

Mendel University of Agriculture and Forestry in Brno

**Faculty of Business and Economics
Department of Regional and Business Economics**



**The analysis of technical-economical and
financial system of the company Greiner
Packaging Slušovice, s.r.o.**

Bc. Jana Drahošová

In Brno, 30.11 2009

Declaration

I declare that I have worked out this diploma thesis on the topic “The analysis of technical-economical and financial system of the company Greiner Packaging Slušovice, s.r.o.” independently with help of the resources published in the list of resources.

In Brno, 30.11.2009

.....

Expression of thanks

The biggest expression of thanks belongs to Prof. Dr. Ing. Libor Grega, the supervisor of my diploma thesis who has provided me with personal consultations and methodological guidance. I appreciate his expert advices and new ideas that contributed to better level of this work. Secondly, I would like to give many thanks to Ing. Stanislav Šmíd and Ing. Ivo Benda, the executive of the company Greiner Packaging Slušovice, s.r.o. who provided me with financial statements and other necessary information about the firm.

In Brno, 30.11 2009

Abstract

Drahošová, Jana: *The analysis of technical-economical and financial system of the company Greiner Packaging Slušovice, s.r.o.*. Diploma thesis, Brno 2009.

The main goal of this thesis is to analyze the technical-economical and financial subsystem of the company Greiner Packaging Slušovice, s.r.o. for the nine year period (1999-2007). After summarization of theoretical knowledge supported by citations from relevant text books and on-line resources, after explanation of all used methods, formulas and indicators and after setting certain simplifications and assumptions, the real analysis can follow. It is divided into two parts: Analysis of technical-economical subsystem (that focuses on productivity of inputs and intensity of production) and analysis of financial subsystem (that goes through the three basic financial statements and analyses their content.) Within this part we will monitor structure of company's assets and equities and efficiency of utilization of capital. We will calculate indicators evaluating Indebtedness, Liquidity and Profitability of the firm and in special part we will perform pyramidal decomposition of profit that will reveal how big impact the technical-economical and financial factors have on changes of the profit. The last topic will be aimed at cash flow and related indicators. All calculated results will be interpreted and summarized to provide general view of the company's performance. In case of any extreme findings we will try to explain what can be the potential reasons and suggest possible solutions to these situations.

Key words: technical-economical analysis, financial analysis, accounting statements

Abstrakt

Drahošová, Jana: *Analýza technicko-ekonomického a finančního systému podniku Greiner Packaging Slušovice, s.r.o.*. Diplomová práce, Brno 2009.

Hlavním cílem této práce je analyzovat technicko-ekonomický a finanční subsystém firmy Greiner Packaging Slušovice, s.r.o. za devítileté období (1999-2007). Po shrnutí teoretických znalostí podpořených citacemi z relevantních odborných knih a internetových zdrojů, po objasnění všech použitých metod, vzorců a ukazatelů a po stanovení určitých zjednodušení a předpokladů, může následovat skutečná analýza. Ta je rozdělena na dvě části: na analýzu technicko-ekonomického subsystému (která se zaměřuje na produktivitu vstupů a intenzitu výroby) a na analýzu finančního subsystému (jenž zkoumá tři základní účetní výkazy a analyzuje jejich obsah). V této části budeme sledovat strukturu aktiv a pasiv podniku a efektivnost využití kapitálu. Budeme počítat ukazatele hodnotící zadluženost, likviditu a rentabilitu firmy a ve speciální části provedeme pyramidální rozklad zisku, který objasní jak velký vliv mají na změny zisku technicko-ekonomické a finanční faktory. Poslední téma se zaměřuje na cash flow a odpovídající ukazatele. Veškeré vypočtené výsledky budou interpretovány a shrnuty tak, aby poskytly všeobecný pohled na výkon firmy. V případě jakýchkoliv extrémních nálezů se pokusíme vysvětlit potenciální příčiny a navrhnout možná řešení těchto situací.

Klíčová slova: technicko-ekonomická analýza, finanční analýza, účetní výkazy

Table of contents

1.	Introduction	7
2.	Literature search	8
2.1.	Concept definition	8
2.2.	Analysis of technical-economical subsystem	13
2.2.1.	Production	14
2.2.2.	Classification of inputs and other factors influencing output	16
2.2.3.	Productivity and intensity	18
2.2.4.	Combinations of factors of output	22
2.3.	Analysis of a financial subsystem	25
2.3.1.	Elements and relationships of financial base and assets	27
2.3.2.	Elements and relationships of economic result	38
2.3.3.	Elements and relationships of cash flow	48
3.	Goal and methodology	52
3.1.	Goal of the work	52
3.2.	Methodological process of solution	53
4.	Results and discussion	54
4.1.	Company characteristics	54
4.2.	Basic calculation rules and assumptions	56
4.3.	Applied analysis of technical-economical subsystem	60
4.3.1.	Production and industrial classification	60
4.3.2.	Measurement of productivity and intensity	62
4.4.	Applied analysis of financial subsystem	68
4.4.1.	Analysis of Balance Sheet	68
4.4.2.	Analysis of Profit and Loss Statement	75
4.4.3.	Analysis of Cash Flow Statement	82
5.	Summarization	84
6.	Recommendation and conclusion	86
7.	List of graphs, tables and pictures	89
8.	References	90
9.	List of attachments	92

1. Introduction

This diploma thesis focuses on analysis of technical-economical and financial performance of selected company. The system of the firm and its functioning can be expressed by many different financial as well as non-financial characteristics. The most exact view of the operations of the firm can be provided by basic accounting statements (Balance Sheet, Profit and Loss Statement and Cash Flow Statement). The accounting view of the firm means description of all transactions expressed in monetary units that happened in the firm during certain period. All data are interconnected and create unified system of the firm.

The most important part for all producing companies is the ability to combine suitable amounts and types of inputs and boost their productivity to produce large amounts of products for reasonable costs. Another inseparable part is to ensure sales for relevant prices.

To ensure this production and trade ability it is necessary to create and sustain good relation between property and used capital. The attempt to reach optimal structure of capital demands high intensity of asset utilization, control of level of indebtedness, liquidity and such way of financing that leads to as low average costs of capital as possible.

Increasing profitability is one of the crucial goals of every company. Whether this goal is met or not it is always good to evaluate firm's performance using methods, such as absolute or ratio indicators, trend and structure analysis and decomposition of certain indicators.

The results of analysis of the financial statements basically serve for financial planning and for decision making of managers who have to implement suitable measures in case of any bad result tendencies.

2. Literature search

2.1 Concept definition

Enterprise / Firm / Company

According to Grega and coll. (1999) the company is a basic unit where the production is realized or where the services are provided. In the Commercial Code, the enterprise is defined as a set of tangible, personal and intangible elements of business. It consists of assets, rights and other property values that belong to the entrepreneur and are used for running the company (www.business.center.cz, 2009).

The same internet resource states, that basic division of legal forms of organizations is: business companies, co-operatives and trades. In general provisions of the Commercial code, we can find out that a company is a legal entity founded with the aim of running business. The legal forms of business companies in the Czech Republic are: General Partnership (v.o.s), Limited Partnership (k.s.), Limited Liability company (s.r.o.), Joint Stock company (a.s.) and Co-operative (družstvo). Any Natural Person or Legal Entity can become founder of the company and participate on running of the business. Natural and Legal Entity can be liable with his/her entire property only in one business company. Liabilities of the partners are different for each legal form.

On the other hand, trades are defined in Trade Law as a systematic activity, performed independently by an entrepreneur under his own name and at his own responsibility with the aim to make a profit. Any Natural person or Legal Entity who fulfills general conditions to run business (majority, integrity, eligibility, no indebtedness) can become trader. In certain cases defined by the Trade Law man has to obtain a license to run some specific kind business. Any foreigner (Natural person or Legal Entity who has a seat outside of the Czech Republic) can run a business in the Czech Republic under the same conditions as Czech person.

(www.business.center.cz, 2009).

System

As the on-line encyclopedia en.wikipedia.org writes, this term comes from Latin *systema*, it means a set of interacting or interdependent entities, real or abstract,

forming an integrated whole. Most systems share the same common characteristics. These common characteristics include the following:

- Systems are **abstractions** of reality, or part of reality (real-world systems)
- Systems have **structure** which is defined by its parts and their composition.
- Systems have **behavior**, which involves inputs, processing and outputs of material, information or energy.
- Systems have **inter-connectivity**, the various parts of a system have functional as well as structural relationships between each other.

Firm as a system

Simply, we can say that system is a set of elements and set of relationships among them and the external environment of the system that enables to fulfill its functions and goals (Grega and coll., 1999).

The firm as an economic system has two characteristics. First, it is an **open system** – it is interconnected with external environment, mainly represented by suppliers of inputs and customers demanding firm's products and services. Second, it means that the firm is developing in time therefore we can say that the system is **dynamic**.

According to Mlčoch (1996) the external environment is not represented only by suppliers and customers. There are many other important external relationships. Among the most important belong:

- Relationships with competitors - here it is important to analyze their behavior and react accordingly.
- Relationships with banks - it intermediates necessary payment services, cares about our bank account, can provide a credit or other financial services.
- Relationships with organs of State Administration - here it is about regular payments to the Tax office, Social Security Office, Health Insurance Company, etc.

The internal relationships of the firm are also very important. Beside the internal operating relationships among factors of production connected with production process Mlčoch (1996) names also relationships between:

- Firm and employees - this involves not only wages, but whole area of personal management (motivation, improvement of qualification, recruitment, etc.)

- Firm and owners (shareholders) - while in sole proprietorships, the manager and owner is one person, in other types of companies (for example in joint stock company) there is a big gap between management and ownership. Usually the interests of managers and owners are controversial therefore it is necessary to coordinate them.

As a result of the suitable composition of the elements and relationships, the firm can fulfill its functions (production, organization, managerial, social, financial and environmental functions) and goals (maximization of profit, sales, strengthening position on the market and others).

Because firm is a relatively complicated system, for better understanding Prof. Grega and coll. (1999) introduced following schema where the integrated system is decomposed into smaller parts (subsystems).

Picture 1: Economical system of a company

		technical-technological subsystem		managerial subsystem and information subsystem
economical subsystem	technical-economical subsystem			
	financial subsystem	elements and relationships of financial base		
		elements and relationships of financial result		
		elements and relationships of financial flows		
organizational subsystem				

Resource: Grega,L.and coll. (1999)

- Subsystem technical-technological includes volume and combinations of factors and energetic linkage in frame of their lay-out.
- Subsystem organizational solves cooperation and division of labor.
- Managerial subsystem defines its elements as managing and managed units and their mutual relationships. Its important part is formed by Information subsystem.
- Subsystem economic has two parts: subsystem technical-economical and subsystem financial (Grega and coll. 1999).

Technical-economical subsystem

This subsystem is characterized by relationships between inputs and outputs. It takes into consideration not only volume of employed factors of production but also their productivity that states how much output can be produced by one employed unit of input. In inverse point of view, we can talk also about intensity of production telling us how much input do we need to produce one unit of output. There is also trade-off between different factors of production, for example labor can be replaced by capital and vice versa. Generally, the production is influenced by volume, productivity and different combinations of factor of production. How to analyze this technical-economical subsystem we will discuss in the next part of the diploma thesis.

Financial subsystem

It focuses on elements and relationships of a financial base, elements and relationships of financial result and elements and relationships of financial flows. Simply, it analyses three basic financial statements:

- Balance Sheet including financial resources (equity), their allocation into property (assets)
- Profit and Loss Statement (Income Statement) describing revenues, costs and related economic result
- Cash Flow Statement monitoring all cash inflows and outflows from the company

Analysis

Analysis is the process of breaking a complex topic or substance into smaller parts to gain a better understanding of it. The technique has been applied in the study of mathematics and logic since before Aristotle, though analysis as a formal concept is a relatively recent development. The word is a transcription of the ancient Greek *analusis*, "a breaking up" (www.en.wikipedia.org, 2009)

Nominal versus real variables

On the web page www.economics.about.com (2009) they say that a real variable, (such as the real interest rate, real output or real wage), is that one where the effects

of inflation (growth in prices) have been factored in. On the other hand, a nominal variable is one where the effects of inflation have not been accounted for. If inflation is positive, which it generally is, then the real variable is lower than the nominal variable. If we have deflation and the inflation rate is negative, then the real variables will be larger.

Important is to differentiate between **inflation**, that is expressed in percentage (2,5 %), **inflation rate** that is written as decimal number (0,025) and **price index** that is also decimal number but expresses the growth of prices as ratio between prices in actual and base year (1,025). The price (wage or interest rate) index can serve also as a price (wage or interest rate) deflator.

Nominal variables are usually expressed in actual market prices. However, real variables have to be recalculated (to eliminate inflation) and are expressed in comparable prices. Almost all real variables can be recalculated into the comparable values by the following manner:

Index = nominal variable in actual year / nominal variable in base year

Real Variable = Nominal variable / Index

Short run versus long run in economic and financial terms

Talking about short and long run we have to distinguish between economic and financial terms:

Economic terms

The 2nd edition of Parkin and Bade's "Economics" gives an excellent distinction between the two: "The **short run** is a period of time in which the quantity of at least one input is fixed and the quantities of the other inputs can be varied. The **long run** is a period of time in which the quantities of all inputs can be varied."

(www.economics.about.com, 2009)

- **Short Run** – In short run some inputs are variable, others are fixed. New firms do not enter the industry, and existing firms do not exit. Short run is time period in which a firm can change the amount of some factors of production but at least the

amount of one factor of production is fixed. In our simplification (having only two explaining factors) we assume capital to be fixed while labor to be a variable factor (Ševela, 2005).

- **Long Run:** In long run all inputs variable, firms can enter and exit the market place. We will meet these terms when talking about factors of production and related costs. Generally in short run labor is considered as variable and capital as a fixed factor of production. In the long-run both factors can be changed. The long run represents a period within which none of factors of production is fixed. Firms can change their plant size or leave their industry and enter some other (Ševela, 2005).

Financial terms

- **Short Run** – in financial terms, it is derived from short-term securities and other short-term financial assets. It means period that is shorter than one year.
- **Long Run** – is specified with regard to the previous definition. It can be defined as a period longer than one year. However, sometimes we can differentiate also middle-term that refers to the period between one and five years. In this case the time limit for long term is shifted to the 5 years.

2.2. Analysis of technical-economical subsystem

This analysis can be also called “Technical-economical Analysis”. It focuses on relationships between inputs and outputs in the production. This kind of analysis helps us to discover what are the key elements influencing the level of output. Does it depend only on the amount of inputs employed, their type or their combination? How can we be sure that two different employees will produce the same volume output? Would training improve performance of our workers? What would be optimal selling price of the output?

All these questions and much more can be answered by focusing on the company’s technical-economical subsystem. Information about productivity and prices of

individual inputs and intensity of production of different types of products helps the manager to reach maximally efficient production and set correct selling prices of final products.

2.2.1. Production

According to Mlčoch (1996) production is a process of combining various immaterial and material inputs of production so as to produce tools for consumption.

Production can be classified according to way of production process:

- Mass production (production of big volumes),
- Serial production (individual series to satisfy particular demand),
- Single-piece production (time and technologically or other-way complicated production, usually products created according to the customers needs).

According to material inputs we can differentiate between:

- Mechanical (based on physical factors),
- Chemical and biological,
- Mixed production (Most of production processes are mixed. For example in production of plastic products using of chemical processes is followed by mechanical processing (like pressing).

Another classification can be:

- Discontinuous (sequence of processes can be interrupted) and
- Continuous (fluent, non-interrupted production).

According to intensity of production we differentiate:

- Capital (consumption of labor is higher in proportion to consumption of labor) or
- Labor intensive (opposite case).

According to aim of use of resulting product we have:

- Semi-products or
- Products for final consumption

Production versus Output

Sometimes the terms **production** and **output** seems to be equivalents. However, the real meaning is absolutely different.

According to Grega and coll. (1999) the **production** is a transformation of factors of production into outputs (products, services) demanded by consumers. We have two approaches:

- **broad approach** - in this case, the production involves all activities which take place in the firm (acquisition of tangible and intangible assets, recruitment, ensuring of financial means, production and providing of services, transportation, storage, sale,...)
- **narrow approach** – in this sense, production means only creation of products or providing services, purchase of inputs, transportation, storage and management of these activities

Unfortunately, to make it more complicated, the English word **output** can be assigned another two meanings. One of them (in Czech language: “výstup”) represents the result of the production process and its volume is denoted by capital letter Q. Output in this sense means exactly the physical amount of goods or services. The second word **output** (in Czech language: “výkon”) is a sum of produced products and provided services in a given period evaluated by selling price, denoted by capital letter I. For its calculation we can use following formula:

Output: $I = Q * P$

Where: **Q** - means physical volume of production (quantity),

P - represents the price of the output

The volume of production Q can be expressed by physical units (pcs, kg, t, l) in case that it is homogenous. For heterogenous production it is necessary to use expression in monetary aggregates (CZK, Euro, USD or other currency).

If the product is aimed to be sold on the market, we express the price P in market prices. So everyone can easily compare the price to prices of competitors and make purchase decision. For non-market delivery of final output or for semi-products (for

example: change in inventory, unfinished production) we use internal prices. They originate from costs of production or they are derived from market prices.

Because one of the variables in the formula for output I calculation is price, we must not forget to take into account inflation that can have crucial influence on the result.

Therefore Grega and coll. (1999) distinguishes between two types of outputs:

- **Output in market prices (nominal output)** where the change of output in time results from changing volume of production (Q) and also from price changes (P).
- **Output in comparable prices (real output)** that is evaluated in comparable prices (prices stable in time), so we can quantify only change in volume of production (Q). This form is more suitable for comparisons of development of the Output in time.

2.2.2. Classification of inputs and other factors influencing output

In the text book of Mr. Ševela (2005) it is written that all inputs into production are commonly denoted as factors of production. All production factors are economic resources while they are useful and limited in amount that means that they are scarce. Factors of production are always in someone's property. If we want to use them in our production we must pay the owner of factors of production to be allowed to use them. The payment is in general called income. The production factors that the firm disposes of can be defined as following concrete inputs:

Labor (L)

Labor is represented by all persons who are able and willing to work. The extent of labor can be measured in units such as: number of employees, number of working hours (days, shifts) or by volume of paid wages (in this case we assume that all units of labor have the same wage rate).

According to Ševela (2005) labor means all effort of human beings in physical and mental forms. Labor cannot be separated from the human being - man should be motivated to offer his best effort. The payment for labor use – the wage or salary – depends not only on the physical and mental abilities like skills, qualification, experience, etc. Also technical tools, machinery, special instruments, that are workers provided with, increase the labor outcome and so the possible wage.

Capital (K)

Mr. Ševela (2005) defines capital as all resources produced to make further production easier. Capital is useful indirectly because it does not satisfy human wants but help to produce goods that satisfy human wants. Capital is only relatively limited because we can produce more of it when it is needed. Capital should be understood very widely. It is not only financial asset, but tools, machinery and other equipment, buildings, inventories and semi-products. Therefore we have to distinguish between **financial** capital and **real** capital (represented mainly by consumed fixed assets and material).

We usually measure only productivity of real capital. This variable can be obtained either from Balance Sheet as volume of investment (long-term tangible and intangible assets) and inventories or by other indicators measuring consumption of real capital including material and energy consumption, depreciation, etc. We pay interest for using capital of all forms.

Land and natural resources (La, A)

The natural resources are represented by land and its natural conditions, climatic conditions, animals, plants and their production abilities. The volume can be determined either by size of the area (ha, km squared), number of animals (pieces) or kind of average variable.

According to Ševela (2005) land is direct natural resource that is used in every production. Every production needs some space to run. This space is world-wide very limited. It is obvious that the land is a scarce resource. While it takes part in all productions, their outcome has to be also scarce. The payment for using land is labeled as rental income or rent. The height of rent is influenced by fertility and location of the land. If land is used for agricultural purpose the fertility is the decisive attribute. The aspect of location prevails in non-agrarian use of the land plot.

Due to the measurability of all above mentioned variables (L, K, La and A), we can call them **quantitative** factors influencing production.

Grega and coll. (1999) says that the decision making of management about what kind, what combination and how much of inputs will be used for planned volume of output is partially influenced by **time horizon**.

- **In Short Run** only some inputs can be changed (usually only consumption of material and labor). These are called **variable inputs**. On the other hand during the short time period it is very difficult and sometimes impossible to change inputs like land, buildings, technical equipment due to financial conditions, legal contracts, time of build up etc. We denote them as **fixed inputs**.
- The **Long Run** is characteristic by ability of all inputs to be changed. No matter if we want to deal with labor, land or capital, always there is enough time to proceed with all activities connected with the change. Therefore in Long Run all inputs are **variable**.

