoring – Monitoring area provides management routine, often and detail information of logistic organization health.

Diagnostics – Diagnostic part presents information periodically.

Effectiveness – area of record ability of logistic system to convert input to output (inbound – outbound logistics).
Responsibility – area of responsibility helps to increase level of provided services. Mentioned areas are illustrated by Table 4-5.

Table 4. Limitation of space indexes in 3D evaluation of supplier logistics performance

Type of measurement	*3D dimensions*		
	Level of measurement	**Frequency of measurement**	**Competition view**
e - effectiveness			2, 4, 5, 6, 8, 9, 13, 14,
r - responsibility			12,13,
m - monitoring		1, 3, 5, 6, 8, 9, 10, 11, 13,	
d - diagnostic		2, 14,	
o - operative	1, 3, 7, 8, 9, 13,		
s - strategy	2, 4, 6, 10, 12, 14,		

Source: own processing

Table 5. Limitation of space indexes in 3D evaluation of client logistics performance

Type of measurement	*3D dimensions*		
	Level of measurement	**Frequency of measurement**	**Competition view**
e - effectiveness			1, 4,8, 14,
r - responsibility	2,	2,	1, 2, 6, 9, 10, 12,
m - monitoring	2,	4, 5, 7, 9, 11,	
d - diagnostic		3, 5, 10, 12,	
o - operative	2, 4, 7,		
s - strategy	6, 8, 11, 13, 14		

Source: own processing

Flexibility of SCM in logistic net

Methodology for development of conception of the flexibility

To plan SCM there is a new priority, mainly level of flexibility. However, there is any study that would provide full frame, including broad scale of tasks and responses (internal or external), connecting SCM flexibility. In the following part, we try to develop conception of flexibility.

According to research of Christopher and Peck (2004) there was presented frame for the SCM flexibility. The authors confirmed that SCM flexibility is created by four key principles:

1. Flexibility can be included to SCM system yet before its weakening – destabilization (which means restructuring),

2. There is necessary high level of cooperation on management and risk identification.
3. Necessary skills are necessary for rapid reaction at the unpredictable events.
4. Characteristics are skills, availability, efficiency, flexibility, frequency and visibility, which are considered as secondary factors (Kochan, 2019).

Basic definition can be found in technique: tendency of material to return to the original shape. In ecologic science, standard definition of flexibility means ability of eco system to avoid danger, with present observing of variety, integrity and ecologic processes. Conception of flexibility is used also in area of engineering, research and ecologic science that provide view of creation of flexibility conception for SCM. Flexibility in SCM can be defined as adaptive ability of the chain to prepare and react to unpredictable events.

3D view to the evaluation of mutual supplier – consumer partnership

Partnership in supplier – consumer chain means cooperation between seller and buyer, which records certain level of mutual dependence and cooperation on concrete project or concrete contract of purchase. Such partnership emphasizes direct and long-term association, supporting of mutual planning and problem solving. Creation of partnership is necessary for operation sin SCM, as well as for effective providing of services. Evaluation of suppliers or consumers performance is not sufficient – there must be evaluated also relations between supplier and consumer. Parameters that must be regarded during evaluation of partnership are parameters that support and strengthen them. For example, level of help during solving of common problems shows to the strength of partnership. Evaluation of partnership is based on such criteria, which will have consequence as successful partnership that lead to effective and detail integrated SCM.
Evaluation of SCM in context of chain between supplier and consumer chain through 3D (effectiveness, flow, integration, reaction, satisfaction of clients, etc.) includes important measurements on strategic, tactic and operative level.

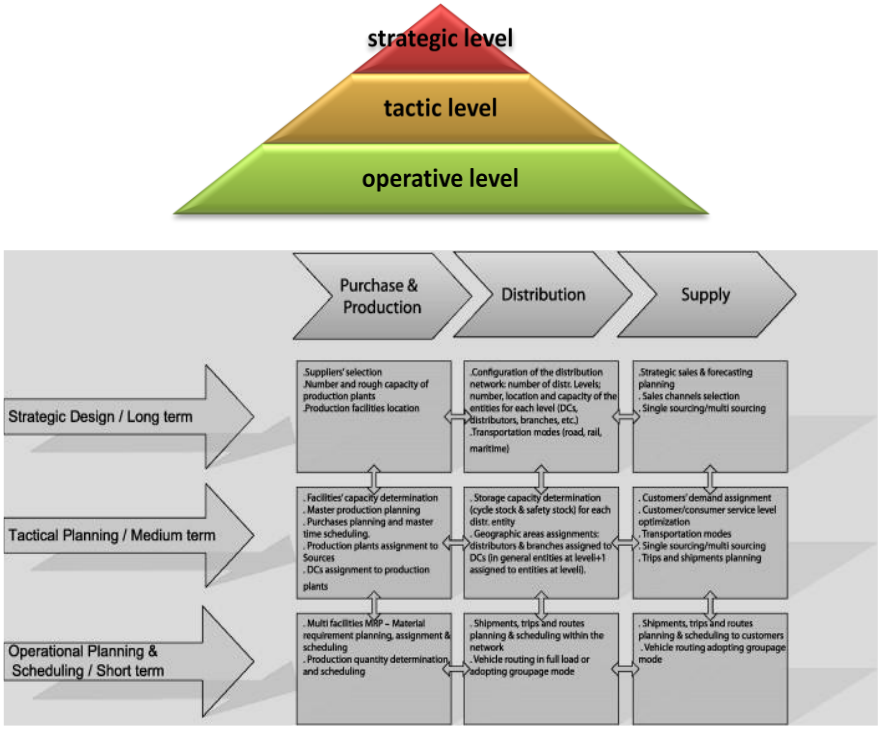

Figure 11 Levels of SCM

Source: own processing

1. ***Strategic level*** **–** area of strategic level includes qualitative and quantitative indexes, evaluation of connection, satisfaction and consumer services between supplier and consumer.

2. ***Tactic level*** **–** the area includes planning of orders and measurements at the level of production at supplier.

3. ***Operative level*** **–** the area includes control of plans filling, fulfillment of suppliers and consumers abilities, management and connection of the chain, fulfillment of orders.

Discussion to the measurement and evaluation of performance from the view of logistics performance

Frame of measurement and evaluation of performance describes feedback or information of activities, connected fulfillment of clients' expectations and strategic

goals. It reflects need of improvement in areas with not satisfied performance, quality and effectiveness.

Table 6 Description of level and indexes for supplier and consumer relations

Level	Logistics indexes	Supplier	Consumer
Strategic	***Quantitative indexes:*** - Cost - Logistic sources using	- effort of cost minimizing, materials sufficiency, qualitative machines, stocks spaces	- effort of cost minimizing, shortage of materials, delay of supplies
	Qualitative indexes: - quality - flexibility - visibility - trust - innovativeness	- quality of material, technological processes, satisfied clients, lack or mistaken documents, certificates, advertisement	- quality of ordered material, supplied volume, trust
	Evaluation of connection between supplier and consumer	- solvency, perspective, flawlessness, reliability, communication	- solvency, perspective, flawlessness, reliability, communication
	Evaluation of satisfaction and consumer services	- index of client satisfaction, evaluation of supplier reliability	- evaluation of client satisfaction level
Tactic	***Planning of orders:*** - method of order placing - order timing - way of order from client	- order meeting, speed reaction to order, proper expedition of goods	- speed of supply, timely supplying, correct communication
	Measurements at the level of production at supplier: - extend of products and services - capacity using - efficiency of techniques and planning	- possibilities of production capacity, ability to extend the capacity, production program and its development	- measure of term deadline, flexibility of supply, volume of capacity, risk of supply in case of trial run, downtime of production at supplier
Operative	***Control of plans fulfillment***	- Supply plan	- Supply plan
	Fulfillment of supplier and consumer abilities	- Flexibility of supply	- Flexibility of supply
	Managing and connection in supply chain	- Strategy of management – push, pull, synchro mrp	- Strategy of management – push, pull, synchro mrp
	Orders fulfillment	- measure and certainty of fulfillment, measure of uncertainty risk	- measure and certainty of fulfillment, measure of uncertainty risk

Source: own processing

In this part there is presented new frame for measurement and evaluation of performance, resulting from quantitative and qualitative criteria, evaluation of connection, satisfaction, planning of orders, measurements at the level of production, control of plans fulfillment, suppliers and consumers' abilities, management and connection of the chain and orders filling. Quantitative criteria can be observed easily, since they are commonly presented numerically, for example as cost, presented by money. Qualitative criteria, as for example trust and visibility, have influence to the performance and they are more conception orientated. There is any concrete definition of qualitative criteria that would be properly applied in SCM. Totally 7 attributes is recorded as important logistics indexes that influence SCM performance. Two of them are quantitative criteria (cost and sources using) and five of them are qualitative (quality, flexibility, visibility, trust and innovativeness). Cost should be hold at the minimum, sources should be used in optimal level with effective using. Some other factors are important for performance, but they are heavily quantified. Measurements should be quantified as time and accuracy. First of all in SCM society is relying also on trust and visibility (Gunasekarana et al, 2004).

Cost

Profit of the company is directly influenced by cost of its activity. Therefore, profit has important task and influence to total performance. In fact, profit presents most important direct type of measurement. Except of domestic supply chain there is also international chain that can consists of various internal markets, which increase also stimulation cost, long-term cost and donations. Costs are then divided to:

1. Distribution cost – cost of transport, manipulation, security.
2. Production cost – cost of job, maintenance, purchase of materials, fees.
3. Stock cost – cost for stocking, final products and semi products or goods.
4. Stimulation cost – donation and taxes.
5. Cost for quality, adaptation of product or cost of coordination and performance.
6. Indirect cost - overhead – total common cost (Chan, 2019).

Using of logistics sources

Performance of supply chain cannot be concentrated only to its output. Production process includes input, process and output. Input of producers includes raw materials, equipment, machines, people, energy, stocks, etc. The best results of such sources are achieved by good organized and optimal way. Shortage of raw materials can lead to long-term delay of supplies and consumer loss. Number of experts thinks the best sources using means that at the end of production process there will be any surplus. However, secure stock is necessary, since there can be rapid increase of orders or other damage during production. Shortage and surplus of sources means waste of time. There is necessary managers determine the closest sources, necessary for any order. Majority of the society employees by this way experts in correspondent areas for providing of optimal using of sources. To measure using of sources, company can directly search percentage surplus of deficit of concrete source in the frame of periods. Using of sources shows also to the effectiveness of the company. Optimal using of sources can save time and money and to improve performance (Chan, 2019).

Quality

There is number of published literature of quality as result of measurement of performance in supply chains. Quality in connection with chain means time of preparation and speed of orders fulfillment. However, the task remains, if measurement of quality in all supply chains is the same. Generally, quality presents standard of product that connect with the level of clients' satisfaction. Therefore, quality connects not only with product, but also with provided services. High satisfaction of clients is very important, since it presents key index of success. Only in case the source of clients is unlimited, company can achieve profit and to extend its market rate and to become leading company in the frame of the sector (Chan, 2019). Quality can be measured through:

1. *Dissatisfaction of clients.* Direct measurement of quality is at the level of clients' satisfaction (reclamation). Problems of clients are many times not

solved or they are solved by unsystematic way. Also not every dissatisfied client must make reclamation. Majority of them simply goes to other supplier without pointing to the bad provided services. In this case, the time is necessary, „time is money", when company manages to give product in demanded quality more rapidly than other competitors, consumers would probably remain in relation with supplier.

2. *Time of clients response.* It means time between order and its correspondent supply. Also it is known as „time of order", which includes time of preparation, production time and time of transport. Sometimes time of clients response is very short, when the product is available at the stocks. Time of clients response is basically dependent on distribution structure of the company.
3. *Time of preparation.* It means time, necessary for production of product of full processing of product. Time of preparation is presented by time for waiting, elaboration, manipulation and transport. Time of preparation is influenced by number of external factors (capacity, planning, etc.) and it has great influence to the control and therefore also to the cost of production systems.
4. *Time of delivery.* By this way performance of product supply is measured. It can be percentage of orders, supplied in day of payment or before term of payment. Between suppliers, as for example DHL or UPS, clients are relying on timely shifting of goods. *Speed of order filling.* As mentioned, time of clients response can be lower or no, in accord with product availability. While client (if ordered products were already in production), gives order, some stocks can be used immediately to fill the order. It can decrease time of client response and client will be satisfied due to the rapid response.
5. *Accuracy.* Accuracy of supplied products is also measure of quality, since there can be no exact supply or improper specification of products. It can be measured by percentage of exact products, supplied to clients. Inaccurate supply means decreasing of clients trust. Therefore, cross controls must be made, including to every production and service, to minimize risk of any mistake.

Flexibility

Flexibility can be considered as most decisive. To be flexible, means to have ability to provide services (products) that fill demands of the individuals and clients. There is existing number of definitions, connecting flexibility. Generally, it means ability or adaptiveness of the company to react to changes. Flexible system is very important for filling of specific demands and there is necessary for support of new product establishment. Development of flexible logistics systems is main method for variability managing. Due to the permanently changing environment, we must consider variability. Not regarding change of the product design or volume of order, but sudden phenomenon, for example late arrivals of raw materials or even new competitors, which have great influence at the market. Some ways of flexibility are divided to two categories: flexibility of extend and response. Flexibility of extend relates extend of operations that should be changed, while flexibility of response means time, price or both, which can change. Flexibility can be categorized by simple input, process and production. Flexibility can be measured by:

1. *Flexibility of work.* Flexibility of work is presently rather less important, mainly when the emphasize is given to the division of work to expert preparation. There is assumed that specialization of workers skills can increase effectiveness. Therefore, any individual has its own task. Number of routine working task is replaced by industrial automatization, but there is also considering with number of working tasks, which worker can make with goal to improve working power flexibility (Chan, 2019).
2. *Flexibility of mobility.* When orientation of the process is stable, immediate damaging or overloading of machines can influence production effectiveness. In this connection there is necessary to have available alternative to manage unpredictable situations. More alternatives to manage unpredictable situations make the system more complex, due to the mentioned time and cost are increasing and more control is necessary to provide unity and quality.
3. *Flexibility of volume*. Volume of demand can be changed and organization must rapidly and effectively react to the increasing or decreasing of demand.

Flexibility of volume can be measured from the view of production prices, level of quality or profitability of the system. Organization that can change volume of production for whole production line is certainly more flexible than organization that can change only production volume of individual parts.

4. *Flexibility of supplies*. Supplement on time is very important. Early supplement can certainly increase level of clients' satisfaction. Ability to transmit planed terms of supplement ahead can be understood as flexibility of supply.
5. *Flexibility of changes*. Client can demand adjustment of existed products without changing of original functions of product design. There is necessary to satisfy clients' demand and therefore flexibility of changes is very important. It is defined as number of product changes that can be achieved without high cost or big changes of performance results.
6. *Flexibility of new product*. Introducing of new product provides view of the organization to products development. Variety of new products is real innovative level of the company. Flexibility of new product is defined as ease during new products introduction to the system. Time and cost are participating on the quality creation during controlling of new product. It is measured either by time or by cost that are necessary for new production adding to the existing production operation.
7. *Flexibility of expansion*. There is necessary to extend company by most modern technology that could provide competitiveness. Number and variety of extensions is regarded that could be accepted without high cost or big changes of performance results.

Visibility

Supply chain consists of suppliers, producers, distributors, clients, etc. Administration, by which client wants to change technical parameters or product design, transit to the end of the chain. It means, not only client losses the time, but also exactness of administration can be skewed. There is therefore necessary to

improve quality of information transition by the way that system of information sharing will be more visible. Presently there is convenient to have system of electronic data change (EDI) in the frame of chain. This show the new information technologies are very important during development of supply chains. Visibility of the chain is very important for exact and rapid providing of information. It is obvious that measurement of visibility is time and exactness of information transition. Obviously, there is not only time, necessary for information transition, but also time, necessary from the moment when the product from proposer begins to be processed by new way (Chan, 2019).

Trust

Trust lies in reliability of the supply chain level and improves long-term relations in the chain. As mentioned, chain presents vertical transition of information and creation of products that connects more companies for successful production of product. There is necessary to observe good relations among any level of chain, since the levels are mutually dependent. For example, supplier must provide qualitative material for producer that is consequently processing the material to obtain good that is normalized and transported by distributors to user. Trust is conception idea with goal to improve reliability of both parties and their long-term relation that should be based on trust. Trust can be considered as very dependent on information sharing in the chain. To increase trust of the chain, we must obtain agreement between all participants in the chain to improve their relation and trust by rapid and exact data transition.

Consistency and reliability is very important part of trust, producer is leaning on suppliers' material for production and transition of products to final users and final users are relying on exact and timely supply of products from distributors. Therefore, when there is delay, it influences whole chain. Measure of consistency is percentage of delayed or mistaken supply to other level of supply chain, which leads to late supply. At the late supply, the percentage of time delay and during improper supply presents percentage of returned goods. Consistency is combined time measurement and products accuracy. Inconsistent supply could cause delay of

products and services that can have great influence to final production, but also to decrease effectiveness of whole chain (Chan, 2019).

Innovativeness

In permanently changing environment, innovation is very important. Competition in sectors is very strong and there is necessary to have certain competitive advantage that clients could easily know. Innovativeness is the only one way, in which the society can be specialized. It is applied also in supply chain. There are existing two aspects for measurement of innovation in the chain:

1. *New products introduction.* For the society that regularly introduces new innovative products without regard if the product gives good response from the market or no, there is certain level of propagation. Propagation helps company to be more publicly recognized.
2. *Using of new technologies.* Except of suggested new products´ improvement of the effectiveness can increase competitiveness. It includes using of new technologies and new method in area of management. Innovation ability is not applied only for physical products, but also for new methods of management and strategies that help to improve effectiveness. However, it is very heavy to measure new technologies. By this way percentage increasing of efficiency can be measured directly, which means, by percentage decreasing of time, necessary for similar product production (Chan, 2019).

Evaluation of connection between supplier and consumer

Connection in supply chain that directly influences consumers is supply. Supply is very important factor of consumers' satisfaction. There is always very necessary and demanded to measure and improve supply for competitiveness increasing. Supply by its characteristics plays in dynamic and changing environment important role, which make study and consequent improvement of distribution system heavily (Gunasekarana et al., 2004).

Evaluation of satisfaction and consumers services

Happy and satisfied client has very high importance for the company. Without satisfied client, strategy of supply chain cannot be considered as effective. Gunasekarana et al. (2004) emphasized during evaluation of chain performance metrics of the chain must be orientated also to the consumers satisfaction.

Method of ordering

This method determines way and extend, which specifications of clients are transited to the information, changed in supply chain (Gunasekarana et al., 2004).

Time of order

Total time of ordering cycle, called time of supply cycle, is related to the time that was between accepting of order from client to supply of final products to client. Shortening of this time leads to decreasing of time for response in supply chain (Gunasekarana et al., 2004).

