ČESKÉ VYSOKÉ UČENÍ TECHNICKÉ V PRAZE

Masarykův ústav vyšších studií
Katedra inženýrské pedagogiky

Investment Appraisal of a Company

Hodnocení Efektivnosti Investice ve Firmě

Bakalářská práce

Studijní program: Ekonomika a management

Studijní obor: Řízení a ekonomika průmyslového podniku

Vedoucí práce: Prof. Ing. František Freiberg, Csc.

Enkh-Uyan Saruultugs

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Zásady pro vypracování:

- Teoreticky zpracujte základy investičních projektů
- Uveďte možné zdroje financování investičních projektů
- Určete kritéria hodnocení efektivnosti
- Charakterizujte jednotlivé metody hodnocení efektivnosti investičních projektů
- Zpracujte a vyhodnoťte konkrétní investiční projekt ve firmě

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Rozsah práce bez příloh: 30-50 stran

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- GÖTZE, Uwe, Deryl NORTHCOTT a Peter SCHUSTER. *Investment appraisal: methods and models*. Berlin: Springer, c2008, xv, 391p. ISBN 978-354-0399-681.
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Abstrakt

Cílem této bakalářské práce na téma „Hodnocení efektivnosti investice ve firmě“, je provést zhodnocení efektivnosti nakoupeného strojního zařízení firmou MCS Coca Cola LLC, na základě dat poskytnutých podniku.

Teoretické část se věnuje zpracování literární rešerše zaměřená na investiční činnost podniku. Praktická část se věnuje konkrétní investici, na níž je demonstrováno využití jednotlivých metod hodnocení investic. Závěr této práce tvoří vyhodnocení výsledků a rozhodnutí, zda je či není investice pro podnik efektivní.

Klíčová slova

Investice, peněžní toky, návrat, investiční rozhodování, výnosnost

Abstract

The aim of this bachelor thesis with the topic “Investment appraisal of a company”, is to evaluate the effectiveness of purchased machinery by MCS Coca Cola LLC, on the basis of gained data from the company.

The theoretical part engages in literature review focused on the investment behaviors of the company. The practical part is devoted to a particular investment, where it is demonstrated by using different methods of investment appraisal. The conclusion of this thesis constitutes the assessment of the results whether it is an effective profitable investment for the company

Key words

Investment, cash flow, return, investment decision, profitability

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Introduction

The investment represents devote of financial means, which are expected to return within a few years. During this awaiting period, lot of changes that could affect the profitability of investments or even changes that could result in loss of invested means may occur. To minimize these risks, there exists so-called investment appraisal to analyze the effectiveness of the investment. It is a way that reveals the investment partially and informs the investors about how the investment will progress. The reason, why I chose this topic is that investment and the necessity to set aside the current consumption for the sake of financing and its implementation capability is a routine issue for both business and family budgets. Investment decisions have the long-term, financially significant impacts borne by the investor and may be liquidating for a given entrepreneurial entity. It is an important activity that should be concerned by executive directors and top management.

The purpose of this thesis and of course the aim of analyzing and evaluating the effectiveness of investments is to ascertain whether the investment is acceptable and fulfilling the required amount of return by using the information that we have considering all external influences and risks. The whole thesis is divided into two main parts – theoretical and practical, and five chapters.

The first part of my thesis (theoretical framework) consists of chapter one, which provides the basic information on investment behavior, and chapter two, that deals with the criterions and methods of investment appraisal. The second part of this thesis (practical framework) will focus on the investment project of a particular company. This part is entirely drawn up in cooperation with a company named MCS Coca Cola that is located in Ulaanbaatar, Mongolia. I chose this company, because I am from Mongolia and was an internship in the summer of 2014 at the department of finance. Although the company is relatively young, it has become one of the leading soft-drink producing companies in Mongolia in the last decade. As it is clear from the topic, my job is to analyze and evaluate the effectiveness of the investment, which was implemented in early 2014. The subject of this appraisal is to determine the most realistic identification of cash flows and define the profitability of the investment for the time horizon from 2014 to 2023. Since the investment was already implemented last year, my output won't be the decision on accepting or rejecting the investment, but verify its current situation according to the prognosis for the next years of its lifetime.

THEORETICAL FRAMEWORK

1. Introduction to the Investment Behavior

1.1. Investment

The word ‘investment’ originally stems from the Latin word ‘investire’ which means ‘to clothe’. Nowadays, the term ‘investment’ has many different meanings and is used in three disciplines - which are economics, business and finance. If we identify each of them, *economic investment* refers to the net addition to the capital goods, while *business investment* refers to the money invested in the business and *financial investment* refers to shares, real estate, debentures, government securities, fixed deposits etc. (Rachchh Minaxi A., 2010, p. 489). The scope of the thesis is restricted to economic investment since it will be valuating capital investments in a company.

As I was studying all these books, I have found out that there is no single, collectively used definition of investment. However, there is a multitude of slightly different definitions in the literature - most of them are quite similar to the following two examples mentioned below. AS 13 mentions that “Investments are assets held by an enterprise for earning income by way of dividends, interest, rentals, for capital appreciation or for other benefits to the investing enterprise”. Martina Röhrich (2007, p. 2) presents a slightly broader and more general definition of investments “An investment involves the sacrifice of an immediate level of consumption in exchange for the expectation of an increase in future consumption” or we could also say that it is the current commitment of money or other resources in the expectation of reaping future benefits.

1.1.1. Macroeconomic Perspective

In macroeconomics, investment is defined as the usage of savings that are for the production of capital goods, or else for the development of technology and for the acquisition of human capital. This means sacrificing today’s (certain) value for the purpose of obtaining future (usually less certain) values and further it quantitatively represents the difference between gross domestic product and the sum of consumption of the government purchases and net exports. From a macroeconomic point of view, we can distinguish between the following investments:

- **Gross investment** is the sum of the newly purchased capital goods, changes in business inventories, sometimes referred to as *inventory investment*, and the purchases of new residential housing. (Roger A. Arnold, 2008, p.140) It consists of two parts: the replacement investment, which is required to keep the capital stock intact and the net investment that is required to expand the existing capital stock.
- **Net investment** is an accretion to the stock of capital. To arrive at net investment, a deduction is made from gross investment for producer's durable equipment and the existing structures that are used in the production process. Therefore it is equal to gross investment minus depreciation. (Agarwal Vanita, 2010, p.122)

1.1.2. Corporate Perspective

According to the corporate concept, investments are goods that are not intended for an immediate consumption but for the further production in the future. (Translation from Synek, 2007, p.452) This implies that investments are larger expenses that are expected to transform into future return within a long period of time. Therefore used expenses are called capital expenditures. (Translation from Valach, 2006, p.156)

If a company doesn't deal with an issue of investment as a fundamental issue of its future survival, then it will not be able to function well and stand out in the competitive environment in a long term. All means of production are in fact obsolete over time. Physical things get worn out over time and intangible things become obsolete and old-fashioned. To preserve its business it is necessary to address the issue of investment for upgrading or buying new means of production, which will replace the outdated ones. Most organizations plan to expand their activities in the future, and this trend may lead to an overall growth of the company. Existing equipments and production capacity may be no longer sufficient, and therefore it will be necessary to invest in the purchase of another asset. (Translation from Scholleová, 2009, p. 13)

1.2. Classifications of Investment

Investments can be classified in several ways. In terms of financing, accounting and tax assessment; investments are classified into **three basic categories:** (Translation from Valach, 2006, p.156)

- **Financial investment** such as purchase of long-term securities (bonds, mortgage debentures, long-term promissory note), deposits in other companies (stocks, share lists), long-term loans, purchase of real estate in order to trade in them and get interests, dividends or profit.
- **Physical investment** creates or expands the production capacity of the company. They are construction of new buildings, structures, roads; purchase of estate, machineries, means of transport that are needed for the further production(with an acquisition price of more than 40 000 Crowns and an applicability of longer than 1 year). It is marked as a fixed asset.
- **Intangible investment** (non-financial) such as the purchase of know-how, licenses, software, copyrights; expenses on research activities, schooling, social development; expenses on the foundation of the company and others. If the intangible investment is worth less than 60 000 Crowns, the cost of it will be included in operating expenses. (Translation from Synek, 2007, p.452)

Another way to classify investment is according to possible causes for investment. Since the thesis will be concentrating on capital budgeting, here is another classification enclosed. The following classification (adapted from Kern, 1974, p.14) shows a differentiation of physical investment projects:

1. **Foundational investments** are linked with a start-up and they can be either investment in a new company, or in an existing company's new branch at a new location.
2. **Current investments** are replacement, major repair or general overhaul investments: a simple replacement investment is characterized by the substitution of equipment without a change in its characteristics.
3. **Supplementary investments** refer to investments in equipment in existing locations and they can be classified as:
    - *Expansion investment* leads to a rise in either the capacity or the potential of a company.
    - *Change investments* are characterized by the modification of certain features of the company for varying reasons. (e.g. rationalization, diversification)

- *Certainty investments* are those that aim to reduce risk in a wider sense. (e.g. buying shares in suppliers of raw material or in research and development companies)

The final, very important, classification criterion is the level of uncertainty an investment entails. A situation of perfect certainty in regard to the effects of investments rarely exists, since investments generally show long-term future effects. However, uncertainty can vary substantially and it is possible to differentiate between relatively certain or uncertain investment projects. (Uwe Götze, 2008, p.4)

1.3. Investment Decision

Investment decision is one of the most important categories of the company decisions. It is about deciding whether to accept or reject the individual investment projects that are arranged by the company. The larger these projects are, the greater the impact they may have on the company and its surroundings. It is clear that the success of individual projects can significantly affect the company's business prosperity and contrarily their failure can cause significant difficulties that may lead to the downfall of the company. (Translation from Fotr, Souček, 2005, p. 13)

From the definition above, we can see that decisions on investment projects have a direct impact on the ability of an organization to meet its goals. For investment decision making, we usually use as a valuation base the fact whether the investment project benefits the shareholders.