2.2.3. Productivity and intensity

Grega and coll. (1999) also states that volume, structure and quality of output vary not only by the volume and combination of factors of production but also by their productivity (or in other words efficiency of their utilization). Therefore it is necessary to introduce another – **qualitative** factor influencing the production. We call it **productivity (efficiency) of inputs**.

On www.en.wikipedia.org (2009) it is published that while productivity is the amount of output produced relative to the amount of resources (time and money) that go into the production, efficiency is the value of output relative to the cost of inputs used. Productivity improves when the quantity of output increases relative to the quantity of input. The efficiency improves when the cost of inputs used is reduced relative the value of output.

As mentioned above, productivity is very closely related to efficiency. Efficiency means that production is realized with such combination of inputs that will lead to the satiation of human wants in the greatest extent. Efficiency means situation that can not be improved. According to Ševela (2005) applying this attitude, production mix is efficient if we cannot increase any single production without lowering some other. Reaching effective production mix requires full employment of all resources and their optimal allocation to the individual productions. In this situation we can only redistribute the resources decreasing one production with intention of increasing another. Above explained concept of efficiency was introduced by Italian economist Vilfredo Pareto.

Single-Factor Productivity

Single-factor productivity is defined on www.en.wikipedia.org (2009) and refers to the measurement of productivity that is a ratio of output from a production process and unit of one input factor. In other words, it expresses how big volume of output can be produced by consumption of one unit of input and therefore how efficient the factors of production are.

Productivity of Labor
$$e_L = \frac{I}{L}$$

Where:

I – revenues form production or value added in comparable prices (CZK)

L - wage costs in comparable prices (CZK) or number of employees

On the same web page we can read that most well-known measure of single-factor productivity is the measure of output per labor input, describing labor productivity. Labor productivity is the ratio of output (I) to the input of labor (L). Labor productivity should be interpreted very carefully if used as a measure of efficiency. In particular, it reflects more than just the efficiency or productivity of workers. Labor productivity is the ratio of output to labor input; and output is influenced by many factors that are outside of workers' influence, including the nature and amount of capital equipment that is available, the introduction of new technologies, and management practices.

Productivity of Real Capital
$$e_K = \frac{I}{K}$$

Where:

I - revenues form production in comparable prices (CZK)

K - capital employed (consumption of material, energy and services + depreciation of fixed assets) in comparable prices (CZK)

According to Grega and coll. (1999) productivity of real capital is expressed as a ratio of volume of output and extent of real capital (K). The result will be output in comparable prices that is related to 1 CZK of comparably assessed material costs.

Multi-factor productivity

Multi-factor productivity described on www.en.wikipedia.org (2009) is the ratio of the real value of output to the real value of input. Sometimes this measure is referred to as total factor productivity. In principle, multifactor productivity is a better indicator of efficiency. It measures how efficiently and effectively all inputs (represented by overall costs) are used to produce output (that corresponds to overall revenues of the firm for given period).

Labor productivity and multifactor productivity, both increase over the long term. Usually, the growth in labor productivity exceeds the growth in multifactor productivity, reflecting the influence of relatively rapid growth of capital on labor productivity. Clear example of multi-factor productivity is overall productivity that summarizes influence of all inputs on final output.

Overall productivity
$$e_N = \frac{I}{N}$$

Where:

I - total revenues in comparable prices (CZK)

N – total costs in comparable prices (CZK)

Factors influencing productivity

According to Grega and coll. (1999) productivity of input is determined by the scope of other inputs. For each company it is important to reach growth of the productivity of labor. It depends on:

- Technical equipment the employees are provided with
- Technology level (the methods of combining the inputs of production in the process of making output)
- Qualification of employees
- Organizational and production management standards
- Weather conditions (mainly in agrarian sector)

Ševela (2005) adds that there are also few activities that help the human beings to obtain more products and wants satiation under limited resources. To the basic activities of this type we count:

- Specialization - occurs when some factors of production are adapted to the particular activity or operation. Specialized factors are then more productive in appropriate activity than factors with general use. We can get larger quantities of final products through specialization. Special type of specialization came about at labor. The division of labor is the oldest form of specialization and enables the economy to profit from differences in abilities of human beings, their learning by doing and saving time by absence of idle time arising from switching the activities, places instrument etc.
- Trade - most of people lost self-sufficiency through the specialization of labor. They had abundant amount of products they created and lack of other necessary products. Therefore they started to exchange his products with some others. Ševela (2005) also states that these voluntary exchanges for products enabled workers to concentrate all their effort on the selected activity and significantly increased the efficiency of production.
- Investment in capital - is another activity that enlarges the production possibilities of economy. Investment is the process of giving up current consumption in belief of increasing future gains. Use of capital goods lead to indirect production that is usually more productive. Accumulation of capital goods increases the future production and supports economic growth.

On the www.en.wikipedia.org (2009) it is published that in the broadest sense the productivity growth stems from a complex interaction of factors. As just outlined, some of the most important immediate factors include technological change, organizational change, industry restructuring and resource reallocation, as well as economies of scale and scope. Over time, other factors such as research and development and innovative effort, the development of human capital through education, and incentives from stronger competition promote the search for productivity improvements and the ability to achieve them. Ultimately, many policy, institutional and cultural factors determine a nation's success in improving productivity.

Production Intensity

Production intensity is a reciprocal to productivity. It determines how much factors of production must be consumed to produce 1 unit of output. We use similar variables like in the productivity formulas: output (I), labor (L), capital (K) and variable for summation of all input costs denoted (N). All values have to be expressed in comparable form.

$$\text{Labor intensity} \quad \frac{1}{e_L} = \frac{L}{I}$$

This indicator expresses how much labor (in our case how high wages) has to be paid in order to produce one unit of output (output or value added in value of 1 CZK). Another alternative is how many employees are needed to produce 1 CZK of output.

$$\text{Real capital intensity} \quad \frac{1}{e_K} = \frac{K}{I}$$

Prof. Grega and coll. (1999) interprets this formula as the amount of real capital that is tied in production of one unit of output. How much material and energy has to be consumed and how big part of the fixed asset value must be used to produce 1 CZK of output.

$$\text{Overall intensity} \quad \frac{1}{e_N} = \frac{N}{I}$$

Belongs to the group of multi-factor indicators and determine necessary overall consumption of inputs (overall costs) that are involved in production of 1 CZK of output (overall revenues). All variables have to be in comparable prices.

2.2.4. Combinations of factors of output

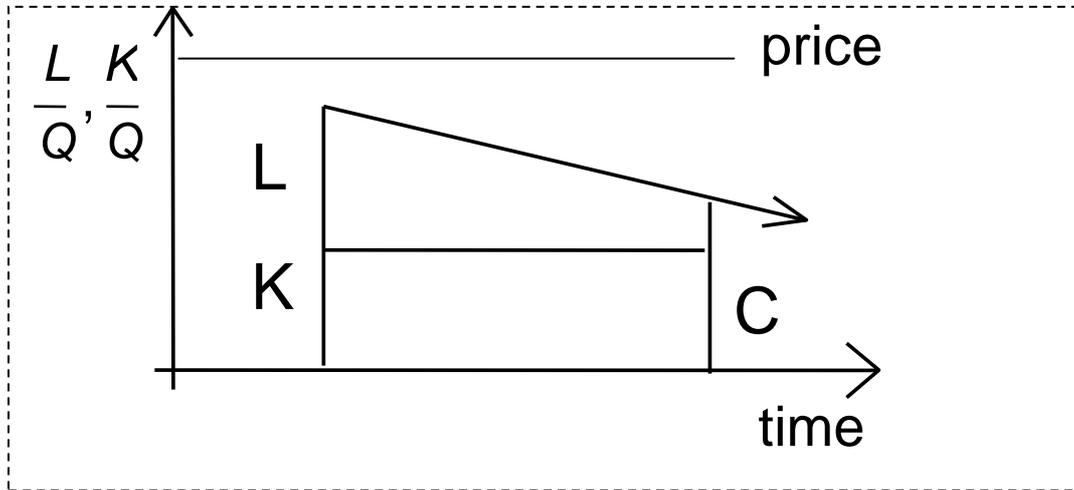
If we consider that development of a firm is connected with growth of volume and quantity of its outputs, we have to focus on increasing of productivity of labor. There can be 3 situations (with assumption of stable prices of inputs and output):

- **Capital neutral growth**

In this situation, volume of capital needed is constant, productivity of capital and capital intensity is constant as well. Volume of labor decreases and therefore the productivity of labor increases and labor intensity decreases. To sum it up, the

volume of all inputs decreases so the overall productivity grows and overall intensity drops. This situation results in higher profit and profitability of production.

Picture 2: Capital neutral growth

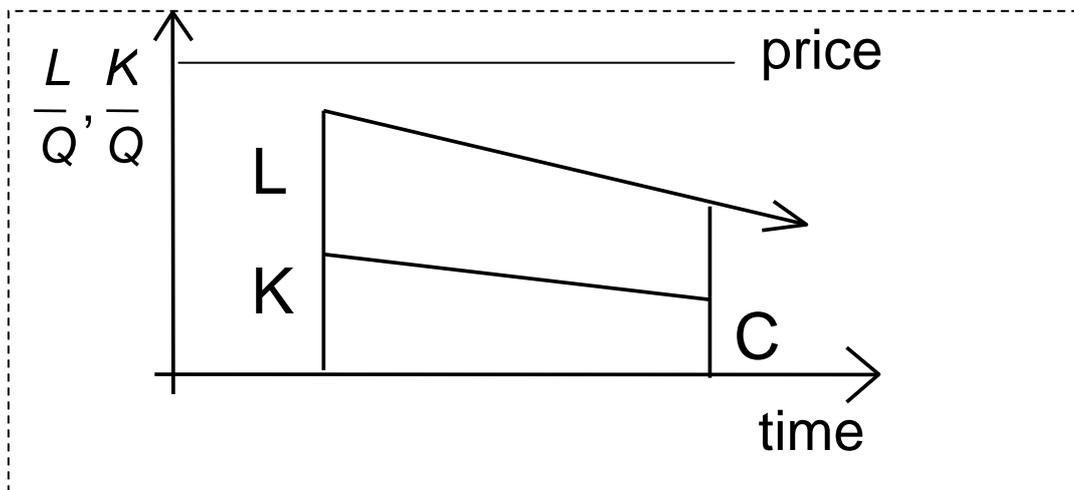


Resource: Grega, L. a kol (1999)

- **Capital saving growth**

Here the volume of capital needed decreases so the productivity of capital increases and capital intensity declines. At the same time the volume of labor decreases, its productivity increases and intensity decreases. When considering volume of all inputs, it is decreasing thus overall productivity increases and overall intensity drops. Result of this situation is again higher profit of the company.

Picture 3: Capital saving growth



Resource: Grega, L. a kol (1999)

- **Capital intensive growth**

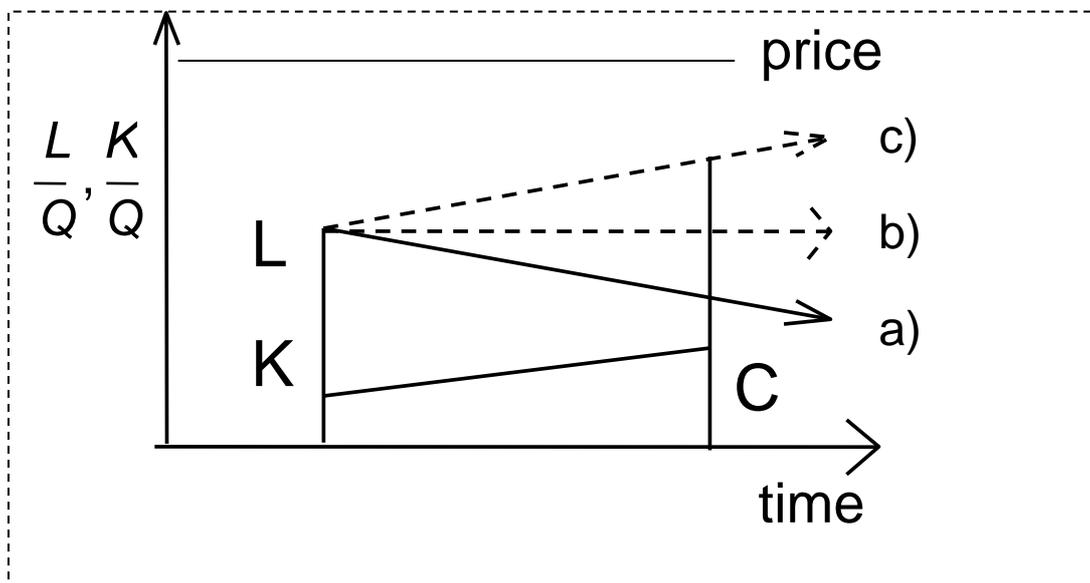
In case of capital intensive growth, the volume of capital needed increases, its productivity decreases and intensity increases. The productivity of labor and overall productivity can be different. We can define three situations:

a) This alternative can be considered as the best situation. By increasing volume of capital in the firm, labor becomes much more productive so the overall productivity increases as well and the overall intensity drops. This situation generates higher profit of the firm.

b) In this situation we can see the edge of efficiency. Saving of labor is just high enough to cover increased volume of capital. Overall productivity and intensity remains constant. Therefore also profit does not change

c) The alternative c) is absolutely not desirable. Even if the firm uses more capital, labor productivity drops and more workers are needed. The overall productivity decreases and at the same time overall intensity increases. Naturally, profit and profitability are on decline.

Picture 4: Capital intensive growth



Resource: Grega, L. a kol (1999)

Production in short and long-run

According to Ševela (2005) in the short-run the firm produces using a fixed quantity of capital and variable quantity of labor. The extent of its production can be managed

only by changes in labor *ceteris paribus*. Its output varieties are then explained by labor as an explanatory variable.

Ševela (2005) also says that variability of all factors of production is characteristic for production in the long-run. The firm can decide about the amount of both used factor – labor and capital – in our simplified model of production. The task of the firm is to choose an optimal bundle of inputs to meet the firm's goal of effective production.

The firm is limited by technological constraints and mainly by its financial situation and money available. Therefore it is very important not to think only about volume and amount and quality of inputs used for production, but also about their price and other costs taking part in production process and selling price of final products to generate sufficient revenues.

It is clear that we have to focus also on financial part of the company's system. Simply, the financial health of the firm depends on its potential to generate profit and increase the market value of the firm and on its ability to pay its obligations to the creditors, suppliers, employees and owners. However, having a lot of property and profit has no meaning in case that the firm has no available cash for necessary payments.

According to Valach (1997) we use financial analysis to evaluate time development of important financial indicators (profit, profitability, liquidity, indebtedness, use of property), to compare its development with other companies or with own planned aims of the firm and to show the reasons of divergences. This analysis enables us to evaluate overall financial situation of the company, its financial health and serves for creation of financial plans. Let us discuss this topic in detail in the following chapter.

2.3. Analysis of a financial subsystem

Analysis of the financial subsystem, in other words financial analysis is well known concept, defined as systematical analysis of data gained mainly from financial statements. It includes evaluation of company's past times, current situation and prediction of future financial conditions. It is a very famous tool for assessing of real overall economic situation of the company (Růčková, 2007).

Kovanic (1997) says that financial analysis can reveal true information about:

- Property of a company – it provides answers for questions such as: which concrete kinds of assets the company disposes of and how they are valued, how much they are amortized, how fast are they turning over and if the portfolio of assets is suitable for firm's activities.
- Resources from which the property was financed – it means information about level of own and external resources and their detailed structure, about long and short-term credits, if the company is not too much indebted and creates reserves for potential future risks and losses, if the firm is not heading bankruptcy etc.
- Financial situation of the firm – it tells us how big profit the firm reached in given year and how it was distributed or how big loss the company had and how it was covered, if the firm is able to pay its liabilities in time and how the financial policy is managed, what is the solvency of the firm, what is the profitability of invested resource, etc.

Technical financial analysis is very often performed according to standard methodology, usually based on type of indices used and it is focused on different aspects like indebtedness, profitability, activity, liquidity, financial distress and others.

Usually, the financial analysis is divided into parts like:

- Horizontal analysis (trend analysis) - that finds out percentage changes of individual items of financial statements in relation to the previous accounting period. From the changes we can also determine the potential development of relevant indicators in the future (Živělová, 2003).
- Vertical analysis (structural analysis) - expresses percentage portion of certain item of financial statement in given base. It is used for expressing of structure of assets and equities and for analysis of Profit and Loss Statement and their trends (Živělová, 2003).
- Ratio analysis – these financial ratios are calculated to evaluate aspects of a company's operations. There are following categories:
 - **Debt ratios** – important indices measuring level of indebtedness of the firm and its ability to pay the liabilities on time.

- **Liquidity ratios** – informs the company about its ability to meet its current liabilities.
- **Activity (turnover) ratios** – measure the efficiency of use of company's assets
- **Profitability ratios** – provide information about how big profit can be earned from the resources committed to the business.
- **Return-on-investment ratios** – describe returns generated from firm's investments.
- Decomposition of pyramidal system of indices (Du Pont Analysis) - Usually the top indices (ROA and ROE) are decomposed. It synthetically shows examined processes and explains reasons of these processes. It enables us to express mutual connections of these indices. It is used mainly when evaluating profitability of invested capital (Živělová, 2003).
- Prediction of financial distress – sometimes called also bankruptcy models, that help the financial manager determine what will be the situation of the firm in the future and if it will be endangered by bankruptcy

Let us make different logical order and analyze the financial subsystem gradually. The base will be formed by three financial statements: Balance Sheet, Profit and Loss Statement and Cash Flow Statement. Firstly, we will focus on elements and relationships of financial base and assets then we will analyze elements and relationships of financial result and finally elements and relationships of cash flow. Generally, we will look at the volume, structure and backing of the company's property, its business activities and operations and flows of money in and out of the firm.

2.3.1. Elements and relationships of financial base and assets

Balance Sheet

The first financial statement that we will explain and analyze is called **Balance Sheet**. It is one of the three basic accounting statements that summarizes the financial position of a company at a given point of time. It is always compiled by the last day of every accounting period (every year), or in shorter intervals.

Růčková (2007) says that Balance Sheet provides static view of the amount and structure of firm's short term and long term tangible and intangible assets and sources of their financing (equities). According to Kovanic (1997) to get dynamic view we have to compare and analyze balance sheets for more following accounting periods.

With respect to the time at which the Balance Sheet is created, Kovanic (1997) introduces following classification:

- Initial Balance Sheet - this one is set up at time of foundation of the firm,
- Opening Balance Sheet - is prepared at the beginning of accounting period,
- Closing Balance Sheet – is created at the end of each accounting period and also at the end of business activity of the firm, for example at the moment of fusion, acquisition, liquidation, etc.

Balance Sheet is an account of a company's property on one side and financial backing on the other side. When we talk about property we mean individual types of assets that the company possesses. On the other hand, the financial backing represents resources that were used to acquire the property. Simply, assets means what the company has and equities tells us where the company got money for it.

Using the two terms **property** and **resources** reveals the fact that there is simultaneous double view of the property of the firm. We call it **principle of duality**. The name of the financial statement "Balance Sheet" is derived from the principle that everything the company owns has to be backed by some resource. Therefore overall assets have to be in the same value as the total equities. This rule is called **principle of balance** and we can express it by following equation:

$$\text{Assets} = \text{Equities}$$

Valach (1997) says that **Property-financial stability** means ability of a firm to create and sustain good relationship between property and used capital. Concretely we solve three questions:

- 1) Ratio between individual elements of assets (property structure),
- 2) Ratio between individual kinds of used capital (financial structure),
- 3) Mutual relationship between individual elements of property and individual kinds of used capital.

Company's assets and their structure

Assets are used for generating profit and growth of the market value of the firm. The profit is not influenced only by suitable ratio between own resources and liabilities, but also by suitable structure of assets.

Kovanic (1997) states that it is important to know how to deal with long-term property, that is gradually amortized and is renewed in longer time periods and on the other hand how to treat short-term property, that has fast turnover and has to be purchased repeatedly and very often. To judge if some element is short or long-term there is a decisive interval of utilization - one year. From this point of view we divide the assets into two big groups: **fixed assets** and **current assets**.

There are also two special groups, one of them called **stock subscription receivables** monitoring subscribed but unpaid basic capital. The second group **accruals and deferrals** includes items that go over the borders of the accounting period. This group can be found also on passive side of the balance sheet.