Measurements at the level of production at supplier

After planning of order and obtaining of goods, the next step presents level of production. Level of production can be understood as activities, made by companies and their performance has great influence to the product price, quality, speed, reliable supply and flexibility (Gunasekarana et al., 2004). Since it presents important part of the chain, production must be measured and permanently improved. Proper measurements for measuring of production level are:

- Extend of products and services,
- Capacity using,
- Effective techniques of planning.

Control of plans achievement

Control of plans achievement is important, since people can make mistakes, unpredictable fluctuation can arise, or demands, final term can be changing, as well as budget or priorities can be changed. Therefor properly constructed plan gives information:

- Direction of the activity,
- Coordination of all participants effort,
- Determination of necessary sources, minimizing of their wasting, avoiding duplicity,
- Providing of norms and criteria for evaluation of plan filling (Neely et al., 1995).

Filling of supplier and consumers abilities

Many times suppliers embark on realization of clients demand without understanding of basic values the client demands. The question is what is key for the client? Is it price, filled term of supply, hundred-percentage quality of service or product? Has the client other demand to be ranked over any others (www.ipaslovakia.sk).

Management and connections in supply chain

Management of the chain serves for managing of purchase, sale, and stocking processes. Connection of sale and purchase orders between themselves in case when good will be supplied from supplier directly to the clients is proper for the company that sale product without stock using.

Orders fulfillment

Slow order processing can influence business activity due to the using of not effective and damaged system of orders processing. To basic advantages for the

effective solving of orders meeting belong: decreasing of manual processing of orders, shortening of invoice time, improving of services, provided to clients, etc.

Model of supply chain flexibility – DOPRU model

Development of DOPRU model consists of two steps:

1. Determination of postulates for DOPRU

First of all two postulates were determined. Such postulates will be lately necessary for suggestion of research as control of accuracy. They present base for the implementation of flexibility conception. The frame of flexibility is based on vulnerability. Petit et al. (2019) understand vulnerability as damages, sensibility of supply chain, influencing the product, services or sources. Therefore, following postulates are accepting:

POSTULATE 1: strength of the change creates vulnerability of supply chain. Such vulnerability is defined as „basic factor that makes the chain prone to damage."
In the literature with SCM there is existing number of publications, which are orientated to the chain vulnerability. Table 7 describes most often vulnerability of supply chain with vulnerability categorization to:

1) external vulnerability (turbulence, regulation, legal and bureaucracy, financial pressure),
2) internal vulnerability (limitation of sources, supplier, client, infrastructure, intentional threats).

Table 7. Vulnerability of supply chain

Vulnerability of supply chain		
External vulnerability: - Turbulence - Regulation, legal and bureaucracy pressure - Financial pressure	**Internal vulnerability:** - Sources limitation - Supplier - Consumer - Infrastructure - Intentional threats	**Structural vulnerability:** - Chain structure - Suggestion of chain characteristics - Chain complexity

Source: own processing

Base for the flexibility must regard such basic factors that include broad scale of threats. With aim to fight against vulnerability, the research showed that supply chain could develop abilities that provide undamaged operation of the chain. Such abilities are attributes demanded for performance and success. Among abilities of supply chain belongs for example flexibility, skill, adaptability and visibility (Petit, et al., 2019).

POSTULATE 2: control of management creates ability of supply chain. Ability of supply chain can be defined as „characteristic that enables the chain to predict and overcome problems." Such abilities could help avoid damages, ease consequences of damaging or to improve adaptation after damaging (Petit, et al., 2019).

Table 8 describes abilities of supply chain. According detail research of the literature, we divided them to three groups – reaction, preparedness, evaluation. Group Realization includes facility, speed, visibility, flexibility, renovation, capacity. Group Preparedness presents effectiveness, variation, market position, security, cooperation, financial power, expectations, market power, organizational and cultural expectations. To group Evaluation belong: adaptation, mobility of sources, communication strategy, and mitigation of consequences.

Table 8. Abilities of supply chain

Abilities of supply chain		
Reaction: - Handicraft, - Speed, - Visibility, - Flexibility, - Capacity.	**Preparedness:** - Effectiveness, - Variance, - Market position, security, - Cooperation, - Financial power, - Expectations, - Market power, - Organization.	**Evaluation:** - Adaptation, - Sources mobilization, - Strategy communication, - Mitigation.

Source: own processing

However, extend of supply chain flexibility demands broader view, not only mentioned two strategies. The frame should include all processes, relations and sources of supply chain that offer abilities for vulnerability managing. In this lies

flexibility, which is illustrated by Figure 12 and it is mentioned in the Suggestion I (Petit, et al., 2019).

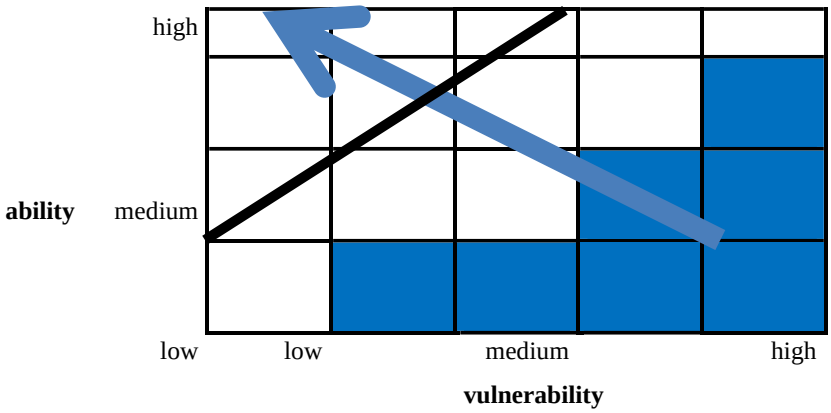

Figure 12. Flexibility measurement

Source: own processing according (Petit, et al., 2019)

Abilities of supply chain

Second step: determination of suggestions for DOPRU model

SUGGESTION No 1:

Flexibility of supply chain is increasing with growth of abilities and decreasing of vulnerability. Studies can provide management view of connection between any vulnerability and file of successfully used abilities. For example at very busy market there can be used strategy of supply chain with simple and limited obtaining of sources with goal to achieve close cooperation and rapid establishment at the market (Lambert, 2004). On the other hand, open obtaining of sources for various innovative suppliers can improve competitiveness at the market. Development of abilities that are adequate for overcoming of supply chain vulnerability, presents balance between investment and risk. Such situation is defined as „balanced flexibility“. Therefore, we apply following suggestion of solution:

SUGGESTION No 2:

There are connection between any vulnerability and file of abilities that can directly improve balance of flexibility. Supply chain that does not create sufficient capacity for decreasing of high vulnerability, will meet risks. On the other hand supply chain that can invest to the abilities and less to vulnerability, can cause damage of profit.

Balanced resistance will be result of balance between vulnerability and abilities, registered as Zone of flexibility (illustrated by Figure 13). Therefore, we are processing through following research suggestions:

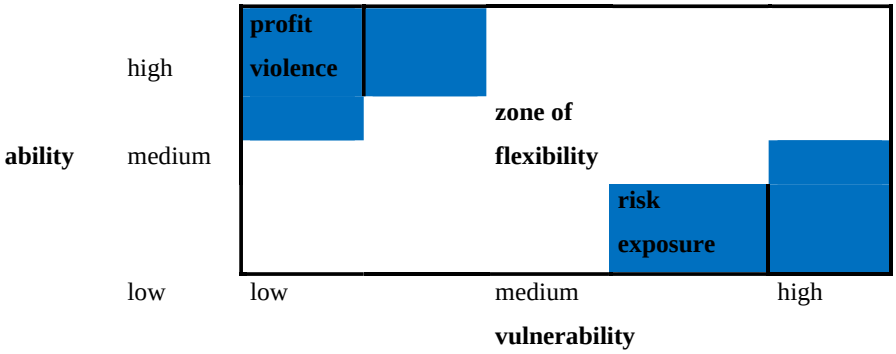

Figure 13. Zone of flexibility

Source: own processing according Petit et al., 2019

SUGGESTION No 3A: Excessive vulnerability can bring high risk.

SUGGESTION No 3B: Excessive ability could disrupt profitability.

SUGGESTION No 3C: Performance of supply chain is improving when abilities and vulnerability are balanced.

Except of Zone of flexibility in any of two unbalanced situations (3A and 3B) there is assumed that any company could be long term vital. Such suggestions are included in flexibility of the supply chain at Figure 14, while we used results of three possible cases of flexibility, which are described in suggestion 3A, 3B and 3C.

Both potential situation A and B are considered as states of unbalanced flexibility and they are therefore not demanded. Only potential situation C, obtained by effective implementation of abilities portfolio, which is the best for the model of supply chain vulnerability, lead to the performance improving. By regular measurement of vulnerability and abilities present level of supply chain flexibility can be evaluated. It will lead to improvement of the chain.

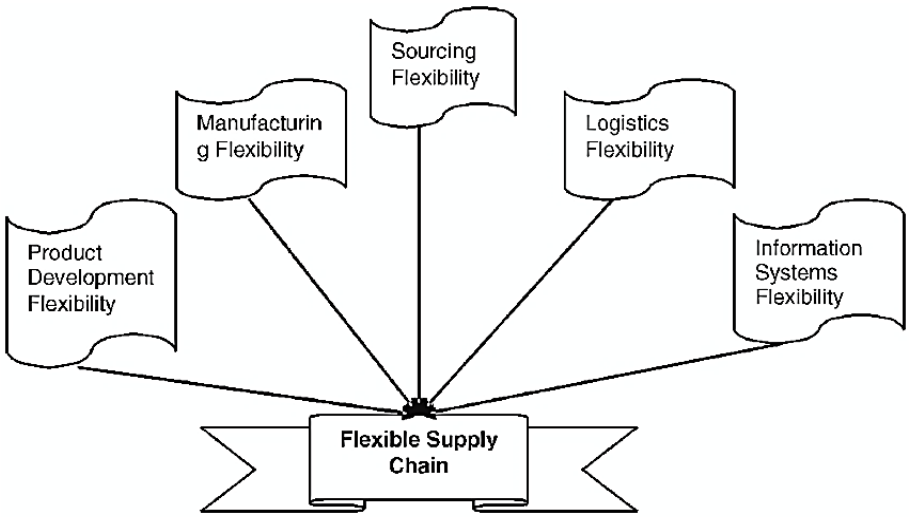

Figure 14 Frame of the supply chain flexibility

Source: own processing according Petit et al., 2019

Contribution of measurement of supply chain flexibility

Flexibility of supply chain has very big potential for providing of managerial knowledge of strengths, weaknesses and priorities. Managers must have according identification of abilities, detail information of companies' strengths. Suggestion 3C illustrates that flexibility is not only interest of strengths, but balance between abilities and vulnerability creates real competitive advantage of the company. Global supply chain has high level of connectivity. It must create possibility in area of cooperation, visibility and flexibility, to manage effectively great number of mutual connected operations between various levels of suppliers and clients and by this way to contribute to the balance flexibility.

The frame can identify shortages in net of companies that present supply chain. Low capacities that correspond with smooth or high vulnerability can considerably worsen flexibility of supply chain. For example, chain with high vulnerability against connectivity can meet catastrophic consequences when having weak ability of visibility and cooperation (suggestion 3A).

The frame provides managerial guide for determination of priorities, necessary for creation of strategy for improving of supply chain flexibility. This strategy must be based on evaluation of vulnerability model in the company and its competitive advantages that are considered due to the potential return on investment. Properly managed company searches permanently its damaged environment and make

measurements more rapidly against its competition. Therefore, there is necessary regular evaluation of supply chain flexibility (Petit et al., 2019).

Table 9 defines seven resulting factors of vulnerability and in Table 10; there are mentioned fourteen resulting factors of the ability with their 71 partial factors.

This compilation provides first detail taxonomy of factors for supply chain flexibility that enables management to develop portfolio of abilities that demand their natural structure of vulnerable places, in accord with supply chain flexibility.

Table 9. Factors of vulnerability

Factor of vulnerability	Definition	Partial factors	Percentage of appearance
Turbulence	Environment, characterized by often changes in internal factors	Natural catastrophes, geopolitics damages, currency and prices change, technology failure	85.7%
Intentional threats	Intentional attacks, orientated to the damaging of operation or causing of human and financial harm	Theft, terrorism, working controversy, spying, responsibility for product	85.7%
External pressure	Influences, not directly orientated to the society, creating business limits	Competitive innovation, social and cultural changes, political and regulation changes, prices pressure, responsibility of companies to living environment protection	14.3%
Lack of sources	Limitation of production according available production factors	Supplier, production and distribution capacity, availability of sources and public services, human sources	28.6%
Sensibility	Control of conditions for product and processes integrity	Complexity, clean production, limited materials, reliability of equipment, security risks	50%
Relationship, continuity	Level of mutual dependence and relying on external subjects	Net extend, relying on information, level of outsourcing, import and export, relying on special sources	78.6%
Recall of consumers and suppliers	Tendency of suppliers and consumer to external strengths	Reliability of supplier and consumer	14.3%

Source: own processing according Petit et al., 2019

Table 10. Factors of ability

Factor of ability	Definition	Partial factors	Percentage of appearance
Flexibility during sources obtaining	Ability to change inputs rapidly or regime of input acceptance	Part of agreement, product design, multiple using, flexibility of supplier contract, multiple sources	*83.3%*
Flexibility during order fulfillment	Ability to change outputs rapidly or regime of output supply	Alternative distribution channels, multiple sources obtaining, delay of liabilities, suspend of production, stock management	*88.9%*
Capacity	Availability of assets for maintenance of production level	Reserve capacity, backup power sources, communication	*16.7%*
Effectiveness	Ability to produce output with minimal demands on sources	Removing of waste, work productivity, using of assets, decreasing of product variability	*0%*
Visibility	Knowledge of floating assets and living environment state	Collection of business information, technologies, products, assets and people visibility, change of information	*61.1%*
Adaptability	Ability of differentiation of operation to challenges or possibilities	Rapid orientation of demands, decreasing of time limit	*33.3%*
Expectation	Ability to discovering of future events and situation	Monitoring of timely signals, prognosis, variances and analysis of shortages, planning of continuity, preparedness, risk management	*50%*
Renovation	Ability of rapid returning to normal operation state	Crisis management, mobilization of sources, communication strategy, mitigation	*50%*
Variance, interface	Broad distribution or assets decentralization	Distribution decision, decentralization of key sources, strengthening of position at the place, markets diversion	*11.1%*
Cooperation	Ability to cooperate effectively with other subjects for mutual benefit	Planning of cooperation, management of clients, communication, order delay, sharing of risk with partners	*11.1%*
Organization	Human structure of sources, policy, skills and culture	Learning, responsibility and strengthening of market position, team work, creative problem solving	*77.8%*
Market position	State of the society or its products at the market	Products differentiation, market rate of clients, own brands, relation with clients, communication with clients	*0%*
Protection	Protection against intentional infiltration or attack	Limitation of access, connection of employees, cooperation with government, protection of personnel, computer protection	*44.4%*
Financial power	Ability to find fluctuation of financial flow	Insurance, financial reserves, liquidity and price expanse	*5.6%*

Source: own processing according Petit et al., 2019

Evaluation of suggestion of the system for evaluation in logistic chain in the company and logistic nets

The presented material suggested system for evaluation of performance in logistic chain in the company and logistic nets, resulting that during measurements and evaluation of performance we are interesting about economic indexes, financial indexes (activity, indebtedness, profitability, liquidity), and during logistic performance we are interesting about logistic indexes of logistic potential, quality, productivity, cost, economy, etc.

The question is how to measure and evaluate performance in logistic chain, which means in the frame of logistic net that consists of supplier, company and consumer. Methodology of logistic performance evaluation results from the flexibility of supply chain and from determination of logistic indexes for individual participants of logistic chain in logistic net.

1. **Evaluation of logistic performance of the company:** 350 indexes in structure – quality, economy, productivity and logistic potential.

2. **Evaluation of logistic performance of supplier:** defining and placement of logistic indexes in 3D space for first participant of supply chain – supplier. Fourteen logistic indexes had been defined that had been placed according three dimensions. Margin points limit any dimension. The level of measurement has its margin points – operation and strategy. Frequency of measurement is limited by margin points – monitoring and diagnostic. Third dimension presents competitiveness, which has its margin points – responsibility and effectiveness.

3. **Evaluation of logistic performance of consumer:** defining and placement of logistic indexes in 3D space for second participant of supply chain – consumer. 14 logistic indexes had been defined, which are placed according three dimensions. Its margin points give any dimension. Level of measurement has margin points – operation and strategy. Frequency of measurement is limited by

margin points – monitoring and diagnostic. Third dimension presents competitiveness, which has its margin points – responsibility and effectiveness.

4. **Evaluation of relation between supplier and consumer from the view of their logistic performance:** determination of relation by 3D pyramid, when defining three dimensions. Any dimension is given by margin points. Dimension – level of measurement – has it margin points – operation and strategy. Frequency of measurement is limited by margin points – monitoring and diagnostic. Third dimension presents competitiveness, which has its margin points – responsibility and effectiveness. Evaluation of relation performance results from qualitative and quantitative indexes, evaluation of connection and orders filling.

5. **Evaluation of relation flexibility between supplier and consumer:** for planning of the chain there is new priority given – flexibility. Global supply chain has high level of connectivity. It must create possibilities in area of cooperation, visibility and flexibility to manage effectively vast number of mutually connected operation between various levels of suppliers and consumers and by this way to contribute to the balance flexibility. Therefore, there is necessary to evaluate flexibility of the chain regularly.

6. **Evaluation of intensity of cooperation between supplier and consumer:** the length of vector and angle of the vector between supplier and consumer, angle and length of the vector reflects relation between supplier and consumer. This view, idea is rather topic for further research.

Advantages of suggested methodology:

1. philosophy of methodology
2. support for decision
3. evaluation of performance
4. evaluation of flexibility
5. economic contribution
6. extra economic – organizational contribution.

7. improving, increasing of quality of relations between consumer and supplier.
8. building of partnership between supplier and consumer.

CONCLUSION

Managers of the company are presently forced to evaluate and manage their activities, connected processes, products and services, mainly by increasing of company performance. Mainly this area is becoming more and more subject of interviews. The goal of the book´s chapter was to analyze and generalize collected file of knowledge from area of measurement and evaluation of logistic chain and logistic net performance. The chapter characterizes the idea of logistic performance, its individual elements and indexes with possible solution for logistic performance measurement, resulting from knowledge of individual chain participants' performance from the view of logistic cost, flexibility, productivity and time. This means from supplier to final consumer, while regarding synergy of all logistic subsystems of the company and logistic nets.

One of the results of the chapter is methodology for creation of measurement and evaluation of logistic performance that includes determination of basic model structure, identification of factors that influence performance in the frame of relations between them.

Measurement and evaluation of logistic performance in SCM was realized through individual participants of the supply chain by logistic indexes, defined in 3D space:

- According type of measurement and idea of observer,
- Indexes are part of three dimensions (level of measurement, frequency of measurement, competition).

Measurement and evaluation of logistic performance in the frame of SCM is possible through consumer, supplier and the company. As during measuring and evaluation of logistic performance of the company, we are interesting of indexes, such as quality, productivity, cost, etc., as also logistic indexes. Fourteen logistic indexes had been defined in 3D space according type of measurement and view of observer.