The decision making process consists of different stages:

1. Planning.
2. Identifying the alternatives to be considered and their transformation into workable proposals.
3. Appraising the alternatives and selecting the best one with regard to the organization’s goals is the third step. In order to select an investment opportunity and to decide whether the firm is better off or not after implementing the investment, appraisal techniques are used. The basic question is whether the benefits of an investment are worth the outlay. this is not yet the end of the decision-making process. After having decided which investment to undertake.
4. Implementing the decision.

5. The final stage entails reviewing the selected investment project. (Röhrich, 2007, p. 2)

1.4. Investment Strategy

According to Valach, an investment strategy includes various procedures that help us achieve desired investment goals. In regular business practice of investing, it is possible to identify several types of investment strategies.

A) In terms of maximizing the market value of the company:
   - **Strategy to maximize annual revenue** – in this case, investor prefers the highest annual revenues and doesn't care about the growth of investment's value nor its maintenance. It is applicable during low inflation.
   - **Strategy of investment's price growth** - Investor prefers projects with the biggest increase in the value of the original investment deposit. This type of investment strategy is applicable especially during higher rates of inflation, which devalues the regular annual revenue. However, as a result of higher inflation, the future value of assets grows rapidly.
   - **Strategy of investment's price growth associated with the maximum annual revenue** – Investor selects those projects that will bring both growth of investment's value in the future, and growth of annual revenues.

B) In relation to the risk:
   - **Aggressive investment strategy** - Investor prefers projects with high risk, but when there is also a possibility of high profitability.
   - **Conservative strategy** - Investor proceeds carefully and chooses those projects that show minimal risk, and yet also with lower rate of return. This strategic approach is typically used in case of portfolio investments, which absorbs the possible risks.

C) In terms of expected changes in the dynamics of inflation:
   1) **Strategy of maximum liquidity** – Investor prefers projects, that show the highest ability to convert into money, which means the most liquid ones. These kinds of investments naturally have less profitability. This strategy is used if the company has problems with their liquidity or if in the near future there will be a sudden change in the rate of inflation.

Characteristics of the types of investment strategies that are mentioned above show that the choice of one or another option is due to the specific conditions in which the company invests with specific goals in given period. (Valach, 2006, p.141)

1.5. Phases of Investment Project

The investment project is a set of technical and economic studies used for the preparation, implementation, financing and efficient operation of the proposed investment. (Translation from Valach, 2001, p. 37) The life cycle of an investment project can be broken into three different stages: the pre-investment phase, the investment phase, and the operational phase. The pre-investment phase includes all the studies, investigations and pilot tests that take place prior to the decision of investment by the project sponsors and financiers. The investment phase concerns the implementation as such of the project and takes place following the decision of investment by the project's sponsors. The operational phase starts when the project benefits start being reaped. Following the end of the operational stage, an evaluation or post-evaluation of the project can be conducted. (J.M. Ribeiro, 2011, p. 12)

1.5.1. Pre-Investment Phase

The pre-investment phase is characterized by various studies that take place in logical progression, each more detailed than the last. Over the course of the pre-investment process, the project matures through the various interactions among the project's sponsors and stakeholders as the project's various facets are continuously evaluated, validated and refined. A pre-investment phase for a development project can take about two years depending on the effective due diligence by the different players and the availability of funding. In the first stage of the pre-investment phase, the project owner will define the key idea and purpose of the project in a project Concept Note (CN). The CN results from a brainstorming session on the various ways to address the identified problem or development opportunity. (J.M. Ribeiro, 2011, p. 13)

Following the preparation of the CN, an Opportunity Study (OS) is normally conducted in order to do preliminary assessment of the project's potential profitability. The principal objective of the OS is to raise the interest of potential financiers for the project. At this stage, subject to a conclusive OS, the government can forward a request for financing to potential financiers.

Subject to a conclusive OS and identification report, the project sponsors, meaning the government and financiers, can have a pre-feasibility study (PFS) drawn up by a consulting firm. The aim of the PFS is to study in further detail the various technical options for implementing the project, assess their respective cost, financial and economic viability and environmental acceptability, and prioritize them. When the PFS is completed, the financiers will normally undertake a preparation mission in order to review the conclusions of the PFS and report to their management with recommendations as to pursue with the project financing or not.

If all the sponsors agree that the project is of interest following the PFS, a full feasibility study (FS) is conducted. The objective of the FS is to provide a detailed assessment to the first-ranked option defined in the PFS with sufficient precision in terms of costs so as to lay the groundwork for the project's budget preparation and enable financial commitments by the different sponsors. The FS finalizes the project formulation process. On the base of the FS the financiers normally prepare an Appraisal Report (AR) that will seek to justify their involvement in the project with respect to their relevant strategies and policies and to provide detailed budget and financing information on the basis of the PFS. Once the AR is approved by the financiers' boards, the pre-investment phase comes to an end. (J.M. Ribeiro, 2011, p. 14)

1.5.2. Investment Phase

The investment phase starts with the financiers' decision to go ahead with the project. The investment phase is characterized by major project management efforts in general and the procurement of civil works, goods, or services in particular. Various reports are produced, including progress reports by the borrower, super-vision reports, financial audit reports and a mid-term review report by the financier. The mid-term review is a key stage that takes place mid-way through project implementation and that aims to revisit the project design to address the constraints faced so far. (J.M. Ribeiro, 2011, p. 15)

1.5.3. Operating Phase

The operating phase includes the commissioning and start-up of the economic infrastructure created by the project, regular operation and maintenance including the eventual replacement or repair of parts of the infrastructure or the infrastructure as a whole, and eventually expansion or innovation to upgrade or widen the project's benefits.

Following the end of the operating phase, although that moment is rarely identified as such in development projects the project will normally be decommissioned. In practice, this is mostly applicable to industrial projects. (J.M. Ribeiro, 2011, p. 16)

<table>
<tr><td rowspan="2">Phase</td><td rowspan="2">Content</td><td colspan="2">Role of Borrower</td><td rowspan="2">Financier's Milestones</td></tr>
<tr><td>Activity</td><td>Output</td></tr>
<tr><td rowspan="4">I</td><td rowspan="4">Pre-investment phase</td><td>Opportunity, need or problem analysis</td><td>Project concept note (or business concept)</td><td></td></tr>
<tr><td>Preliminary assessment of project viability</td><td>Opportunity study, request for financing ⧖ ➡</td><td>Project identification ⧖</td></tr>
<tr><td>Screening and ranking of project's technical options</td><td>Pre-feasibility study ➡</td><td>Project preparation ⧖</td></tr>
<tr><td>Detailed analysis of selected option and establishment of budgets</td><td>⧖ Feasibility study ➡</td><td>Project appraisal</td></tr>
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<tr><td rowspan="4">II</td><td rowspan="4">Investment phase</td><td colspan="3">Loan negotiations and signing of financing agreement</td></tr>
<tr><td>Project definition and pre-production marketing</td><td>Detailed engineering design, training of staff or beneficiaries</td><td rowspan="2">Supervision reports, mid-term review reports, audit reports</td></tr>
<tr><td>Project implementation</td><td>Project plan, procurement, progress report</td></tr>
<tr><td>End of project implementation</td><td>Commissioning</td><td>Project completion report</td></tr>
<tr><td rowspan="2">III</td><td rowspan="2">Operating phase</td><td>Transfer to user entity</td><td>Operating manuals</td><td rowspan="2">Project post-evaluation</td></tr>
<tr><td>Operation</td><td>Project's benefits</td></tr>
</table>

Note: the sign ⧖ means that there will be a decision before proceeding to the next stage. The sign ➡ indicates subsequent action by the financier following the borrower's output.

(adapted from J.M. Ribeiro, 2011, p. 16)

1.6. Sources of Investment Financing

One of the most important components of investment decision in every company is the allocation of resources for financing the acquisition, renewal or extension of fixed assets.

Financing investment projects is based on long-term financial decisions on choosing the best option of obtaining financial resources (capital and money) and possible limitations of alternatives to the chosen subject of the project and their subsequent distribution. We can distinguish them between internal and external resources. (Translation from Tetřevová, 2006, p.38)

1) **Internal Sources of Financing Corporate Investments:**
   - Capital contribution
   - Depreciation
   - Retained earnings
   - Revenue from sale and disposal (Translation from Synek, 2007, p.289)
2) **External Sources of Investment Financing:**
   - Investment loan
   - Bond
   - Indirect short-term loan
   - Long-term reserves
   - Installment sale (Translation from Valach, 2006)
   - Leasing
   - Venture capital
   - Subsidies from the state or from the local budget

1.7. Risks Of Investment Decision

We all know what we mean by risk – the possibility that we will lose some (or all) of our initial investment. (Geddes, 2002, p.98) In an uncertain world, capital investment decisions have to be taken on the basis of expected project cash flows, which may or may not turn out to be the same as the cash flows that actually arise. Decision making involves taking a risk: the risk that the actual outcomes may differ from what expected. In our analysissi of the handling of uncertainty in financial decision making we shall use the two terms ‘risk’ and ‘uncertainty’ interchangeably. When reference is made to a risky investment decision, we are concerned with a situation where we are uncertain about that investment’s actual future outcome. (Lumby, 1994, p. 219)

1.7.1. Fundamental Sources Of Risk

Investment risk may be examined on the basis of the fundamental components (sources) of risk and making predictions of how future returns will be affected by each fundamental risk. Each asset class reacts slightly differently to individual sources of risk. There are many potential risks to the expected return in any investment, but for brevity the classification is limited to four main categories. (Geddes, 2002, p.98)