Property structure of the firm represents detailed structure of assets of the company. According to Valach (1997) the basic way of division of assets is the **period of their usage** or on other words their ability of conversion into cash - **liquidity**.

- Short-term assets (current assets, term of usage < than 1 year),
- Long-term assets (fixed assets, investment property, term of usage > 1 year).

The other criteria for classification of assets are the **material aspects**.

- Financial assets – short term financial assets like cash and money on bank account are important for liquidity of the firm. The long-term financial assets, usually kind of securities serve mainly as an investment generating interests or other benefits (rights to decide in other companies etc.)
- Tangible assets – they form material side of the company, ensure physical processes and all activities (buildings, land, machines).
- Intangible assets – these are assets that can be neither seen nor touched but they are extremely important for every business activity (rights, patents, technological know how).

Evaluation of Structure of assets

The Structural analysis is sometimes called vertical analysis and is described in the text book of Prof. Živělová (2003). This analysis expresses percentage portion of certain item of a financial statement in a given base. Generally, it is used for expressing the structure of assets and equities and reveals their trends. To evaluate structure of the firm's property we can use percentage indicators expressing the ratio of:

- Fixed and current assets to overall assets
$$\text{Fixed Assets} / \text{Total Assets} * 100 \quad [\%]$$
$$\text{Current Assets} / \text{Total Assets} * 100 \quad [\%]$$
- Inventories or receivables to overall assets
$$\text{Inventories} / \text{Total Assets} * 100 \quad [\%]$$
$$\text{Receivables} / \text{Total Assets} * 100 \quad [\%]$$

Prof. Grega and coll. (1999) states that companies vary largely in the structure of their assets, depending on:

- The nature of entrepreneurial activity and its technical demand,
- The state of development of the money and capital markets,
- The economic situation of the enterprise and its objectives.

Along the structure and level of firm's property, it is important set also **correct valuation of individual assets**. The valuation depends on type of the individual assets and is strongly influenced by the level of inflation. According to Prof. Grega and coll. (1999) the ways of property valuation in Czech Republic can be as follows:

- **Acquisition costs** - this type of valuation is used for tangible and intangible assets acquired by purchase. It includes purchasing price and costs connected with acquisition of the property, for example: installation, transportation, duties, insurance and others. Kovanic (1997) states that in case of acquisition of the same type of material and financial assets we can use **prices calculated by weighted average** or by **FIFO technique** (the purchased inventories are valued at the price of the latest supply).

- **Own costs** – are used for assets created by own activity and operations. As an example we can name situation when the company built building or produced material on its own. These costs include consumed material, energy, wages and many other
- **Replacement acquisition costs** – this valuation is used for gifts, inherited assets, property received for free. The value is determined according to the price for which the property could be purchased at the moment of evaluation. Usually it is based on expert estimation of common market value.
- **Nominal (face) value** - is a kind of valuation that serves for cash, shares, bonds, issued valuables, checks, securities and receivables.

Circulation and turnover of capital

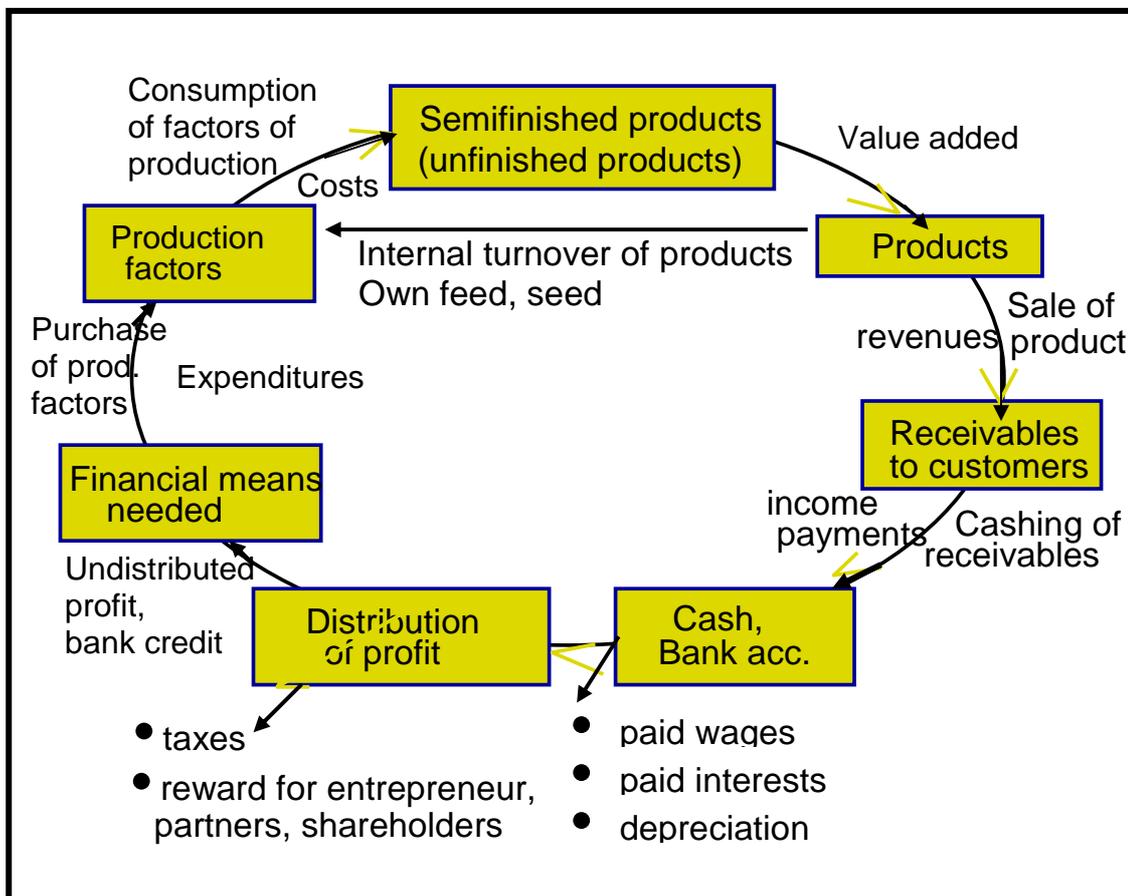
There is never ending process of transformation of the individual items of property in the company. This is typical mainly for the current assets. The process starts with cash that is spent on material and other factors of production. They are transformed into semi-products and later into final products. By selling them the firm has receivable to its customers. When consumer fulfills his obligation and pays the invoice, the company receives cash again that is available for further purchase of inventories. Prof. Grega and coll. (1999) states that typically, current assets appear in the firm in all forms at the same time (cash, inventories, final products and receivables).

The circulation and turnover of capital can be measured by two types of indicators:

- **Turnover velocity** - that expresses how many times during certain period (usually one year) can be given item of the firm's property changed into other forms of assets.
- **Time period of turnover** that indicates how long time this change takes. Sometimes we call it also **turnover in days**. Both indicators belong to the group of activity ratios that measure efficiency of assets utilization and fixation of capital in individual forms of property.

Following picture shows the never-ending circulation of capital, representing the transformation of assets and also the fact, that there can be time discrepancy between costs and expenditures, and revenues and incomes that will be explained later.

Picture 5: Circulation of capital



Resource: Created by author

Turnover velocity (V_T) measures the efficiency of usage of different groups of assets in the company. If the turnover is high, the company uses its assets well. Turnover velocity is calculated as volume of turnover divided by average capital. Average capital means any form of company's assets, but most commonly we calculate Total asset turnover, fixed asset turnover, inventory and account receivable turnover. Volume of turnover may be expressed by overall annual revenues R (sales) or overall yearly costs C .

$$\text{Total asset turnover} = \text{Sales} / \text{Average total assets}$$

$$\text{Fixed asset turnover} = \text{Sales} / \text{Average fixed assets}$$

$$\text{Inventory turnover} = \text{Sales} / \text{Average inventory}$$

$$\text{Accounts receivable turnover} = \text{Sales} / \text{Average receivables}$$

Time period of turnover (T_T)

This indicator provides information about length of the turnover process. It is calculated as reciprocal to the turnover velocity. If we want to receive result as number of days, we have to multiply it by 365. The most widely used formulas are following:

$$\text{Days to sell inventory} = 365 / \text{Inventory turnover} \quad [\text{days}]$$

$$\text{Collection period of receivables} = 365 / \text{Acc. receivable turnover} \quad [\text{days}]$$

Grega and coll. (1999) lists following **benefits of speeding up capital turnover:**

- The enterprise gains profit with less capital.
- Given amount of capital brings larger mass of profit.

The main **methods of accelerating** capital turnover are:

- More advanced technologies - maximal use of factors of production and boosting their productivity, shortening time of production.
- Optimization of the stock of supplies - rational supply management, lower storage costs.
- accelerating sales of products and services - shorter time of storage of goods, shortening collection period of receivables.

Financial base and its structure

According to Valach (1997) the financial structure of a firm represents structure of company's capital from which all the property is financed. It is described on equity side of the Balance Sheet. Sometimes we can hear also about term capital structure that means that part of company's capital from which only fixed property and long-term assets are financed. The capital structure is therefore only part of the financial structure. Simply, we can say that financial base of the firm is an important component of company's financial system. The financial base means capital the enterprise disposes of. It means financial resources (own as well as external) that are used for financing of company's assets. These assets are important for firm's operations and profit generating.

The basic structure of the financial base are very closely related to legal form of the firm and it can be in individual firms different. Divergence can be seen also in foreign countries.) According to the Czech Accounting standards, most of firms have following structure of equities. Total equities are divided into two parts reflecting the source: **owner's equity** and **liabilities** and one special group called **accruals and deferrals** that have similar function as accruals and deferrals in the asset side of the Balance Sheet.

Owner's equity is further divided into registered capital (varying according to the legal form of company), capital funds, reserve fund and other funds, economic result from previous years (retained earnings) and economic result from current year.

Liabilities are then differentiated according to the time when they are due and according to their provider. Therefore we have short-term and long-term liabilities and short-term and long-term bank credits. Another kind of liability are the voluntary and legal reserves – their amount again depends on the legal form of the company.

Evaluation of Structure of equities

According to Valach (1997) in the frame of financial structure of the firm it is necessary to evaluate and analyze mainly relation between own capital and liabilities. For this reason we have different indicators that expresses ratio of overall, short-term and long-term liabilities to total assets (capital). These indicators, sometimes called **debt ratios**, belong to the measures characterizing level of financing and level of indebtedness. We can use percentage indicators expressing the ratio of own equity and debts to overall equities:

$$\textit{Equity ratio} = \textit{Owner's Equity} / \textit{Total Equities} * 100 \textit{ [%]}$$

$$\textit{Total debt ratio} = \textit{Total liabilities} / \textit{Total Equities} * 100 \textit{ [%]}$$

$$\textit{Long-term debt ratio} = \textit{Long-term liabilities} / \textit{Total Equities} * 100 \textit{ [%]}$$

$$\textit{Short-term debt ratio} = \textit{Short-term liabilities} / \textit{Total Equities} * 100 \textit{ [%]}$$

Optimizing the structure of financial base

As Prof. Grega and coll. (1999) says, optimization of structure of financial base is one of the most important financial aspects of business decision-making. Basically, it is valid that own capital should exceed debt resources, that has to be paid back. Low ratio of owner's equity to firm's property is closely connected with financial

instability. (The company relies on debts in too high extent.) Main criterion regarding the structure of financial base is cost associated with obtaining a given kind financial resources. In this connection we use term cost of capital.

- **Cost of Capital – Owner’s Equity:**

The cost of own capital are mainly dividends, shares on profit and opportunity costs. In some cases own capital can be evaluated by interest rates for non risky state obligations.

- **Cost of Capital – Liabilities:**

External capital is connected with different type of costs, namely: interest from bank loans, bonds and obligations offered to commercial subjects. The longer is the maturity date, the higher is risk connected with provision of credit and the higher cost of capital must be paid to the creditor.

According to Valach (1997), nowadays, the most popular theory related to optimization of capital structure is represented by so called **U curve of total cost of capital**. The principle is, that from certain level of indebtedness the overall costs of capital start to increase (the positive influence of taxes on price of external capital is absorbed by higher creditor’s demand on interest related to higher risk). Therefore the company should have such relation of own and external capital where the total costs of acquisition of new capital are the lowest and simultaneously the market value of the firm is the highest.

Minimal total costs of overall capital

We calculate costs of overall capital using formula **weighted average cost of capital** (WACC):

$$k_o (WACC) = k_d (1 - t) \frac{L}{OE + L} + k_e \frac{OE}{OE + L}$$

Where:

k_o – overall cost of capital

k_d – cost of debts (interest rate - i)

t – tax rate

L – market value of the debt

k_e – costs of equity (own capital)

OE – market value of owner’s equity (own capital)

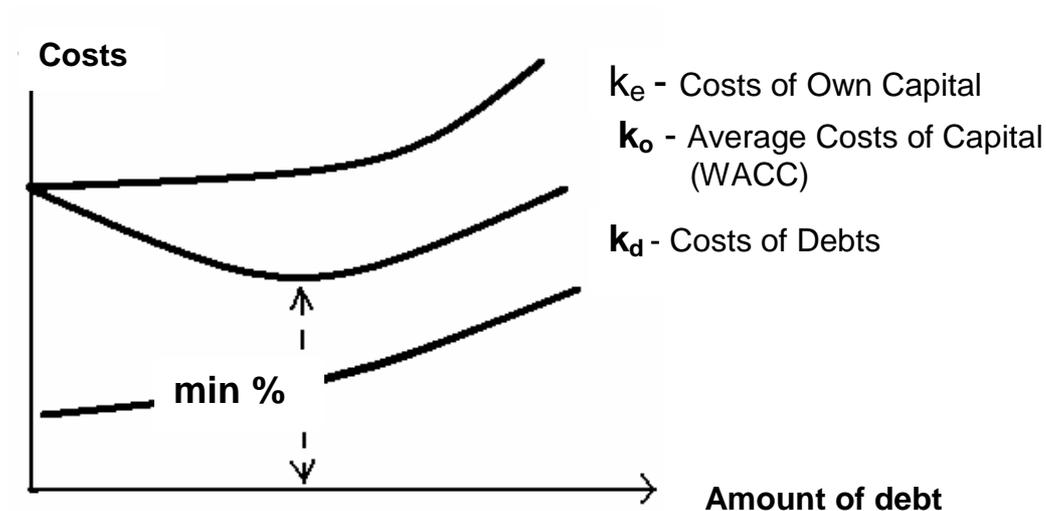
$OE + L$ – overall capital (market value of the firm)

When optimizing the capital structure we have to consider aspects, that:

- Liabilities are cheaper – own capital holds higher risk and dividends are paid from earnings after taxes (net income).
- Higher indebtedness is connected with higher interest rate.
- With higher indebtedness, shareholders demand higher dividends.
- Substitution of own capital by debt brings lowering of costs of overall capital but only till certain level of indebtedness (min %).

All mentioned aspects can be seen on following picture:

Picture 6: Weighted average cost of capital



Resource: Created by author

According to Grega and coll. (1999) the **ratio of own to external capital depends on:**

- Area of operation - in industrial and agricultural firms own equity prevails, in business companies is the ratio close to 50:50, financial companies have more liabilities.
- Structure of assets - firms with higher amount of investment property have also higher level of own long-term capital.
- Capital and money markets - determine accessibility to bank loans, interest rates, willingness of investors to bear risk.
- Financial position and goals - firms with stable sales and profits can afford higher level of indebtedness.

- Personal attitudes of managers and their ability to face risk - because using external resources can improve profitability of own capital but simultaneously increases risk of business.

Advantages of using liabilities

Using liabilities is convenient in case when the entrepreneur does not have enough own capital. Generally, debts are cheaper than use of own capital and what is more taking a credit does not influence management of the company as the creditor does not receive any voting rights. Using external sources leads to higher profits because interests can be included in firm's costs and therefore it cuts down the tax base. This principle is called **effect of tax shield**. On the other hand, using own capital leads to lower profits because dividends and shares on profit are paid from earnings after taxation.

Another advantage is called **financial leverage** that means that using of external capital increases profitability of own resources. The profitability of own resources is quantified by capital profitability indicator ROE and will be explained in following chapter.

Disadvantages of using liabilities

Logically debts and credits increase indebtedness of the firm and decrease its financial stability that may lead to bankruptcy. Each new debt is more expensive and it is more difficult to get it as the credibility of indebted company is low and it is very risky for potential creditors to provide money. At the same time high portion of debts limits decision making and acting of managers.

Liquidity of firm and Liquidness of assets

- **Liquidness** is the ability of individual assets to change on cash quickly and without losses. Logically the current assets are more liquid than the fixed assets as they can be sold (converted into cash) quite easily. On the other hand sale of fixed assets takes longer time - usually months even years.
- **Liquidity** is the ability of a firm to pay for short-term liabilities (liabilities which are due) and is a presumption for financial balance. High liquidity reduces danger

of inability to make payments but simultaneously decreases profitability of the company as the money could be used for further investments. Liquidity is measured by calculating ratio of payable liabilities and different forms of current assets (cash, inventories, receivables, etc...) The most common are the following indicators:

Cash ratio = Short-term financial / Current liabilities

Quick ratio = (Sh.-term fin.assets + short-t.and long-t. receiv.) / Current liabilities

Current ratio = Current assets / Current liabilities

According to the Czech standards, the value of cash ratio should be around 0,5, quick ratio should range between 1-1,5 and current ration between 1,5-2,5.

2.3.2. Elements and relationships of economic result

Profit and Loss Statement

Růčková (2007) says that the profit and loss statement provides summarization of revenues, costs and the economic result for certain period. It records all revenues and costs – not inflow (income) and outflow (expenditures) of money. It is compiled regularly in yearly or shorter intervals. It describes all operations that happened during this time. By the end of accounting period (31.12.) is the calculated economic profit or loss transferred to the Balance Sheet. Profit increases the owners equity, loss makes it lower.

The P/L Statement monitors all costs and revenues that happened in given accounting period, regardless the fact if they were followed by expenditures or incomes. The reason is that revenues and incomes and costs and expenditures are not harmonized and there may be time gap between them. The principle of recording of costs and revenues related to adequate period (regardless to the incomes and expenditures) is denoted as **accrual principle** (Kovanic, 1997).

Kovanic (1997) distinguishes also between two forms of Income Statement:

- Horizontal - separate summarization of all revenues and separate summarization of all costs that are facing each other.

- Vertical - indicating of revenues with positive sign and costs with negative sign. Revenues and costs are monitored separately for production activity, trading activity, financial and extraordinary activities. This type is preferred by legislation in Czech Republic.

Kovanic (1997) says that if we want to have Profit and Loss Statement that provides correct information, all the costs and revenues has to be arranged in reasonable way. In other words, to all revenues in given period, such costs have to be assigned, that are related to these revenues. And vice versa: to all costs for given period we will assign related revenues. This generally accepted accounting rule, that costs must be always connected with relevant revenues even if there is time differentiation, is called **principle of factual conformity of costs and revenues** or sometimes also **principle of commensurability**. However, Kovanic (1997) admits that in reality it is impossible to provide individual revenues and to them related costs in the Profit and Loss Statement. Usually they are summarized into groups according to certain criteria (for example summarization of all sold goods, overall consumption of material, amount of investment property, etc.)

Revenues versus incomes

Revenue is a special economic term that is very often mixed with incomes. Simply, revenues are operations of the firm that positively influence the economic result regardless the flow if money. For example, the company has revenue at the moment of sale of goods or products on invoice bill. At this time there is still no income. The company will have income at the moment when the money for invoice bill will be collected. In comparison to revenues, income simply means inflow of money.

Revenue classification in the Profit and Loss statement

Grega and coll. (1999) provides following classification of revenues of firm:

- Operation revenues – revenues obtained from usual operations like sale of products and services, change in level of inventories, sale of fixed assets etc.
- Financial revenues – represent revenues originating from financial investments, financial assets (share, stocks).

- Extraordinary revenues – are connected with extraordinary events or operations (for example payment from insurance company for damages).

Sales (Revenues from sale)

Another misleading term is sales that represent just one type of revenues. Generally, sales are revenues from sale of:

- Products and services (manufacturing firms and service providers),
- Purchased goods (trading companies),
- Material stocks, machinery, equipment and other fixed assets,
- Patents, licenses, know how.