Indexes are part of three dimensions: level of measurement, frequency of measurement and competition.

At the planning of supply chain there is rising priority – flexibility. Flexibility of supply chain can be defined as ability to be prepared and to react on unpredictable situations.

Flexibility of supply chain resulted from four key principles:

- Flexibility can be included to SCM system yet before its weakening,
- High level of cooperation on management and risk identification is necessary,
- Skill is necessary for rapid reaction during unpredictable situations,
- Characteristics, such as skill, availability, efficiency, flexibility, frequency and visibility are considered as secondary factors.

Partnership of supply chain is understood as cooperation between seller and buyer, which records certain level of mutual dependence and cooperation on concrete project or concrete contract.

Evaluation of suppliers and consumers in context of supply chain through 3D Picture (effectiveness, flow, integration, reaction, satisfaction of clients, etc.) included important measurements on strategic, tactic and operative level.

Measuring and evaluation of performance describes feedback or information of activities, connected meeting of clients expectations and strategic goals achievement. It reflects need of improving in areas with dissatisfied performance, quality and effectiveness.

The frame for measuring and evaluation of relation between supplier and consumer resulted from quantitative and qualitative criteria, evaluation of satisfaction, connection, orders planning, measurements at the production level, control of plans filling, suppliers and consumers abilities meeting, management and connection of the chain and order fulfillment.

Not always are all elements of supply chain at the same level and many times it is not demanded. Similarly, there is not demanded in the practice to achieve in supply chain highest level of maturity and flexibility, since high level of maturity and

flexibility brings also high cost. There is therefore necessary any company found optimal rate of individual logistic indexes performance.

3

MEASUREMENT AND EVALUATION OF FINANCIAL PERFORMANCE

Condition of successful business is excepting of other also following of financial performance of the company, when there is necessary to determine proper criteria and methods for its measuring. Assumption to follow indexes of financial performance means defining of business goals and their balance with interests of all subjects of the company. To hold competitive ability of the company, there is necessary the company should have clear determined business strategy, goals and processes for its achievement. Clear measure, evaluating success of the company is therefore financial performance as ability to achieve demanded results during certain period. Traditional way of following of financial performance results from the evaluation of the ability to achieve demanded financial indexes – profit and turnover. The company has good financial performance when achieves planed financial results.

3.1 Characteristics of financial performance

Financial performance is ranked between factors of success of the business, together with products and services quality and low costs, speed and flexibility of reaction to the clients´ need and innovativeness of products and processes. According Wagner (2009) Financial performance means characteristics, which describes way or process, by which analyzed subject makes certain activity, according similarity with reference way of process making. Interpretation of these characteristics assumes ability to compare searched and reference indicator from the view of determined criteria scale.

From the mentioned characteristics, we can generally describe financial performance as ability of the company to evaluate its sources, invested to its activities, the best. Any subject that is connected by certain way with company sees

financial performance differently. To define some criteria of financial performance is becoming necessity, since by the way we can determine performance and competitiveness of the company. Such criteria can be net present value, while its positive value is considered as satisfactory performance. The higher the value, the higher performance of the company (Neumaierová, Neumaier, 2002).

According to Dluhošová (2006) one of the main goals of financial management is permanent increasing of financial performance of the company. Presently globalization trends, competition, mergers and acquisitions influence business sphere. Key idea in area of evaluation of the business success is idea of financial performance, its measuring and management of the business value.

Although measurement may at first glance be associated with some technically orientated discipline, in actually means certain activity, with which we meet daily in working or personal life. In expert literature, we can find several characteristics of financial performance. Generally, it means determination of activity, during which there is determined value of searched object (Wagner, 2009). The result of such activity is the value, related to its characteristics, which can be used for description of certain characteristics of the object with assumption that we know the key to its interpretation.

3.2 Measurement of financial performance

Measurement of the financial performance can be understood in various contexts; therefore, its measuring will not be unique. Presently during evaluation of the financial performance, there is prioritized view of the owners. Owners invested their finances and ideas to the business, and from all subjects, connected with business; they bear the highest risk (Pavelková, 2005).

Financial performance is traditionally measured by value criteria that are constructed according data from accounting reports, while the highest emphasize is given to the profit creation by obtained sources (Fibírová, 2005). Profit is then one of the strategic goals of the company, but not the main. It presents tool for achievement of main goal, as well as measure for evaluation of economic results of the company. Nevertheless, it cannot be considered as single criteria that could

complexly evaluate the business (Živělová, 2007). Financial performance can be measured by the way to meet needs of any concrete group that participate at the business. Evaluation of financial performance then lies mainly in ability to choose proper approach to evaluation and its application (Šulák, 2003).

By traditional way, we can evaluate financial performance by financial indexes, calculated according data form accounting reports. Through analysis of financial indexes, company can know actual development of business, according declared chosen values to determine its performance and to compare with competition. Disadvantage of such measurement is that there is no respecting views, which also importantly influence financial performance of the company. Among such aspects belong for example human sources and its activities, internal processes and position of the clients (Pavelková, 2005). The most convenient view to the business performance is view, orientated to the creation of value for owner. Some authors mention that company has good performance, while achieving positive net present values and when the higher is such value the higher performance of the company (Neumaierová, 2002). The idea that for owners' value has only investment, creating positive net present value, leans on theory of shareholder value management. Company, which wants to belong among successful businesses, should respect this theory.

3.2.1 Measurement of financial performance through cash flow and working capital

Production companies demand certain volume of shortage assets for support of their operation. For example, all companies need certain volume of cash to support every day activities. Companies continually obtain invoices form suppliers and make invoices for consumers. Therefore cash inflow and cash outflow are not always identically distributed, any company must observe own policy of cash at bank accounts. Similarly, it is applied also with majority of other shortage assets, as for example stocks, receivables, which are necessary for normal activity of the company. Some elements of shortage capital, mainly shortage liabilities and expenses of future period, rise as normal part of operation activity of the company. Without knowledge of cash flow there is presently not possible to manage company effectively. It is due

to the cash flow, connected with number of activities that company needs for its existence.

Review of the working capital measurement in literature

Number of authors mention the necessity to concentrate during the business to the creation of positive financial indexes, for example liquidity, profitability, activity, indebtedness, etc. (Kovaľová et al., 2018). Following of such indexes is necessary the management of the company could make various important economic decisions. Reliable evaluation of financial situation of the company could bring except of others analysis of its ability to finance operation activity of the company. It means when the company will be able to finance its operation (sufficient working capital), the company would be stable, able to cover its liabilities and debts. On the other hand company with shortage of working capital will have first of all problems with payment ability.

There is therefore given great attention to the following of ability to finance business operation activity and ability to cover company debts (Chodasová, 2014). In this area there is important to follow various indexes, influencing working capital, as for example liquidity and solvency, shortage liabilities, length of production cycle, sector structure, business area, external economic environment, etc. (Kislingerová, 2010). During management of working capital and liquidity, companies use various strategies, for example aggressive, conservative and neutral strategy. Neutral strategy means defensive approach, which is typical for smaller companies that connect on its key consumer (Tóth a Mura, 2014). To avoid payment disability, companies must follow up risk of failure during liabilities payment (Chen et al., 2018). To solve payment ability of the company demands to make analysis of individual element that create working capital and liquidity. In this connection, Corbett (2001) analyzed relation of the company with its clients and suppliers with goal to decrease supplier margin, but presently providing purchase motivation to increase its purchases. Analysis and optimizing of such elements can contribute to the better financial performance of the company (Simonidesová et al., 2015).

Characteristics of cash flow and working capital

Cash flow (CSF) can be defined as incomes and expenses, connected the money, or incomes and outcomes, connected money equivalents, which can be:

- Money means – cash, equivalents of cash, such as valuables, checks, monetary means, invested in current accounts in banks, overdraft account, etc.
- Money equivalents – shortage financial property, changeable in ahead for known certain sum of money, during which there is not so considerable change of the value in close three months. Among such equivalents belong term deposits, which have the most three month notice period, liquid securities, determined for business, etc. (Cisko a Klieštik, 2009).

On the other hand CSF is not equal the profit, difference results form time space between incomes and expenses (CSF) and costs and revenues (profit). Due to the mentioned CSF and profit expresses differentiation between long-term need to create profit and short-term necessity to create money for debts payment (Sedláček, 2007, p. 43). In the company, there can be situation: "We earn much money, but we do not have any money." It is because in balance sheet and loss and profit statement we do not find development of the company development from time horizon, growth or decrease of individual elements of assets and capital, movement of money, etc. Balance sheet and loss and profit statement do not provide therefore enough information, necessary for the business analysis. Such information can be obtain better by cash flow, by which company could identify intensity of money, reasons of money change, form of capital investment in individual elements of business property, ways of financing, etc. Cash flow in production company connects with its activity, which can be illustrated by Figure 15.

Cash conversion cycle can be expressed as:

- + turnover time of stocks
- + turnover time of receivables
- - payment term of liabilities
- *= cash flow cycle*

Cash flow cycle can be positive, negative or balanced:

- *Positive cash flow cycle* (operation cycle > payment term of liabilities) expresses term in days, during which company must finance its working activity from other sources, not from liabilities (working capital, other shortage liabilities).
- *Balanced cash flow cycle (*operation cycle = payment term of liabilities) is in case when payment term of liabilities is equal operation cycle.
- *Negative cash flow cycle* (operation cycle < payment term of liabilities) expresses state, when payment term of liabilities is longer than operation and cash flow cycle. Negative cash flow cycle rises many times when company finances negative working capital or problematic shortage assets from business liabilities (Fetisová et al, 2004).

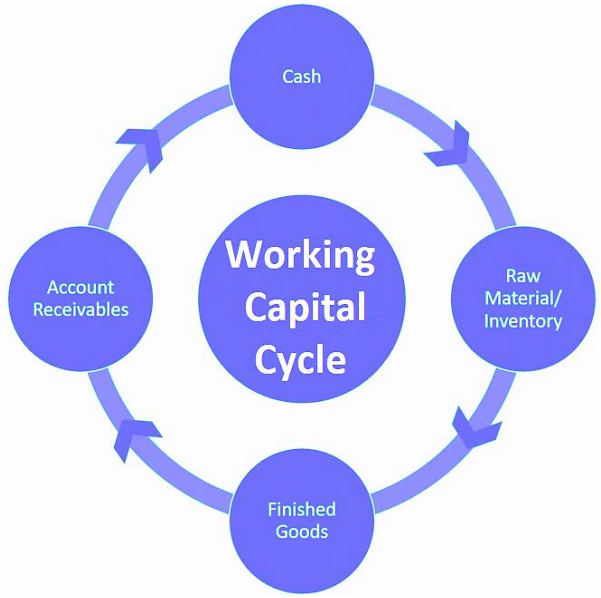

Figure 15. Working capital cycle in production company

Source: Synek, 2011

Except of mentioned cash flow can be expressed as CSF fund. Fund presents sum of money (imaginary moneybox), consisted as (Růčková and Roubičková, 2012):

Net money – receivables fund:

- = floating assets – stocks – not liquid receivables – shortage debts

It presents then modification of working capital, removing of working capital shortages: including among floating assets also not liquid elements.

Net cash fund:

- = cash – immediately payable liabilities

The fund presents most exact method for liquidity management. Problems of following are in case of various current accounts, which can be solved by cash pooling.

Fund of working capital:

Working capital presents capital, available in the company for providing of its production activity (Růčková, 2011, p. 51). This fund can be expressed as:

as a state:

$$WK = floating\ assets - shortage\ debts$$

or as a change:

$$\Delta WK = \Delta floating\ assets - \Delta shortage\ debts$$

Volume of working capital must be continually observed with aim company avoid useless investment of money, which are necessary for other important tasks. Useless high level of working capital can be the same, when the company invests to the business, which lately closes and not uses. Importance of working capital is as follows:

- providing of business liquidity,
- control of financial development of the company,
- source of financing – internal financing,
- evaluation of credibility of the company,
- influence to the payment ability of the company,
- importance for prediction of future development of the business.

Function of working capital can be:

- internal – trouble-free flow of property and capital,
- liquidity – providing of solvency,
- reserve – part of shortage property serves as reserve for covering of various risks,

- guarantee – covering of debts,
- external – realization of relations with the environment.

There are various way how working capital can be expressed:

- from the view of financial management – working capital present the part of floating assets, which must be used for shortage debts covering,
- from the view of owner – how great rate from long term capital belongs to financing of operation (circular assets). Both ways are illustrated by Table 11.

Table 11. Ways of working capital expression

From the view of owners		**Managerial expression**	
Followed through Report of Working capital change		Followed through report of changes in Working capital	
Using (expenses)	**Sources (incomes)**	**Reduction (decrease)**	**Increase**
De financing	Financing	Reduction of short term property	Increase of short term property
Reduction in long term debts	Increase of long term debts	Increase of short term liabilities	Decrease of short term liabilities
Reduction of equity	Increase of equity		
Loss, reserve	Internal sources of financing		
Increase of long term property (investments)	Decrease of long term property (disinvestments)		

Source: own processing according Fetisová et al., 2004

3.2.2 Optimizing of working capital

Effective management of working capital is presently necessity and in modern managed companies, it presents *best practice.* Working capital is in separately connected with liquidity of the company and it demands active management and control (Vlachynský, 2009). **Optimal level of working capital** presents the level when company is able to make its operations without limits and to provide necessary supply service for clients and at the same time does not bind in working capital excessive means and costs.

When using simple comparison, optimal level of working capital presents blood in the blood system and excessive working capital presents fat in the body.

It means that from long term there is necessary to try to have the lowest possible level of working capital. However, at the same time, any element of the working capital has its critical level, and when it is under this level and then optimizing of working capital begins to be contra productive:

- too low level of material stocks causes downtime in production and low costs of products decrease level of supply service to clients.
- High lengthening of payment term of liabilities leads to conflicts with suppliers, worsening of credibility and finally it can lead supplier to bankruptcy.
- Far too aggressive terms of receivables payment decrease competitiveness at the market.

Any sector works with different optimal level of working capital, and in the frame of the same sector, various companies can have various level of working capital in connection of their business model. Companies that outsource production will work with different level of stocks and liabilities in comparing with companies that provide production by own. Other companies can use factoring of receivables or to sale their products by distributors, which will cause different payment term of receivables. The biggest companies in the sector can make more pressure to their business partners, to lengthen payment terms of liabilities and to speed up payment of receivables, which would decrease total turnover term of working capital. Figure 16 illustrates graphical illustration of working capital optimizing.

Simple way how to evaluate proper volume of liabilities and receivables means comparing of average payment terms. When company pays to its suppliers averagely to 30 days and receivables are paid averagely to 45 days, its business conditions are not balanced and the company must consider balancing both payment terms. For indicative evaluation, if the company works with optimal working capital we can use comparing of working capital level with other companies in the sector – benchmarking. For deeper analysis of working capital there is necessary to evaluate receivables, stocks and liabilities, and especially in these areas

to find space for optimizing (Walter and Skousen, 2009). During optimizing there is necessary to follow up individual elements, entering working capital creation.

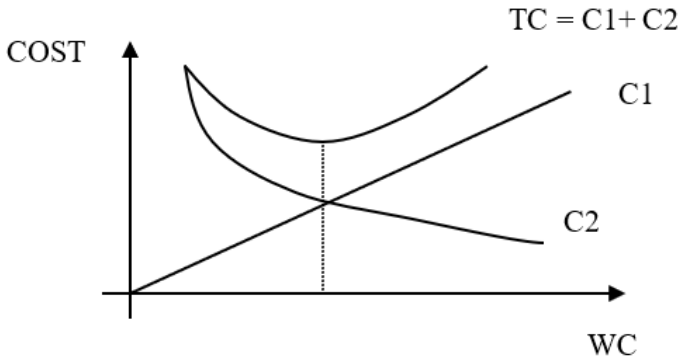

Figure 16. Graphical illustration of working capital optimizing
Source: Jaffe et al., 1990

Such elements can be according Figure 16 connected with high or low costs. Table 12 illustrates costs for individual elements of working capital.

Table 12. Costs on working capital

	C1	C2
Financial property	Sacrificed possibility of financing	Costs of bad liquidity and insolvency
Receivables	Costs of receivables growth – risk of payment disability of client	Costs of restrictive credit policy
Stocks	Costs of stocking	Costs of ordering
Liabilities	Costs of liquidity decrease during liabilities increase	Costs of financing from long term capital

Source: own processing according Verlag Dashofer (2018)

3.2.3 Influence of working capital to cash flow of the company

Majority of companies records positive value of working capital (which means stocks + receivables) > liabilities. It means the company pays its suppliers sooner than receivables are paid from clients. The company that works with negative working capital must consider with long term invested finances in working capital.

- Positive working capital is recorded for example in majority of production sectors that must operate with certain level of stocks.

- When company with positive working capital is growing, it will need to invest to working capital new finances, either from their own cash flow, or from external sources. When the company wants to sell more, it must first of all more buy and more produce, and the company will receive money from clients only after paying liabilities to its own suppliers, it means the company will need additional finances for such growth.
- Situation, when rapidly growing companies "forget" that growth of sales means also working capital growth and need of additional financing, such situation is called "overtrading". Companies have new orders, which could bring possible profit, but when not secured rapidly available sources, the companies can have problems with liquidity.
- On the other hand, in time of sale decrease company liberate from working capital cash, due to retarding of purchase and production, but still it has payments from old receivables.

Table 13. Influence of working capital to cash flow

Working capital	Influence to cash flow	
	In time of sale growth	In time of sales decrease
Positive	WC is growing and exhausting finances	WC is decreasing and liberating finances
Negative	Negative WC is growing and liberating finances	Negative WC decreases and exhausts finances

Source: Kráľovič and Vlachynský, 2011

Connection of cash flow and working capital can be illustrated at the example of the production company ABC. Assumed that ABC draws only one long-term credit, it has any other sources for working capital financing. Table 13 illustrates mentioned influence of working capital to cash flow.

Optimizing of individual elements of working capital

Working capital consists of financial means, stocks, short-term receivables and short-term debts. Since short-term debts the company cannot much manage, only to receive conditions, given by supplier, bank or other creditor, in following part we will deals by management and optimizing of receivables and financial means. Stocks of the company are optimized at the level of economic department of the company.

Optimizing of receivables

Content of receivables optimizing (tool of credit management) is:

1. Determination of volume and limit (decision of business credit contract)
2. Determination of credit providing conditions (term, place and way of payment)
3. Monitoring of increasing and payment of receivables, as well as providing of receivables payment through:

a) contractual penalty – in case when client would not abide the payment obligation
b) guarantee – for example by bank guarantee, factoring, forfaiting, receivables investing to the business company, insurance of receivables, etc.

Determination of optimal volume of receivables results from the fact that there is existing certain risk (moment of uncertainty), which rises due to the time difference between fulfillment (providing) of goods from the side of supplier and fulfillment (payment) for goods from the side of client. Supplier must have trust that client will be able to fill its liability. Complex evaluation of payment ability includes financial and non-financial analysis. The task of non-financial analysis is defining of all non-financial influences and resulting risks, primary task of financial analysis is identification and quantification of possible risks that could influence invoice payment. Process of receivables (receivables) payment can be illustrated by scheme at Figure 17.