1) **Interest rate risk** – is the variability in return caused by changes in the level of prevailing interest rates. Fixed income securities are most directly affected as an increase in interest rates leads to a decline in the price of a bond. (Geddes, 2002, p.99)
2) **Purchasing power risk** – also known as inflationary risk, is the risk of unanticipated inflation occurring during the holding period of an asset. All expected returns contain a real expected return (assuming no inflation) and an estimate of future inflation to form a normal expected return. If inflation turns out to be greater (or less) than anticipated, the real return will be lower (higher) than anticipated. (Geddes, 2002, p.99)
3) **Business risk** – reflects the uncertainty of cash flows generated by the firm's business. Government securities contain no business risk. (Geddes, 2002, p.99) It refers to the possibility that the issuer of a stock or a bond may go bankrupt or be unable to pay the interest or principal in the case of bonds. A common way to avoid this kind of risk is to diversify- that is, to buy mutual funds, which hold the securities of many different companies. (Investopedia, series 6, chapter 10)
4) **Financial risk** – is associated with the degree of debt in a corporation's capital structure. Typically, the higher the debt/ equity (gearing) ratio, the riskier the return on a company's securities. (Geddes, 2002, p.99)

2. Criterions and Methods of Investment Appraisal

2.1. Essence of Investment Appraisal/Capital Budgeting

Appraisal of investments in projects that are anticipated to have a life longer than one year is also called capital budgeting. Capital budgeting usually involves an investment followed by a number of years of revenues and profits. Corporate managers, seeking to increase shareholder wealth (i.e. the value of their firm) have a number of choices with respect to investment decisions. These might include:

- Investment in new equipment (hardware) or technology (software) in order to reduce future operating costs.
- Investment in equipment or plant to enable an expansion of production

- Investment in the development of new products or services to offer to existing or new customers. (Geddes, 2002, p.58)

Let's first determine the term capital. Firms continually invest funds in assets, and these assets produce income and cash flows that the firm can then either reinvest in more assets or pay to the owners. These assets represent the firm's capital. Capital is the firm's total assets, which includes all tangible and intangible assets. These assets include physical assets (such as land, buildings, equipment, and machinery), as well as assets that represent property rights (such as accounts receivable, securities, patents, and copyrights). When we refer to capital investment, we are referring to the firm's investment in its assets. The term "capital" can also mean the funds used to finance the firm's assets. In this case, capital refers to notes, bonds, stock, and short-term financing. (P. Peterson, J. Fabozzi, 2002, p.3)

Because a firm must continually evaluate possible investments, capital budgeting is an ongoing process. However, before a firm begins thinking about capital budgeting, it must first determine its corporate strategy, which is the broad set of objectives for future investment. (P. Peterson, J. Fabozzi, 2002, p.6) The decisive criteria for assessing investment is its:

- Profitability (return) – is the relationship between income (brought by an investment during its existence), and expense (costs of the acquisition and operation)
- Risk – the level of uncertainty, whether it will bring the expected returns
- Payback Period (also known as the level of investment's liquidity) – is the period of investment's transformation back to its monetary form

The ideal investment is the one that has high return, risk free and pays as soon as possible. In reality, these criterions are totally opposite: investments with high return are usually very risky, and the highly liquid investments with low risks are again relatively low profitable. Therefore the essence of investment appraisal is the comparison of the invested capitals (expenses on the investment) with returns that the investment will bring. It is basically about budgeting one-time expense and annual returns over the lifetime of the investment. Return on investment is the increase in profit (profit after tax) and an increase in depreciation, which is returned to the firm in the price of sold products. Collectively, these two (and some others) constitutes cash flow, which is the basis for decisions on investment projects. The final result of capital budgeting is the decision, whether to carry

out the investment or in case of evaluating multiple investment options, which option to use. (Translation from Synek, 2007, p.292)

The most important unit of analysis in evaluating capital investments is the project's anticipated cash flow. Cash flow is the most important measure because a firm's suppliers of raw materials and services expect to receive cash payment. A company that cannot meet its financial obligations will face bankruptcy. According to Geddes (2002, p.61), the cash flows involved in investment appraisal can be grouped in four categories. They are capital investment, working capital, operating cash flow and taxation.

2.2. Investment Appraisal Process

In literature, we can encounter with many different investment appraisal processes. Let's mention only the few that are used most in practice. Peterson and Fabozzi (2002, p.6) divided the capital budgeting process into five stages, which are:

1) Investment screening and selection
2) Capital budget proposal
3) Budgeting approval and authorization
4) Project tracking
5) Post-completion audit

However, Ross Geddes (2002, p.58) presents slightly broader, more general division: "the process of capital budgeting or investment appraisal can differ from company to company, but will almost always consist of four elements." These four elements are:

- Idea generation and investment proposal
- Evaluation of project proposals
- Application of acceptance/rejection criteria
- Ongoing evaluation and monitoring

Although, processes mentioned above were both commonly applicable, the most suitable process for this thesis is Synek's (2007, p.292) process of investment appraisal. It consists of four steps:

1. Determining the Capital Expenditures
2. Estimating the Risk and Return

3. Determining the Discount Rate
4. Calculating the Present Value of Expected Return (Expected Cash-Flow)

2.2.1. Determining the Capital Expenditures

Capital expenditures can be defined as the funds that are used by a company to upgrade or acquire physical assets such as industrial buildings, property or equipment. This kind of outlay is made by the companies to increase or maintain the scope of their operations. These expenditures can also include everything from repairing a roof to building a brand new factory.

Determining required capital expenditures for investment in the purchase of new manufacturing equipment is not a complicated issue. These investment costs include the market value of purchased equipment, the cost of transportation and installation, or else the costs of the investment project documentation. If a company, within the investment, produces tangible assets in its own overhead, then it will be evaluated as its own cost that was spent. Regarding the additional expenditures on research and development, training of experts on safety or protection of nature, it is impossible to always determine them precisely, and so they are determined more likely by estimate. However, in practice we encounter this situation frequently, which brings severe economic difficulties to the companies. (Translation from Synek, 2007, p.293)

Capital expenditures can be expressed by following models:

$$C = I + O - R \pm T$$

Where: C = Capital expenditure

I = expenses on the acquisition of fixed assets

O = expenses on permanent increase of net working capital

R = revenue from the sale of existing replaced fixed assets

T = tax effects (plus or minus) (Adapted from Valach, 2006, p.56)

If capital expenditure is pursued more than one year, it is necessary – for the purpose of capital planning and investment evaluation – to discount the expenditure using the corresponding discount factor. (Translation from Valach, 2006, p.56)

2.2.2. Estimating the Revenue

The next step after determining the expenditure is the determination of future cash flows from investments and revenue which will be brought by the investment. Because there are many factors that can affect the estimation of future return, it is not an easy discipline. Managers should be very cautious and conservative. If the investment returns are more than expected, everyone will be satisfied. If there is less return, not only no one would be satisfied, but the company would squander their money unnecessarily. (Translation from Bermanová, 2011, p. 174)

Returns from investments are all the expected revenues, generated by the investment during its acquisition, lifetime and disposal. Their starting point is the expected after-tax profit enriched by depreciation and other possible returns from the investment project. As we have mentioned before, determining the return value of investment project is the most challenging part of the process of capital planning and investment decisions. The reason is that the return is generated throughout the whole project's lifetime. (Translation from Valach, 2006, p.51)

In the current financial management theory, the annual return from the investment project during its lifetime is considered as:

- After-tax profit, that is brought by the investment every year
- Annual depreciation
- Changes in current assets (of net working capital) associated with the investment project during its lifetime (increment reduces return, loss increases return)
- Revenue from sales of fixed assets at the end of their lifetime, enriched by tax (Translation from Valach, 2006, p.57)

The overall concept of return from the investment project can be formally expressed as:

$$R = P + A \pm C + S \pm T$$

Where: R = total annual return from the investment project

P = annual increment in after-tax profit, which is brought by the investment (interests from the loans are not included in expenses)

A = increment in annual depreciation due to the investment

C = change in current assets (more precisely, net working capital) as a result of investing during its lifetime period (decrease +, increase -)

S = net income from the sales of assets at the end of lifetime

T = the tax effect from the sales of assets at the end of lifetime. (Translation from Valach, 2006, p.57)

To obtain the present value of return, it is necessary to discount them in every single year.

2.2.3. Determining The Discount Rate

The discount rate must reflect the risk that the project entails. A low risk project will have a low discount rate – thereby resulting in a higher net present value, while a high risk project will discount its cash flows at a higher rate, resulting in a lower net present value. Calculating the appropriate discount rate can be difficult and requires significant thought. (Geddes, 2002, p. 71)

Capital also costs something alike other factors of production, it has its own expenses. We have to calculate them when evaluating the investment. If the company finances the entire investment by its own capital, then the expense would be the required return of capital (expressed e.g. in dividends), or income that is achieved by other feasible projects or income that is set by specific procedures. (Translation from Synek, 1999, p.456) If the investment is financed only by foreign resources (loans, bonds), then the expense would be the interest of the loan (the cost of the bond), if the company in this case did not achieve the investment appreciation at least equal to this amount, that means they had worked with loss. Substantial part of companies uses the combined method of financing - part of the investment financed by internal resources and part by external. Then the average capital expenditure is calculated on the basis of individual capital components. Capital components of joint-stock companies are registered capital, preferential stocks, various types of debt and retained earnings. Capital expenditures are usually expressed by percentage, just like the interest rate is expressed. We calculate average capital expenditures (WACC), which are calculated as a weighted arithmetic average, by the formula: (Translation from Synek, 2007, p. 298)

$$k_0 = W_i k_i \, (1\text{-}t) + W_p k_p + W_e k_e$$

Where: k_0 = average rate of the company's capital expenditure (corporate discount rate)

k_i = interest rate for new loans before tax

t = income tax rate expressed by decimal number

k_p = expenditure rate of preferential stocks (the rate of preferential dividends)

k_e = expenditure rate of retained earnings and registered capitals (equal to the dividend rate of joint stocks)

$W_i W_p W_e$ = weight of individual capital components determined by percentage of total resources

This indicator can be used as a discount rate of future values when converted to current values. This procedure should ensure that the new investment will not impair the already attained profitability of capital. All corporate discount rates should include risk, associated with the investment evaluation. The higher the risk is, the higher the discount rate is. (Translation from Synek, 1999, p.456)

2.2.4. Calculating the Present Value of Expected Revenue (Cash-Flow)

While one-time investment expenses are expended in a relatively short period of time (usually assumed to be 1 year), the expected return from investment is consequent upon several years.