Sales are used for calculation of profitability (described in following chapter) and turnover (mentioned in the text above). Sales are determined by **scope of production** (quantity produced and sold), usually denoted Q and by **prices** (selling price of goods), denoted by P. The formula for sales calculation is following:

$$Sales = Q * P$$

Costs versus expenditures

Similarly like in case of revenues and incomes, also costs and expenditures have not identical meaning. While expenditures mean spending of money, costs have no influence on level of cash. And at the same time costs have direct impact on economic result, expenditures not.

Costs classification in the Profit and Loss Statement

Due to the principle of factual conformity, we can find exactly such types of costs that correspond to revenues. Grega and coll (1999) names:

- Operation costs – material, energy and services consumption, paid wages and other personal costs, taxes, fees etc.
- Financial costs – in the form of interests, insurance, bank commissions.
- Extraordinary costs – that have one-shot character like cash deficits, damages.

Other types of classification

Prof. Grega and coll. (1999) states that we can classify costs according to many different criteria.

We can have classification related to **type of costs** (consumption of materials, fuel and energy, depreciation of fixed assets, personal costs, financial costs, services costs, etc.)

Another classification is according to the **origin of costs**, concretely.

- External (primary) costs – arise from contact with external suppliers,
- Internal (secondary) costs – created due to own activity of the firm.

Next type is classification according to the **way of consumption**:

- Direct costs – for example depreciation and material that is processed and becomes part of the final product.
- Indirect costs – help the production to be realized, can be divided into more types:
 - Production Overheads – consumed electricity, heat, rent of the factory.
 - Administration Overheads – wages for managers, accountants and other employees, rent and maintenance of administrative buildings, etc.
 - Sales Overheads - advertising, promotion, wage of sales person.

According to the **changes in volume of production** we can also classify costs as:

- Fixed (not dependent on volume produced) and
- Variable costs (that depend on quantity produced). These Variable costs can be further divided into:
 - Proportional costs - increase proportionally with the volume of output,
 - Degrressive costs - growth of costs is slower than growth of output and
 - Progressive costs - growth of costs is faster than growth of output.

Cost functions

Costs also vary according to the time period. In the **Short Run**, firm can vary its outputs through more or less intensive use of its variable resources. In Short Run only variable costs can be changed. However, in the **Long Run**, the company has enough

time to enter or leave an industry or to vary its outputs. Therefore in Long Run also fixed costs can be changed, so all resources (costs) are variable.

Economic result (profit versus loss)

Economic result is monitored in Profit and Loss Statement and is determined by difference between revenues and costs that occurred in a given period of time. Economic result of a company is usually calculated at the end of accounting period (by the 31.12.) and can have two scenarios: profit or loss. Naturally, the more desirable alternative is to have profit. This happens if revenues exceed costs. In case that costs are higher than revenues, the economic result is loss. At the end of the accounting period economic result is recorded in Balance Sheet as a part of owner's equity, concretely as an economic result of current year. As already mentioned, profit increases owner's equity, loss makes it lower.

At the same time economic result (profit) is the base for tax, social and health insurance calculation. According to Grega and coll. (1999) it provides very important information for different subjects:

- Owners of the company - evaluation of their investment into company,
- Managers - economic result expresses their managerial skills and evaluates efficiency of management and correctness of their strategic decisions,
- Employees - profit making and strong firm ensures safe working position,
- Potential investors and equity investors - economic result is taken into consideration when deciding about providing loan or investing into the company,
- State Institutions – they are interested in economic result to determine amount of income into their budget.

Kovanic (1997) states that according to Czech accounting standards Profit and Loss Statement is compiled in vertical form. Now we will introduce simplified structure that reveals that the economic result is determined gradually. We separate economic result for

- **Operating** activities - revenues and costs connected with normal operating activities of the company,
- **Financial** Activities - revenues and costs connected with financial investments, financial assets, interests, etc.,

- **Extraordinary** activities - revenues and costs due to unexpected events (damages, thefts, payment from insurance company,..).

Sum of operating result and financial result gives us economic result from common activities that is reduced by corporate income tax.

$$\text{Result from common activities} = (\text{Operating Result} + \text{Financial Result}) - \text{tax}$$

Where:

$$\text{Operating Result} = (\text{Operating Revenues} - \text{Operating Costs})$$

$$\text{Financial Result} = (\text{Financial Revenues} - \text{Financial Costs})$$

The rest is formed by Extraordinary result – again decreased by tax payment.

$$\text{Extraordinary Result} = (\text{Extraordinary Revenues} - \text{Extraord. Costs}) - \text{tax}$$

Summarization of taxed economic result from common activities and taxed extraordinary result gives us economic result after taxation, sometimes also called net income (NI) or earnings after taxation (EAT).

$$\text{EAT} = \text{Result from common activities} + \text{Extraordinary Result}$$

This profit for disposal is in next accounting period distributed among:

- Legal reserve fund,
- Corporate statutory funds and other voluntary funds, which are not fortified in the society status,
- Payment of dividends, shares on profit to partners and owners of the company, or reward to entrepreneur,
- Further investments into fixed assets and extension of the firm,
- Retained earnings – remaining part of profit that will stay in form of undistributed profit from previous years in Balance Sheet as a part of owner's equity.

In the process of income distribution, there is usually conflict among owners (shareholders) of the company who want receive high dividends and managers who prefer keeping profit in the company for further investments and growth of the firm.

Profitability of a company's business activity

Grega and coll. (1999) writes that profitability of business activity is used to evaluate a company's profit making with regard to expended inputs. Profitability is quantified by an **absolute indicator**, i.e. the amount of profit made or **relative (proportional) indicators**, i.e. profitability ratios like ROA, ROE, etc.

According to Růčková (2007) the profitability is expressed as a ratio of profit to amount of invested capital. If we should analyze the terms serving as inputs into mentioned basic ratio, we have to note that they can largely differ. There can be different interpretation of profit as well as invested capital. For financial analysis there are 3 basic categories of profit that can be used in the formula:

- **EBIT** – Earnings before payment of interests and taxes. Can be calculated as EBT + interest costs. We can use this type of profit for profitability calculations in years where the tax rate was different.
- **EBT** - Earnings before taxes (operating profit that has been already reduced or increased by financial result, but has not been taxed yet),
- **EAT** – Earnings after taxation (net income) – part of profit that can be distributed for dividends payment and for further company reproduction. This category is used in most indicators that evaluate efficiency of the firm.
- **EAT + interest costs * (1 – t)** - for evaluation of profitability with respect to owners as well as with respect to creditors who provided the loan. This expression also takes into consideration taxes and it reflects profit of owners (EAT) and also profit of creditors who obtained interest (interest costs * (1 – t)).

Růčková (2007) states that invested capital is also inconsistent term but its interpretation can be easier according to the fact what we would like to measure. We can measure for example profitability of overall capital, profitability of capital employed (only long-term), profitability of own equity, profitability of revenues (sales) or costs. Following indicators are most commonly used or profitability determination:

Return on Assets:

ROA after taxes = [EAT+Interest cost*(1-tax rate)] / Average total assets *100 [%]

ROA before taxes = EBIT / Average total assets * 100 [%]

Růčková (2007) introduces the first indicator as a measure of profitability of overall capital, regardless to the sources from that the business activities were financed. It evaluates return of total invested capital locked up in business activities (operating, financing as well as investment) regardless to the structure. It is used only for measuring of overall efficiency of the firm, its production power (ability to make profit). This formula evaluates manager's skills and capital reproduction.

The second indicator informs us about profitability of overall capital however it is not influenced by tax rate and it does not take into consideration origin of resources.

Return on Equities:

$$ROE = EAT / \textit{Average owner's equity} * 100 \quad [\%]$$

By calculating of this formula we measure profitability of own capital (profitability of capital invested by share and stock holders and owners of the company). Using this indicator investors can find out, if their capital is sufficiently reproduced with respect to the investment risk. Simply the result should be higher than interest rates from state-guaranteed non-risky securities. The difference is called risk premium. Growth of this indicator can originate in better results of business activities, decreasing amount of own capital in firm or also lower interest rate of external capital (Růčková, 2007).

Return on Capital Employed:

$$ROCE = EAT + \textit{Interest cost} * (1 - \textit{tax rate}) / (\textit{Aver. long-t. debt} + \textit{Aver. own. equity}) * 100$$

This category of invested capital includes overall long-term invested capital. Simply, long-term resources invested by creditors (obligations and long-term bank credits) and owners equity. It expresses level of utilization of all assets of the firm, financed by own capital and long-term debts. It is used for inter-company comparisons.

Return on revenues and Return on sales ((Net profit margin):

$$ROV = EAT / \textit{Revenues} * 100 \quad [\%]$$

$$ROS = EAT / \textit{Sales} * 100 \quad [\%]$$

In case of these indicators we can use overall revenues or revenues from sales of goods and products. Revenues (sales) profitability expresses how efficiently the company can produce per 1 CZK of revenues (sales). This indicator is sometimes also called net profit margin and is compared to industrial average.

Return on Costs:

$$ROC = EAT / Costs * 100 [\%]$$

Růčková (2007) considers cost profitability as a complementary indicator to revenue profitability. It is a ratio overall costs to revenues of the firm. Generally, it is valid that the lower the value of this indicator, the better results the company reaches, as it was able to generate 1 CZK of profit with lower costs. We have to note that to increase the absolute amount of profit can be reached not only by decreasing of costs but also by extending of sales.

Development of income from business activities

Prof. Grega and coll. (1999) provides simple classification of factors affecting (positively or negatively) profit and profitability of a company. For their classification we can use different views:

- External factors (competition, suppliers, prices of inputs, substitutes complements, Central Bank interventions, legislation)
- Internal factors (wages, trade union, technology level, management)

- Factors that can be altered (volume of production, new products, machinery)
- factors that cannot be altered

- Direct factors (decrease of labor material or energetic intensity of production)
- Indirect factors (inflation, state interventions)

Pyramidal decomposition of profit

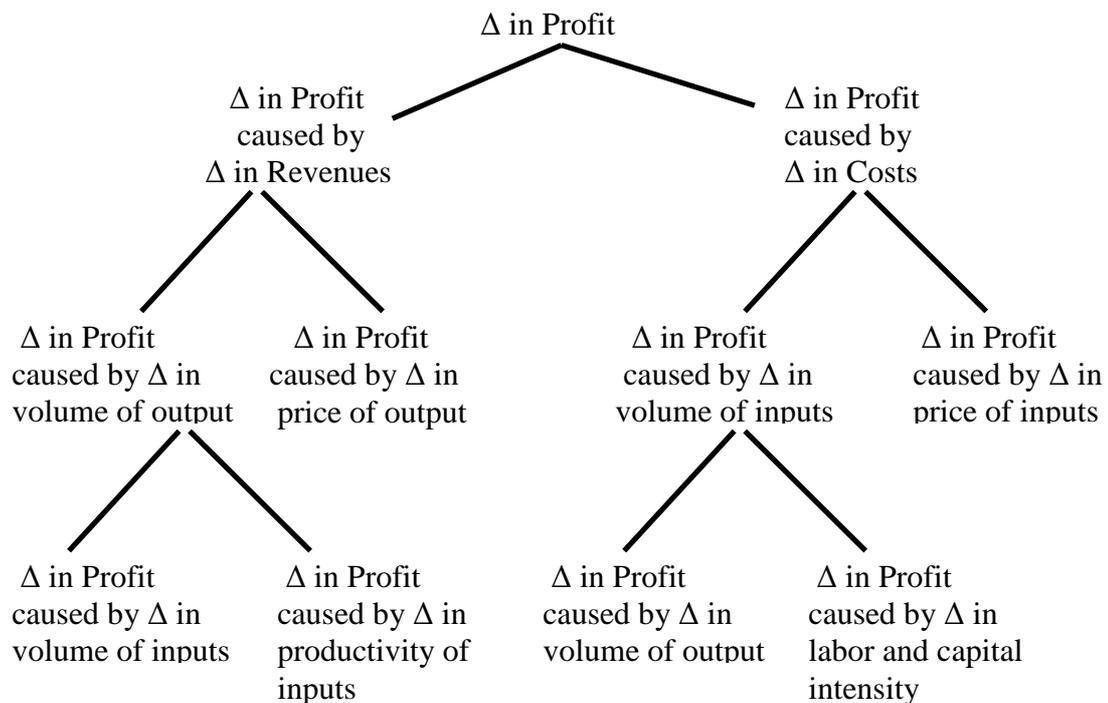
In terms of economic concept of efficiency we can differentiate following factors:

- 1) **Technical-Economic factors** that determine change in productivity of the basic factors of production or intensity of production.

- 2) **Financial factors** – for example costs of production, prices of final products, changes in tax and interest rates and other financial tools.

This classification will be used in the practical part when performing analytical method called **pyramidal representation of profit**. Grega and coll. (1999) says that it is based on ordering of sets of economic indicators into pyramidal structure with profit as one top indicator. Each lower level of the pyramid is formed by indicators and relationships among them that are defining the indicators on the higher level of the pyramid. It allows us also to quantify the effect of individual factors by the use of logarithmical decomposition of indexes of the indicators.

Picture 7: Pyramidal decomposition of profit



Resource: Created by author

Form above described pyramidal structure we can find out that indicators like **productivity of inputs** and **labor and capital intensity** represent profit changes associated with the changing degree of **technical-economical efficiency**. On the other hand, **price of output** and **price of input** belong to the **financial factors** influencing the development of profit.

2.3.3. Elements and relationships of cash flow

We already know that the Balance Sheet is the back-bone of whole accounting. We have separated economic result and analyzed it in more detail in Profit and Loss Statement. But there is one more element that we are interested in – Cash and its flows that can be also analyzed in separate financial statement.

According to Grega and coll. (1999) cash flow represents inflows (incomes) and outflows (expenditures) of financial means during certain period of time which are connected with business activity of the firm (operations, investing, financing). Cash flow can be expressed as a difference of level of cash on the beginning (M_0) and end (M_1) of the period

$$\Delta M = M_1 - M_0$$

- If ΔM positive, then there is cash inflow.
- If ΔM negative, then we can talk about cash outflow.

General rule is that cash inflow must exceed cash outflow, otherwise the company faces insolvency.

Revenues and incomes, costs and expenditures, profit and level of financial means are not synchronized. There are usually time and volume differences. Therefore even highly profitable firm can have problems with payments of liabilities and have lack of money for further development (Grega and coll., 1999)

Generally, profit must be always followed by inflow of money so the firm has cash for disposal (it is source for investments, further development of the company, sustaining operations and payment of dividends). No company can survive for longer time if it does not generate cash from operating activity.

Cash Flow Statement

Cash flow is monitored in Cash Flow Statement. It provides information about sources generating cash and way of their utilization during certain period. It answers questions about how much cash the company generated and how were the money used. This statement proves that profit and cash are not identical (Růčková, 2007).

Cash flow statement is compiled at last once a year (by the 31.12.) and provides complementary information to the Balance Sheet and Profit and Loss Statement.

Forms of CF Statement

Similarly like in case of Profit and Loss Statement there are two forms of Cash Flow Statement:

- **Horizontal** – lists all sources of cash inflow (incomes) on one side and way of utilization of cash (expenditures) on the other side. After summing up the expenditures and final level of cash it should correspond to summarization of all incomes. Simply, there should be balance between incomes and expenditures + final amount of money.
- **Vertical** – Using this form, inflows as well as outflows of money are recorded with positive or negative sign in one table. This form tries to assign relevant expenditures to corresponding incomes therefore we can again create homogenous groups of cash flows (usually those related to operations, investments and financing).

Methods of producing Cash Flow Statement

- **Direct method** – total sum of all incomes minus total sum of expenditures
- **Indirect method** – in Czech Republic the Cash Flow statement is compiled by indirect method and is presented in vertical form. It is divided into three basic parts:
 - Cash flow from operating activities (includes all activities related to basic operations),
 - Cash flow from investment activities (summarizes operations with fixed assets),
 - Cash flow from financial activities (is determined as activities that cause changes in size and structure of owner's equity and debts).

The indirect method is based on transformation of costs and revenues into expenditures and incomes (separately for each type of activity). We come out from operating profit (EBIT) that is adjusted for revenues and costs which do not cause

flow of money during the period. The result is completed with cash flow from financial and investment activities (Grega and coll., 1999).

Basically, it is valid that:

Total Net Cash Flow = Net CF from operating act. + investment act. + financial act

And at the same time it corresponds to the level of cash at the end of period (M_1) minus level of cash at the beginning of considered time period (M_0).

Total Net Cash Flow = M_1 – level M_0

Use of cash flow and related indicators

Monitoring of the cash flow is important for:

- Evaluation financial stability of a company and for detecting reasons of changes in the level of cash.
- Short-term and long-term planning,
- It is one of the possible ways of estimating market value when company is being sold.
- Evaluation of financial efficiency of investment alternatives (dynamic methods): Payback Period, Net Present Value, Profitability Index, Internal Rate of Return
- Management of liquidity and company's solvency

Cash flow liquidity

Cash Flow Liquidity = Operating CF / Average Short-term Liabilities

Prof. Živělová (2003) says that this ratio expresses ability of the firm to pay its short-term liabilities from cash flow in monitored period. In other words, it measures ability to produce financial means to pay short-term debts. We use operating cash flow as we consider only flow of money connected to typical operations of the firm.

Degree of discharge form debts

Degree of discharge from debts = Operating CF / (Aver.short-t. + long-t .Liabilities)

Degree of discharge from debts evaluates ability of the company to pay all its debts, not only the short-term but also those long-term. (Živělová, 2003). It provides ratio

between amount of used debt financing and ability of the firm to cover these liabilities from its own financial power. Decreasing values signalize problematic financial position of the firm. According to Růčková (2007) the reasonable value of this indicator is between 20 and 30 %. However, it is much more useful to monitor the development of this indicator in time.

Financial profitability of overall capital:

*Financial Profitability of Overall Cap. = Total CF / Average.Total Assets *100 [%]*

Živělová (2003) introduces this indicator as expression how much cash is the firm able to create with respect to one unit of overall invested capital. It is a measure of ability of the company to pay liabilities, by own financial means, to realize planned investments or pay out presumed dividends and shares on profit. In this formula we use total cash flow. We compare cash flow from all activities of the firm to overall capital the company disposes of.

Financial profitability of own capital:

*Financial Profitability of own capital = Total CF / Aver.Owner's equity *100 [%]*

Růčková (2007) states that this indicator expresses utilization and internal financial potential of own capital. When making time and inter-company comparisons, it is a complementary indicator to the profitability of own capital (ROE) mentioned in previous chapter.

3. Goal and methodology

3.1. Goal of the work

As the name of my diploma thesis indicates, the main goal of this work is to perform analysis of the economic system of the firm Greiner Packaging Slušovice, s. r. o., that is one of the main producers of plastic packaging in the Czech Republic.

The economic system of a company can be divided into two parts:

- a) technical-economical subsystem and
- b) financial subsystem

Accordingly, the main goal of the thesis consists of two partial goals:

- a) Analysis of the technical-economical subsystem of the company that focuses on relationships between factors of production and output of the firm measures and compares productivity of inputs and related production intensity.
- b) Analysis of the financial subsystem of the company that has much wider content. Basically it means processing of the data from individual financial statements (Balance Sheet, Profit and Loss Statement and Cash Flow Statement) for 9 year long period. Using special economical formulas we will find out how the company deals with its property and how it ensures financing of the capital and operating process. We will be able to explain the development company's costs, revenues and economic result, cash inflow, outflow and many others.

If the analysis and mainly the calculations are performed precisely and the results interpreted correctly, then we will reach our goal. We will be able to evaluate efficiency of the whole economic system of the company and potentially we could suggest any measures leading to improvement of the situation.

3.2. Methodological process of solution

The title of the diploma thesis reveals that the main method used is analysis that means breaking-up a complex topic into smaller parts. In our case it means that we will decompose economic system of the company into two subsystems. Within each of these subsystems we will investigate its elements and relationships, reveal their development in time and search for reasons of these changes.

In the part called Analysis of the technical-economical subsystem we will focus on productivity of labor, capital, overall productivity, capital, labor and overall intensity of the production, including the capital-labor ratio.

In the part titled Analysis of the financial subsystem we will firstly analyze elements and relationships of the financial base (Balance Sheet), then elements and relationships of the financial result (Profit and Loss Statement) and finally the elements and relationships of the financial flows (Cash Flow Statement). For individual calculations we will use mainly ratio indicators measuring structure of the assets and equities, indebtedness, liquidity, activity and profitability of the company. In this part we will include also calculation of Weighted average cost of capital and Pyramidal decomposition of profit.