Conclusion of commercial contract should consist of:

1. Payment term of invoices – term to which client need to pay for goods and services
2. Payment standards – what criteria client must meet to qualify for certain type (level) of payment conditions:

   - Payment in ahead
   - Payment in cash
   - Payment term of invoice

3. Debt collection – what policy to apply in case when client is not meeting his obligation
4. Discount – criteria when client can have rebate

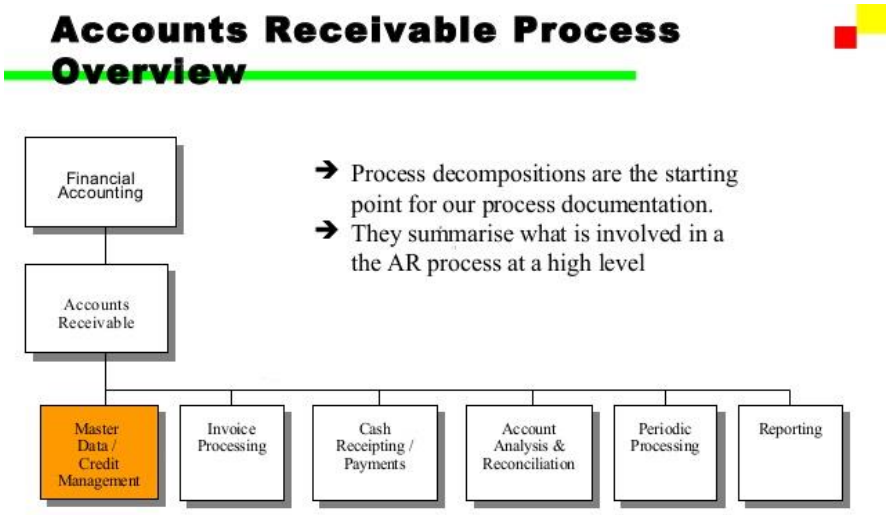

Figure 17. Process of receivables management

Source: own processing according Valach, 2001

During receivables´ monitoring, company makes following activities:

1. Evidence and control of receivables volume (determination of credit limits against clients and their control),
2. Verification of client's credibility,
3. Control of receivables after payment term and initiation of consequent measurements,
4. Initiation of payment, sanctions, reminders, payment calendar, etc.
5. Control of payment conditions,
6. Monitoring of receivables (turnover period, average daily sale, speed of turnover, age of receivables, etc.).
7. Analysis, plans and control of credit relations and receivables.
8. Communication with marketing department, etc. (Harumová, 2002).

Effectiveness of receivables payment

As mentioned, turnover term of receivables can be in case of sale fluctuation provide not exact view of receivables development, and it does not always identify problem with growing level of receivables after payment term. When for example level of receivables after payment term is increasing monthly and at the same time in next month the sales are increasing, turnover term of receivables need not to be considerably changing, which could lead controlling to viewing of negative development of receivables after payment terms.

Collection Effectiveness Index

CEI – Collection Effectiveness Index gives rate of real paid receivables and receivables that should be paid in given period according contracted conditions. Its maximal value is 100%, the closer to this level, the more effective CEI. CEI index shows the measure, to which company is able to have its receivables paid, or to which measure are receivables after payment terms (Olsen, 2007).

$$CEI\ index = \frac{Initial\ state\ of\ claims + sales\ per\ invoices - final\ state\ of\ claims}{initial\ state\ of\ claims + sales\ per\ invoices - claims\ after\ payment\ term\ at\ the\ end\ period} \cdot 100\%$$

Optimal turnover period of receivables

Optimal turnover period of receivables means period, theoretically achieved when all clients of the company are paid in time (Kotulič a kol., 2010). Optimal turnover period of receivables can be calculated as total receivables decreased by all receivables after payment term (which means in calculation we use only receivables to maturity). In fact, we do not achieve always optimal state, since always will anybody delay with payment. The goal should be maximal approach to optimal turnover period. When for example 3-4 days over optimal level, the receivables payment could be considered as high effective. Average number of days in delay presents difference between real and optimal turnover period of receivables. It means how many days are the receivables averagely after payment term to certain

date. This simple index evaluates effectively payment discipline of the clients (Bobáková, 2004). The other useful indexes are:

- Volume of bad credits and their rate on total sales,
- Age structure of receivables (Zalai, 207).

During receivables collection, time plays very important tasks. The influence of time on receivables collection can be considered as follows:

- To collect the most and rapidly,
- In case of non-successful collection, company could sell the receivables for the highest possible price. But there is necessary remember that receivables collection in time decreases:

  - to one year to 20%
  - to one month with 95% probability of payment
  - to 3 month to 75% probability of payment

Mentioned is illustrated by Figure 18.

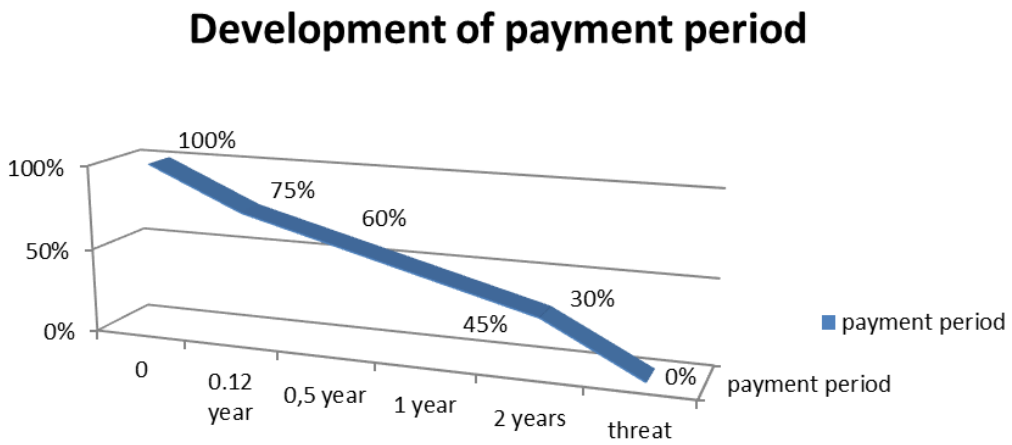

Figure 18. Development of receivables collection in time

Source: own processing according Klieštik and Cúg, 2010

Determination of optimal volume of receivables

Companies in practical conditions decide if to provide sales on credit to client. The solution and answer to the question is determination of present value of receivables and risk of payment (Daniel, 2013, p.28). Present value of receivables should be positive, on the other hand, company should not sell on credit, and since such sale would be without profit due to the risk, the receivables will be not paid. Mentioned can be determined by following calculation:

Profit from sale on credit = Payment of receivables – Cost of sold products

$$\boldsymbol{PVc = \frac{p \cdot (PC - C)}{(1 + i)^n} - (1 - p) \cdot C > 0}$$

when:

- *PVc – present value of receivables*
- *p – probability of payment*
- *PC – payment of receivables*
- *C – cost of sold products*
- *i – interest rate*
- *n – payment period of receivables*

Optimizing of financial means volume

Similarly, the volume of financial means cannot be voluntary, it should be optimized in the frame of lower (insure) level (for providing of operation activity of the company) of finances in cash desk and bank account, to upper level (with aim to limit devaluation of finances due to the inflation, etc.). Financial means present:

- asset with „low“ revenue
- common payment
- compensation payment to banks
  - interests, resp. principal

- fees of services

➢ preventive balance in case of unpredictable fluctuation of incomes and expenses

➢ "speculative" balance

- Convenient business possibilities (acquisition, etc.)

Optimizing of financial means level belong under cash management. It means finding of such minimum of financial means in cash that could permanently provide undisturbed business activities (see Figure 19).

Figure 19. Cash flow management

Source: own processing according https://www.123rf.com/

Cash is king when it comes to the financial management of a growing company. The lag between the time you have to pay your suppliers and employees and the time you collect from your customers is the problem, and the solution is cash flow management. At its simplest, cash flow management means delaying outlays of cash as long as possible while encouraging anyone who owes you money to pay it as rapidly as possible.

3.3 Measuring Cash Flow

Prepare cash flow projections for next year, next quarter and, if company is on shaky ground, next week. An accurate cash flow projection can alert you to trouble well before it strikes.

Understand that cash flow plans are not glimpses into the future. They're educated guesses that balance a number of factors, including your customers' payment histories, your own thoroughness at identifying upcoming expenditures, and your vendors' patience. Watch out for assuming without justification that receivables will continue coming in at the same rate they have recently, that payables can be extended as far as they have in the past, that you have included expenses such as capital improvements, loan interest and principal payments, and that you have accounted for seasonal sales fluctuations.

Start your cash flow projection by adding cash on hand at the beginning of the period with other cash to be received from various sources. In the process, you will wind up gathering information from salespeople, service representatives, collections, credit workers and your finance department. In all cases, you'll be asking the same question: How much cash in the form of customer payments, interest earnings, service fees, partial collections of bad debts, and other sources are we going to get in, and when?

The second part of making accurate cash flow projections is detailed knowledge of amounts and dates of upcoming cash outlays. That means not only knowing when each penny will be spent, but on what. Have a line item on your projection for every significant outlay, including rent, inventory (when purchased for cash), salaries and wages, sales and other taxes withheld or payable, benefits paid, equipment purchased for cash, professional fees, utilities, office supplies, debt payments, advertising, vehicle and equipment maintenance and fuel, and cash dividends.

"As difficult as it is for a business owner to prepare projections, it's one of the most important things one can do," says accountant Steve Mayer. "Projections rank next to business plans and mission statements among things a business must do to plan for the future."

Improving Receivables

If you got paid for sales the instant you made them, you would never have a cash flow problem. Unfortunately, that doesn't happen, but you can still improve your cash flow by managing your receivables. The basic idea is to improve the speed with

which you turn materials and supplies into products, inventory into receivables, and receivables into cash. Here are specific techniques for doing this:

- Offer discounts to customers who pay their bills rapidly.
- Ask customers to make deposit payments at the time orders are taken.
- Require credit checks on all new noncash customers.
- Get rid of old, outdated inventory for whatever you can get.
- Issue invoices promptly and follow up immediately if payments are slow in coming.
- Track accounts receivable to identify and avoid slow-paying customers. Instituting a policy of cash on delivery (c.o.d.) is an alternative to refusing to do business with slow-paying customers.

Managing Payables

Top-line sales growth can conceal a lot of problems-sometimes too well. When you are managing a growing company, you have to watch expenses carefully. Don't be lulled into complacency by simply expanding sales. Any time and any place you see expenses growing faster than sales, examine costs carefully to find places to cut or control them. Here are some more tips for using cash wisely:

- Take full advantage of creditor payment terms. If a payment is due in 30 days, don't pay it in 15 days.
- Use electronic funds transfer to make payments on the last day they are due. You will remain current with suppliers while retaining use of your funds as long as possible.
- Communicate with your suppliers so they know your financial situation. If you ever need to delay a payment, you'll need their trust and understanding.
- Carefully consider vendors' offers of discounts for earlier payments. These can amount to expensive loans to your suppliers, or they may provide you with a change to reduce overall costs. The devil is in the details.
- Don't always focus on the lowest price when choosing suppliers. Sometimes more flexible payment terms can improve your cash flow more than a bargain-basement price.

Surviving Shortfalls

Sooner or later, you will foresee or find yourself in a situation where you lack the cash to pay your bills. This doesn't mean you're a failure as a businessperson-you're a normal entrepreneur who can't perfectly predict the future. And there are normal, everyday business practices that can help you manage the shortfall.

The key to managing cash shortfalls is to become aware of the problem as early and as accurately as possible. Banks are wary of borrowers who have to have money today. They'd much prefer lending to you before you need it, preferably months before. When the reason you are caught short is that you failed to plan, a banker is not going to be very interested in helping you out.

If you assume from the beginning that you will someday be short on cash, you can arrange for a line of credit at your bank. This allows you to borrow money up to a preset limit any time you need it. Since it's far easier to borrow when you don't need it, arranging a credit line before you are short is vital.

If bankers won't help, turn next to your suppliers. These people are more interested in keeping you going than a banker, and they probably know more about your business. You can often get extended terms from suppliers that amount to a hefty, low-cost loan just by asking. That's especially true if you've been a good customer in the past and kept them informed about your financial situation.

Consider using factors. These are financial service businesses that can pay you today for receivables you may not otherwise be able to collect on for weeks or months. You'll receive as much as 15 percent less than you would otherwise, since factors demand a discount, but you'll eliminate the hassle of collecting and be able to fund current operations without borrowing.

Ask your best customers to accelerate payments. Explain the situation and, if necessary, offer a discount of a percentage point or two off the bill. You should also go after your worst customers-those whose invoices are more than 90 days past due. Offer them a steeper discount if they pay today.

You may be able to raise cash by selling and leasing back assets such as machinery, equipment, computers, phone systems and even office furniture. Leasing companies

may be willing to perform the transactions. It's not cheap, however, and you could lose your assets if you miss lease payments.

Choose the bills you'll pay carefully. Don't just pay the smallest ones and let the rest slide. Make payroll first-unpaid employees will soon be ex-employees. Pay crucial suppliers next. Ask the rest if you can skip a payment or make a partial payment.

Mentioned can be summarized by Figure 20.

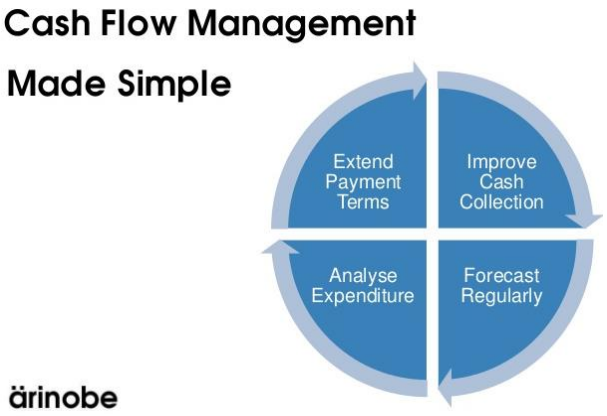

Figure 20. Cash flow management simplification

Source: own processing according to Arinobe (www.slideshare.net)

Basic decision situations during optimizing are as follows:

I. how many financial means does the company need **minimally and maximally** (analysis of incomes and expenses and their **structure in time**.

II. Determination in **what form** to have financial means.

I. Need to determine volume of financial means

There is used probability model, resulting from the knowledge of net daily cash flow. Medium value is zero, which means averagely daily incomes are equal daily expenses. In some days incomes can be different from expenses, which means probable distribution of daily cash flow. Need of financial means is followed up through payment calendar that illustrates initial and final state of financial means.

Final state = Initial state + Incomes – Outcomes

II. In what form to have financial means

It presents decision, how much financial means to have in bank account, how much in short-term securities and how much in cash desk. There are existing two models for financial means form determination:

1. Baumol model (deterministic) – model assumes fluent change of money.

$$Qopt = \sqrt{\frac{2 \cdot E \cdot t}{i}}$$

E – annual expenses of financial means

t – transaction costs of money change to securities and vice versa

i – interest rate

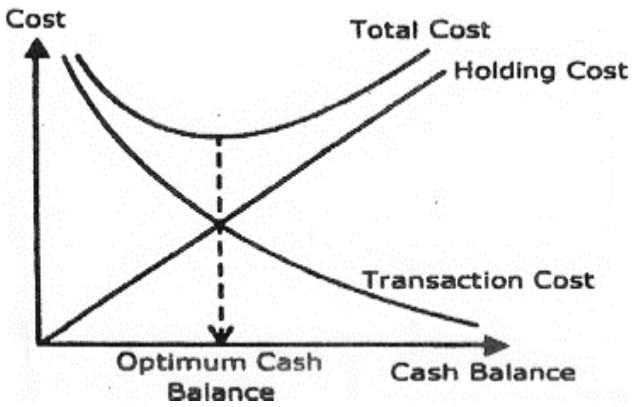

Figure 21. Optimal volume of financial means according Baumol model
Source: Ross and Westerfield, 1988

2. Miller – Orr model (stochastic):

The model results from unregularly changes of financial means. It is very close to the practical needs of the company. Incomes and expenses are changed randomly. Lower limit is determined by management decision.

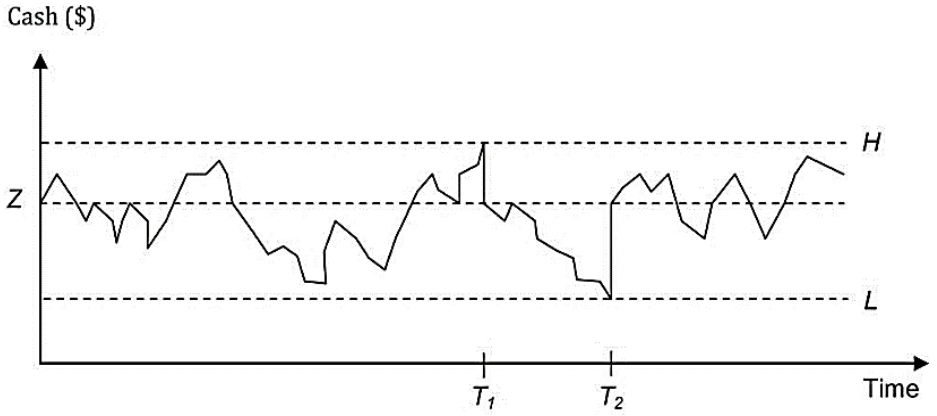

Figure 22. Optimal volume of financial means according miller – Orr model
Source: Moraes and Nagano, 2013

$$\textbf{Change range} = 3 \cdot \sqrt[3]{\frac{\frac{3}{4}\,\textbf{Transaction Cost} \cdot \textbf{Cash flow wariance}}{\textbf{intereset rate}}}$$

$$\textbf{Return point} = \frac{\textbf{Lower Limit} + \textbf{change range}}{3}$$

$$\textbf{Upper Limit} = \textbf{Lower Limit} + \textbf{change range}$$

At the management of financial means volume, there can be two situations. Surplus of money can be managed by:

1. Keeping money at current account,
2. To invest money at the capital market,
3. To use money for example for sales support, early payment for lower price, etc.

Shortage of financial means must be solved by:

1. Increasing of equity (emissions of shares)
2. Credit acceptance
3. Sale of some elements of the property
4. Receivables collection
5. Deferred payment of liabilities
6. Capital release,
7. Other measurements, for example release of the reserves and depreciation, etc.

3.4 Case Study – Analysis of working capital in production company

Production company purchase inputs from suppliers with average payment term of liabilities to 60 days. Production process from purchase to stocking removal is averagely 40 days, and company provides its clients averagely 40 days for receivables payment.

Total supply cycle of the company from purchase to payment is 85 days. From this period, first 35 days are financed by supplier credit, and remaining 30 day to receivables payment company must pay from its own or other sources. Turnover period of working capital in the company is then 44 + 30 – 35 = 39 days. Figure 23 illustrates graphically turnover period of working capital.