The time factor presents, that the money which will be obtained by the company in the future is not equivalent to those that are available in the present. Therefore the money in the present day is more valuable than those that will be obtained in the future. And because the returns are generated in longer terms, we have to convert them to the same time base; that is the year of the investment's acquisition. Future value is then converted to the present value. It is defined as the amount of money that must be invested, if it has to be obtained back more than the expected return within a specified time. The company's discount rate is used as the conversion rate. (Translation from Synek, 1999, p.457)

$$\text{PVCF} = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \ldots + \frac{CF_n}{(1+k)^n} = \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t}$$

Where: PVCF = present value of the cash flow in period t

CF_t = expected value of the cash flow in period t (t=1 to n)

k = rate of investment's capital expenditure (corporate discount rate)

t = period 1 to n (years)

n = the expected lifetime of the investment in years

It should be pointed out that, during either determination of the discount rate or the calculation of the cash flow, it is necessary to take account of the inflation rate and adjusting all variables to its estimated amount.

If we evaluate different investment options, then economically acceptable is any option that satisfies this condition. More advantageous is the one that will bring higher appreciation from the invested capital. (Translation from Synek, 2007, p. 301)

2.3. Methods of Investment Appraisal

The role of investment appraisal is to ensure that relevant information is gathered relating to all the alternatives and to enable decisions to be taken with consideration being given to the objectives of the organization. Whether we take into account that money and, therefore, the input variables of an investment appraisal have a time value or not, we distinguish between:

- Non-discounting methods of investment appraisal and
- Discounting methods of investment appraisal

All of the techniques to be discussed require the input of data relating to the investment project. The advice given by investment appraisal methods can only be as good as the data on which the calculations are based. Any fixed costs or other profits of an existing company will be the same regardless whether the investment is realized or not. They are not affected by the investment decision under appraisal. Relevant data is the marginal or incremental cash flow or profit attributable to the commencement of the new project and not the total cash flow or profit of the company. The role of investment appraisal is to ensure that appropriate information is gathered relating to the investment alternatives. (Röhrich, 2007, p. 4)

2.3.1. Non-discounting methods

The characteristics of the non-discounting method:

- The values from the investment are represented through costs and revenues.

- The methods don't focus on the whole life of the project, that is, its useful economic life expectancy. They work with an average value of a representative period instead.
- The time value of money is not considered. Whether a payment is made at the beginning or at the end of the economic life of an asset is not taken into account. This is the reason for the name non-discounting methods. (Röhrich, 2007, p. 4)

These methods are used commonly in practice for its simplicity. They include:

- The return on investment method
- Payback method (Lumby, 1994, p.40)

The return on investment method

This method has many different names and a wide variety of methods of computation. The most common name is the return on investment (ROI). In its basic form, it is calculated as the ratio of the accounting profit generated by an investment project to the required capital outlay, expressed as a percentage. There are many variations in the way these two figures are actually calculated, but normal practice in its use for investment appraisal is to calculate profit after depreciation but before any allowance for taxation, and to include in capital employed any increases in working capital that would be required if the project were accepted. (Lumby, 1994, p. 47) The most commonly used expression of ROI in practice is:

ROI = (Average annual profit/Investment costs) x 100%

The return on investment (ROI) ratio follows the same approach with investment appraisal, and relates the accounting profit to the costs of the investment used to generate this profit.

The decision criteria for the accounting rate of return method are:

- A single investment is accepted, if it is return on investment exceeds the minimum acceptable level of return on capital employed. This means $R > R_{min}$.
- In the context of mutually exclusive investments, an investment project 1 is advantageous to an investment project 2, if it is return on investment is higher. This means $R_1 > R_2$. (Röhrich, 2007, p. 29)

Payback method

This method is one of the most tried and trusted of all methods and its name neatly describes its operation, referring to how quickly the incremental benefits that accrue to a company from an investment project 'pay back' the initial capital invested- the benefits being normally defined in terms of after-tax cash flows.

The payback method can be used as a guide to investment decision making in two ways. When there is a straight accept-or-reject decision, it can provide a rule where projects are only accepted if they pay back the initial investment outlay within a certain predetermined time. Also, this method can be used when a comparison is required of the relative desirability of several mutually exclusive investments. In such cases projects can be ranked in terms of 'speed of payback', where the fastest paying-back project is the most favoured and the slowest paying-back project is the least favoured. Thus the project which paid back quickest would be chosen for investment. (Lumby, 1994, p. 40)

If the return is the same in each year of the lifetime, then the payback period is calculated by dividing the investment outlays with the annual amount of expected net revenue.

$$\text{PP} = \frac{initial\ outlay}{annual\ cash\ flow}\ (years)$$

Payback has three well-known, and fatal, flaws:

- It ignores all cash-flows after the payback period has been achieved;
- It does not take account of the timing of the cash-flows during the payback period; and
- It does not differentiate between projects with different risk profiles.

However, despite its well-known flaws, payback does remain in favor with many managers. Its simplicity is one reason: payback illustrates the speed at which a project can be expected to begin to generate cash: the quicker the payback, the better. Payback gives no information about overall total return. This is one reason why many risk-averse managers and many lenders use payback as an indication of when a project loan can be repaid. (Geddes, 2002, p.66)

The final problem with the payback method is that, it suffers from the fundamental drawback of failing to allow for the 'time value of money'. This term means that a given

sum of money has a different value depending upon when it occurs in time. This difficulty can easily be overcome by applying the method – not to ordinary cash-flows – but to 'present value' cash flows. In such circumstances, the technique is usually referred to as 'discounted' payback. (Lumby, 1994, p.45)

2.3.2. Discounting Methods

The characteristics of the discounting method:

- The values from the investment are represented through cash inflow and cash outflow.
- Not only is the amount of money to be paid and received from the investment important to the investment decision, but also the point of time at which money is generated.
- The times at which money is realized is considered. All cash-flows received at different points of time are converted to a common reference point to allow direct comparison. (Röhrich, 2007, p. 4)

This method involves estimating both the future amounts and the timing of the amounts. They include:

– Net present value method (NPV)
– Internal rate of return method (IRR)

Net present value method

The net present value investment appraisal method works on the simple, but fundamental, principle that an investment is worthwhile undertaking if the money got out of the investment is at least equal to – if not greater than – the money put in. (Lumby, 1994, p.75)

The use of this method is highly recommended in evaluation and selection of projects in capital budgeting. By producing a result in today's monetary terms, it is possible to evaluate projects of different sizes and projects that start at different times or have different patterns of cash-flows. The managers' rule with respect to using NPV is that projects with a net present value greater than 0should be accepted, while projects with a negative NPV should be rejected. If two mutually exclusive projects are being considered, the project with higher NPV should be chosen. (Geddes, 2002, p.69)

The present value of a cash-flow to be received in the future (at times 'n') is found by the formula:

$$PV = \sum_{i=1}^{n} \frac{CF_i}{(1+r)^i}$$

Similarly, the net present value (NPV) of a project, takes into account the present value of future cash flows to be generated as well as the initial investment to arrive at a figure: NPV is the present value of the cash flow of the project, net of the investment expenditure. It is derived by discounting the cash flows by the rate of return (r). The initial investment is likely to be a negative figure in the formula. (Geddes, 2002, p.69)

$$NPV = -IN + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \ \dots + \frac{CF_i}{(1+r)^i} = -IN + \sum_{i=1}^{n} \frac{CF_i}{(1+r)^i}$$

Where: IN = initial cash flow or investment (likely to be a negative value)

CF_i = cash flow in period 1, 2, … to period n

r = discount rate

If capital is a limited resource, then management should calculate the so-called profitability index.

$$PI = \frac{PV}{Initial\ outlay}$$

When available investment funds are limited, the net present value is divided by the initial investment. The profitability index is the value increase per unit money invested. The greater the profitability index, the greater is the relative attractiveness of the investment. Using the profitability index, it is possible to provide a ranking of projects if they are divisible. (Röhrich, 2007, p. 65)

Internal rate of rate of return method

Using the non-discounting methods of investment appraisal we have already calculated a rate of return of the capital involved in the investment. This can be done equally for the discounting methods of investment appraisal. The internal rate of return is the discount rate which sets the net present value of an investment to zero. Thus, the internal rate of return is found by solving for i in the following equation:

$$0 = -(initial\ outlay) + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \ \dots + \frac{CF_n}{(1+r)^n}$$

Both IRR and NPV use the same technique of discounted cash flow analysis. Whereas the financial outcome of a project is represented as a monetary return using NPV, under the IRR method it can be represented as a percentage rate of return. (Geddes, 2002, p.73)

The internal rate of return is also called critical discount rate of the investment, because a higher discount rate would lead to a net present value of the investment of below zero. The internal rate of return represents a break even rate of return of the investment opportunity. A single investment is profitable, if its internal rate of return exceeds some pre-determined cut-off rate of return IRR_{min}. This burdle rate is usually the market rate of interest which reflects the opportunity cost of the capital employed. To be selected, an investment project must generate a return at least equal to the return available elsewhere on the capital market. (Röhrich, 2007, p. 79)

The rule is to accept the investment project if the IRR is greater than the appropriate discount rate. In most simple situations IRR and NPV will arrive at the same conclusion regarding acceptance of a project. However, there are a number of weaknesses to the IRR approach when compared to NPV in making capital budgeting recommendations. One drawback to IRR is that it cannot be calculated using a simple calculator and present value tables. It requires a scientific calculator or a computer spreadsheet program with the capacity to run iterative operations in order to determine the internal rate of return. (Geddes, 2002, p.73)

NPV or IRR?

If a project is viable then it is likely that both NPV and IRR will meet a company's appraisal hurdles. Also when choosing between two or more projects unless the profile of cash flows is quite different – in other words the projects are of quite different natures then NPV or IRR analysis will indicate the same choice. One way of summing up the message revealed by NPV is to say that at the required rate if NPV is positive then the project will satisfy the company's criteria. NPV analysis is for committed investors – ones who wish to be or get into a particular business and who require a certain minimum return – higher if possible.