The structure of the thesis includes introduction, literature search, goal of the work and methodology, results and discussion, summarization, and recommendation and conclusion. The most important is the literature search, and results and discussion. The Literature search includes summarization of theoretical knowledge found in all available resources. Everything that is theoretically described in this part, will be practically applied in the other part called Results and discussion.

The main source of data for this paper are the financial statements of the company Greiner Packaging Slušovice, s.r.o. for the period of years 1999-2007 that are included in the attachment. Another important data come from Czech Statistical Office, Ministry of finance and other printed or on-line resources that can be found in the chapter References.

Due to large amount of analyzed data, necessary calculation of formulas and expression of results in graphs, mostly mathematical and statistical methods were used.

4. Results and discussion

4.1. Company characteristics

Basic information about Greiner Packaging Slušovice s. r. o.

Greiner Packaging Slušovice s. r. o. is a 100% daughters' firm of the Austrian company Greiner Packaging G.m.B.H. with the seat in Kremsmünster and simultaneously is a member of the group Greiner Packaging which has its own production plants in nine European countries (www.greiner-gpi.com, 2009).

Greiner Packaging Slušovice s. r. o. employs about 600 employees and belongs to the largest producers of plastic packaging in Czech Republic and in Slovakia. In conformity with their motto "do the innovation" they still expand their activities and portfolio of offered packaging solutions. Except from food packaging, they produce also special packaging for flat chemistry, painting materials and other. Specific part of their production portfolio is production of technical components, which are supplied to many important foreign companies.

Table 1: Information about Greiner Packaging Slušovice, s.r.o.

Business Name	Greiner Packaging Slušovice, s. r. o.
Legal Form	Limited Liability Company
Seat	Greinerova 54, Slušovice, 763 15, Czech Republic
Identification No.(IČO)	46901507
Commercial Register	Brno, division C, enclosure no. 5788
Date of registration	30. 6. 1992
Initial basic capital	399 770 000 CZK
Basic capital from 3.12. 2002	399 870 000 CZK
Main area of business:	- lock-smithery, tool engineering - production, trade and services included in attachments 1-3 of the Czech trade law - activity of accountant advisors, accounting management and tax evidence management
Statutory organ – agent	Ing. Ivo Benda

Resource: Ministry of Justice of Czech Republic

History

In 1985 there were first contacts and negotiations between former JZD AK Slušovice and Austrian firm Greiner about the possibility of cooperation in the area of production of food packaging. The establishment started to produce plastic packaging in 1987 and in the same year new recycling line was installed. Cooperation with firm Greiner und Söhne G.m.B.H. with seat in Kremsmünster and producer of plastics DAK MOVA Bratislava lead in 1992 to foundation of new common Austrian-Czech company Greiner, plastic packaging, s. r. o. Slušovice, as 100% daughters' firm of holding company Greiner Holding AG. In frame of changes in whole group Greiner Packaging International, the company was renamed to Greiner packaging Slušovice s. r. o. in 2003. Nowadays it is the largest producer of plastic packaging in the Czech Republic and Slovakia, where it offers exclusive packaging solutions for its customers (www.greiner-gpi.com, 2009).

Picture 8: Logo of Greiner Packaging Slušovice, s.r.o



Resource: Greiner Packaging Slušovice web page

Greiner Group

The whole Greiner Group was founded in Germany in 1868 and with an Austrian company was operating since 1899. The wholly owned family firm combines the expertise of a network organization with the high innovative capacity and flexibility of legally autonomous company units. The Greiner Group is notable for its diversification of products and markets, which is the guarantee of steady growth.

Today the group has 7 production industries in the area of polyurethane and plastic processing. Namely it is: Greiner Packaging, Bio-One, Eurofoam, Extrusionstechnik, Perfoam, Purtec and Rubbertec. Together they have 117 production and sales locations in 27 states in the globe and nearly 7 841 employees who create overall turnover about 1 117, 9 millions Euro (www.greiner.at, 2009).

4.2. Basic calculation rules and assumptions

Nominal versus real variables

In the theoretical part we mentioned that for some kind of calculations it is important to eliminate growth of output and input prices to ensure comparability of the values. This is mainly crucial when comparing the productivity and intensity of production in individual years.

In the Czech statistical office there are available all basic price and wage indexes between individual years. Because we will be comparing values for years 1999-2007, we have to recalculate the yearly price and wage growth to the base year 1999. Simply, we will express all values in prices of the year 1999.

Because Greiner Packaging, s.r.o. is a producer of industrial products that are not aimed to be sold to final consumers, we will use for recalculation of its output values the **Producer Price Index**. The values were found in Czech statistical office web pages. On the same web page I have found also **wage indexes** that were used for conversion of costs of labor force (paid wages and salaries) into comparable form. Capital costs were adjusted by **interest rate index**. The source data are represented by interest rates used for commercial credits in capital market in CZK. However, here we had to introduce an **assumption** that that company's obligations are equal to profitability of own capital as we are not sure from which source the capital is financed. The interest rates development was provided by Ministry of Finance.

For evaluation of overall costs, I calculated **input price index**. This index was created on weighted average principle. It is based on ratio of certain groups of inputs in the production and their related price indexes. I divided the inputs into 3 main groups:

- personal costs (evaluated by wage index) that represent approximately portion of 10 % of overall costs.
- material, energy, services consumption (evaluated by price index of chemical products that are the main material input for production of plastics). Their amount in overall costs rose from 55 % in the beginning of the period to 73 % at the end of the period.

- other involved costs such as depreciation, residual value of used fixed assets, financial costs, etc were evaluated by index of interest rates. Their percentage amount dropped from 34 % to 17 %.

Table 2: Output and input price indexes

Item	Year								
	2000	2001	2002	2003	2004	2005	2006	2007	
wage index between years	1,064	1,088	1,080	1,058	1,063	1,050	1,066	1,072	
wage index (base year 1999)	1,064	1,158	1,250	1,323	1,406	1,476	1,574	1,687	
Producer price index between years	1,049	1,029	1,005	1,003	1,057	1,030	1,016	1,041	
Producer price index (base year 1999)	1,049	1,079	1,085	1,088	1,150	1,185	1,204	1,253	
Inter.rate index betw years (comm.credits)	0,824	1,004	0,935	0,885	0,758	0,947	1,005	1,131	
interest rate index (base year 1999)	0,824	0,827	0,773	0,685	0,519	0,491	0,494	0,558	
Chemical product price index (base year 1999)	1,005	1,009	1,014	1,029	1,098	1,133	1,182	1,217	
overall input price index (base year 1999)	0,951	0,97	0,973	0,992	0,981	1,033	1,103	1,151	

Resource: Czech statistical office and author's calculation

Corporate income tax

Another important part of our calculations is influenced by the corporate income tax. Due to the development of Czech economy and changing political and legal environment, the tax rate differs every year. In the following table you can see the income tax development in years 1999-2007.

Table 3: Corporate income tax rates

Item	Year									
	1999	2000	2001	2002	2003	2004	2005	2006	2007	
Income tax (%)	35	31	31	31	31	28	26	24	24	
Income tax rate	0,35	0,31	0,31	0,31	0,31	0,28	0,26	0,24	0,24	

Resource: www.az-data.net

Cost of debt and cost of own capital

In the practical part we will be evaluating also costs of capital of the company (own as well as external). Because it was not possible to find out concrete level of interest rates for credits that were taken by the company in individual years and at the same

time we had no information about development of costs of own capital we made following simplification. **Costs of own capital** were evaluated by the **interest rates for state obligations** (where the level interest rate corresponds to minimal or zero risk). On the other hand, **costs of debt** were evaluated by **interest rates used for commercial bank credits**. These rates were naturally higher as they take into account certain amount of risk. The development of interest rates in individual years is shown in the following table.

Table 4: Interest rates of state obligations and interest rates of commercial credits

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
interest rates (state obligations)	7,57	6,77	6,35	4,94	4,12	4,75	3,51	3,78	4,28
interest rates (commercial credits)	8,69	7,16	7,19	6,72	5,95	4,51	4,27	4,29	4,85

Resource: Ministry of finance

Short-term versus long-term variables

In the practical application of our analysis we will use some formulas where variables like “long-term liabilities”, “short-term liabilities” and “receivables” will appear. To make it clear, let us introduce following rules:

- The term long-term liabilities always include long-term liabilities and long-term bank loans.
- The term short-term liabilities include short-term liabilities and short-term bank loans.
- The term receivables means summation of short and long-term receivables. The reason is that the time differentiation in case of receivables is in some formulas useless, because even if some receivables are due in long-term, the money compensation can happen immediately. The thing is that we never know when our debtor will pay back his debt.

State versus flow variables

In the analysis of the economical system of the company we used source data from Balance Sheet and Profit and Loss Statement of the company. The problem was with the basic characteristics of data provided in these two statements. While Balance Sheet includes state variables the Profit and Loss Statement shows flow variables. The problem arises when we have to combine these two types of data in our calculations. To provide relevant information we had to recalculate the state variables from Balance Sheet (providing information about the state of individual items the end of the accounting period) to the average values. We simply summed up the values at the beginning and end of given year and divided it by two. The same procedure had to be done for all years in the monitored period. These average values were used mainly in the activity, profitability and cash flow ratios where state and flow variables were combined.

Other knowledge and assumptions

Output, Capital, Labor – as we know these variables can be expressed in many different units, however to keep uniformity of our calculations, we will use price units (CZK) for their quantification. Output can be represented by Revenue from production, Value Added or overall Revenues. Capital consists of consumption of material, energy, services and depreciation of fixed assets and labor is equivalent to paid wages. Overall inputs correspond to total costs during certain accounting period.

Reserves – even if they are included among liabilities they do not mean exactly debt. Reserves are only kind of retained earnings that serve for covering losses and other unexpected negative economic results. Obligatory reserves reduce the tax base therefore some economists consider it as a debt because of lower payment to the tax office.

EAT (earnings after taxes) – means economic result that can be found in the next to the last line of the Profit and Loss Statement.

EBT (earnings before taxes) – means economic result before taxes from the last line in the Profit and Loss Statement

EBIT (earnings before interests and taxes) - is a summation of the economic result before taxes and Interest Costs.

4.3. Applied analysis of technical-economical subsystem

4.3.1. Production and industrial classification

According to the Industrial classification of economic activities (OKEČ) that has been used for statistical purposes since 1994, the activity of Greiner Packaging Slušovice, s.r.o. belongs to the:

Section: D - Processing and manufacturing industry,
Subsection: DH - Production of rubber and plastic products
Group: 25.21 – Production of plastic packaging.

Since 1.1.2008 this classification has been replaced by Classification of economic activities CZ-NACE. (www.businessinfo.cz/cz/nace/ 2009). This classification takes into consideration technological development and structural changes of economy in the last 15 years. It is more relevant with respect to economic reality and is more comparable with other international classifications. According to the CZ-NACE, the classification is as follows:

Section: 22 – Production of rubber and plastic products
Subsection: 22.2 – Production of plastic products
Group: 22.22 – Production of plastic packaging

Product

The company Greiner Packaging Slušovice s. r. o. offers the widest assortment of packaging for foodstuff and nonfood products, tops, plastic foils, many technical parts and also various solutions for specific customers. Customers can choose the best alternative from wide range of products or they can have the concept developed according to their individual needs. The company lays stress on the fact that good packaging makes good product (www.greiner-gpi.com, 2009).

Philosophy of quality – Quality has to be produced

The quality of the products is one of the basic assumptions to have satisfied customers. There is an attempt to bring the quality to the place of its production, and to assign its good attributes to the worker who has produced it. The certificate ISO

9001/2000 is one of the proofs of perfectly functioning management of all processes in the firm, focused on quality standards of the products.

Production technology

The input material for production of plastic packaging is a mixture of granulate depending on type of the final product. As main examples of the material we can name polypropylene (PP), polystyrene (PS), polyethylene (PE), polyamide (PA), polycarbonate (PC) and polyethyltereftalate (PET). The exact process of production depends on technology used (www.greiner-gpi.com, 2009).

- **Extrusion blow moulding (vyfukování)**

The granulate (PE and PP) is melted in extruder of the machine and later pressed out in form of never-ending parison (předlisek, baňka). The parison is later closed into the form and blew into the cavity inside of the form. We can remove the product after cooling down. This technology is used mainly for canister, bottle and technical parts production.

- **Extrusion of the folio (extruze fólie)**

The granulate (PP and PS) is melted and pressed out in shape of thermoelastic folio. That is cooled down. This folio is a semi-product that is used in further production processes. It is possible to make folio consisting of more layers (usually the middle one is produced from recycled material)

- **K3 – can, cartoon, combination**

K3 is a modern technology originating in Switzerland and being very suitable for marketing purposes. The innovative combination of plastic and cartoon saves material and is easy to have the printing applied (from both sides).

- **Injection (vstřikování)**

The granulate (PP, PS, PE, PA or PC) is melted and injected under high pressure into the cavity of the form, where it is immediately cooled down. The plastic can falls out. This way of production is used for special packaging, because thanks to the injection it is possible to produce various shapes.

- **Injection and blow moulding (vstřikovyfukování)**

The melted granulate (PET, PP and PC) is injected into the shape of the parison, that already has the final upper part. Second machine stretches out the remaining parts according to the form. This technology is used for production of 5-gallon pots, bottles for milk, custard packaging etc.

- **Shaping of the folio (tvarování)**

The polypropylene or polystyrene folio is brought to the shaping machine. It is heated, pots are shaped and stabilized. The rest of the folio is automatically moved to recycling machine, where it is crushed and prepared as a raw material for further production. This technology is suitable for pots, tops and tray production.

The produced packaging is later **decorated** according to the customer's demands. There are also different ways of decoration like:

- **applied printing (potisk),**
- **labeling (etiketování)**

Above mentioned technological processes prove that the production of plastic packaging can be characterized as **mixed production** (combination of chemical processes and mechanical processing). Due to necessary temperature requirements (heating and cooling to predefined temperatures) the production is predominantly **continuous**. High level of mechanization ensures fluency of the process and proves highly **capital intensive production**.

Greiner Packaging Slušovice, s.r.o, as one of the biggest and most important producers and suppliers of the plastic packaging (not only for Czech and Slovak Republic) realizes **mass production** to be able cover the high demand for its products.

4.3.2. Measurement of productivity and intensity

For uniformity selected values from the Profit and Loss Statement that were used for calculation of factor productivity and production intensity were recalculated from nominal values to comparable prices with base year 1999. All variables in the

following table were converted into real values using different price indexes that are presented in the table 2.

Revenues from production, Value added and overall Revenues were recalculated using producer price index, wages and salaries using wage index, capital consumption (material, energy, services and depreciation) by interest rate index and overall costs by input price index. When calculating with these real values, we will get more relevant results.

Table 5: Selected indicators expressed in prices of year 1999

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Revenue from prod.	882341	852704	994997	959437	962995	950054	1028451	1369605	1518711
Value added	354920	303173	302609	305902	316404	277166	250677	298762,2	305915
Total Revenues	1061441	1083494	1229370	1209424	1125348	1167824	1212836	1561669	1759588
Wages and salaries	76820	78367	80653	83213	85874	71673	72444	79863	89144
Cons.of mat.,energy	440777	596036	775305	756233	842634	1211638	1575277	2271929	2338628
Consumed services	86646	103545	127993	160500	257916	279502	354731	339367,8	383960
Depreciation	133995	150802	138602	126734	133113	141713	129558	129692	117641
Total Costs	959725	1095150	1289838	1238098	1132690	1265590	1323160	1603960	1814869

Resource: author's calculation

Productivity of Labor

When calculating the profitability of labor, it is possible to create more modifications of the basic formula (where we divide output by labor). Selection of the concrete variables mostly depends on data available. Because we were working with the financial statements of the company we selected revenues from production and value added to represent the output. Amount of labor was expressed by wage costs. However, due to variability of working positions of employees (where not all of them are directly involved in production) and diversity in wage rates of different workers, we had to introduce **assumption**, that all units of labor are evaluated by the same wage rate. By this way we have calculated productivity of 1 CZK of paid wages. Simply, how much revenues or how big value added (in CZK) was produced by 1 CZK of paid wages.

When looking on the results in the table 6 we can see that productivity of labor from revenues rose from 11 486 CZK to 17 037 CZK that creates impression that the

company is using labor more and more effectively. However, if we focus on the productivity of labor from value added we can notice that it shows much lower results. And what is more it proves completely opposite trend. In years 1999–2007 the productivity dropped from 4 620 CZK to 3 432 CZK. The question now is which of these two results provides more relevant information. Generally, the productivity of labor from value added should be more correct, because it leaves out value of material, energy and services used for production. Simply, it expresses only the value created by workers. Therefore we may say that unfortunately the labor utilization is getting worse in time.

Calculation of productivity of Labor using wage costs is only one of many alternatives. If we had information about number of employees in individual years we would be able also to determine how much CZK can be generated by one employee. From the company's web page we know that it has about 600 workers now, we have no information about their numbers in previous years. Therefore we could calculate only productivity in the last year 2007, to have only approximate idea how much one employee could produce per year. However, we have to admit, that this number could be totally different if there was less or more employees.

Productivity per employee:

Productivity from Revenues from production = $1518711000/600 = \underline{2\,531\,185\text{ CZK}}$

Productivity from Value added = $305915\,000 / 600 = \underline{509\,858\text{ CZK}}$

Productivity of Real Capital

For productivity of capital calculation, we have used revenues from production as output and material, energy, services consumption and depreciation of fixed assets as expression of capital costs. Again someone could argue that not all fixed assets owned by the company are used directly for production of the output. This is right, as some part of the fixed asset depreciation belongs to the administrative and sales overheads. Unfortunately we are not able to say how big part it is, therefore we have made another **assumption** saying that overall assets depreciation takes part on creation of the output, therefore it was included in the productivity calculation as a

whole. At the same time, we have to state, that the productivity of capital can be strongly influenced by depreciation policy that the company applies.

According to the results in the table 6 the productivity of capital is in comparison to productivity of labor quite low. The values dropped from 1 334 CZK to 534 CZK per year.

Overall Productivity

When we look at the labor and capital used in production, we can see that paid wages are much lower than the capital costs. And when we compare them with the revenues from sales, it looks like the labor is much more productive than capital. However, this would be bad conclusion as the labor and capital can not be separated, they have to be combined in suitable proportions to reach satisfactory level of production. What is more, there are also other inputs involved in the production. From this reason it is very important to calculate overall productivity that summarizes productivity of all inputs (including labor, real and financial capital other input costs). Overall productivity compares total costs to the total revenues of the firm in comparable prices.

The results of overall productivity were relatively stable. Unfortunately they were decreasing in time. The values were usually lower than 1 000, that means that 1 CZK spent on inputs produced less than 1 000 CZK per year. Highest impact on the productivity can be assigned to the relatively low productivity of capital and its high employment in production. It seems that to reach profit, the company has to set quite high profit margin and produce large amount of products. This corresponds to the mass production that is typical for the firm.

Table 6: Productivity

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Prod.of Labor (Reven)	11 486	10 881	12 337	11 530	11 214	13 554	14 197	17 150	17 037
Prod.of Labor (Val.add)	4 620	3 869	3 752	3 676	3 685	3 867	3 460	3 741	3 432
Productivity of Capital	1 334	1 003	955	920	781	582	500	500	535
Overall productivity	1 106	989	953	977	994	923	917	974	970

Resource: author's calculation

Factors influencing productivity

We should not forget to say that the company Greiner Packaging Slušovice, s.r.o. tries to boost their productivity by many ways. First of all, the firm lays high impact on introducing of **new technology** and different **technological processes** that are described in bigger detail in the previous pages. The best success was brought by **technology K3** that has been invented in Switzerland. This technology enables creation of variously shaped products that can be decorated from internal as well as from an external side. Therefore it offers twice bigger area for text, decorations and other marketing tools. Moreover the combination of plastic and paper is more environmentally friendly as it is recyclable.

New technological processes enable to produce **innovative** products with various graphical design, decorations, shapes and also functions. We can name for example new plastic pot for creamy cheese is much better for the consumer than the aluminum packaging. There exist also new lids that have a spoon integrated inside, so the firm avoids extra spoon production and putting it into the pots. Some pots consist of two separate parts, where one of them can be used for marketing purposes (like plastic toys for children, etc) and the second one is filled by the typical food product. From above mentioned facts and from the company's mission we can judge, that Greiner Packaging Slušovice, s.r.o. considers its products to be a marketing tools that create successful brands on the market.

As the production is strongly dependent on capital, it is very important to maintain and extend its **technical equipment**. The new implemented technologies prove that the firm still works on renewing of the capital makes **investments**. The fixed property creates about 60 % of the overall assets of the company.