The afford of the company is to shorten the most turnover period of working capital and by this way to decrease also volume of financial means, necessary for its financing in time between payment of supplier´s invoices and receivables collection.

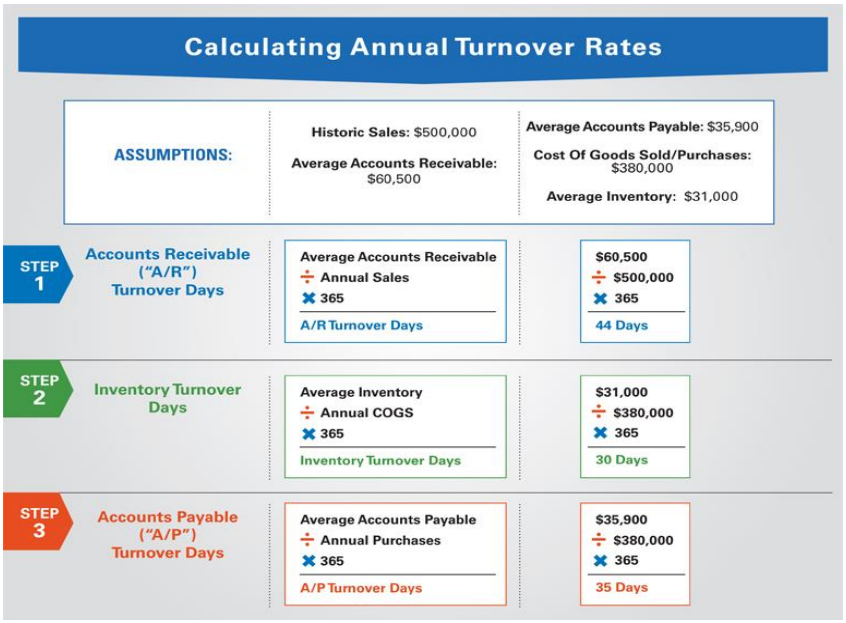

Figure 23. Turnover of working capital

Source: CFO, 2013

Analysis of working capital development in production company

Basic principle of working capital analysis is to have disposal proper volume of financial means when it is necessary. Therefore, financial needs of any company

must be developed by the way to meet demand of concrete company. Table 14 illustrates development of working capital and financial means in analyzed production company.

Table 14. Development of working capital and financial means in production company

WC and finances (in mil. EUR)	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
WC	11.0	12.4	13.8	13.7	11.8	10.7	11.4	11.6	9.9	9.5	10.3	13.3
Bank credits	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Cash	8.3	6.9	5.5	5.6	7.5	8.6	7.9	7.7	9.4	9.8	9.0	6.0
Net debt	16.7	18.1	19.5	19.4	17.5	16.4	17.1	17.3	15.6	15.2	16.0	19.0

Note: WC development assumes that except WC any other factors influence volume of cash
Source: own processing according internal material of the company

From mentioned development of working capital we can see that growth of working capital during April "consumed" financial means in volume 2,8 mil. EUR, which the company financed from its bank accounts. Lately financial means from working capital during May and June were repeatedly released. In fact, the volume of cash should be influenced also by other factors, for example increase of profit of the company, investments, owners deposits, etc.

Figure 24 gives mentioned development of working capital and financial means also.

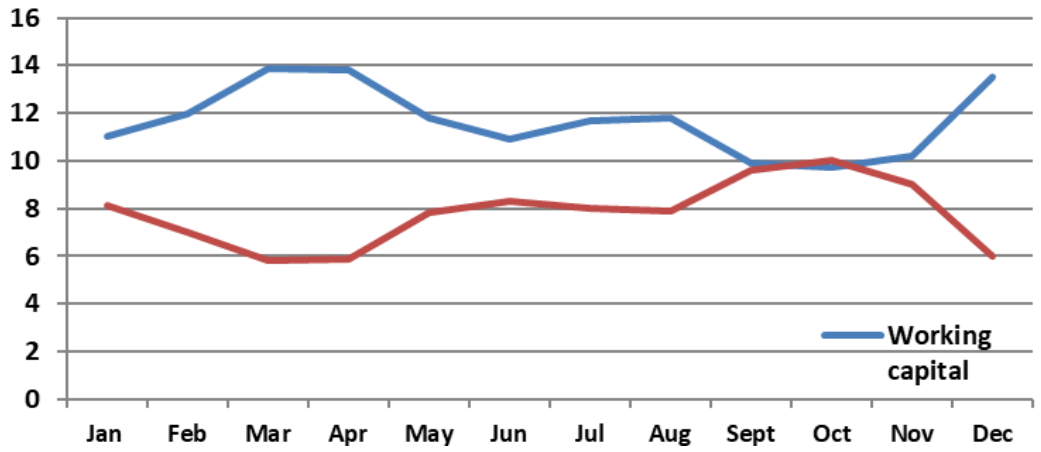

Figure 24. Graphical illustration of WC and finances development (in Mil.Eur)
Source: own processing according internal material of the company

Working capital must be considered always during preparing of business plan or during start-up of new products. In case company considers in its business plan with sales increase, company must regard the need of additional investment to the working capital as negative element in cash flow plan. In analyzed production company there was considered with working capital at the level of 4% from sales, company wants to increase annual sales in next year from 295 mil. EUR by 20%, which must regard additional investment at the level 295 · 20% · 4% = 2.4 mil. EUR.

Monitoring of receivables

Except of analysis of working capital development there is need to analyze in the production company also monitoring of receivables, determination of optimal volume of receivables and financial means. Due to the seasonal character of sales creation in analyzed company we monitored receivables in case when sales have seasonal character (see Table 15).

Table 15. Monitoring of receivables, when sales are seasonal

			Data of quarter		Data of annual base	
Month (1)	**Sales (2) (€)**	**Receivables (3) (€)**	**ADS (4) (€)**	**Payment period (5) (days)**	**ADS (6) (€)**	**DSO (7) (days)**
January	60	54				
February	60	90				
March	60	102	2.00	51	2.00	51
April	60	102				
May	90	129				
June	120	174	3.00	58	2.50	70
July	120	198				
August	90	177				
September	60	132	3.00	44	2.67	49
October	60	108				
November	60	102				
December	60	102	2.00	51	2.50	41

Value and percentage from total value of receivables at the end of any quarter								
Receivables structure (days)	31th March		30th June		30th September		31th December	
0-30	54€	53%	108€	62%	54€	41%	54€	53%
31-60	36€	35%	54€	31%	54€	41%	36€	35%
61-90	12€	12%	12€	7%	24€	18%	12€	12%
	102€	100%	174€	100%	132€	100%	102€	100%

Source: own processing according internal data of the company

From the analysis of receivables in analyzed company there is possible to segment clients of the company.

The result of the clients´ segmentation is matrix with various level of supplier service, in which top clients are included to the category, indicated by green color (see Table 16).

Table 16. Categorization of clients according profit per client

Categorization of clients		Profit per client			
		1	2	3	4
Net turnover on client	A	97%	95%	92%	80%
	B	95%	92%	85%	PO
	C	92%	85%	80%	PO

Note: PO – production to order

Source: own processing according internal materials and Kita, 2010

Determination of optimal volume of receivables

Production company should rather sale its products by cash, but competition force to sale by credit, when the company registers receivables rising. Their volume is influenced by volume of sale on credit and average period that rise between sale and receivables collection. Part of the credit policy of the production company is to determine optimal volume of receivables. In analyzed company we considered with two situations:

Situation A:

- Cost on sold products – 7 548 €,
- Company expects receivables collection – 158 281 €,
- Probability of payment – 50%,
- Demanded rate of return – 10%

$$\mathbf{SHp = p \cdot \frac{IP-N}{(1+i)-(1-p)} \cdot N = 0.5 \cdot \frac{158281-7548}{(1+0.1)-(1-0.5)} \cdot 7548 = 64\ 741\ tis.\ €\ >\ 0}$$

In this situation, with 50% probability of receivables collection, company can sell on credit.

Situation B:

- Very low probability of payment – 5% and
- Very high rate of return – 20%

$$\mathbf{SHp = p \cdot \frac{(IP-N)}{(1+i)-(1-p)} \cdot N = 0.05 \cdot \frac{150733}{1.2-0.95} \cdot 7548 = -890.1\ € < 0}$$

At very low probability of receivables collection, we do not recommend the company sell on credit.

Optimizing of financial means volume in analyzed production company

Idea of liquid funds – (cash) financial means are understood as most liquidity short-term assets of the company (assets with 1st level of liquidity), including cash in cash desk, financial means at the bank account in bank and repo tender (short-term financial property). It is known that capital, invested in liquidity funds bring the company relatively low direct return. Cash do not bring any revenue (demanded also yet cost for their protection), current accounts deposits in banks are interested by low percentage and interest rate of short-term securities is commonly lower than return on financial investments, etc. The main task is therefore how much minimal cash company need and what volume of cash must the company will have optimally.
The base of such solution is to analyze cash inflow and cash outflow in the company, as well as structure of cash flow in time. To determine necessary cash flow from the view of transaction motive of finances holding, there was used probability model.
Transaction motive – cash inflow and outflow of the company cannot be perfectly synchronized, and therefore there is necessary to hold certain reserve of finances, which would balance such daily imbalances and provide by this way payment ability of the company.
The base is knowledge of daily net cash flow (which means difference between cash inflow and cash outflow during individual days).
When using data from Table 17, cashbook has much more incomes over expenses. At the end of the day company makes transfer to bank account with leaving 11.000€ in cash desk. Medium value is zero – which means we assume that averagely daily cash inflows are equal cash outflows. There is rising therefore probability structure of

daily net cash flow, from which we can calculate standard deviation. The company is willing to accept probability of appearance of cash flow shortage at level 1% (which means company demands to have secured sufficient finances for covering of its daily needs with probability 99%).

Table 17. Cash book of the analyzed industrial company (January 2018)

	Initial state (€)	Income (€)	Expense (€)	Transfer to the bank (€)	Final state (€)	Cash flow (€)
2.1.	0.00	165 250.00	1 476.50	163 000.00	773.50	163 773.50
3.1.	773.50	104 864.50	0.00	97 000.00	8 638.00	104 864.50
4.1.	8 638.00	105 800.00	6 024.00	99 000.00	9 414.00	99 776.00
5.1.	9 414.00	89 716.00	1 142.00	88 000.00	9 988.00	88 574.00
8.1.	9 988.00	160 274.50	54.50	160 000.00	10 208.00	160 220.00
9.1.	10 208.00	119 401.50	12 476.50	108 000.00	9 133.00	106 925.00
10.1.	9 133.00	191 153.50	5 066.50	186 000.00	9 220.00	186 087.00
11.1.	9 220.00	85 667.50	10 471.50	75 000.00	9 416.00	75 196.00
12.1.	9 416.00	179 802.50	1 001.00	180 000.00	8 217.50	178 801.50
15.1.	8 217.50	230 601.50	4 028.00	226 000.00	8 791.00	226 573.50
16.1.	8 791.00	252 797.50	28 653.00	224 000.00	8 935.50	224 144.50
17.1.	8 935.50	153 699.50	29 534.50	124 000.00	9 100.50	124 165.00
18.1.	9 100.50	289 532.50	6 164.00	284 000.00	8 469.00	283 368.50
19.1.	8 469.00	363 477.50	13 240.50	350 000.00	8 706.00	350 237.00
22.1.	8 706.00	332 519.50	15 619.00	316 000.00	9 606.50	316 900.50
23.1.	9 606.50	193 360.00	4 888.50	189 000.00	9 078.00	188 471.50
24.1.	9 078.00	243 527.50	48 537.50	195 000.00	9 068.00	194 990.00
25.1.	9 068.00	182 454.00	4 211.00	179 000.00	8 311.00	178 243.00
26.1.	8 311.00	128 131.00	17 834.00	110 000.00	8 608.00	110 297.00
29.1.	8 608.00	247 209.50	788.50	246 000.00	9 029.00	246 421.00
30.1.	9 029.00	275 025.00	6 697.50	268 000.00	9 356.50	268 327.50
31.1.	9 356.50	172 528.00	3 059.00	170 000.00	8 825.50	169 469.00

Source: own processing according internal materials of the company

Standard deviation σ is calculated from selection file according equation:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n}(x_i - 0)^2}{(n-1)}}$$

when:

x_i – net cash flow in day „i“

n – considered number of days (in our case n = 22)

The value of standard deviation is then 202.869.80 €.

According data of normal distribution of the multiplicity for determined standard deviation and medium value means that 99% certainty would provide volume of financial means at the level 471.945.50 € that company must have at the beginning of every day.

Second important task is to decide, in what form to hold financial means. Cash in cash desk is regularly minimal, and therefore there must be decision how much financial means to hold at current accounts and how much in repo tender. To solve this task Miller-Orr model had been used.

The model works with:

- Fixed transaction costs of money conversion to repo tender f (developed from basic interest rate, given by National Bank of Slovakia) and vice versa, given by difference of currency course NBS EUR – Purchase and Sale
- Percentage expressed daily interest rate of repo tender i_d , interest rate is 4.10% p.a.

The model considers with expenses and incomes; both indexes are meanwhile in individual days changing randomly. Average daily cash inflows are equal average daily cash outflows (net cash flow is zero). Real daily net cash flow has normal distribution and its decline from zero is characterized by standard deviation – σ.

$$f = 34.160\text{-}33.418 = 0.75\ €$$

$$i_d = \frac{0.041}{360} = 0.000114$$

$$\sigma = 202.869.80\ €$$

The model determines upper limit of financial means, hold as finances (U), its lower limit (L), determined by management decision and demanded average level of finances (R) – reversion point. Lower limit – 50000€, regards reserve of financial means due to the currency course during foreign trades. Difference between upper and lower limit presents spread (S).

$$L = 50000\ €$$

$$3 \cdot \sqrt[3]{\frac{3 \cdot f \cdot \sigma^2}{4 \cdot i_d}} = 3 \cdot \sqrt[3]{\frac{3 \cdot 0.75 \cdot 202869.80^2}{4 \cdot 0.000114}} = 176392\ €$$

$$R = \frac{U}{3} + L = \frac{176392}{3} + 50000 = 226.392\ €$$

$$U = R + L = 176.392 + 50000 = 226.392\ €$$

State of financial means of the company is changing in the frame of mentioned limits. If in some day finances reach U limit, company invests to repo tender the sum that financial means would decrease to the demanded limit R. When in some day sum decreases under limit L, the company sell repo tender with volume that sum of financial means would return to demanded level R.

From the graph, illustrated by Figure 25 we can see that cash desk reflects short-term financial surpluses.

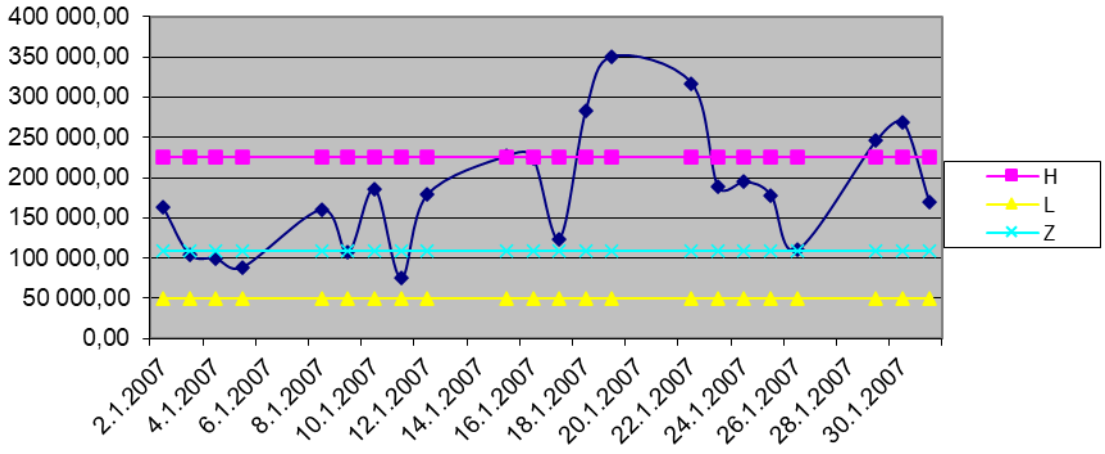

Figure 25. Miller – Orr model of cash flow in chosen industrial company

Source: own processing according internal material of the company

Miller – Orr model had to determine, in what form to hold finances. Limitation of the model is decreasing of its practical using (the model does not consider with volume of transactions and its relation to the level of fixed costs). Presently the company does not have insured cash desk and therefore there is necessary to transfer finances every day to the bank. Production company must pay for finances transport through private security service. In case the company would in the future:

- Secure its cash desk and
- Incomes would be approximately equal to expenses, for example by establishing of overpayment in cash,

then the model will present considerable contribution for optimizing of finances in cash desk.

Management of optimal volume of working capital is orientated to its decreasing or increasing. It is possible to be done for example through:

1. Increasing of working capital by:

- Growth of owners deposits,
- Acceptance of credit,
- Sale of long-term property,
- Net profit.

2. Decreasing of working capital can be done by:

- Dividend payment,
- Loss recognition,
- Credit payment,
- Purchase of long-term property,
- Providing of long-term loans.

Ethical Evaluation of Performance Measures

To evaluate whether decisions made by working capital management are both effective and ethical, performance is measured through responsibility accounting. This is a double-layer ethical analysis that requires some thought to establish and implement, as the evaluation system must also operate in an ethical fashion, just as the decision-making process itself does. In most organizations, the overall results of choices made by management, not just the resulting profit, need to be examined to determine whether or not the decisions are ethical.

When an organization's customers and other stakeholders are happy, and the corporate assets are in good condition, these are indicators that the customers, stakeholders, and assets are being treated ethically. Evaluation of customer and

stakeholder satisfaction should come directly from the customer, such as through surveys or other direct questionnaires. Proper treatment of organizational assets can be determined by viewing the physical condition of such assets, or the loss rates and productivity of equipment. Customer satisfaction and positive results in the utilization of corporate assets typically indicate ethical decision-making and behavior, while negative results typically indicate the opposite. An organization with a satisfied group of stakeholders and customers, as well as assets that operate efficiently, is often more profitable in the long term.

Managerial accountants therefore must design a framework of responsibility accounting in which the evaluation system is based on criteria for which a manager is responsible. The framework should be structured to encourage managers to make decisions that will meet the goals of the company as well as their own professional goals. In your study of managerial accounting, you have learned about company goals such as increasing market share, increasing revenues, decreasing costs, and decreasing defects. Managers and employees have their own goals. These goals can be work related such as promotions or awards, or they can be more personal such as receiving raises, receiving bonuses, the privilege of telecommuting, or shares of company stock. This aligning of goals between a corporation's strategy and a manager's personal goals is known as goal congruence. Managers should make the best decisions for the benefit of the corporation, and the best way to motivate a manager to make those decisions is to link a reward system to performance results. To accomplish this, a business establishes performance evaluation measures that align the decisions made by management with the goals of the corporation and the professional goals of the manager.