IRR could be summed up as the measure for disinterested investors – that is investors with no particular attachment to a specific type of investment or strategy apart from maximizing the company's rate of return. (Tiffin, 1999, p.13)

PRACTICAL FRAMEWORK

3. Company introduction

"MCS Holding" LLC, which was incorporated in Ulaanbaatar in 1993, is one of the leading private sector entities in terms of number of employees, with about 3,000 full-time direct staff and about 1,000 indirect staff through its contractors and subcontractors. MCS Holding LLC has over 15 subsidiaries covering diversified business activities. It engages in the fields of energy, infrastructure, information technology (IT), communication technology, food and beverage, cashmere and wool apparel production and sales, wholesale and retail sales, real estate, and mining in Mongolia. One of their subsidiaries is "MCS Coca Cola". In 2001, "MCS holding" LLC started their partnership with the multinational company "Coca Cola" and created their subsidiary "MCS Coca Cola" by its hundred percent of investment.

3.1. Brief history

In summer of 2002, the company started their operation by launching its first plant. The first plant had only one line that produced glass bottled sparkling beverages. However, today they are offering wide range of products like sparkling drinks, fruit juice, tea and water that are bottled in glass, plastic bottles and Tetra Pak packages. At the time, MCS Coca Cola became the first world standard beverage producer in Mongolia.

In 2009, the first phase of the new bottling plant project started by commissioning new facilities like, three bottling lines with 4 times better productive capacity than the first one and of course new office, factory and steam boiler, which were worth 22,3 million dollars. This new plant has the capacity to produce 500 000 liters per day and was officialy opened in Ulaanbaatar, on august 24 by Muhtar Kent (president and CEO of The Coca-Cola Company) and Odjargal Jambaljamts (chairman and CEO of MCS Group). In 2010, "MCS Coca Cola" built its own residual water purifying machinery.

The additional fourth line was installed in 2014 and the fifth line is planned to be installed in years 2015 and 2016. 78,6 million dollars were invested in this plant from 2009 till 2013 and MCS holding is planning to invest another 43,9 million dollars in years 2014-2016.

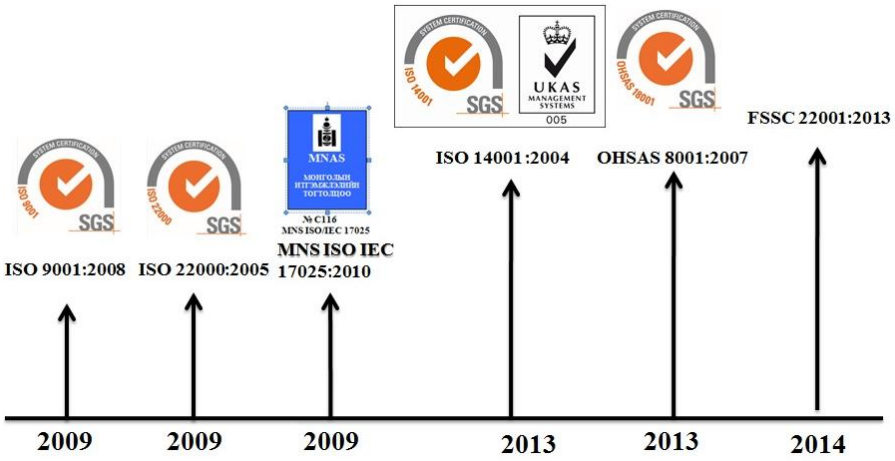
3.2. Company characteristics

Management system standards

Management system standards that are applied to "MCS Coca Cola" are:

- Quality management system **ISO 9001**
- Food safety management system **ISO 22000**
- Environmental management system **ISO 14001**
- Occupational health and safety management system **ISO 18001**

These management systems are controlled and verified annually by the international auditing organization SGS. The following diagram shows how these standards were transmitted in timeline.



Economic results

Table 1- Economic results of the company

Indicators	Unit	2011	2012	2013	2014
Total revenue	$	30 154 882	46 530 476	51 067 460	79 323 689
EBIT	$	9 290 246	10 581 674	11 115 969	14 265 401
EBT	$	6 803 807	7 924 831	9 337 414	11 982 937
Net income	$	5 443 046	6 835 112	7 469 931	9 586 350
ROA	%	15,72	18,93	21,83	27,43
ROE	%	21,54	32,76	39,78	42,54

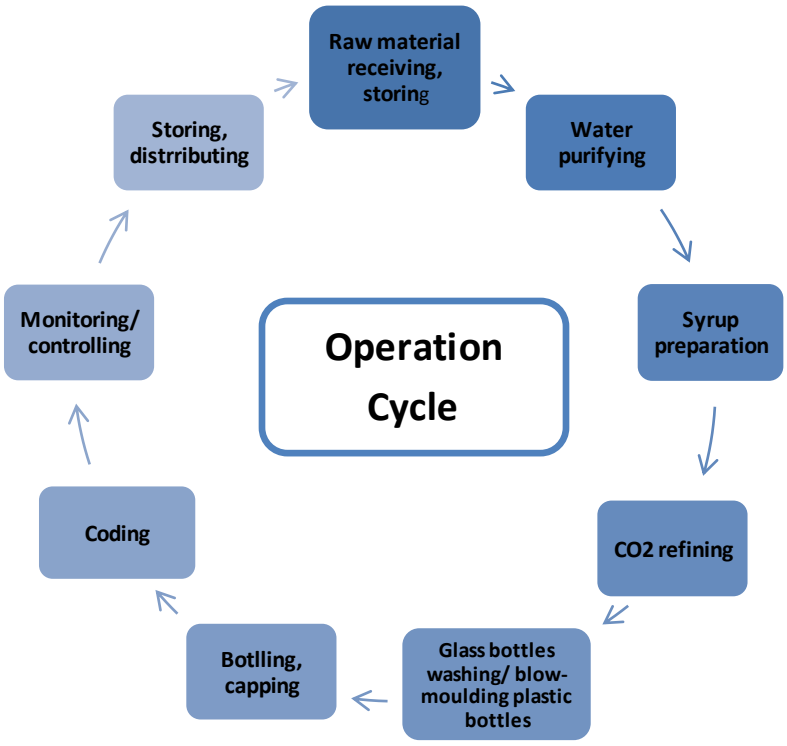
Source- information from the company

We can see from the table that the total revenue is constantly increasing year by year which affects and also increases net income. However, in 2014 total revenue was drastically increased by 20 million dollars, due to the new fourth line. Return on assets was relatively low in 2011, but it gradually increases by around four percent every year except 2014.

Scope of production

The production of these soft drinks, juice and water is held in three different production lines and from 2014 in four different lines with various capacities. The operation cycle is shown below, that starts by receiving and storing raw materials and ends by distributing or storing the produced bottles of beverages.

Graph 1- Operation cycle



Source – information from the company

Line 1

This bottling line of Krones[1], started operating since 2009. It has the capacity to produce 20 000 liters per day and 150-400 plastic bottled sparkling drinks and water per hour and it occupies 576 square meters. This line consists of the following machines:

[1] Krones is a German manufacturing company of bottling and packaging machines.

- Conveyor of empty bottles
- Rinser
- Blender
- Filler
- Capper
- Conveyor of bottled beverages
- Valve monitor
- Coder
- Case packer
- Conveyor of packed beverages
- Palletizer
- Stretch wrapper

Line 2

The second bottling line has the capacity to produce 4,500 liters per day, 300 glass bottled sparkling beverages per hour and the whole line occupies 864 square meters. It has been operating since 2002 and is able to produce 200-250 thousand packs of soft drinks per month. The bottling line consists of the following machines:

- Conveyor of glass bottles
- Depalletizer
- Pallet washer
- Glass washer
- Monitor of washed glasses
- Blender
- Filler
- Capper
- Coder
- Valve monitor
- Case packer
- Conveyor of packed beverages
- Palletizer
- Stretch wrapper

Line 3

This line has been operating since 2010 and it occupies 864 square meters. This line has the capacity to produce 12000 liters per day, 150-300 bottles of non-sparkling beverages like juice, tea and flavoured water and 500-550 thousand packs per month. The line consists of the following machines:

- Conveyor of empty bottles
- Rinser
- Cleanser
- Filler
- Capper
- Conveyor of products
- Valve monitor
- Coder
- Cap cleanser
- Cooling tunnel
- Case packer
- Conveyor of packed beverages
- Palletizer
- Stretch wrapper

Line 4

The fourth line was installed in 2014 and has the capacity to produce 42000 liters per day, 200-466 bottles of sparkling beverages per hour. This line is the product of German Krones and it blow-moulds plastic bottles on itself while the other lines used already prepared bottles. It occupies 2,120 square meters. The scope of this thesis is this new line. The line consists of the following machines:

- Bottle blower
- Controller of bottle quality
- Blender
- Filler
- Capper
- Valve monitor
- Tagger
- Tag monitor
- Coder
- Case packer
- Conveyor of packed beverages
- Pack coder
- Palletizer
- Stretch wrapper

Line 5

The fifth line, which has the capacity to produce 90 million liters of juice, flavoured water and tea is planned to be installed in 2015-2016. This line is claimed to have the bottle blower as in fourth line and also a cleansing system with more than 90 degrees water.

Other than these lines, the production involves following sections:

- **Water purifying section**

  The water being used in the process of production or in the cleaning process is purified in this section in three different types. Such as: purified water, softened water and reverse osmosis (RO) water.

- **Carbo-cooler system**

  This system consists of screw compressors and DH system. Screw compressor is the type York of Johnson Controls Inc.

- **Sugar and syrup preparing section**

  It works by adding ingredients of the beverages, depending on which product, to the prepared sugar suspension. The prepared sample of Coca Cola comes from China every month.

- **Laboratory**

  This comprehensive microbiological laboratory, which has the standard of ISO/IEC 17025, controls and monitors all the raw or supporting materials and packages in every deliveries, the technological section every 4 hours and the quality of ready-made products in every 30 minutes.