The Greiner Packaging, s.r.o. has been closely **specialized** on plastic packaging for food products. Later they started to produce packaging also for chemical substances and now they newly introduced also production of plastic technical parts that are supplied to many national as well as foreign companies.

The company belongs with its 600 employees among the most important employers in the region of Zlín. **Foreign capital**, high **quality management** and **interesting production program** represent basic safety for their current and also new potential employees. In the testimony of the firm is stated that they support individuality as

well as team work, respectful and reliable environment. They put impact on good **qualification** and **education of workers** to increase their **skill professionalism**.

Last but not least factor that helped to boost the productivity (mainly in the beginnings of the business) was the **political situation**. The company was founded soon after the Velvet revolution 1989 when the communism era finished. At that time, the new firms were ready to grow, supported by special governmental measures that should help recovery of the Czech economy.

Labor intensity

Similarly like in calculations of labor productivity, also labor intensity calculations can vary. As a measure of output we can use value added and overall revenues from production where depreciation, material, energy and services consumption were included.

In the first line of the table 7 we calculated intensity of labor from revenues from production – this says how much we had to pay to our workers to get 1 CZK of revenues (however here the revenues do not include only the labor but also contribution of capital). More reasonable are the values on the second line, that say how much the firm has to pay to its employees to obtain 1 CZK of value added (here the impact of material, energy and services consumption is eliminated). Again the trends between these two types of calculations have opposite trend. The values related to revenues are lower and are slightly decreasing, that could be interpreted that a bit less labor was needed to produce 1 unit of revenues. This corresponds to the slightly increasing productivity of labor from revenues. On the other hand, results related to value added were a bit higher and have increasing trend that is again logical with respect to the decreasing productivity of labor from value added.

Capital intensity

Capital intensity reaches values from 750 to 2 000 CZK that proves that the production is very heavily dependent on capital and on average we have to spend about 1 4000CZK on real capital consumption to gain revenues from production in the value of 1 CZK. The trend is increasing, that means that still more and more capital has to be involved in production – the production is more capital intensive.

Overall intensity

Overall intensity puts together all input costs. It expresses how intensively they are together used in the production. Values are slightly higher than 1 000 CZK. It means that the firm had to pay more than 1 000 CZK for production inputs to generate 1 CZK of revenues. These results are again strongly influenced by higher capital intensity of the production.

Table 7: Intensity

Item (CZK)	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Labor intensity (Rev.)	87	91	81	87	89	75	70	58	59
Labor intensity (Val.ad)	216	259	267	272	271	259	289	267	291
Cupital intensity	750	997	1 047	1 088	1 281	1 719	2 003	2 001	1 870
Overall intensity	904	1 011	1 049	1 024	1 007	1 084	1 091	1 027	1 031

Resource: author's calculation

4.4. Applied analysis of financial subsystem

4.4.1. Analysis of Balance Sheet

Evaluation of Structure of assets – Structural analysis

Overall assets of the company were constantly growing during the time. The value increased from 982 295 000 CZK in year 1999 to 1 848 756 000 CZK in year 2007. Simply we can say that the property of the Greiner Packaging Slušovice, s.r.o. doubled during the period. Now, we should analyze the development of the structure of the property.

From presented graph no. 1 we can see that the portions of individual asset groups were relatively stable, therefore we may assume that volume of fixed assets, current assets, receivables and inventories grew proportionally with the overall growth of the firm. It seems that the company has conservative policy and keeps amount of its property in constant ratios. Due to high profitability of the firm we may assume that this policy is ideal.

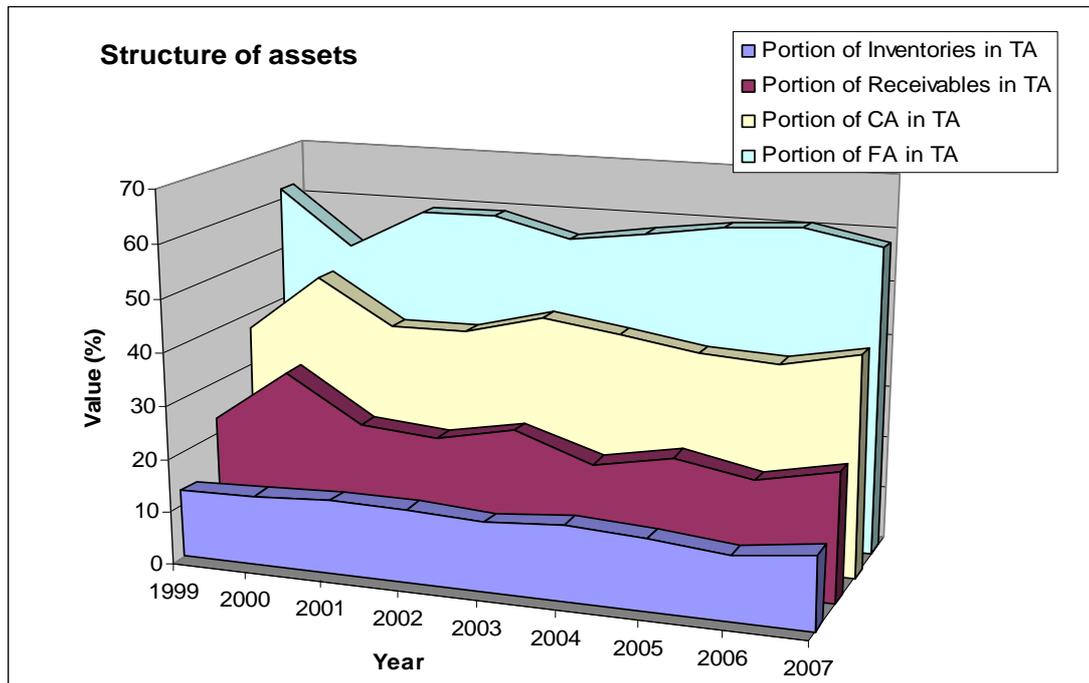
Quite high portion (about 60 %) of total assets is represented by **fixed assets**. The value of fixed assets rose from 609 625 000 to 1 075 095 000 during monitored period. These are mainly formed by tangible assets like machinery and buildings. This fact has its origin in manufacturing nature of the firm, high capital intensity of its production and investments into new assets due to implementation of new technologies. Another very important part of fixed assets includes long-term financial assets that proves that the company does not rely only on its production but tries to generate money also by acquiring of shares in other companies.

The remaining 40 % are represented by **current assets**. The only exemption was in year 2000 when the ratio of fixed and current assets was nearly 1:1.

Big part of overall assets is formed by **receivables** – mainly by short-term trade receivables. Their value increased during the time from 216 689 000 to 434 791 000 CZK. However, their amount in ratio to the total assets is constantly around 23 %. Only in year 2000, the value reached 33 % of total assets. Unfortunately we can not judge if this growth of receivables is caused by wrong credit and trade policy or if it is only related to higher production, higher sales and more job orders. More details about inventory management will be revealed in following page when calculating accounts receivable turnover and collection period.

Another substantial part of current assets is formed by **inventories** that are necessary for continuity of production and satisfaction of all customers (also in cases of unexpected higher demand). The company has its stable customers, the production is done round whole year (is not seasonal) and it has already experience with the volume of inventories that has to be on stock to ensure sufficient production. Level of inventories slightly fluctuates between 12 and 14,5 % of total assets and their absolute volume grows proportionally with the whole firm. Probably this constant level can be reasoned by the fact that the company has already field tested norms for its inventories.

Graph 1: Structure of assets



Resource: created by author

Circulation and turnover of capital

Velocity and time turnover of capital are indicators that should help to estimate time of fixation of money in various forms of assets. The **turnover of overall property** of the firm was slightly increasing in time. It used to be very low however since 2006 it overreached the value of 1.

Already the name “Fixed assets” signalizes that these assets are fixed in the company for a long time, therefore their circulation is much slower than circulation of current assets that are consumed in daily operations and therefore has to be supplied more often. **Fixed asset turnover** reaches maximal values of 1,81 that means that these assets stay relatively long time in the firm.

Absolutely different values could be seen when considering inventory and accounts receivables turnovers. This is because both forms of assets belong among current

assets. Due to manufacturing nature the firm, it very important to calculate inventory turnover and accounts receivables turnover.

Inventory is mainly composed by material and final products ready for sale. **Inventory turnover** increased from 6,58 to 8,23. This is very positive information for the company, because the circulation of inventories is speeding up. During the year 2007 it was able change purchased material into final products and sell them more that 8 times.

Talking about inventory it is also necessary to measure time of its turnover – simply, **days to sell inventory**. With respect to the velocity of the turnover, that has increasing trend, the time of turnover was declining. In the beginning of the monitored period it took 55 days to sell the inventory, however in 2007 only 44 days were needed for realization of sale of inventories. The fixation of money in inventories is relatively for short time therefore we may say that for the Greiner Packaging Slušovice, s.r.o, as a producer these results were very good.

Also **accounts receivables turnover** presents excellent results. This group of assets is mainly formed by short-term trade receivables that is typical for a manufacturing firm. The turnover velocity speeded up from 3,05 to 4,72 during the time and the **collection period** of receivables dropped from 120 days to 77 days. This might be caused by change of its credit policy and shortening of due (expiry) date of the invoices or by excellent payment morality of its customers. There was just one extreme in year 2003 when the collection period increased again and reached value of 101 days. We may guess that this year there were some problems with payment morality of its customers.

Now if we get back to the structure of assets and mentioned double increase of receivables during the years and if we put it together with excellent results of the turnover, we may say, that this rising volume of receivables is not dangerous and only corresponds to the extension of production and whole property of the firm.

Table 8: Velocity and time of turnover

Indicator	Year							
	2000	2001	2002	2003	2004	2005	2006	2007
Total assets turnover	0,8593	0,945	0,8692	0,889	0,8685	0,8989	1,0812	1,0773
Fixed assets turnover	1,5204	1,7045	1,4647	1,5412	1,5262	1,5228	1,785	1,8108
Inventory turnover	6,5815	6,9161	6,228	6,5937	6,3261	6,506	8,5058	8,2325
Days to sell inventory	55	53	59	55	58	56,102	42,912	44,336
Accounts receiv.turnover	3,0484	3,3106	3,6703	3,6168	3,7003	3,9783	4,8097	4,7163
Collection period in days	120	110	99	101	99	92	76	77

Resource: author's calculation

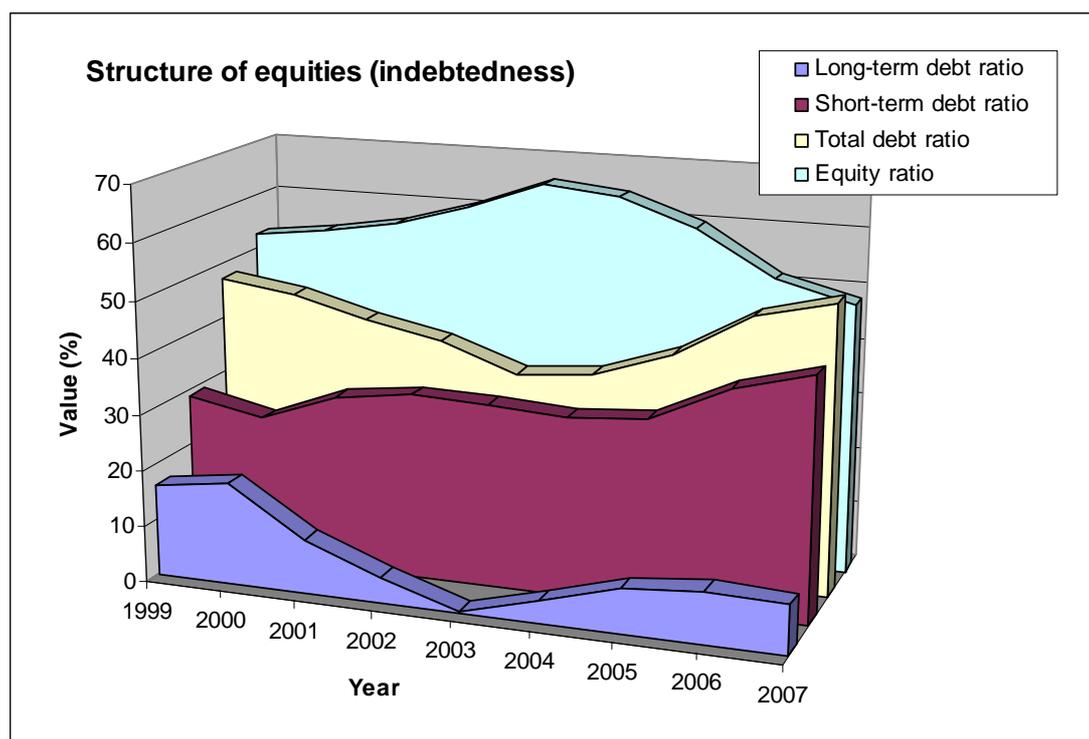
Evaluation of Structure of equities

According to the graph representing structure of equities we may obviously see that the overall capital is divided into **own equity** (represented by green color) and **Liabilities** (colored by yellow). These two forms of sources of capital are complementary. Therefore higher amount of owner's equity seen in years 2002-2005 is accompanied by lower level of total debts. In the beginning and middle of the period, the company kept higher portion of own resources (more than 50%) relatively to the liabilities. However, in last two years the amount of debts overreached owner's equity. If this trend will follow also in the future, it may lead to high undercapitalization and indebtedness of the firm.

This rising level of indebtedness in the final period is mainly caused by growth of **short-term debts** (in the last year reaching 43 % of overall capital). Before all they consist of short-term bank credits and partly also by increase of short-term trade liabilities. If we assume that short-term liabilities usually serve for financing of current assets, we can make conclusion that these debts were used for purchase of material that will be processed and sold in form of final products within short time, so the firm will be able to pay the debts back within one year. By taking more short-term debts the company supports and boosts its production and accelerates turnover.

The level of **long-term debts** – especially long-term bank credits - is fluctuating in the range from 18 to 4 %. This is mainly because of purchase of new fixed assets, mainly buildings and shares in other companies. Only in year 2003 the amount of long-term debt dropped to zero and accordingly at that time no new fixed tangible assets were purchased and amount of long-term financial assets declined.

Graph 2: Structure of equities



Resource: created by author

Optimizing the structure of financial base

When analyzing amount of debts and own capital that is used for financing of assets, we should not forget, that there should be some optimal ratio between these two sources. The optimal structure of financial base is usually in that point when the weighted average costs of capital (external as well as internal) are minimal.

Unfortunately due to changing conditions like interest rates and income tax rates in time, it would not make sense to calculate and create U curve expressing the optimal structure of the capital. Instead, I constructed graph of the weighted average costs of overall capital in individual years, respecting conditions that were valid for given years.

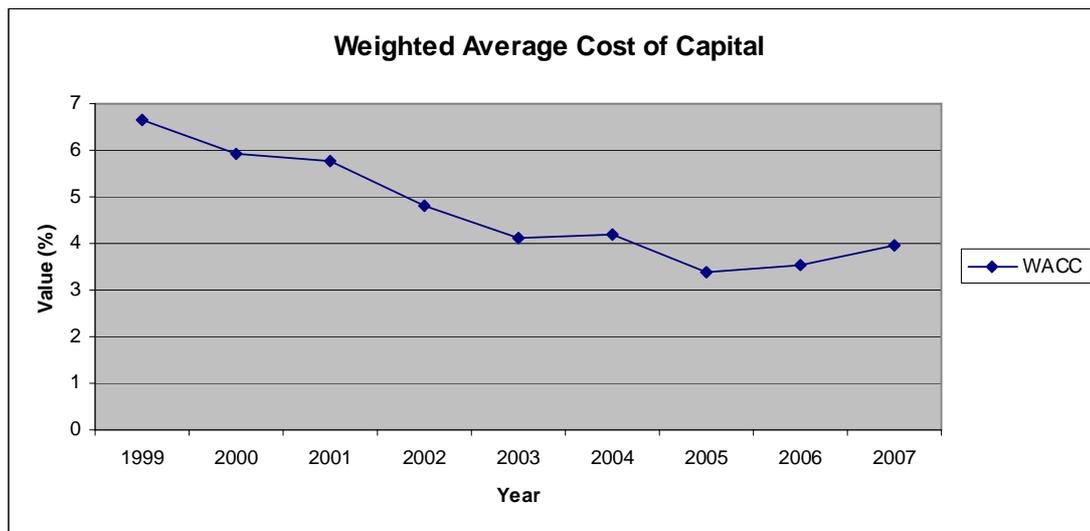
Costs of debt (represented by interest rate for commercial subjects), cost of own capital (evaluated by interest rate of non-risky state obligations) as well as income tax rates were decreasing in time. This fact contributed to decreasing trend of the curve on the graph regardless to the changing volumes of own and external resources.

According to the graph, Greiner Packagins Slušovice, s.r.o. had the lowest costs of overall capital in year 2005 when there was 40 % of debts and 60 % of owner's

equity. In that year the tax rate was 26 %, interest rate for commercial credits 4,27 % and interest rate for state obligations 3,52 %. Simply, in year 2005 there were better conditions for actual structure of its property than in other years.

The slight growth of weighted average costs of capital in last two years can be (beside the influence of changing interest and income tax rates) connected with the fact that debts overreached own capital.

Graph 3: Weighted average cost of capital



Resource: created by author

Liquidity and liquidness

From the graph presented below and from our theoretical knowledge of the formulas for liquidity calculation, it is logical that current ratio (considering overall current assets) reaches higher values than the quick ratio and also much higher values than cash ratio (as cash forms only small part of overall assets).

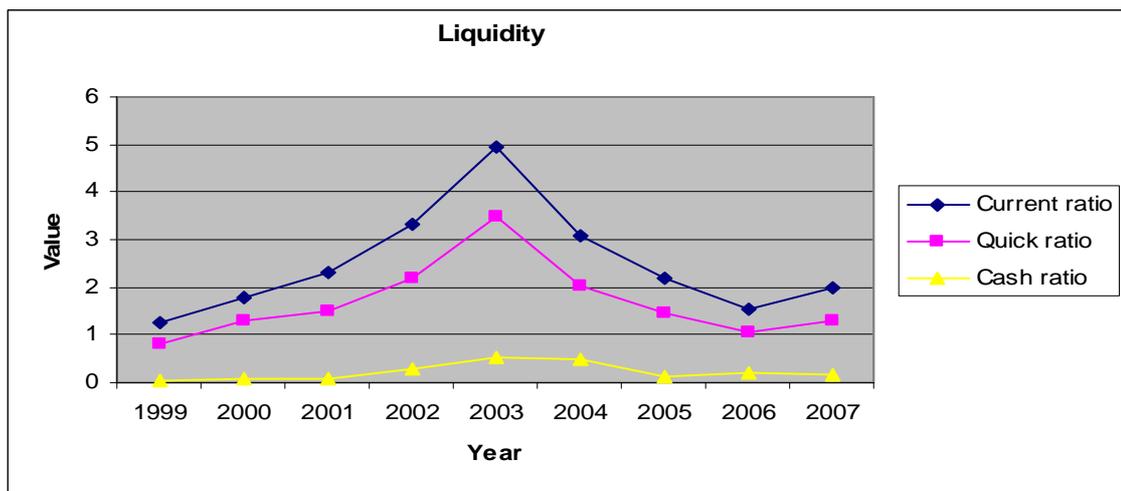
All three kinds of liquidity were extremely high in year 2003. In this year Greiner Pakcaging Slušovice, s.r.o. had higher volume of overall currents assets (mainly consisting of receivables and also a bit higher level cash and money on bank account). Short-term liabilities including the short-term bank credits were relatively similar to all other years (about 30 % of total capital). The most important factor of liquidity increase in this year was high amount of receivables. In this year they had probably problems with cashing of trade liabilities. The proof of worsened customer payment morality is also higher collection period. In year 2003 when getting into

troubles with cashing of receivables, the company did not make any investment in fixed assets and had also lower profits.

On the other hand the company had such amount of inventories that could cover its overall short-term liabilities 5 times and such amount of cash, that could cover short-term debts 3,5 times. Also the cash liquidity was higher in comparison to other years, however it would not be high enough to cover all short-term liabilities. It reaches only value of 0,5.

After the year, the liquidity dropped nearly to the initial level. Just since 2006 it started to increase again. The main factors are growing volumes of short-term receivables and inventories. The short-term liabilities went up as well (in comparison to previous period they rose to 43 %). However the calculated liquidities showed positive trend. In year 2007 the overall current assets would cover the short-time debts approximately 2 times, and the receivables and money 1,3 times. The cash liquidity is very low.