CONCLUSION

Working capital presents convenient tool for management of supply chain logistics. Therefore management and optimizing of working capital should be integral part of financial management of the production company. Effective management of working capital is presently neccessity in modern managed industrial companies, connected with liquidity management. Such management demands not only active management of working capital, but also its control. Using of working capital in the

practice results from the necessity to manage individual elements of working capital, defining of its optimal level due to the volume and character of the sale, following of receivables collection and evaluation of working capital elements. Although financial manager in his position cannot influence individual elements of working capital, but his task cannot be in practice undermined in connection with finding of financial situation improving in the production company.

Due to the still increasing competitiveness at the market there is very important for the company to follow up financial performance continuously to know what is its momentary position, as well as functional situation and to what direction the development is orientated. Measurement of financial performance then provides information, according which managers can better decide, since what every area that company can measure, can be also easily managed and controlled.

4

MARKETING PERFORMANCE

Marketing effectiveness and performance means quality, with which marketers enter the market with goal to optimize their expenses for achievement of good results in short term and long-term horizon. Introducing of effectiveness measuring is process that is many times criticized, since it ostensibly concentrates only on short term goals. But in fact according the definition marketing effectiveness is orientated to marketing activities that could be realized for improving of short term and long term results. Short term improvements are measured while speaking about profit and long term improvements means concentration to the capital increasing by the way of brand in thinking of business clients, which means increasing of image. Evaluation of marketing performance is important supplement of marketing activities in the company. Its importance grows with number of tools, invested to the marketing. Any manager senses responsibility for investments, finances, production or information technologies, but he cannot how to invest marketing expenses. Measurement of marketing effectiveness is therefore rather art, not science. Especially in B2B demanded environment, when there are long sale cycles and general shortage of marketing strategy understanding, there is necessary to be orientated to the measurement of invested capital return and to connect marketing with business finances. Any marketing department must understand there is necessary to measure effectiveness of its activity, but by proper methods of measurement. There is available research, when 54% respondents from top management are not satisfied with measurement of marketing activities effectiveness. Main obstacles of effectiveness measuring lie in insufficient data, shortage of tools for data analysis in long-term sale cycle.

The intangible benefits of marketing – improving and enhancing brand awareness; educating customers and prospects about product benefits; and strengthening stakeholder relationships – make measuring its financial impact a perplexing and challenging process. Ideally, marketing performance measurement should be a logical extension of the planning and budgeting exercise that happens before a

company's fiscal year. The goals that are set, should be both measurable and applicable to every marketing role within an organization. Companies employ various methodologies to measure marketing performance and ensure they meet those performance goals.

Marketing is a key business function that requires good performance indicators to measure how successful it is. Here we look at how to find the most relevant and meaningful marketing KPIs that really matter to company. When it comes to marketing metrics, it's never one size fits all. The right metrics depend on marketing goals and business model. Moreover, those goals are different for each business. So, how to find the KPIs that really matter to measure marketing performance? Isn't the goal of marketing to increase revenue? Ultimately, for commercial companies that might be the case, but there are many factors at play. For most businesses, there are incremental steps that will help drive organization to achieve its goals. This might start with marketing campaigns that increase brand awareness alongside initiatives to increase conversions. The first step towards finding the most relevant KPIs is therefore to determine what key marketing goals are planning to achieve.

The most common marketing objectives are to:

- Build brand awareness and thought leadership
- Generate leads and acquire customers
- Engage, add value and nurture customer relationships

Of course, some marketing activities can aim to achieve more than one of these goals. For example, a blog on website might drive brand awareness and generate leads. Once the company clears about marketing goals, company can then them to determine the right KPIs to help measure marketing performance.

Traditional measuring of marketing performance had been orientated to the evaluation of influences of marketing activity to the sale. Basic reason was that information about sale had been available, but information about profitability had not been available, those information demand summary elaboration of data. In eighty years, idea of market rate measuring got into the consideration as the main

predictor of incomes and profitability. Gradually market rate started to be understood as function of perceived quality. Yet in 1996 Aaker (1996) showed to the fact that prices change can be explained by combination in return on investment change and brand equity, not only through single ROI. Quality as competitive advantage was possible to use less, both due to the fact it influences the clients short time, and due to the broad convergence of qualitative standards (as for example Total Quality Management – TQM establishment). Such development stimulated also rising of whole other indexes using, which did not have by then importance during measuring of business success.

4.1 New parameters as reaction to the changing environment

New parameters that started to be considered, expressed base of the relation between clients and products, service or single company, also quality of experience, resulting from the products or service using (user experience).

To basic indexes, due to the mentioned, belong:

- Clients loyalty,
- Capitalized value of brand and
- Satisfaction of client.

The studies from the end of nineties, last century, show important statistic relation between satisfaction of client and future financial performance of the company that is positive. Important activity was publishing of the book Balanced Scorecard by Kaplan and Norton (1996), which offers way to connect strategy of business to four managerial perspectives: financial, consumers, process and knowledge. Also other authors, for example Stewart (1995), showed how financial indexes, for example profit, sales, cash flow, can be replaced by non-financial indicators – such as market rate, quality, satisfaction of clients, loyalty, capitalized value of brand, etc. Increasing of number of created and used marketing measuring indexes had been the reason of various factors influencing. One of them is extension and improvement of database technologies, which enabled companies to collect more information about clients and to certain level also information about competitors and their consumers.

The next influence is rise of new distribution channels for products and services, such as for example internet that increased considerably availability and complexity of marketing indexes that had not been limited only to the measuring of clients values and return on investments.

4.1.1. Modern tools, enabling measurement of marketing performance

Increase of number of indexes led to the considerations about optimal number of searched parameters that top management can follow up effectively, but also development of techniques and tools, which enable such following, had been supported. Modern tool for illustration of individual indexes values and process of the development, is so called dashboard, which presents software, enabling following of various indexes in graphically high qualitative and properly structuralized form.

4.1.2. Factors, influencing marketing indexes selection

Selection of measures of marketing indexes is influenced by objective and subjective factors in the frame of the company. There are four main groups of factors, influencing selection of marketing indexes, which are:

1. Perception of paradigm of modern marketing in last decade, for which there are characteristic areas for building of relations with clients (which means not only through business transactions), which is typical for relation marketing; further application of corporate social responsibility aspects (rather we will speak about effort and finding of approaches in social and ethically sensible area); higher connection of marketing to interests of the society, for example as phenomena of social networks. Present marketing influences considerably direction of profitability finding for client (through value of product for the client) and for the company and profit achievement from the satisfaction of clients' needs.

2. Business model: company is choosing measuring indexes that connect the best areas and impacts of managerial decisions to financial results of the business. Lately their tasks is to follow up performance of most important strategies, resp. their realization during value creation.
3. Goals: selection of indexes should follow up goals that are critically important for generation of financial value, not only their target filling, but also their filling in time process. These are not only financial indexes, but also indexes from clients' perspective, from area of internal processes, and from area of learning and development of the company.
4. Time horizon: companies with long time sale cycle or with orientation to the business position building and values references should quantify and follow up indexes with profit contribution in the future. In the frame of such approach, there is emphasized evaluation of so-called capitalized value of the brand or evaluation of capital brand. Such ideas are considered as equivalent and resulting from interpretation of market capitalization, which means brand, given by market, what "potential to bring for shareholders by sale at the market."

4.2 Quantitative indexes for marketing performance measurement

Among classical quantitative indexes for marketing performance measurement belongs big number of indexes from area of market research. To this group belong also market rate (value, volume, absolute, relative market rate, product´s rate, category rate), brand penetration, spontaneous and supported knowledge of the brand, advertisement knowledge, intention to buy, shopping habits, willingness to recommend, indexes of consumers´ satisfaction, etc.

Evaluation of activities for sale support includes area of support of basic and supplementary sale (sale, achieved by sale support activities); further price of activities for sale support (which means regularly total costs, connected with coupons and rebates); rate of the sale in the frame of activity for sale support on total sale, rate of sale time with activities for sale support on total sale time (during certain period); so-called "price waterfalls".

Management of distribution channels evaluates completely raw of parameters, beginning with performance of businesspersons, for example through volume of sale or according total sales. Further, there is analyzed achieved index of numerical distribution, total level of stocks at clients, missing goods at the sale place (so-called out of stock).

There are evaluated also parameters, connected compensation or bonus element of wage, number of business representatives and their performance according regions, their workload, personal performance parameters, as for example number of visitations, success of visits, visits in the frame of plan, unplanned visits, etc.

Measurement of advertisement, communication activities, demands for example so-called gross rating points (rate of penetration of advertisement on total number of persons) and indexes, such as price per thousands of advertisement penetrations, "net penetration" – number of persons, addressed by advertisement, average frequency of advertisement, effective frequency, rate on total advertisement, etc. New types of advertisement on internet brought new measuring indexes, such as: cost on "clicks", parameter of "click through", number of page visits, costs of order, costs of new clients obtaining, decrease of visits, etc.

Permanently actual is area of measuring indexes, to which financial managers are orientated. It includes evaluation of margin (for example unit margin, margin according distribution channel, percentage of margin), further following of variable and fixed costs, structured view to the costs of marketing budget, development of unit average prices, evaluation of goals achievement in volume of sales and goals in sales, etc.

The next area of indexes that are presently mostly demanded, is area of connection between financial and marketing indexes. However, there is necessary to underline that their using is very selective, according abilities of the company and its managers to manage implementation of new indexes. Such indexes can be profitability that can be evaluated from various points of view. The main indexes are: net profit (according activities of the company, regularly adapted by tax), sale return, return on investments – ROI, economic value added – EVA), net present value – NPV, internal rate of return – IRR, or return of marketing investments – ROMI).

4.3 Trends of marketing performance measurement

In last period, we see new trends in area of measuring and evaluation of marketing activities in business, mainly:

- Transition from non-financial indexes to financial indexes,
- Transition from historical measurement to perspective orientation,
- Transition from short term to long term perspectives,
- Transition from summary indexes to detail data (from macro data to micro data),
- Transition from independent indexes to causal relations,
- Transition from absolute indexes to relative indexes,
- Transition from subjective to objective indexes.

Generally, we can see more than 60 various marketing measures that are presently used in theory. However, findings from practice confirm low measure of their knowledge and using. Businessman should choose such indexes, by which he could succeed in evaluation of marketing activities evaluation, mainly with regard to the area of business and volume of the company. Any company should underestimate marketing indexes any time.

4.4 Measuring the efficiency of marketing activities

Measuring the efficiency of marketing activities should be a top priority for any society. It has been a main concern in marketing literature research and a core and troubled issue in companies. Nonetheless, since the seminal works on marketing productivity analysis, the academician and managerial domains have seldom generated essential new knowledge on the topic (e.g. O'Sullivan & Abela, 2007). Though a strong effort has been devoted to the development of punctual measures better suited to assess the evolving relevant performances in response to the emerging marketing paradigms, marketing performance measurement system (MPMS) design still remains a widely uncovered topic (Clark, 1999). Sychrová (2013) stresses that besides traditional indicators, it is important to track other

metrics related to marketing management that are integral to the marketing strategy.

An improved visibility of marketing efficiency helps companies to better prioritize their efforts, as well as to improve the quality and precision of the marketing resources demanded by the sales force (Milichovský & Šimberová, 2015).

The relationship between marketing strategy and the measurement of marketing efficiency is a substantially under-researched topic (Lamberti & Noci, 2010). Therefore, identifying the appropriate key metrics should contribute to the evaluation of marketing efficiency (Milichovský & Šimberová, 2015). Barwise and Farley (2004) find that a majority of firms consistently adopt one or more of six marketing metrics.

Marketing in companies presents a complex phenomenon with several multidimensional aspects that have opposing criteria directions. Therefore, it would be appropriate to adopt multi-criteria evaluation methods for such analysis (Ginevičius et al., 2013). In addition, marketing capabilities are of multi-dimensional scale (Chahal and Kaur, 2014. Despite the present irreplaceable status of marketing, a number of organizations underestimate this element of management. In other companies, subjective evaluation by individuals, without any data, analysis, or measurable indexes, often govern marketing decisions (Pajtinková, Bartaková & Gubiniová, 2012).

As for the marketing activities involving clients, Al-Alak (2014) indicates that company clients do not feel that establishing a close relationship with the company will have a positive impact on quality. Padmavathy, Balaji, and Sivakumar (2012) develop measures of the efficiency of customer relationship management for retail business; company can improve their efficiency by implementing efficient customer relationship management (Gupta, Singh & Kainth, 2014).

4.5 Case study – Measurement of marketing activities performance in bank sector

In the case study, we apply the marketing mix efficiency research conducted by previous authors to the clients of the chosen analyzed bank of Slovakia (Tatra bank)

in provided data from 2013. We conduct a survey through online questionnaires to investigate the utilization of the bank's marketing mix among retail banking clients. The most important findings of the research are as follows (Antošová, Mihalčová, & Csikósová, 2014):

- Analyzed bank presents a retail bank and it should obtain new retail banking clients in order to access to financial market leaders.
- Bank should create suitable conditions for their clients, mainly by the way of adapting products and services to individual client needs with aim to prevent them from turning to the bank's competitors.

As an empirical method of research, we used observation to obtain relevant data directly through the bank. In order to achieve an adequate overview and to develop concrete ideas, we made several visits to the bank and consulted with the bank's management.

We choice to use main groups of indicators on measurement of marketing activities in Slovakian banking sectors according existing research of Pajtinková, Bartaková & Gubiniová (2012), which are as follows:

a. measurement and evaluation of market rate and share from clients' perspective,
b. indexes of clients' profitability,
c. effective management of product portfolio, and
d. efficiency of individual pricing strategy tools.

a. Measurement and evaluation of market rate and share from clients' perspective

The indicator reflects the level to which an organization is successfully compared to its competitors. The means of the index measuring present the Sales.

$$Market\ share\ based\ on\ number\ of\ performances = \frac{number\ of\ sales\ ormances\ of\ the\ company}{total\ pnumber\ of\ sales\ erformances,sold\ at\ the\ market} \quad (1)$$

$$Market\ share\ based\ on\ sales = \frac{total\ sales\ of\ the\ company}{total\ sales\ of\ the\ market} \quad (2)$$

In business services, alternative method of market share calculation, share of revenue can be used. The market share indicator reflects changes in the competitive market environment, which forms the basis for future strategic and operational decisions. Accordingly, the index monitors potential growth or market declines and predicts the impact of a change in customer preferences.

b. Indexes of clients' profitability

Indexes represent a group of indicators that evaluate individual customer relationships. Clients' profitability reflects the profit that the company has obtained by meeting customer needs. Generally, one monitors profitability over a period of one year. Banks may select individual customer relationships based on client profitability.

$$Profitability = incomes\ arising\ from\ client\ relationship - costs\ arising\ from\ client\ \ relationship \quad (3)$$

In managing profitability, the bank must keep in mind that not all customers are equally profitable and therefore, it must consider how individual customers affect profitability.

During calculation and evaluation of managing profitability the banks have to consider not all customers are equally profitable and therefore, the banks must regard how individual customers affect profitability.

Customers' lifetime value means following index, expressing the present value of planned cash flows obtaining by relationships with client.

$$Customer\ lifetime\ value = profit\ margin \cdot \frac{customer\ retention\ rate}{1 + discount\ rate - customer\ retention\ rate} \quad (4)$$

This indicator encourages profits instead of merely developing long-term customer

The indicator prefers profits instead of merely increasing long-term customer relationships. It also reflects the upper level of the cost that the company is willing to invest on acquiring and retaining of new customers. The index is future orientated and useful for marketing decision making.

c. Effective management of product portfolio

This category of indicator concerns the ability to recognize and satisfy customer needs. In order to achieve effective marketing management, a company monitors variables, such as the sales volume of new products, the impact of introducing new products on the sale of existing products, and the development of brand value.

Mentioned variables evaluate the product portfolio growth of the organization including annual growth and compound annual growth for a period of time that exceeds one year:

$$Annual\ growth\ = \frac{(Value\ at\ time\ t - Value\ at\ time\ t-1)}{Value\ at\ time\ t-1} \quad (5)$$

Many times the organization growth indicator is used. Expressing the indicator in percentage expression addresses what is the performance of the organization in the analyzed period compared to the previous period. In practice, marketing managers mostly use achieved sales volume to compute annual growth.

d. Efficiency of individual pricing strategy tools

Price is a key attribute that plays an important role in purchase decisions. During pricing following relevant indicators must be considered: creation of product price with regard to its value added, and the relationship between quantity and price, price elasticity, and price formation under linear and constant elasticity. Traditional indicator of the efficiency of individual pricing strategy tools means relative product price, comparing the price of the product with competitors of the organization:

$$Relative\ price\ = \frac{(Price\ of\ product\ A - Price\ of\ competing\ product)}{Price\ of\ competing\ product} \cdot 100 \quad (6)$$

Monitoring relative prices enables a company to develop its pricing strategy based on the prices of its competitors. This index can indicate a lack of certain products in the market, or, conversely, their abundance. However, average price replaces this index in practice, except for direct comparisons with selected competitors. According to surveys in the UK, the USA, Germany, and Japan, more than half the organizations use only an indicator of relative prices. In addition, other indicators can measure the efficiency of the pricing strategy, such as value-creating price, price elasticity of demand, own, residual, and cross-price elasticity, and the percentage of positive values.

The subject of this research is chosen bank, operating in Slovakia – Tatra banka, which operates in the territory with 155 sale posts and more than 700,000 clients and is the third largest bank in the Slovakian market. It acts as a modern, global bank, providing not only banking services, but also innovative financial investment products. Tatra banka is a subsidiary of the international group, Raiffeisen Bank International AG (RBI), operating in 15 markets of Central and Eastern Europe. We chose the bank as a representative sample of the banking sector due to the irreplaceable importance that it ascribes to marketing activities, especially in the context of growing competition in the area. The choice is based on several criteria with the existence of a functional marketing department being the fundamental factor (Csikosova, Culkova, & Janoskova, 2016).

We track individual indicators of efficiency of marketing activities over time and compare them with selected competitors. The application of quantitative methods transforms the acquired data on actual marketing information, which enables the analysis of relationships between determined facts. Crucial method is using of Balanced Scorecard, since it helps to achieve business strategy and to ensure that the organization strives to achieve positive future developments and to improve the implementation of individual marketing activities (Porter, 1990). The main contribution of the Balanced Scorecard is to transform strategic goals and visions to quantified indicators.

Foundation of Balance Scorecard concept provides possibility to evaluate four perspectives (financial, customer, process, and learning and growth) (Kaplan & Norton, 1996) and it helps the evaluation of organizational performance. Every aspect has specific and concrete goals and metrics that lead to goals achievement. The main characteristic of the Balanced Scorecard, helping to achieve the research aim, is to connect financial and non-financial performance metrics since it is not possible to determine strategy purely based on past financial results.

We track Tatra banka in terms of loans, received deposits, and mortgage bonds due to the given available data within the group of market share indicators. We obtain overall market necessary data from National Bank of Slovakia and corporate data from individual annual reports.