- **Steam boiler**

  It has the new modern scrubber system that can filter the polluting composition up to 86 percent.

- **Distributing auto parks**

  Today, the company has over 75 distributing vehicles, of which 60 of them are almost new.[2]

3.3. Products

Here are all the products allocated to each line in different sizes. The main products (Coca Cola, Fanta, Sprite) are produced in the fourth line as well as the first and second line in different sizes.

- **Line 1 (plastic bottled)**
  - ***Coca Cola*** (1,25 l; 2 l)
  - ***Fanta*** - orange; grape (1,25 l; 2 l)
  - ***Sprite*** (1,25 l; 2 l)
  - ***Bonaqua*** - water (0,5 l; 1,5 l)
- **Line 2 (glass bottled)**
  - ***Coca Cola*** (250 ml)
  - ***Fanta*** - orange; grape (250 ml)
  - ***Sprite*** (250 ml)
  - ***Schweppes*** – soda water; tonic water; ginger ale (250 ml)
  - ***Burn*** (250 ml)
- **Line 3 (non sparkling, plastic/ Tetra Pak)**
  - ***Minute Maid*** - orange; aloe; grape; punch (0,5l l; 1 l)
  - ***Fuze Tea*** - lemon; honey and pear; lime (0,5l, 1 l)
  - ***Bonaqua*** - flavoured water 3+ (0,5 l)

[2] All the pictures of each line are included in the appendix.

- ***Moya Semiya*** - multivitamin; cherry and apple; orange; pineapple; apple; peach and apricot juice (1 l; 2 l)
- ***Moya Semiya 100%*** - pineapple; orange; cherry; mango; tomato (1 l; 2 l)
- ***Da!*** – peach and apple; apple; kiwi, apple and grape; orange (1 l; 2 l)

- **Line 4 (plastic bottled)**
  - ***Schweppes*** – +C; Cream soda; grapefruit (0,5 l)
  - ***Coke Light, Zero*** (0,5 l)
  - ***Fanta*** - orange; grape apple, pineapple; lime; granny apple; peach (0,5 l)
  - ***Coca Cola*** (0,5 l)
  - ***Sprite*** (0,5 l)

4. Characterization of Investment

4.1. Information of the investment

Even though, the company renewed and opened a whole new plant that had three bottling lines in 2009, the top management of MCS Coca Cola was still dissatisfied with the fact that they could sell more if they could produce more. Therefore, they decided to invest in their manufacturing facilities, including water purifying system, carbo-cooler system, bottling lines and steam-boiler. First of all, they made a plan to install at least two more bottling lines that have some additional productive features with better capacity. The fourth line was planned to be installed in 2014 and the fifth line in years 2015 and 2016. In this thesis I will be focusing on the physical investment of the fourth bottling line.

Once they decided to invest and purchase these new lines, they had to choose the supplier that ensures all the requirements they were obligating. However, this process didn't take much time since they had formerly bought a line in 2009 from the trustworthy German company Krones, which is by far one of the leading companies in manufacturing machineries and lines and exporting them all around the world. Apart from these reasons, Krones as well offers uncompromising quality, and a level of service support that met the company's requirements one hundred percent. When they had already decided the perfect supplier, the thing left to do was to choose the right line for the production. Since 2009, Krones brand has been manufacturing many other renovated lines that have way better producing capacities and some other additional features. The biggest advantage and difference from the previous one, is that it has this supplementary function to blow-mould plastic bottles on itself.

However, only a line is indeed not enough to produce different kinds of beverages. They had to purchase two more production equipments, which are syrup system and water treatment machine, also some other technological equipments for the complete production. Syrup system was previously purchased by MCS Coca Cola for the new plant in 2009 from the German company Van Der Molen. So without hesitating about the supplier, they repurchased the same syrup system. The water treatment machine was whereas from China. Since China is Mongolia's bordering country and moreover the biggest manufacturing country, it was quite a convenient decision to purchase the machine from China. They chose Tianjin Flecksom Technology limited company, considering their good quality with reasonable cost. The investment project was implemented in the summer of 2014.

This fourth line can blow-mould plastic bottles only into 0,5l, which means it will produce sparkling drinks in 0,5l. The following table shows the capacity of this new production line per hour, per day and bottles (0,5l) per year:

Table 2 – Capacity of the fourth line

	Day (8 hours)	**Year (250 days)**	**Bottles (0,5l)**
Line 4	42 000 l	10 500 000 l	21 000 000 bottles

Source- information from the company

4.2. Financial coverage sources

After deciding the suppliers, they had to calculate the amount of all the capital expenditures and decide its financial coverage. The total amount of the investment was calculated to be 13 620 670 $ altogether. The following table shows the initial outlay of this whole investment. The detailed list of these expenditures is mentioned in the further chapter 5.1.

Table 3 – Initial outlay / Capital expenditures

Production Equipment	10 599 747 $
Technological Equipment	1 791 857 $
Other expenditures	1 229 066 $
Total	**13 620 670 $**

Source- information from the company

The amount of this transaction makes it impossible for the company to purchase the whole production line and other equipments entirely from its own internal source.

Nevertheless on the grounds of maximizing return on equity this kind of attitude isn't even desirable. Therefore, this whole investment project was planned to be financed from two different sources- 34 % from their equity (internal source) and 66 % from the bank loan (external source). Table 4 shows, how the total expenditures are divided in each source of the company.

Table 4 – Financial sources

Internal source (equity)	4 620 670 $
External source (bank loan)	9 000 000 $
Total financing	13 620 670 $

Source- information from the company

Although there were many different banks that offered long-term investment loans with low interest rates, the company decided to go with German investment bank called BHF since it was importing the main production line from Germany. BHF-Bank is a private bank with a high reputation in Germany, and moreover it offers the export financing, which means that they can grant loans directly to the company located abroad to finance planned investments in fixed and current assets. The bank offered very low interest rate of 3,8% p.a. with 6 years of maturity. The loan is due every quarter of the year.

The annual amortization is calculated by the following formula:

$$A = P \times \frac{r(1+r)^n}{(1+r)^n - 1} \quad \Longrightarrow \quad A = 9\,000\,000 \times \frac{0{,}038(1+0{,}038)^6}{(1+0{,}038)^6 - 1} = 1\,705\,695$$

Where: A= Amortization

P= Initial principal

r = Interest rate per annum

n = number of years

$$Amortization = interest + installment$$

$$Final\ principal = initial\ principal - installment$$

Amortization as a matter of fact is the sum of interest and installment. Installment is the money paid for the actual loan, which means if this amount is subtracted from the initial principal, the final principal will be defined. The total interest, or else the amount of money paid in addition to the current loan is *1 234 169 $*. (see table 5)

Table 5 – Amortization schedule

Year	Initial principal	Amortization	Interest	Installment	Final principal
1	9 000 000 $	1 705 695 $	342 000 $	1 363 695 $	7 636 305 $
2	7 636 305 $	1 705 695 $	290 179 $	1 415 516 $	6 220 789 $
3	6 220 789 $	1 705 695 $	236 390 $	1 469 305 $	4 751 484 $
4	4 751 484 $	1 705 695 $	180 556 $	1 525 139 $	3 226 346 $
5	3 226 346 $	1 705 695 $	122 601 $	1 583 094 $	1 643 252 $
6	1 643 252 $	1 705 695 $	62 443 $	1 643 252 $	0 $

Source- own calculation

4.3. Preliminary data for the appraisal

Determining the depreciation

The decidedly important data that will be used in further appraisal is the amount of the annual depreciation. MCS Coca Cola chose the straight line depreciation method for this main production line. According to the law, this bottling and producing line is a big machine and belongs to the third category of straight line depreciation. In this category, these kinds of big machines are depreciated for 10 years with a rate of 5,5 % in the first year and 10,5 % for the next years. The whole production line, including the bottling line and other supplementary equipments, costs 12 391 604 $.

Table 6 – Depreciation

Years	Rate of the depreciation	Amount USD	Residual value
1.	5,5 %	681 538 $	11 710 066 $
2.	10,5 %	1 301 118 $	10 408 948 $
3.	10,5 %	1 301 118 $	9 107 830 $
4.	10,5 %	1 301 118 $	7 806 712 $
5.	10,5 %	1 301 118 $	6 505 594 $
6.	10,5 %	1 301 118 $	5 204 476 $
7.	10,5 %	1 301 118 $	3 903 358 $
8.	10,5 %	1 301 118 $	2 602 240 $
9.	10,5 %	1 301 118 $	1 301 118 $
10.	10,5 %	1 301 118 $	

Source- own calculation

Determining the operational expenses

Operational expenses consist of expenses for repair, or wage cost and other overhead cost, material consumption, energy consumption specifically electric energy, water and gas. The year-on-year increment in energy costs are not only reflected by their consumption growth due to the increasing production, but also by the inflation. The same thing can be said about the material consumption. The amount of the wage costs are also expected to increase by the inflation rate. Furthermore, the operational costs are enclosed with overhead cost, which includes all the other expenses like administrative costs, safety tools and other personal costs and with office expenses. These operational costs are only from the fourth production line, since the whole investment is focusing on this additional production line. The following table shows the inflation rate forecast of Mongolia:

Table 7 – Inflation forecast

Inflation rate	**2014**	**2015**	**2016**	**2017**	**2018-2023**
	9,8%	9,3%	9,1%	8%	7%

Source- from the web site of Trading Economics

Table 8 – Operational expenses

Expense entries	**Years**				
	2014	**2015**	**2016**	**2017**	**2018-2023**
Energy (electricity, water, gas)	13 697	17 216	20 474	24 102	28 110
Wage	130 113	142 214	155 155	167 567	179 297
Maintenance and repair	1 026 528	1 121 995	1 224 097	1 322 024	1 414 566
Material consumption	5 857 156	7 362 152	8 754 998	10 306 383	12 020 335
Advertisement and marketing	541 075	591 395	645 212	696 829	745 607
Overhead costs	627 438	685 790	748 197	808 052	864 616
Office expenses	69 394	75 848	82 750	89 370	95 626
Total costs	**8 265 401**	**9 996 610**	**11 630 881**	**13 414 328**	**15 348 156**

Source- information from the company

The expenses of 2014 are real operational expenses of the fourth line, and the information was gained from the company's interdepartmental accountancy. According to the company's estimate, the production volume would increase by 9% every year. However, in 2015 it increases by 15% as a result of the new production line that was implemented in 2014. These production increments are calculated only for the expenses of energy and material consumption. From years 2018 – 2023, we assume that the production and the inflation would be constant.