Graph 4: Liquidity



Resource: created by author

4.4.2. Analysis of Profit and Loss Statement

Profitability of capital

When considering the influence of tax rate on economic result of the company we have to compare indicators **ROA after taxation** and **ROA before taxation**. The amount of paid taxes is represented by the difference between pink and blue line

showed in the graph 5. Even if the tax rate was decreasing from 31 % to 24 % during the years, the percentage difference between these two indicators is approximately constant. Relatively higher tax was paid in year 2002 (that is connected also with higher earnings and also higher tax base in this year). On the other hand, a bit lower tax was paid in 2005 when the tax rate dropped to 26 % and also the performance of the firm was not so good (earnings before taxes were much lower than in other years). For these calculations we were evaluating profitability of overall (own as well as external) capital.

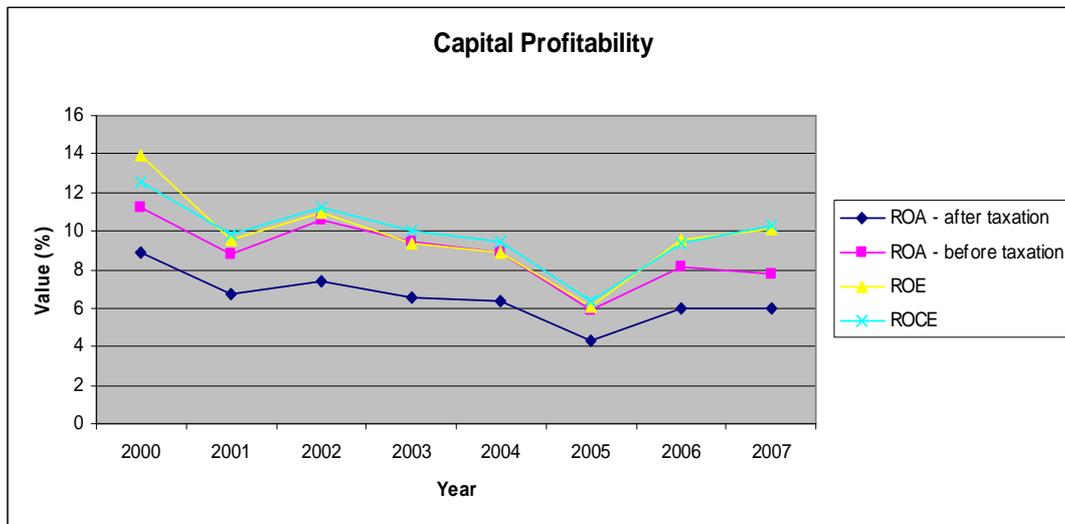
In case of evaluation of profitability of own equity **ROE** and evaluation of total long-term invested capital **ROCE** (including owner's equity and long-term debts) we can see that the curves had nearly identical shape and value.

To sum it up, we can say that even if the company had sufficient profit every year, the profitability of capital in individual years fluctuated. In year 2000 it reached excellent values that were slightly decreasing in following period. The critical time came in year 2005 when the profitability before taxation dropped to 6 % and profitability after payment of taxes fell to 4,31 %.

When thinking about potential reasons of this decline we have revealed that there was neither extreme decrease in produced volumes of output nor extraordinary increase of inputs used in production. Therefore we may assume that the negative change of profit could be caused by changes in productivity or prices. Index of prices of products were higher than one, therefore this would influence the economic result positively. The problem was in sudden increase of prices inputs. Generally the overall input prices compared to base year 1999 were slightly decreasing in years 2000-2004, but in year 2005 the input price development nature got increasing tendency. Probably that was the surprising point for the firm that caused unexpected decline on profits.

However, important is that in next two years the company managed to deal with it and started to generate higher profits again. ROA after taxes increased for 2 % and in case of ROE and ROCE nearly for 3,5 %. More detailed expression of price and non-price influences on change of profit may be seen in following page.

Graph 5: Capital profitability



Resource: created by author

Profitability of sales, revenues and costs

If we calculated profitability of sales, revenues and costs, we could notice that all of these indicators had decreasing tendency. The biggest decline was in case of profitability of sales. The sales of goods and own products and services contributed to the generating of profit less and less. When looking at overall revenues and their profitability, we can see that the decline was a bit lower. This is caused that we include also other types of revenues – mainly those financial revenues and revenues from sale of fixed assets.

Profitability of costs also drops to nearly one half of its initial state. The question is what is the main reason for this decreasing trend. As we already know that volume of input and also output is growing in normal rate, it has to be caused by decreasing productivity of inputs and increase of input prices in last years.

Simply, from mathematical view, the reason for this general decline is that sales, revenues and costs approximately doubled during the monitored period. However, profit before taxation EBT increased only minimally.

Table 9: Profitability of sales, revenues and costs

Indicator	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
(%)									
ROS	10,98	8,706	5,626	7,388	6,644	6,623	4,196	4,869	4,688
ROV	8,935	6,839	4,516	5,758	5,731	5,384	3,607	4,311	4,022
ROC	9,882	7,464	4,789	6,274	6,248	5,824	3,793	4,579	4,244

Resource: author's calculation

Pyramidal decomposition of changes in profit

As mentioned in the theoretical part, the changes in profit can be caused by two types of factors: **Technical-Economic factors** that mean productivity of the inputs or intensity of production and **Financial factors** - for example prices of final products, prices of inputs, tax and interest rates and others.

In the following text we analyzed and expressed the influence of individual factors on change of profit between years. In the calculations we leaved out the impact of taxes and came out from basic knowledge, that:

$$\text{Profit (EBT)} = \text{Total Revenues} - \text{Total Costs}$$

After that we analyzed Revenue Part separately from the Cost part using the basic formulas:

$$R = Q * p \qquad Q = N * s \qquad C = N * w \qquad N = Q * (1/s)$$

To be able to come to desired results it was necessary to convert revenues and costs into comparable prices. To transform Revenues R into real value, we used producer price index. The result was corresponding to the volume of production Q. (Simply we have eliminated influence of price of production the total revenues and from the equation $R = Q * p$, the variable p disappeared and Q remained). The same happened in case of costs where we used for conversion into comparable form input price index. It means that from costs, the impact of input prices w disappeared and only Volume if inputs N remained.

Productivity was calculated always with respect to the year 1999 so the value was not disorted by increase or decrease of prices. The values correspond to the values in the table 6.

Table 10: Profit, Revenues and Costs in nominal and real values

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK									
NOM. VALUES									
EBT	101716	95187	75620	107868	101340	101388	70445	110022	115165
Tot.Revenues = R	1061441	1136585	1327008	1312005	1224460	1343106	1436720	1879545	2204578
Tot. Costs = C	959725	1041398	1251388	1204137	1123120	1241718	1366275	1769523	2089413
Productivity = s (base y.1999)	1,11	0,99	0,95	0,98	0,99	0,92	0,92	0,97	0,97
REAL VALUES									
Tot. Revenues (Vol.of output = Q)	1061441	1083494	1289609	1305478	1220798	1270677	1394874	1849946	2117750
Tot. Costs (Vol.of inputs = N)	959725	1095150	1226531	1201191	1101621	1254896	1298202	1656225	2002202

Resource: Author's calculation

For further calculations it was necessary to find out the indexes of all variables between individual years. Their list can be found in following table.

Table 11: Indexes

Item	Year								
	2000	2001	2002	2003	2004	2005	2006	2007	
INDEXES									
index of Revenues I_R	1,07079	1,16754	0,98869	0,93327	1,0969	1,0697	1,30822	1,17293	
index of Costs I_C	1,0851	1,20164	0,96224	0,93272	1,1056	1,10031	1,29514	1,18078	
index of Volume of output I_Q	1,02078	1,13464	0,98378	0,93048	1,03775	1,03854	1,28762	1,12674	
index of Volume of inputs I_N	1,14111	1,17777	0,95989	0,91486	1,11733	1,04549	1,21222	1,13149	
index of productivity I_s	0,89455	0,96337	1,02489	1,01707	0,92877	0,99336	1,0622	0,9958	
producer price index I_p	1,049	1,029	1,005	1,003	1,057	1,03	1,016	1,041	
input price index I_w	0,95092	1,02027	1,00245	1,01952	0,9895	1,05244	1,06841	1,04356	

Resource: Author's calculation

These indexes were substituted instead of the basic variables into the formulas. Next step was to make logarithm from all values in the equation, so we got summation instead of multiplication in the formula.

$$\begin{array}{lll}
 R = Q * p & I_R = I_Q * I_p & \log I_R = \log I_Q + \log I_p \\
 Q = N * s & I_Q = I_N * I_s & \log I_Q = \log I_N + \log I_s \\
 C = N * w & I_C = I_N * I_w & \log I_C = \log I_N + \log I_w \\
 N = Q * (1/s) & I_N = I_Q * I_{1/s} & \log I_N = \log I_Q + \log I_{1/s}
 \end{array}$$

The formulas had to be rearranged and extended in such way to get number 1 on the left side of the equation. After calculating concrete numerical values, we multiplied both sides of equation by 100, to get results in percentage (expressing % influence of variable on the other variable). These percentage values were later expressed in absolute values in thousands CZK.

Table 12: Impact of factors on change in profit

Item	Year							
	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK or %								
change in profit	-6529	-19567	32248	-6528	48	-30943	39577	5143
REVENUE PART								
absolute Δ in revenue R	75144	190423	-15003	-87545	118646	93614	442825	325033
absol. Δ in price of output p	52553,4	35143,7	6581,02	3797,49	71115,5	41068,6	26162,9	81880,2
% influence of Δ p on Δ R	70	18	-44	-4	60	44	6	25
absol. Δ in vol. of output Q	22590,6	155279	-21584	-91342	47530,5	52545,4	416662	243153
% influence of Δ Q on Δ R	30	82	144	104	40	56	94	75
absol. Δ in vol. of inputs N	337347	45525,8	16470,9	4689,72	212947	48306,9	19918	84770,9
% influence of Δ N on Δ Q	642	130	250	123	299	118	76	104
absol. Δ in product of input s	-284794	-10382	-9889,9	-892,22	-141831	-7238,2	6244,97	-2890,8
% influence of Δ s on Δ Q	-542	-30	-150	-23	-199	-18	24	-4
COST PART								
absolute Δ in cost C	81673	209990	-47251	-81017	118598	124557	403248	319890
absol. Δ in price of inputs w	-50327	22936,3	3007,53	22481,7	-12472	66593,3	103172	82075,7
% influence of Δ w on Δ C	-62	11	-6	-28	-11	53	26	26
absol. Δ in vol. of inputs N	132000	187054	-50259	-103499	131070	57963,7	300076	237814
% influence of Δ N on Δ C	162	89	106	128	111	47	74	74
absol. Δ in vol. of output Q	20563,5	144396	-20081	-83808	43772,1	49278,4	394160	229705
% influence of Δ Q on Δ N	16	77	40	81	33	85	131	97
absol. Δ in intens. of prod. 1/s	111437	42657,3	-30177	-19691	87298,3	8685,21	-94084	8109,67
% influence of Δ 1/s on Δ N	84	23	60	19	67	15	-31	3

Resource: Author's calculation

Increase or decrease of profit always depends on level of revenues and costs. Revenues were mostly increasing, only in year 2002 and 2003 they dropped down. The growth and decline of costs was corresponding to the revenues. Costs were mainly increasing, just in years 2002 and 2003 decreased. Changes in revenues and costs can be caused by changes in volume of inputs/outputs and price of inputs/outputs. Volume of inputs/outputs can further depend on productivity of inputs and intensity of production. These influences are expressed in percentage and numerical values in table above.

The most extreme changes in profit were monitored in year 2002, where it increased by 32 248 000 CZK in comparison to the previous year. Another extreme came in year 2005 when there was a bad period for the firm that resulted in decline of profit by 30 943 000 CZK. This huge profit decline was followed by enormous growth of profit by 39 577 000 in next year. Let us see the possible reasons for these enormous changes and how big was their impact.

Year 2002 – the main reason for profit increase was extremely high decline of costs (they dropped by 47 251 000 CZK) relatively to revenues. Very important influence (106 %) originated in lower input consumption (it decreased by 50 259 000). This impact of volume of inputs was slightly moderated by growth of input prices (approximately by 3 008 000 CZK). If we focus on the volume of inputs we can see that the decline was by 40 % caused by lower volume of production and by 60 % influenced by low overall productivity.

Year 2005 – in this year very high decrease in profit (by 30 943 000 CZK) was monitored. In comparison to previous year, Revenues increased by 93 614 000 CZK and costs by 124 557 000 CZK. This enormous increase of costs was the main reason for negative economic result development. Therefore we focused on cost part again. The extreme growth in costs was by 53 % caused by increase in input prices and by 47 % by higher consumption of inputs that reached the absolute value of 57 964 000. If we analyze this amount in bigger detail, we can see that high input consumption corresponds to higher output production (by 49 278 000) and also to higher production intensity (8 685 000) in comparison to previous year. The higher production contributed to growth of input consumption by 85 % and intensity of production by 15 %.

Year 2006 – profit growth of 39 577 000 CZK can be explained by growth of revenues by 442 825 000 CZK and growth of costs by 403 248 000 CZK compared to year 2005. Both sides (revenue also cost) contributed to this optimistic economic result development. Higher revenues were caused by 85 % by higher volume of outputs produced and also by 25 % increase in output selling prices. The produced volumes that were in value of 243 153 000, were positively influenced by volume of

inputs employed (104 %) and negatively influenced by worse productivity (-4 %). The crucial impact (75 %) on increase in costs had the volume of inputs. By 25 % it was influenced by growth of input prices. Volume of inputs (234 814 000) was resulting from 97 % from higher volumes of products produced. Only small impact was originating in higher production intensity.

4.4.3. Analysis of Cash Flow Statement

Cash Flow liquidity and degree of discharge form debts

For cash flow liquidity and degree of discharge from debts calculation we used operating cash flow before payment of taxes and interests. The results express to what extent the cash flow connected with basic operations covers short-term debts and bank credits. All calculated values show that operating cash flow covers short-term debts maximally up to 88 %, however in some years (for example in 2000 or 2007) they are much lower as in these years cash flow from operating activity was minimal. In case of degree of discharge from debts we measure how the operating cash flow before taxes and interests would cover overall debts. Because in this case we include short-term as well as long-term debts, the results are even lower.

Financial profitability of overall and own capital

In case of financial profitability we have to take into consideration total cash flow after taxes and payment of interests (including cash flows from investment and financing activities that represent mostly outflow of money). We have put this value in ratio with overall and also with own capital. Values of financial profitability of overall capital are naturally lower than values of profitability of own capital, because they include also liabilities. The results were absolutely random, depending mainly on cash flow change in individual years. If the total cash flow was negative (like in years 2001, 2005 and 2007), the profitability is also negative. Highest profitability of own and also overall capital was reached in year 2006, surprisingly exactly between the two years were the profitability was below zero. We can not connect these irregular results with bad management or operations. We already know that cash flow is not

synchronized with revenues and costs, so we may assume that these fluctuations probably depend on maturity dates of company's receivables and debts.

However, as the company has reached negative results of total cash flow in some years, it should be more careful about dealing with money to avoid possible insolvency and lack of money for further development.

Table 13: Cash Flow indicators

Indicator	Year							
	2000	2001	2002	2003	2004	2005	2006	2007
CF liquidity	0,02	0,88	0,55	0,46	0,5	0,23	0,47	0,03
Degree of discharge from debts	0,01	0,6	0,45	0,43	0,47	0,2	0,38	0,02
Fin.profitability of overall capital (%)	0,38	-0,11	1,66	1,53	2,62	-4,09	3,72	-1,49
Fin.profitability of own capital (%)	0,72	-0,21	2,84	2,42	4,03	-6,61	6,73	-2,99

Resource: author's calculation

5. Summarization

The main goal of every company is to generate profit, to meet expectations of owners of the firm and potentially to attract new investors. It reflects the abilities of managers to coordinate company's activities and it signals if some changes have to be implemented. At the same time stable profitability of the firm ensures safe working positions for its employees and the company will be trustful subject for all creditors and banks. Naturally, the higher the profit, the higher is the income into the state budget.

Beside the external factors like income tax rates, interest rates etc., generating of profit depends on structure of the firm's property and way of its financing, utilization of capital, economic operations and correct decision making of the firm about inputs and outputs, their amounts, kind and price. The aim of this diploma thesis was to evaluate so called technical-economical and financial subsystem of the firm that enabled us to identify and quantify influence of different factors on the profit.

During the monitored period there was suitable environment for running business. The corporate income tax declined by 11 %, interest rates (cost of capital) decreased as well. During first five years, growth of prices of industrial producers was accompanied by decline of prices of inputs that created ideal conditions for production. However, since 2005 the input prices started to grow more rapidly and the company had to deal with higher production costs. Therefore it caused decline in this year profit declined rapidly. It seems that the company was able to accommodate its production to this input price growth and generated high profits in last years again. From the technical-economical analysis we could judge **productivity of inputs** and **intensity of production**. Productivity of all factors of production is declining that negatively influences the economic result. On the other hand, the production intensity increases that corresponds with worse productivity.

Greiner Packaging Slušovice, s.r.o. has suitable **structure of the property** (with respect of type of production) and until 2006 it also kept optimal capital structure where amount of liabilities was lower than extent of owner's equity. However, this situation changed and in last year debts overreached owner's equity that might be dangerous in the future. Positive information is that it retains decreasing **weighted average cost of capital**. In the last year it dropped to 4 %.

Good economic result is supported by increasing **turnover velocity and time** of all measured forms of assets (fixed assets, inventories and receivables). **Liquidity** is except for the year 2003 in reasonable limits. However, the cash ratio is very low. The **profitability of capital** did not vary so much (except for the year 2005) because neither EBT nor structure of capital changed dramatically. On the other side, the **profitability of sales, revenues and costs** declines in time (in 2007 it dropped to one half of the value of the year 1999). The main reason is that the volume of revenues and costs nearly doubled from the beginning of the period while extent of EBT increased only minimally.

6. Recommendation and conclusion

By performing analysis of technical-economical and financial system of the firm using well known indicators and formulas we were able to obtain numerical results quite easily. Much more difficult was their correct interpretation, investigation of factors leading to these results, identifying the problematic ones and to suggest possible measures to improve them. The overall performance of the firm is very good however there are still some areas where the management should focus its attention.

The results of technical-economical analysis evaluating productivity of labor, capital and overall productivity are not optimal. The absolute values are satisfactory and high enough, however the trend of their development is on decline and influences the economic result by negative way. The task of the firm is to find potential resources of factor inefficiency and boost their productivity to stop the negative development tendency. Possible solutions for labor productivity support can be training of employees, higher motivation or better working conditions. On the other hand the capital productivity may be improved by equipment renewal and investment in new technologies. This might increase fixed costs but on the other side it would reduce material consumption and labor costs. Consumption of capital is much higher than consumption of labor – production is capital intensive. Therefore, improvement of capital productivity is much more important than increasing productivity of labor that is involved in production only minimally.

Greiner Packaging Slušovice, s.r.o. extends all forms of its property evenly therefore there are no extreme changes in asset structure. The excellent results of activity ratios, including turnover velocity of total assets, fixed assets, inventory and receivables prove excellent utilization of property and inventory and accounts receivables management. Accordingly, collection period and days to sell inventory is still shorter so no improvements in this area are necessary.

As volume of company's property has doubled also resources for its financing grew by the same amount – partly in retained earnings, reserve funds, but mainly in

liabilities. Therefore the structure of assets is more variable. During mid of the monitored period owner's equity reached nearly 70 % while by the year 2007 debts already overreached own capital that is not optimal. High indebtedness increases danger of insolvency and it will be sign of incredibility for banks and creditors. Therefore it would be better to use for financing of assets rather from own resources (depreciation, profit, sale of unnecessary fixed assets) even if it is usually more time consuming and expensive than using liabilities and it would probably increase weighted cost of capital that was relatively low in 2007.

From results of liquidity ratios that were relatively low with respect to standard values it is clear that the company has to focus on reduction of short-term liabilities. Another solution for the low cash liquidity would be sale of old and unnecessary fixed asset. This operation would generate cash that could be used to pay the short-term liabilities.