The research follows the market share of Tatra banka in terms of loans, deposits received, and loans and mortgage bonds issued during the period 2014-2018. In terms of loans provided, the market share of Tatra banka is relatively stable at 17% owing to the positive increase in the number of entities operating in the banking sector during the reporting period. Similarly, market share in terms of deposits and loans is relatively stable at 16%. However, in terms of issued mortgage bonds, the market share significantly decreases from 31% to 19% during the study period.

Customer profitability in the study is analyzed for two selected segments of Tatra banka, namely corporate and retail clients. The corporate customer segment represents large enterprises while retail clients include entrepreneurs, micro-enterprises, small businesses, private clients, and individual employees. Revenues from customers include net interest income comprising net income and net revenue from fees and business activities. In customer-related expenses, operational costs are included.

Figure 26 shows a result of customer profitability development in the retail segment and it is obvious the index has increased slightly throughout except in 2016 when it underwent a slight decline. On the other hand, the corporate segment grew only in 2016 and has declined in recent years. This is mainly due to the decline in revenues

from the corporate segment over the last two years of the study period. In 2016, there was a change in focus towards corporate clients, which affected the development of customer profitability in both segments. This change involved the transfer of some retail clients to the corporate segment. Small business clients fall within the retail segment mainly based on the amount of revenues earned. The change in classification from retail to corporate caused a significant increase in the profitability ascribing to a single customer in the corporate segment in 2016. As for the retail clients, the transfer of customers between segments reflects a moderate view of the fact that the number of retail clients is several times higher than the number of corporate clients.

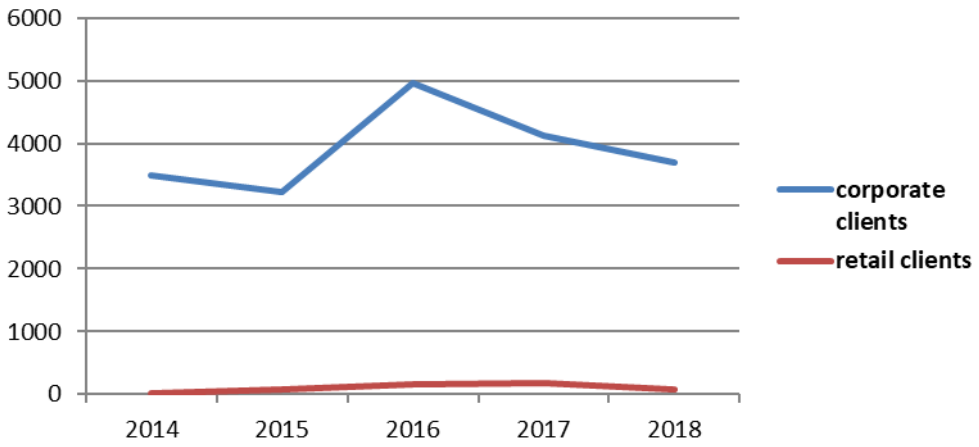

Figure 26. Profitability per client of corporate and retail segments (in EUR)

Another indicator of customer profitability is customer lifetime value. In contrast to profitability, this indicator is future-oriented and reflects the planned cash flows obtained by relationship with clients. Profit margin presents the base for indicator calculation, but it must be adjusted by the discount rate and the rate of customer retention.

The development of the customer lifetime value of the corporate segment, as presented in Figure 27, is similar to the corresponding development of profitability per client.

The customer lifetime value initially declines in 2015, then rising to a level of more than 13 thousand EUR in 2016. Thereafter, it again records declines in 2017 and 2018, mostly due to declining revenues from interest payments and fees. Figure 27 also shows the fluctuating trend of a retail client's customer lifetime value, with

significant drop of index by almost 300 EUR in 2018. The discount and the customer retention rates contribute to this fluctuation, given that the profit margin during the survey period (except in 2016) is increasing.

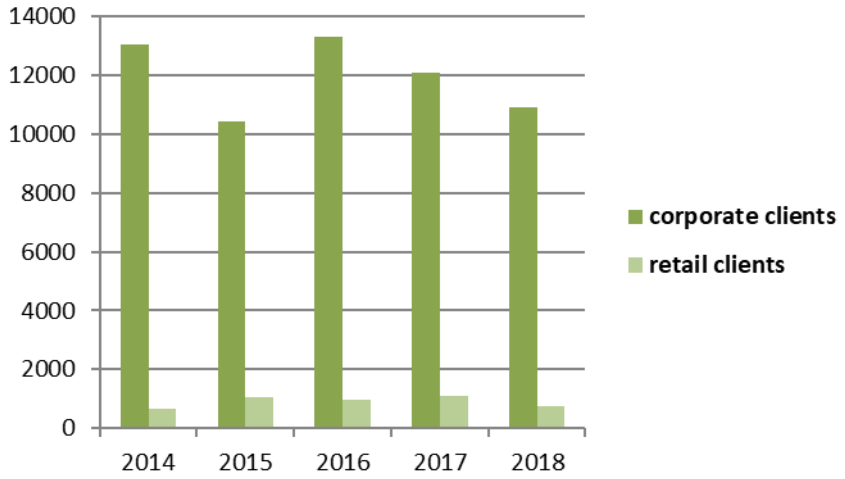

Figure 27. Customer lifetime value of corporate and retail segments (in EUR)

Marketing managers use sales as one of the most important indicators of customer satisfaction. A rising trend of annual changes in sales is obvious from Figure 28, considering five individual customer segments, namely corporate clients, retail clients, financial institutions and public sector, investment banking and treasury, and equity. The analyzed bank recorded the highest growth over the period in the equity segment followed by treasury and investment banking, while the growth in the financial institutions and public sector was also significant.

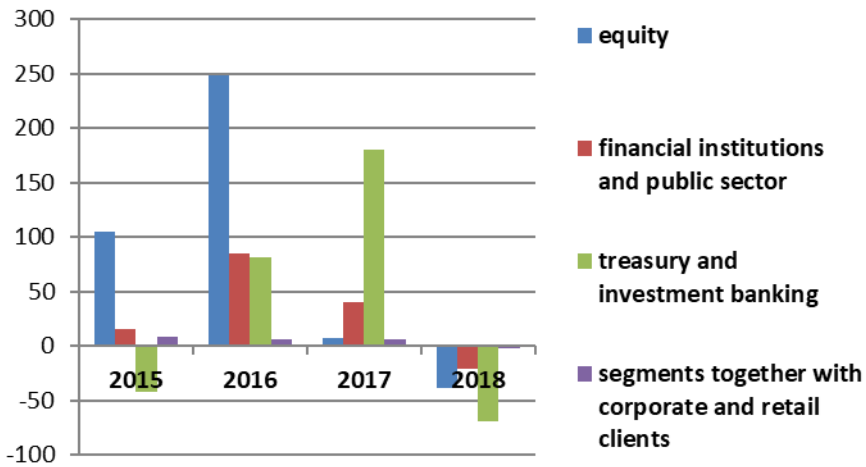

Figure 28. Annual growth rate of individual segments in Tatra banka (in %)

The revenues of each of the segments remained positive mostly across all analyzed years except 2017. The achievement of the highest overall annual growth level at almost 8% was in 2010. The revenue of the corporate segment recorded an initial increase in 2014 and 2015, followed by a slight decrease in 2016. Revenues of financial institutions and public sector grew in all years except 2013, while the treasury and investment-banking segment exhibited a fluctuating revenue trend. Development of revenue of equity is similar to financial institutions in all analyzed periods, except 2018. Moreover, in 2016 segment of equity enjoyed a more than 200% increase in revenues.

Further, we made analysis of the compound annual growth, which reflects the average annual growth during the analyzed period. Equity investments record the highest compound annual growth rate in the bank at nearly 36%. On the other hand, retail customers experienced the lowest average growth rate at 2.3%, while the treasury and investment-banking segment registered a negative value of compound growth at -2.3%.

In addition, we compare Tatra Bank with other four banks (Slovak Savings Bank, VÚB, KBC Bank, and Prima Bank Slovakia) in order to evaluate pricing strategies, by the analysis based on the quantification of relative prices. We analyze individual banks by examining selected services provided relative to their charges. Accordingly, we acquire data on the tariff of individual banks, based on price.

Regarding the pricing process, the analyzed bank uses a combination of various methods but it applies primarily the principles of price creation and its adaptation to the competition prices.

Table 18 provides results of a comparison of individual banks' prices with an average price, which quantifies the prices of individual products. We analyze the prices from the customers' perspective, which implies that the lower the price, the better. In the case of analyzed Tatra banka, the product prices are higher than other banks in two cases, namely personal account maintenance fees and debit card fees. At the same time, the price is also the highest for these products compared with the average.

According results of the analysis of the efficiency of marketing activities in chosen bank, the areas of weakness in Tatra banka that need resolution are as follows:

- Stagnant growth trend of credits provided in Tatra banka lagging behind the corresponding growth trend of the overall market.
- Negative growth in client profitability for the corporate segment over the last two years analyzed.
- Negative compound annual growth rates in the treasury and investment-banking segment.

Table 18. Benchmarking tariffs of chosen products compared in main Slovakian banks

	Tatra banka	Slovenská sporiteľňa	VÚB	ČSOB	Prima bank
Payment for account management	7.00 €	5.90 €	5.50 €	6.00 €	3.90 €
Relative price (%)	-	18.64	27.27	16.67	79.49
Debit cards available	Visa Electron	Visa Electron, Maestro	Visa Electron, Maestro	Visa Electron, CL	Maestro
Annual Fees	12.00 €	10.00 €	8.30 €	7.20 €	7.20 €
Relative price (%)	-	20.00	44.58	66.67	66.67
SEPA Processing fee	1.20 €	1.20 €	1.30 €	1.20 €	1.50 €
Relative price (%)	-	0	- 7.69	0	- 20.00

The possible solution is to focus on the customer perspective of the performance assessment of selected banks, since the financial goals of the organization significantly influence the quality of goals achieved from the customer perspective. To address individual proposal, we use strategic maps, which are a tool of the Balanced Scorecard approach (Kaplan & Norton, 2004). Strategic map, mapping the strategic objectives with respect to the individual customers is given by Table 2, which lists also the measurements for control of objectives, as well as the expected target values of individual instruments and determined goals.

4.6 Marketing performance management

Marketing performance management is the organizational capacity for improving the ROI and effectiveness of marketing. It encompasses the planning process, performance measurement and establishment of predictive analytics.

To implement a strong marketing performance management function, marketing teams must:

1) Align marketing teams to revenue goals and corporate goals,
2) Establish accountability and measurability for revenue goals,
3) Implement predictive capabilities for revenue.

Figure 29 Steps of marketing performance management
Source: https://www.bizible.com/marketing-performance-management

By following the three steps below marketing leaders can establish a strong cycle of measurement, planning, and execution that results in revenue growth and impact across the organization.

STEP 1: Aligning To Revenue

Marketing performance management entails creating processes and managing resources for the marketing team with the goal of efficiently achieving business objectives, primarily revenue. This means building and managing teams, allocating budgets, setting smart goals, and accurately tracking and measuring the right metrics.
As opposed to the execution of marketing, marketing performance management focuses on the strategic side – the planning and measurement phases of marketing.

Setting corporate revenue targets
One of the first steps in marketing performance management is identifying the broader business objectives, especially the revenue targets.

In order for the marketing function to put together a plan, company need to know what the ultimate goal is. If corporate goal is to hit € 100M in revenue this year, the marketing plan (e.g. budget and headcount) will be drastically different compared to if the corporate goal is to hit € 50M.

The marketing team needs to know the greater objective so that it can align their plan. It is a top-down approach to figuring out strategic framework.

Aligning and committing marketing to revenue measurement and accountability

The next step is to figure out what role marketing plays in achieving the broader business objectives. A major roadblock to aligning marketing goals to business objectives is getting buy-in on revenue measurement from the marketing team.

Revenue measurement, and as a result, revenue accountability, can be daunting. Compared to activity volume or lead volume – something that marketers have more control over – being responsible for revenue is a big step. However, it is a big step forward. It is a big step forward because for a long time, marketers have had a diminished role in their organization. With revenue measurement and accountability, marketers are finally able to speak in the language of the CEO and their counterparts in sales and finance. They will get a seat at the revenue table, and they will be able to get more budgets because they are no longer justifying it with vanity metrics. In order to have a greater impact, marketers must align to revenue and commit to measuring marketing performance in terms of revenue.

At this point, it is important to note that it is called marketing performance management, not marketing performance control. Organizations must be cognizant that external factors will influence marketing-generated revenue. Just like on the sales side, there will be periods where even the best efforts, the top performers, will miss revenue goals. Marketing performance management is about doing the best with the factors that marketing can affect. Marketers must take a step if they want to have a greater positive impact in their organization.

STEP 2: Gain Accountability to Revenue

Once teams are aligned to revenue, the entire organization can optimize for, and be accountable to, the same goals. Instead of marketers reporting on lead conversion and click-through-rate (CTR), they can now begin to report on the ultimate company goal: revenue.

Holding a team accountable for revenue means being successful in full-funnel tracking, i.e. tracking and attributing revenue to every stage of the buyer journey. This allows every marketing action, whether it is generating leads or converting leads into SQLs, to be measured in terms of pipeline and revenue.

Implementing Multi-Touch Marketing Attribution

To get started, it is necessary for teams to implement a multi-touch attribution solution. Attribution connects each marketing interaction to down-funnel revenue, making it possible to report on individual campaign and channel performance with single, unifying revenue metric.

The granular tracking provided by attribution, gives marketers a unique view into the entire customer journey. Segmenting and analyzing by channel, or even individual campaigns, shows the team which efforts are driving customers. Teams can then optimize for revenue, instead of engagement, which ultimately grows the business.

When reporting to the CEO on marketing performance, it is a much stronger statement to say marketing drove € X amount of revenue last month, than to say marketing improved CTR to X%. The same is true when it is time for budget approval.

Leading Indicators of Revenue

That is not to say that engagement metrics like lead conversion or CTR are not important, they are, but they are not the ultimate success metric of revenue, they are leading indicators of revenue.

Tracking these metrics throughout the customer journey is helpful because they provide a full-funnel view of marketing interactions. Marketers can analyze the data to uncover trends that are great indicators the prospect will convert to a customer.
Company can use this information to implement a lead scoring system. Scores can be based on a number of factors such as number of touch points or filmographies data.
For example, company may realize that prospects who use marketing automation and convert to an opportunity in less than 20 days are 3x more likely to become customers. In this scenario, a prospect with the right filmographies who converted in 15 days would be given an A grade. This grade tells the sales team which contacts/accounts are ripe for outreach because they are likely to close.

STEP 3: Develop Analytics and Forecasting Capabilities

Establish predictive capability for revenue

Leaders in business units outside of marketing have access to advanced planning tools. For example, the CFO uses Anaplan, the CRO uses Salesforce, and the CIO can use Apptio. CMOs today are stuck using simple spreadsheet tools like Excel to do forecasting and annual planning. Moreover, these tools lack analytic and forecasting capabilities for a major part of marketing performance management: annual planning.
Part of marketing performance management is measuring and improving the understanding behind key metrics like revenue. MPM establishes the forecasting needed to make tactical and strategic decisions. To develop these capabilities start by reviewing the current process for deriving estimated revenue across all channels. If the process looks similar to below, consider the alternatives.

As we have explained, forecasting using average conversion rates has many weaknesses. Establishing predictive modeling for revenue requires adopting the view that every opportunity has a multiple probabilities, i.e. each potential contract value amount has a probability attached to it based on past deal sizes, the number of touchpoints, and the quality of touchpoints. These touchpoints are the training sets used to develop predictive models that minimize estimate errors.

4.7 Case study – Marketing evaluation of the economic situation in mining firm

Mining firm that belongs to the industrial branch uses for its marketing evaluation tools of the industrial marketing. Industrial marketing is marketing of goods and services that are determined for institutions and clients from area of industry. Purchased products, as for example raw materials, components and intermediate products are becoming part of clients' product, or they are given to the equipment as replacement parts or outfit. They can be also elaborated during process of production as a fuel, stock or building material. Secondary sellers (small traders, distributors, wholesalers) sale than product, but at the same time they give it value by the way of service that is provided by them.

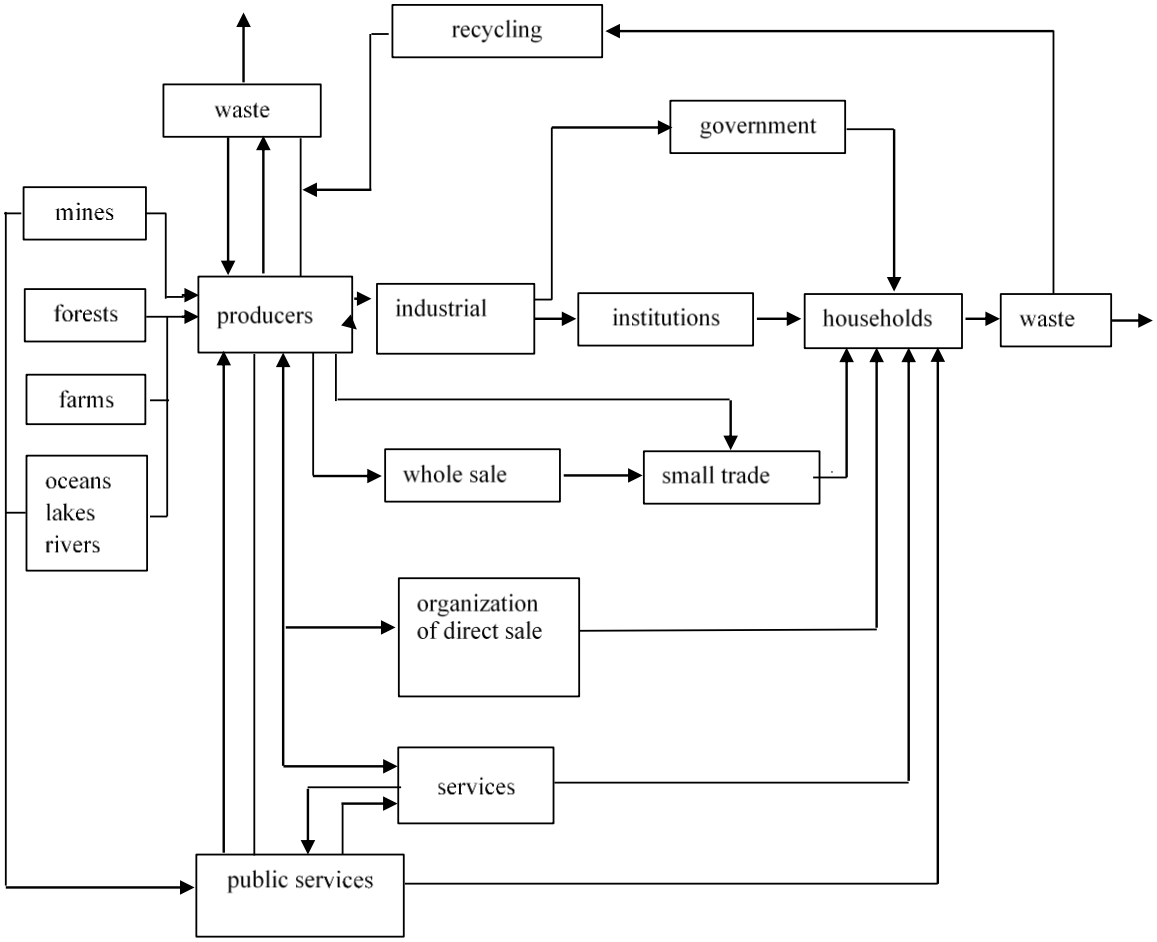

Figure 30. System of industrial marketing
Source: own processing according Webster, 1995

Industrial marketing maintain economy functional by providing of products and services that are necessary for the firms, offices, government institutions, hospitals, universities and other providers of products and services. According estimation transactions of the industrial marketing are double value that is purchased by clients at the consumer market. It is therefore natural to see long and complex chain of transactions at the industrial market that precedes production and sale of the product for final consumer. It is obvious that this chain leads from one product to other, and practically it is closed circle.