5. Investment Appraisal

5.1. Determining the Capital Expenditures

As it was mentioned earlier, the capital expenditure (Capex) is literally money invested by a company to acquire or upgrade fixed, physical, non-consumable assets, such as buildings and equipment or a new business. There are two types of Capex – those that are invested in to maintain existing levels of operation within a company and those that are invested in something new to foster future growth. Since the investment is referring to new equipments, we are going to determine the second version of capital expenditures. Here are primarily included expenses related to the purchasing of all equipments, their transportation to the plant, as well as the costs of installation and assemblies of the equipments. A big production line doesn't just involve one bottling line, it consists of many other equipments. In our case, this production line consists of two main equipments such as production equipments and technological equipments. The detailed information is shown on the following table, which was obtained from the company's interdepartmental accountancy.

Table 9 – Capital expenditures

Production Equipment	**Amount USD**
Bottling Line	7 977 900 $
Syrup system	1 171 847 $
Water treatment / Soft water	1 450 000 $
Subtotal	**10 599 747 $**
Technological Equipment	
Air Compressor	128 571 $
Refrigeration Compressor, Cooling Tower	50 000 $
Utility & piping system	130 000 $
CO2 purification system	100 000 $
Laboratory Equipment	24 000 $
Power supply	1 220 000 $

Water supply & WWTP expand	114 286 $
Start -up & Miscellaneous	25 000 $
Subtotal	**1 791 857 $**
Import Duties and Transportation	529 987 $
Installation	1 830 $
Contingency	644 250 $
Insurance	52 999 $
Grand Total	**13 620 670 $**

Source – own calculation and information from the company

5.2. Estimating the Revenue

First of all, to estimate the sales revenue we need to calculate the expected production and the assumed price of each product. For 2014, the amounts are listed from the invoiced products in reality. The company is estimating 9% of increment every year in its production volume. However, due to the additional fourth line the production of plastic bottled sparkling drinks of 0,5l increases by 30% in 2015. About the non-sparkling drinks, the production increases up to 50% in 2016 also as a consequence of the new fifth line. This fifth line is planned to be installed in 2015 and implemented in 2016. Further, the production will be increasing gradually by 9%, and from 2018 till 2023 we are estimating constant production and inflation. The investment that this thesis is focusing on is the fourth line that produces only the sparkling beverages in size of 0,5l. The following tables show the whole production, prices of all the products and sales revenue from all products to give a comparison.

Table 10- Expected production

Expected production (bottles)					
Entries	**2014**	**2015**	**2016**	**2017**	**2018-2023**
Sparkling 250 ml	5 698 650	6 211 529	6 770 067	7 379 917	8 044 110
Sparkling 0,5 l	**8 477 166**	**11 020 316**	**12 012 144**	**13 093 237**	**14 271 629**
Sparkling 1,25 l	6 017 139	6 558 682	7 148 963	7 792 370	8 493 683
Sparkling 2 l	5 453 684	5 944 516	6 479 522	7 062 679	7 698 320
Bonaqua 0,5 l	4 851 111	5 287 711	5763605	6282329	6847739
Bonaqua 1,5 l	5 428 907	5 917 509	6450084	7030592	7663345
Non-sparkling 0,5 l	5 963 395	6 500 101	9 750 151	10 627 664	11 584 154
Non-sparkling 1 l	5 150 613	5 614 168	8 421 252	9 179 165	10 005 290
Non-sparkling 2 l	4 702 809	5 126 062	7 689 093	8 381 111	9 135 411

Source – own calculation

The prices of 2014 are listed from the real price of last year. In the next years, the price is estimated to increase by the influence of the inflation (see table 7).

Table 11- Interdepartmental price

Interdepartmental price ($/bottle)					
Entries	**2014**	**2015**	**2016**	**2017**	**2018-2023**
Sparkling 250 ml	0,5	0,55	0,6	0,64	0,69
Sparkling 0,5 l	**1,2**	**1,31**	**1,43**	**1,55**	**1,65**
Sparkling 1,25 l	1,8	1,97	2,15	2,32	2,48
Sparkling 2 l	2,3	2,51	2,74	2,96	3,17
Bonaqua 0,5 l	0,5	0,55	0,6	0,64	0,69
Bonaqua 1,5 l	1,3	1,42	1,55	1,67	1,79
Non sparkling 0,5 l	1,5	1,64	1,79	1,93	2,07
Non sparkling 1 l	2,2	2,4	2,62	2,83	3,03
Non sparkling 2 l	2,8	3,06	3,34	3,61	3,86

Source- own calculation

This estimated sales revenue is calculated by multiplying expected production with the price of each product. The bolded sales revenue from sparkling 0,5l beverages are the estimated sales revenue from the fourth line.

Table 12- Estimated sales revenue

Estimated sales revenue ($)					
Entries	**2014**	**2015**	**2016**	**2017**	**2018-2023**
Sparkling 250 ml	2 849 325	3 394 600	4 036 825	4 752 150	5 542 433
Sparkling 0,5 l	**10 172 599**	**14 454 246**	**17 188 845**	**20 234 708**	**23 599 740**
Sparkling 1,25 l	10 830 850	12 903 550	15 344 773	18 063 866	21 067 887
Sparkling 2 l	12 543 473	14 943 918	17 771 157	20 920 207	24 399 237
Bonaqua 0,5 l	2 425 556	2 889 734	3 436 443	4 045 381	4 718 127
Bonaqua 1,5 l	7 057 579	8 408 188	9 998 933	11 770 744	13 728 219
Non sparkling 0,5 l	8 945 093	10 656 915	17 440 041	20 530 416	23 944 625
Non sparkling 1 l	11 331 349	13 499 829	22 092 470	26 007 255	30 332 262
Non sparkling 2 l	13 167 865	15 687 800	25 673 084	30 222 354	35 248 332
Total	79 323 689	96 838 779	132 982 571	156 547 082	182 580 862

Source- own calculation

All products from all production lines are shown on tables 10, 11 and 12 to show that the revenue from 0,5l sparkling beverages is much higher than other products. The annual installment is not included in this cash flow, since this is the operational cash flow of the fourth production line. We calculate the cash flow by adding up the net income and the depreciation.

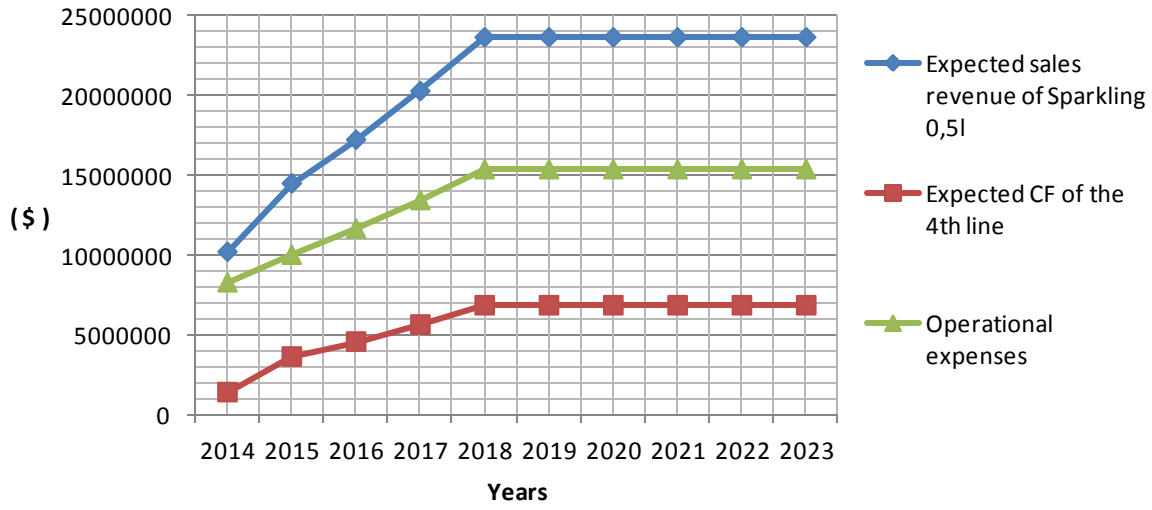
Table 13- Expected Cash Flow

Expected Cash Flow ($)					
Entries	**2014**	**2015**	**2016**	**2017**	**2018-2023**
Sales Revenue	10 172 599	14 454 246	17 188 845	20 234 708	23 599 740
Operating expenses	8 265 401	9 996 610	11 630 881	13 414 328	15 348 156
Interest of the loan	342 000	290 179	236 390	180 556	122 601
Depreciation	681 538	1 301 118	1 301 118	1 301 118	1 301 118
EBT	883 660	2 866 344	4 020 456	5 338 707	6 827 865
Tax (19 %)	167 895	544 605	763 887	1 014 354	1 297 294
Net income	715 765	2 321 735	3 256 569	4 324 352	5 530 571
Depreciation	681 538	1 301 118	1 301 118	1 301 118	1 301 118
Cash flow	**1 397 303**	**3 622 853**	**4 557 687**	**5 625 470**	**6 831 689**

Source- own calculation

The graph 1 shows the progress of the cash flow, including also the operating expenses and expected sales revenue. As it was already mentioned, the company is assuming a constant production and inflation from 2018, and the cash flow follows up and also becomes constant.