The profitability development is positively influenced by excellent turnover of assets. However, there are still areas that might lead to improvement of the firm's ability to generate and increase profit. First, it is the already mentioned improvement of productivity of inputs. Secondly, Greiner Packaging Slušovice, s.r.o. should be more careful about costs of production that are connected with unexpected input price growth since 2005. Both problematic factors are related to cost part of the profit. Unfortunately, from the view of external observer it is very difficult to say if the big growth of costs in last years was really caused only by higher input prices or if the costs were made higher artificially by management to reach lower tax base.

Another way how to increase profits is to focus on the revenue part. The company could imply higher prices of outputs or to produce even higher volumes. But this would be only the alternative solution as these factors are not the main source of the problem.

Company's cash flow is rather unstable and varying all the time, therefore the indicators related to this financial statement can not be used to make any serious resolutions. The company should be careful about negative cash flow results occurring in some years, that might lead to insolvency.

To sum it up the overall economic-technical and also financial situation of the company is very good, however still there are some areas that deserve more attention - mainly strict control and reduction of short-term liabilities and costs of production and by boosting productivity of capital. By implementing above mentioned suggestions the firm could reach excellent production and trade performance that would be reflected in level of generated profit.

In conclusion, I would like to stress that this analysis was performed on at basis of provided financial statements of the firm but without any opportunity to discuss the findings with the company's management or accounting department. Because of my position as an external observer and due to the limited information I had, the observations might be different from any other official results evaluating performance of the firm.

7. List of graphs, tables and pictures

Graphs:

Graph No.1: Structure of assets

Graph No.2: Structure of equities

Graph No.3: Weighted average cost of capital

Graph No.4: Liquidity

Graph No.5: Capital profitability

Tables:

Table No.1: Basic information about Greiner Packaging Slušovice, s.r.o.

Table No.2: Output and input price indexes

Table No.3: Corporate income tax rates

Table No.4: Interest rates of state obligations and of commercial credits

Table No.5: Selected indicators expressed in prices of year 1999

Table No.6: Productivity

Table No. 7: Intensity

Table No.8: Velocity and time of turnover

Table No.9: Profitability of sales, revenues and costs

Table No.10: Profit, Revenues and Costs in nominal and real values

Table No.11: Indexes

Table No.12: Impact of factors on change in profit

Table No.13: Cash Flow indicators

Pictures

Picture No.1: Economical system of a company

Picture No.2: Capital neutral growth

Picture No.3: Capital saving growth

Picture No.4: Capital intensive growth

Picture No.5: Circulation of capital

Picture No.6: Weighted average cost of capital

Picture No.7: Pyramidal decomposition of profit

Picture No.8: Logo of Greiner Packaging, s.r.o.

8. References

- [1] GREGA, L. a kol, *Podnik a jeho ekonomický system*, Brno: MZLU v Brně, 1999. 90s.
- [2] ŽIVĚLOVÁ, I. *Finační řízení podniku I.*, Brno: MZLU v Brně, 2003. 106 s. ISBN 80-7157-339-6
- [3] ŠEVELA, M. *Microeconomics I*, Brno: MZLU v Brně, 2005.120 s. ISBN 80-7157-819-3
- [4] KOVANIC, P., KOVANICOVÁ, D. *Poklady skryté v účetnictví – I. díl: Jak porozumět účetním výkazům, IV.* vydání. Praha: POLYGON, 1997. 248 s. ISBN 80-85967-47-2
- [5] VALACH, J. a kol. *Finanční řízení podniku*, 1. vyd. Praha: EKOPRESS, 1997. 248 s. ISBN 80-901991-6-X
- [6] RŮČKOVÁ, P. *Finanční analýza*, 1. vyd. Praha: GRADA Publishing, a.s., 2007. 120 s. ISBN 978-80-247-1386-1
- [7] MLČOCH, J. *Praktický průvodce podnikovou ekonomikou*, 1.vyd. Praha: Management press, 1996. 229 s. ISBN 80-85943-11-5
- [8] Ministry of justice of Czech Republic
<http://www.justice.cz>
[cit. 2009-10-15]
- [9] Czech statistical office (ČSÚ)
[http://www.czso.cz/csu/redakce.nsf/i/cr: makroekonomicke udaje/\\$File/hlmakro.xls](http://www.czso.cz/csu/redakce.nsf/i/cr: makroekonomicke udaje/$File/hlmakro.xls)
http://www.czso.cz/csu/2002edicniplan.nsf/publ/7004-02-za_prosinec_2002
[cit. 2009-10-20]
- [10] Ministry of finance of Czech Republic
[cit. 2009-10-20]
http://mfcr.cz/cps/rde/xchg/mfcr/xsl/makro_pre_50256.html

- [11] Greiner packaging Slušovice, s.r.o. web page
[cit. 2009-10-15]
http://www.greiner-gpi.com/CzechSlusovice/csy/3660_3726.asp
http://www.greiner-gpi.com/CzechSlusovice/csy/3660_3724.asp
<http://www.greiner-gpi.com/CzechSlusovice/csy/3664.asp>
- [12] Greiner group web page
[cit. 2009-10-15]
<http://www.greiner.at/eng/25.php>
- [13] business.center.cz
[cit. 2009-9-23]
<http://business.center.cz/business/pravo/zakony/obchzak/cast1.aspx>
<http://business.center.cz/business/pravo/zakony/obchzak/cast2h1d1.aspx>
<http://business.center.cz/business/pravo/zakony/zivnost/cast1.aspx>
- [14] wikipedia.org
[cit. 2009-9-23]
<http://en.wikipedia.org/wiki/System>
<http://en.wikipedia.org/wiki/Analysis>
<http://en.wikipedia.org/wiki/Productivity>
- [15] www.businessinfo.cz
[cit. 2009-9-23]
<http://www.businessinfo.cz/cz/nace/>
- [16] economics.about.com
[cit. 2009-9-23]
http://economics.about.com/cs/macrohlp/a/nominal_vs_real.htm
http://economics.about.com/cs/studentresorces/a/short_long_run.htm
- [17] az-data.net
[cit. 2009-9-23]
<http://www.az-data.net/dan-z-prijmu-pravnicky-osob.php>

9. List of attachments

Attachment No.1: Balance Sheet – Assets (shortened version)

Attachment No.2: Balance Sheet - Equities (shortened version)

Attachment No.3: Profit and Loss statement (shortened version)

Attachment No.4: Cash Flow statement (shortened version)

Attachment No.1: Balance Sheet – Assets (shortened version)

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK									
Total assets	982295	1095693	1158822	1194312	1181890	1332625	1415647	1662931	1848756
Fixed assets	609625	564849	685106	711291	659337	771635	850656	1014073	1075095
1. Intangible assets	164	73	993	2657	2979	16766	20338	13929	7533
Software	164	73	993	2657	0	1596	20338	13929	7533
Valuable rights	0	0	0	0	2979	0	0	0	0
Unfinished intang.ass.	0	0	0	0	0	15170	0	0	0
2. Tangible assets	609461	522668	493704	502995	482106	479350	502355	581566	647750
Land	4699	4699	4699	4900	6776	6776	6826	6826	6826
Buildings	259266	256211	244798	261642	277960	291540	311675	307915	382429
Single and sets of tang.ass.	336528	254295	216948	196439	162508	164364	158251	173039	217590
Unfinished tang.ass.	6658	6388	20204	39074	21474	16364	18303	90140	38824
Provided adv.paym.on tang.ass.	2310	1075	7055	940	13388	306	7300	3646	2081
3. Long-term financial a.	0	42108	190409	205639	174252	275519	327963	418578	419812
Shares in companies	0	0	94989	168825	168905	273006	327963	418578	419812
Other long-t.securities	0	0	68876	0	0	0	0	0	0
Povided loans	0	42108	26544	36814	5347	2513	0	0	0
Current assets	366218	528149	463469	479798	519946	558651	561529	645775	771016
1. Inventories	126005	145303	162758	165637	154729	190491	189233	202089	257444
Material	57725	72148	82215	72378	74756	104626	94782	118187	145498
Semifinished products	1458	187	2216	5760	1525	546	0	0	57
Products	66732	72917	77401	87328	78172	84898	94275	77976	99696
Goods	90	51	883	141	36	50	24	237	808
Provided adv.paym.on invent.	0	0	43	30	240	371	152	5689	11385

Attachment No.1 - continued: Balance Sheet – Assets (shortened version)

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK									
2. Long-term receivables	6869	2303	2303	7741	5839	3654	3159	3174	4928
Trade receivables	1246	311	99	6052	0	0	0	0	2476
Long-t. provided advance payments	0	0	0	0	3899	1368	981	661	278
Other receivables	5623	1992	2204	1689	1940	2286	2178	2513	2174
3. Short-term receivables	216689	359899	279060	268142	302330	278376	335811	349892	444139
Trade receivables	196960	294440	254716	247028	249661	253697	310675	343353	434791
Receivables in companies	0	0	0	2607	31811	4500	0	0	0
State - tax receivables	19551	9820	21262	14284	8830	10233	17849	0	0
Short-t. provided advance payments	0	0	0	0	7216	6356	3265	1442	1573
Conjectual asset accounts	11	11	15	623	370	12	461	1415	4238
Other receivables	167	55628	3067	3600	4442	3578	3561	3682	3537
4. Short-term financial ass.	16666	20655	19363	38901	57048	86130	33326	90620	64505
Cash	583	512	367	527	238	240	483	196	205
Bank account	16083	20143	18996	38374	56810	75647	24418	60910	53857
Short-t. securities and shares	0	0	0	0	0	10243	8425	29514	10443
Other assets	6441	2684	10232	2600	2607	2339	3462	3083	2645
1. Accruals and deferrals	6441	2684	10232	2600	2607	2339	3462	3083	2645
Costs connect.with future acc.period	497	262	1110	2596	2607	2339	3461	0	0
Incomes connect. with fut.acc.period	0	138	0	4	0	0	1	0	0
Changes in exchange rates	5944	2284	9122	0	0	0	0	0	0

Attachment No.2: Balance Sheet - Equities (shortened version)

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK									
Total equities	982295	1095693	1158822	1194312	1181890	1332625	1415647	1662931	1848756
Owner's equity	517858	595292	655025	722965	775719	857406	843706	858146	890581
1. Obligatory capital	399770	399770	399770	399870	399870	399870	399870	399870	399870
2. Capital funds	0	0	0	-7334	-24254	-14369	-19412	-28797	-27563
Difference in valuation of property	0	0	0	-7334	-24254	-14369	-19412	-28797	-27563
3. Reserve funds	23200	27922	31787	34774	38498	42887	45985	46001	45230
Obligatory reserve funds (indivisible)	18360	23110	27000	30000	33800	37400	40000	40000	40000
Statutory and other funds	4840	4812	4787	4774	4698	5487	5985	6001	5230
4. Econ.result from prev.years	45	89869	163538	220105	291429	356703	365435	360047	384373
5. Econ.result from curr.year	94843	77731	59930	75550	70176	72315	51828	81025	88671
Liabilities	463496	496292	486885	469414	405753	475219	571941	804785	955620
1. Reserves	19491	12537	15359	21963	20364	660	0	689	5407
2. Long-term liabilities	0	0	0	0	407	4593	11362	16870	20839
Deferred tax liability	0	0	0	0	407	4593	11362	16870	20839
3. Short-term liabilities	129127	96751	90398	89411	103217	133451	158848	282926	254109
Trade liabilities	116648	70 255	67154	77395	89358	121999	144842	216028	219996
Liabilities for partners, shareholders	0	0	0	0	0	0	0	50000	0
Liabilities for employees	172	3002	185	6284	6860	5924	6424	7599	8939
Liab.for soc.and health.insurance	2718	3654	3125	3288	4024	3418	3357	4160	4768
State - tax liabilities and dotations	760	7520	13640	942	1135	928	975	1797	4679
Short-t.accepted advance payments	0	0	0	0	293	156	1615	131	2356
Conjectual equity accounts	0	1230	190	559	807	695	1388	1835	13069
Other liabilities	8829	11090	6104	943	740	331	247	1376	302

Attachment No.2 - continued: Balance Sheet - Equities (shortened version)

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK									
4. Bank credits	314878	387004	381318	358599	281765	336515	401732	504300	675265
Long-term bank credits	160186	198200	110014	54788	1840	47500	97500	133500	136500
Short-term bank credits	154692	188804	271304	303811	279925	289015	304231	370800	538765
Other equities	941	4109	16722	1374	418	0	0	0	2555
1. Accruals and deferrals	941	4109	16722	1374	418	0	0	0	0
Expenses connect.with fut.acc.per.	310	550	835	858	418	0	0	0	0
Revenues connect.with fut. acc.per.	621	897	273	516	0	0	0	0	2555
Changes in exchange rates	10	2662	15614	0	0	0	0	0	0

Attachment No.3: Profit and Loss statement (shortened version)

Item Thous.CZK	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Commercial margin	2	-49	-1	-55	471	80	-42	309	5
Revenues from sale of goods	1020	511	915	403	628	2482	972	622	95
Costs on goods sold	1018	560	916	458	157	2402	1014	313	90
Revenue from production (výkony)	882341	894487	1074021	1040815	1047808	1092650	1218298	1648387	1902785
Rev.from sale of products, services	862917	892298	1064379	1022217	1055564	1089472	1234276	1663626	1891464
Changes on stock by own activity	16956	731	7331	15401	-15331	2528	-15978	-15239	11321
Activation	2468	1458	2311	3197	7775	650	0	0	0
Costs of sales (výk.spotřeba)	527423	576409	747378	708912	703537	773883	921347	1289121	1519511
Consumption of material, energy	440777	491095	641478	584797	576947	628825	774043	1121585	1305218
Consumed services	86646	85314	105900	124115	176594	145058	174304	167536	214293
VALUE ADDED	354920	318029	326642	331848	344271	318767	296951	359575	383279
Personal costs	105415	116105	130110	145326	160493	141779	150539	177078	210953
Wages and salaries	76820	83382	93367	104036	113590	100779	106956	125691	150399
Social and health insur. expenses	26864	29172	32621	36373	40038	35320	37497	44252	52808
Social expenses	1731	3551	4122	4917	6865	5680	6086	7135	7746
Taxes and fees	486	615	467	510	373	361	370	648	4705
Depreciation	133995	124251	114678	98004	91142	73547	63661	64025	65657
Rev.from sale of FA, mater.	162650	225734	230909	179415	153381	218414	183876	182156	226115
Residual value of FA, material	139523	186154	205980	155230	135966	191698	165137	153874	185816
Change in reserv.,time adjustm.	12562	3294	4016	-163	0	0	0	0	0
Change in rectifying items	-17065	-3055	4784	14007	-6379	-15780	6255	-4468	-3734
Other operating revenues	1944	4351	7078	61243	4942	16066	18538	21267	44807
Other operating costs	5999	8513	13603	71445	13820	28794	25837	28237	41730
OPERATING RESULT	129593	112715	111591	115835	107650	132928	87524	143604	149074

Attachment No.3 - continued: Profit and Loss statement (shortened version)

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK									
Reven.from sale of securities	0	0	0	0	0	7000	0	0	0
Securities sold	0	0	0	0	0	7000	0	0	0
Rev.from reval.of secur.,derivat.	0	0	0	0	0	0	119	0	1102
Cost on reval.of secur.,derivates	0	0	0	0	0	0	29	1191	0
Changes in reserves, adjustm.	5663	3660	-6838	9122	0	3823	0	0	0
Interest revenue	4461	7042	7371	6640	6357	2479	979	1392	1545
Interest cost	17898	21099	23891	16548	11013	10632	10045	14680	21990
Other fin. revenues	8890	4383	6700	23489	11344	11015	13938	25721	28129
Other fin. costs	17726	10432	19252	30670	12998	30579	22041	44824	42695
FINANCIAL RESULT	-27936	-16446	-35910	-7967	-6310	-31540	-17079	-33582	-33909
Inc.tax from common activity	6852	17791	15709	32318	31164	29073	18617	28997	26494
ER FROM COMMON ACTIVITY	94805	78478	59972	75550	70176	72315	51828	81025	88671
Extraordinary revenues	135	77	14	0	0	0	0	0	0
Extraordinary costs	76	1159	75	0	0	0	0	0	0
Inc.tax from extraord.activity	21	-335	-19	0	0	0	0	0	0
ER FROM EXTRAORD. ACTIV.	38	-747	-42	0	0	0	0	0	0
ECONOMIC RESULT (EAT,NI)	94843	77731	59930	75550	70176	72315	51828	81025	88671
ER BEFORE TAXES (EBT)	101716	95187	75620	107868	101340	101388	70445	110022	115165

Attachment No.4: Cash Flow statement (shortened version)

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK	1999	2000	2001	2002	2003	2004	2005	2006	2007
Level of cash - beginning of period	13963	16666	20655	19363	38901	57048	86130	37149	90620
CF from OPERATING ACTIVITY									
Ec.Result from common activity before taxes	101657	96102	75681	107869	101340	101388	70445	110022	115165
Adjustment for-non cash operations	147438	133358	124653	80676	84947	61789	68949	63946	73382
Depreciation of FA	134745	126145	114678	98004	91142	73547	63661	64025	65657
Changes in reserves, ajdust.and costs of next periods	967	3026	-4962	-22966	-6379	-11957	6255	-4468	-3734
Profit/Loss from sale of FA	-1711	-9870	-1583	-4269	-4472	-7954	-10033	-8899	-8986
Revenues from dividends, shares on profit	0	0	0	0	0	0	0	0	0
Cost and revenue interests	13437	14057	16520	9907	4656	8153	9066	13288	20445
Other non-cash operations	0	0	0	0	0	0	0	0	0
Net CF from operating activity before taxes I.	249095	229460	200334	188545	186287	163177	139394	173968	188547
Non-cash changes in working capital	-29110	-224279	85298	20573	-5975	40143	-35642	87730	-169191
Changes in receivables, conjectual asset accounts, accruals and deferrals	-52595	-152677	86537	28395	-31856	39193	-57525	-13899	-87289
Changes in sh.t.liabilities, conjectual equity accounts, accruals and deferrals	67048	-57802	20204	-7291	12850	29816	18628	113960	-26262
Change in inventories	-43563	-13800	-21443	-531	13031	-28866	3255	-12331	-55640
Change in sh.t. financial assets (except for cash)	0	0	0	0	0	0	0	0	0
Net CF from operating activity before tax II.	219985	5181	285632	209118	180312	203320	103752	261698	19356
Interest expenses	-17898	-21099	-23891	-16548	-11013	-10632	-10045	-14680	-21990
Interest incomes	4461	7042	7371	6640	6357	2479	979	1392	1545
Paid tax from common activity	-19261	-3348	-13084	-29561	-29909	-47534	-20801	-7900	-17321
Incomes and expenses from extraord.activity	59	-1082	-68	0	0	0	0	0	0
Accepted dividends, shares on profit	0	0	0	0	0	0	0	0	0
Net CF from operating activity	187346	-13306	255960	169649	145747	147633	73885	240510	-18410

Attachment No.4 - continued: Cash Flow statement (shortened version)

Item	Year								
	1999	2000	2001	2002	2003	2004	2005	2006	2007
Thous.CZK									
CF from INVESTMENT ACTIVITY									
Expenses connected with FA purchase	-118637	-82989	-235649	-134668	-94874	-203248	-153895	-247186	-140237
Incomes from sale of FA	4714	12939	872	6528	9913	31449	16404	17985	19037
Provided loans and credits	0	0	0	0	34716	2834	2683	0	0
Net CF from investment activity	-113923	-70050	-234777	-128140	-50245	-168965	-134808	-229201	-121200
CF from FINANCING ACTIVITY									
Changes in long.t., sh.t.liabilities	8459	87345	-22278	-21695	-76834	54750	65216	102569	170965
Changes in own capital influencing level of cash	-79179	0	-197	-276	-521	-513	-60485	-56584	-57470
Increase of cash as result of increase of basic capital	0	0	0	100	0	0	0	0	0
Payment of shares on own capital to partners	0	0	0	0	0	0	0	0	0
Cash gifts and dotations into own capital	0	0	0	0	0	0	0	0	0
Paid loss by partners	0	0	0	0	0	0	0	0	0
Payments from funds	-179	0	-197	-376	-521	-513	-515	16	-1470
Paid dividends, share on profit	-79000	0	0	0	0	0	-59970	-56600	-56000
Accepted dividends, shares on profit	0	0	0	0	0	0	0	0	0
Net CF from financing activity	-70720	87345	-22475	-21971	-77355	54237	4731	45985	113495
Net increase / decrease of cash (190+196+208)	2703	3989	-1292	19538	18147	32905	-56192	57294	-26115
Level of cash - end of period (166+209)	16666	20655	19363	38901	57048	89953	29938	94443	64505