Such flows are illustrated in the model of marketing system at Figure 30. Similar flows for illustration of products movement can be find at the tables of inputs and outputs from the industrial branches, defined according S.I.C. (Standard Industrial Classification).

Problems for industrial marketing installing in the practice of Slovakian conditions

Problems and obstacles during installing of industrial marketing in the practice can be seen in various levels, either from the side of market environment, or from the side of single management of the firm, as follows:

- Single sided technical view
- Obstacles of market adaptation
- Problems of adaptation to the economic environment
- Not sufficient attention given to the clients problems
- Traditional organization structures and old style of management
- Information problems
- Not known reasons of success or not success at the market
- Unclear character of marketing
- International character of the markets
- Not sufficient marketing education.

Slovak economy is influenced by many changes that push to the considerate change of business policy of the individual organizations. Systematic and conception work

during market knowing was till present time in our organizations insufficient article, but difficult conditions can speed up process of adaptation. Limitation of most common present difficulties during installment of industrial products marketing in the Slovakian conditions is as follows:

- Speed decisions
- Not certain market prospects
- Necessity of innovations
- Often change of market partners
- Markets collapse

INDUSTRIAL MARKETING AT THE MARKET WITH RAW MATERIALS

Tools of the industrial marketing are necessary to be used also at the market with raw materials, since this market has its specifications, due to which we cannot use marketing theory at this market in its classical view.

Main reasons of this are that marketing of raw materials is specific due to the following characteristics:

- Technological and technical severity of the mining
- Long preparation of production
- Specialized product
- Price of raw materials depends greatly on the position of the consumer and transport prices
- Raw materials are possible to substitute mutually in case when we use them for example for building aims.
- Mining firms are important employer of people in regions, due to which regions are many times not effectively donated by administration and government also in case, when there is lack of adequate market that could bring for the firm the profit
- Mining firms are not popular due to the devastation of living environment,

directly or indirectly. Several consequences on the living environment (for example earth slide, chimney smoking) are reflecting only after several years.

- Mining industry existence depends from the view of legislative on the decisions of the government.
- Generally we can hardly speak about Public relations, since mining firms are not popular due to the devastation of living environment and therefore they need high cost for investment and to finance this part of marketing is not very effective.

In spite of these specifications marketing in the industry has its justification. Its task is mainly:

- Services about raw material supplement, clients' service, prompt order providing, etc.
- Decision about form of supplied raw materials, to which there is applied marketing research of the market.
- To predict volume of raw materials mining and further development of the firm by the way of marketing research of market.
- Specific and concrete demands of the firm, clients and market.

Area of mining is area with significant specifics; therefore, static access to the economical and marketing evaluation does not have sufficient view to the firm's management. We need to count with risk and time that have greatest influence to the firm's economical results, and moreover firms have to pass to the innovative management that include: permanent innovation of the products, production „tailor made", need of strategic management, flexibility, management by pull system, flexible working time and complex economical management.

In present time, great corporations think about using of controlling tools during management, which means such orientation of firm's activity that is orientated to the maintenance of the business aim – mainly to the profit achievement.

Mining firm that belongs to the industrial branch uses for its marketing evaluation tools of the industrial marketing, which has double value that is purchased by clients at the consumer market. Tools of the industrial marketing are necessary to be used

at the market with raw materials, since this market has its specifications, for example long preparation of production, technological and technical severity of the mining, specialized product, etc.

Totally we can say that economical and marketing evaluation of mining firm must count with various external and internal factors, such as cost, profit, savings, living cycle of the firm, taxes, effect of inflation increasing, risk of the business and others.

5

RELATIONSHIP BETWEEN FINANCIAL, LOGISTICS AND MARKETING PERFORMANCE

Traditionally finance and logistics are thought off as the two organization functions which have always found themselves on opposite sides of each other. On one hand the logistics wants to expand the business by giving more credit to their customers and also by holding inventory to serve the customer better while finance is seen as the controlling function which does not believe in blocking the cash through credit and inventory and in speeding up the recovery process all the time.

Financial performance of a company is dependent on its cash management and profitability. Cash management is very critical for the survival of the company, especially when company is performing well in term of sales and services but fail to generate cash effectively which often results in unfavorable situations for the company. In order to do well financially the company must have enough sales to cover up the running expenses and fixed cost and also a constant and growing return on the investment.

Logistics performance of a company is dependent on low inventories, delivery quality and delivery time etc. Logistics was long before considered as a sub function to marketing where the marketing department forecasts the sales unit in a period and the sales force set about their ways to achieve it. Logistics was primarily doing the procurement, warehousing and transporting of the goods. But the horizon of logistics has become presently a lot wider with the changing scope and emphasis on the supply chain management. Now the logistics management is seen as complete delivery of goods from one end to the other. One approach considers the logistics as a functions required to support supply chain and then identify areas offering the greatest potential to affect revenue growth, operating expense, and capital utilization. Logistics management activities include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfillment, logistics network design, inventory management, and

supply/demand planning. Logistics costs end up being approximately 9% of sales, and transportation makes up 50% of those logistics costs. Since transportation is considered the largest element of logistics cost, it stands to reason that efforts to better manage transportation activities have a high potential to deliver important top- and bottom-line financial improvements.

Many small and mid-size companies may not have the resources in-house to effectively manage the challenges associated with logistics. Focused on their core business, they relegate supply chain management solutions to a back-room function, and fail to recognize the impact of their supply chain on revenue growth, operating expenses and capital utilization.

For the small or mid-size company, the understanding that improvements in the current supply chain will help reduce costs of goods sold, days in inventory and overall hidden operational expenses is one thing. However, there are many issues these companies face that keep them from embarking on improved supply chain management and discovering its benefits on financial performance. For some companies, the manual processes that slow down productivity also do not allow for time to focus on logistics functions. For others, growth is the top priority; the cost of logistics is not identified and the potential for improvement is unknown. Smaller companies may not have the technology to track information or the personnel to deal with all aspects of logistics.

5.1 Finance and the Supply Chain Logistics

During the recent economic downturn, many companies stripped layers of cost from their supply chain operations. These cuts may not have been obvious to target or easy to accomplish. But moving forward, improving supply chain's financial performance will mean focusing on risk and relationships. And this focus could transform supply chain and organization. In the old days, businesses focused on logistics internally. Companies assumed they had to absorb and optimize every challenge thrown at them. Today, however, companies are looking at logistics processes externally through integrating suppliers and customers.

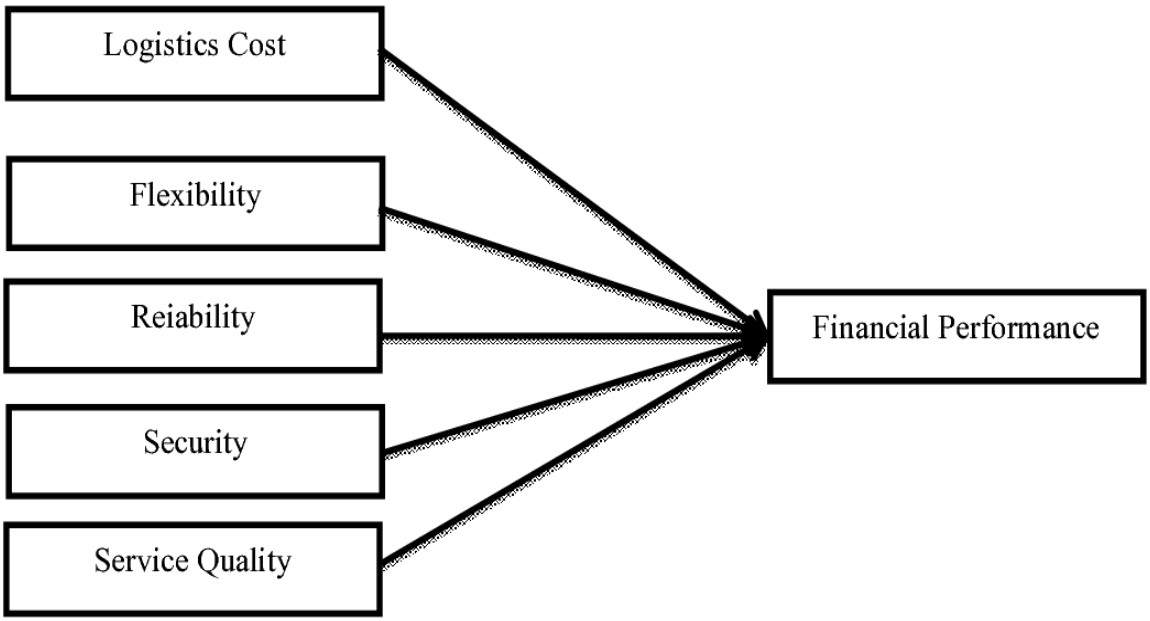

Figure 31. Logistics and financial performance relations

Source: own processing according Muslimin, 2016

That change positions of supply chain professionals as the driving force behind opportunities that can result in better financial performance for their companies.

Most businesses measure success through a high-level set of financial metrics that are reported on a quarterly or annual basis, such as operating or net income, return on investment, and earnings per share. Financial performance metrics are valuable because they capture the economic consequences of business decisions. They are the "language of business," used by internal and external stakeholders to evaluate the results of business operations. Supply chain managers make decisions and use organizational resources that eventually impact the financial outcomes of the firm. To do so effectively, they need to link the results of supply chain decisions to the financial goals and related metrics of the company. By creating a set of linkages between the work that is being performed and the financial outcomes of the firm, the organization's supply chain function can gain organizational visibility and demonstrate the impact of supply chain decisions and resource utilization on the firm's financial performance.

5.2 Logistics of Financial Statements

Using of information from financial statements for evaluation of financial performance demands using of logistics principles. The financial statements of an organization consist of the following primary statements:

- Income Statement – a report of the firm's earnings over a specific period of time, calculated as sales activities (revenues) minus product costs (cost of goods sold) and selling, general, and administrative costs
- Balance Sheet – a report of what the firm owns (assets) and owes to either debtors (liabilities) or owners (shareholders' equity)
- Statement of Cash Flows – a report detailing the sources and uses of cash from three perspectives: operational, investment, and financial
- Statement of Stockholders' Equity – a report that traces the generation and distribution of stockholders' equity through capital stock transactions, retained earnings, and other related transactions

Each of these statements reports financial information that is important to management, analytics, and investors. Financial statements affect decisions made by supply chain managers. The explanation is as follows:

Income Statement

Most managers readily understand the basic income statement components of revenues, product costs, and administrative overhead costs. The net income figure is arguably the most focused-upon performance metric in the business community. Firms may also focus on components of net income, such as gross margin (revenues minus product costs), earnings before interest and taxes (gross margin minus administrative overhead costs), or EBITDA (earnings before interest and taxes minus depreciations and amortization expense). Supply chain decisions and performance have direct impacts on income through each of the three primary components of the income statement, as shown below.

Table 19 Supply chain affects to income statement

Income Statement Component	Supply Chain Issues that Affect Financial Performance
Revenues	• Lead time • Time to market for new products • Response time to customer requests • On-time delivery • Product quality • Product returns • Stock outs • Fill rates
Product Costs	• Transportation costs • Network distance • Procurement costs • Inventory costs – raw materials, work in progress, finished goods • Storage costs • Packaging costs • Waste • Stock outs • Forecast accuracy • Number of suppliers • Product remediation costs
Sales, General, and Administrative Costs	• Warranty costs • Selling costs • Transaction accuracy (invoices, shipping documents, export documentation) • Exchange rate control

Source: McCool, 2020

Balance Sheet

Within the balance sheet, a key component of organizational success (or failure) is the control of working capital. Working capital is defined as current assets less current liabilities; think of working capital as the "lifeblood" of an organization, as it is essential to keeping the organization healthy and viable. The primary components of current assets are cash (and cash-like investments), accounts receivables, and inventories; the primary component of current liabilities for most firms is accounts payables (McCool, 2020).

Not only do supply chain decisions have a direct impact on working capital, but working capital flows and balances have a direct impact on the financial viability and performance of a firm. A firm that lacks adequate working capital will have not have the funds available to pay its employees, suppliers, or government taxes – any of which have the potential to quickly shut the firm down. The firm will then have to

borrow funds to meet working capital needs. A firm with excess working capital will have the ability to fund expansion without increasing borrowings.

One useful supply chain performance measure to evaluate working capital performance is the cash conversion cycle, calculated as Inventory Days plus Accounts Receivable Days minus Accounts Payable Days.

- *Inventory Days = 365/(cost of goods sold/average inventory balance)*
- *Accounts Receivable Days = 365/(sales/average accounts receivables balance)*
- *Accounts Payable Days = 365/(cost of goods sold/average accounts payables balance)*

Cash conversion is to balance the investments a company makes in inventory and extending credit to customers with payments that a company makes for purchases (see Table 20).

Table 20 The supply chain function influences to working capital

Working Capital Component	Supply Chain Issues that Affect Financial Performance
Inventory Days	• Holding costs – financing, warehousing, tracking, moving, insurance • Obsolescence • Theft • Forecasting accuracy • Sourcing time • Delivery time
Accounts Receivable Days	• Bad debt • Follow-up calls to receive payments • Unable to ship due to non-payment • Exchange rate changes • Correct invoicing terms • Proof of receipt
Accounts Payable Days	• Discounts not taken • Late payments; subsequent orders delayed • Correct invoicing terms • Payment penalties

In addition to working capital, the balance sheet helps the firm to measure utilization of the firm's physical assets. Plant, Property and Equipment (PP&E) productivity is measured by dividing sales revenues by the amount recorded for net

PP&E. This measure gives an indicator of how productive the physical assets of the organization are.

Statement of Cash Flows and Statement of Shareholders' Equity

The Statement of Cash Flows contains information generated through the Income Statement and Balance Sheet, but formatted so that managers and investors can see the sources and uses of cash in three primary areas of the firm: operations, investing, and financing. The information on this statement is key to analyzing the health of an organization, because a company requires positive operational cash flows to endure over time. The supply chain organization impacts this statement through actions that influence the income statement or balance sheet of the firm (Adkins, 2020).

The Statement of Shareholders' Equity summarizes the ownership portion of the firm – capital stock sales and purchases, income generation and payment of dividends, and other related items. The supply chain management function most directly impacts the net income generated for the firm.

To build an effective model between supply chain decisions and organizational performance, the supply chain organization in a firm must understand how its actions and decisions link to the financial components of the firm. Then, it should analyze the influence that its various actions and components have on outcomes that influence financial performance. This linkage model will help to ensure that the supply chain organization is making and implementing decisions that are valued by the top management of the firm.

5.3 Case study – Transportation logistics and its impact on revenue growth and profitability

Revenue growth typically is top of mind for most executives and is directly impacted by the supply chain. The importance of a reliable delivery system for getting products to market goes without saying. However, the importance of transportation's impact on revenue goes beyond just delivering the product to the customer.

A good example is the relationship between time and revenue as affected by transportation. Goods with short lifecycles, perishable goods and goods which are essential for production runs rely on transportation capacity and a reliable transportation network to maintain their value. Transportation impacts the top line in other ways as well. For example, vendors who must guarantee delivery of goods within their retail customer's tight time parameters will readily plan expedited transportation services rather than the penalty of chargebacks and dissatisfied customers. And manufacturers practicing just-in-time and lean operations are more likely to use vendors capable of offering the added value of visibility to transportation and delivery information.

Lead time, the ability to meet market demand, customer satisfaction and sales all have an impact on revenue growth. And all are affected by the shipper's ability to assure the customer that it will receive delivery of the right shipment, at the right time, at the right place and in good condition.

Transportation has a significant impact on the company's operating expenses. Companies easily can identify the transportation in their cost of goods sold (COGS) calculations. In addition, if supply chain management truly is about process excellence, and we agree the less time it takes to get products to market the more profitable the operation, then it follows that improvements in transportation management will impact profitability. Since COGS typically accounts for a significant percent of revenue, any actions that reduce the cost of goods sold as a percentage of revenue will deliver a welcomed improvement in the financial performance of the company.

Technology and real-time access to information are important drivers for an efficient and reliable transportation management system. Access to improved information allows transportation to be viewed strategically and with an enterprise-wide perspective of needs. Processes typically covered by transportation management systems include:

- Purchase order coordination
- Shipment planning
- Shipment execution

- Financial settlement
- Reporting and analysis.

Improved transportation management streamlines business processes and reduces cost of goods sold as a percentage of revenue. Companies can consolidate their transportation into larger shipment sizes for transportation savings. Carrier management programs, which give the company access to capacity from multiple carriers and allow them to choose the best mode and carrier for the most efficient routing, free up resources and improve operational costs.

The technology associated with transportation management systems provides multiple financial benefits. By automating manual processes, businesses improve productivity. Access to information increases the accuracy of forecasting and planning. Better scheduling of staff also is possible. Improving visibility of purchase order information, shipment in transit and delivery times allows for more efficient scheduling and reduces the cost of labor at the distribution center. Audit and pay capabilities reduce manual processes in accounts payable departments, enable automated ledger coding and provide easier identification and resolution of billing discrepancies. And reporting features provide easy access to data to help companies with their forecasting and planning processes.

Transportation also has an impact on capital utilization, the amount of revenue generated from each dollar invested in capital. Within supply chains, capital investments typically include such things as inventories, warehouses, fleets, manufacturing plants and equipment, as well as accounts receivables.

It is not essential that a company invest in fleet equipment to feel the impact of transportation on capital utilization. As noted earlier, supply chains are interrelated processes, with transportation woven throughout, and therefore a critical influence on the supply chain's overall efficiency. As operational expectations become more precise, order-to-delivery performance cycles more compact and margins for error reduced near zero, successful firms have come to realize that there is no such thing as cheap transportation. Unless transportation is managed in an effective and efficient manner, procurement, manufacturing and customer accommodation performance will not meet expectations. Inventory, manufacturing, warehousing,

distribution and accounts receivable metrics, the areas typically associated with capital investment, all are dependent on effective transportation management.

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