Graph 2- Cash flow



5.3. Determining the Discount Rate

In order to determine the discounting rate, first it is necessary to figure out how the investment was financed. As it was already mentioned, the investment will be financed by 34% of internal source and 66% of external source. In our case, the internal source is 4 620 670 $ and the external source is 9 000 000 $. The annual interest rate of external source is 3,8% and for the internal source, the owners' required rate of return is 13%. We will consider the tax in the same amount for every year, and that is 19%. The weighted average cost of capital (WACC) or the discount rate of the company is calculated on the basis of the formula in 2.2.3.

$$WACC = \frac{9\,000\,000}{13\,620\,670} * 0{,}038 * (1 - 0{,}19) + \frac{4\,620\,670}{13\,620\,670} * 0{,}13 = 0{,}0203 + 0{,}0442 = 0{,}065$$

The company's discount rate that will be used for the appraisal, is 6,5%.

5.4. Calculating the present value of expected return

The present value of expected return is calculated according to the formula mentioned in 2.2.4., by adding up all the discounted cash flows of 2014-2023. Although, the cash flows from years 2018-2023 are the same (see table 13), the discounted cash flows differ due to the exponent (the years) of the formula.

Table 14- Discounted Cash Flow

Number of Years	Cash flow ($)	Discounted cash flow ($)	Sum of discounted cash flows ($)
1. 2014	1 397 303	1 312 021	**38 382 806**
2. 2015	3 622 853	3 194 122	
3. 2016	4 557 687	3 772 920	
4. 2017	5 625 470	4 374 393	
5. 2018	6 831 689	4 986 634	
6. 2019	6 831 689	4 679 239	
7. 2020	6 831 689	4 407 541	
8. 2021	6 831 689	4 140 418	
9. 2022	6 831 689	3 881 641	
10. 2023	6 831 689	3 633 877	

Source- own calculation

The present value of expected return (expected cash flow) is calculated according to the following formula:

$$\text{PVCF} = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \ldots + \frac{CF_n}{(1+k)^n} = \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t}$$

$$\text{PVCF} = \sum_{t=1}^{10} \frac{CF_t}{(1+0{,}065)^t} = \sum_{t=1}^{10} (discounted\ CF)_t = 38\,382\,806$$

The present value of expected return (otherwise sum of the discounted cash flows) is 38 382 806 $.

5.5. Application of selected methods

To appraise the investment project, we need to calculate it by using several methods mentioned in 2.3. In this chapter, the non-discounting and discounting methods from 2.3. will be used and applicated using the preliminary data.

5.5.1. Net present value method

In order to be a lucrative investment, the future cash flows from the investment should exceed the spent expenditures. The differentiation of the present value of expected cash flows and the initial outlay of the investment is referred as a net present value. Theoretically this method is the most accurate method for an investment decision.

$$NPV = -IN + \sum_{i=1}^{n} \frac{CF_i}{(1+r)^i} = -IN + \sum PV$$

NPV = 38 382 806 – 13 620 670 = 24 762 136

NPV = 24 762 136

As we can see from this calculation, the net present value is positive and has a huge amount. This means that this investment is totally acceptable and will even increase the market value of the company. The net present value method is giving us the information that after 10 years this investment will give the company a contribution of 24 762 136 $.

In some cases, we can also calculate the profitability index.

$$PI = \frac{NPV}{Initial\ outlay} \longrightarrow PI = \frac{24\,762\,136}{13\,620\,670} = 1{,}82$$

The required profitability index is more than 1, and this result shows that the realization of this investment wouldn’t cause any financial problems for the company.

5.5.2. Internal rate of return method

IRR can be defined as a discount rate at which the present value of expected returns from the investment is equal to the capital expenditures on investment. The definition and the formula of this method were already referred in 2.3.2. Nonetheless, by that formula it is impossible to find the IRR. Therefore, we need a new procedure to find the approximate discount rate. In this procedure, we need two discount rates. We have already calculated the net present value for the discount rate of 6,5%, which is the minimum return on the investment required by the owners. The second discount rate is chosen arbitrarily, by which the cash flow will be discounted like the first one. After that, we should compare the sum of the discounted cash flows with capital expenditures. If the total amount of discounted cash flows is higher than the capital expenditures, then we should select a higher discount rate and the whole calculation should be repeated until the sum of discounted cash flows is lower than the capital expenditures. Whenever the sum of discounted cash flows is lower than the capital expenditures, the net present value for this discount rate should be calculated. I selected a discount rate of 35% and then discounted the cash flows from table 13.

Table 15- NPV in different discount rates

Years	**Discounted cash flow for r_a= 6,5%**	**Discounted cash flow for r_b = 35%**
2014	1 312 021	1 035 039
2015	3 194 122	1 987 848
2016	3 772 920	1 852 436
2017	4 374 393	1 693 650
2018	4 986 634	1 523 559
2019	4 679 239	1 128 562
2020	4 407 541	835 972
2021	4 140 418	619 238
2022	3 881 641	458 695
2023	3 633 877	339 774
Total amount	38 382 806	11 474 774
CAPEX	13 620 670	13 620 670
NPV	**24 762 136**	**– 2 145 896**

Source- own calculation

After calculating each net present values, the following linear interpolation is used to calculate the internal rate of return:

$$IRR = r_a + \frac{NPV_a}{NPV_a - NPV_b}(r_b - r_a)$$

Where: r_a= selected lower discount rate

r_b= selected higher discount rate

NPV_a= net present value for r_a

NPV_b= net present value for r_b

$$IRR = 0{,}065 + \frac{24\ 762\ 136}{24\ 762\ 136 + 2\ 145\ 896}(0{,}35 - 0{,}065) = 0{,}327$$

$$IRR = 0{,}327 * 100\% = 32{,}7\%$$

The net present value will get closer to zero when the discount rate is 32,7%. If we compare this calculated discount rate with the discount rate of the company (32,7%>6,5%), it is evident that the investment project is bringing more profitability than the required return. Therefore, we can say that this investment is totally acceptable.

5.5.3. The Return on investment method

This practical method in its simplest form relates the expected average annual earnings of the investment project to the invested capital. Profitability of an investment is assessed by comparing the calculated return with the investor's required minimum yield. If the calculated value is less than the required rate of return, such an investment is unacceptable for the company. The weak point of this method is that it doesn't take the distribution of income into consideration over time. Nevertheless, it has an average high predictive value about the profitability of investments.

Return on investment is calculated by the formula:

$$ROI = \frac{P}{IN}$$

Where: P = average annual net income

IN = investment cost

$$P = \frac{715\,765 + 2\,321\,735 + 3\,256\,569 + 4\,324\,352 + (5\,530\,571 * 6)}{10}$$

$P = 4\,380\,185$ $IN = 13\,620\,670$

$ROI = \frac{4\,380\,185}{13\,620\,670} = 0{,}3216$ $ROI = 32{,}16\%$

The indicator is telling us, that every deposited 1$ of the capital expenditure will bring us 0,3216$ return. If we compare this return with the required minimum return of the company, it is obvious that the reality is much higher and profitable.

5.5.4. The payback method

This method and its formula were already mentioned in 2.3.1. It calculates the time in which the initial outlay of an investment is expected to be recovered from the cash flows generated by the investment. We can also explain this method on the ground of break-even point. The length of time that is required to payback all the expenditures of a given investment, is one of the most important determinants whether to undertake the project. It is good as long as the period is shorter than the depreciation. The main formula in 2.3.1 is however, for the instances, where the cash flows are even every year in the future. In our case, the annual cash flows differ due to the production volume. Therefore, a different formula is used in these cases of uneven cash flows.

$$Payback\ Period = A + \frac{B}{C}$$

Where: A= the number of years before the payback

B= total remaining to be paid at the start of the break-even year

C= total paid back in the entire payback year

To calculate this formula, first of all we need to create a table that shows all the results to find each indicator. In that table, we need to calculate the cumulative cash flows for each year, which is the sum of the current cash flow and the cash flow from the previous period, to see the last time where it wasn't still recovered and the year when it was fully recovered. From the following table, we can see that the payback year is 2017, because in the end of 2016 it was still not fully recovered. However, our goal is to find the exact payback period.

Table 16- Cumulative cash flow

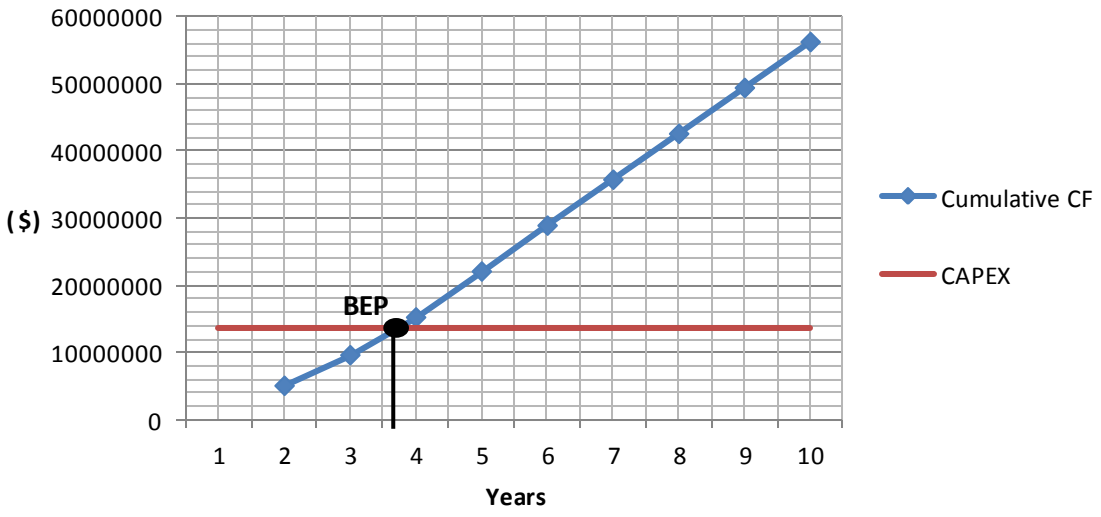
Number of Years	Annual cash flow	Cumulative cash flow	Capital expenditures
1) 2014	1 397 303		13 620 670
2) 2015	3 622 853	5 020 156	
3) 2016	4 557 687	**9 577 843**	
4) 2017	**5 625 470**	15 203 313	
5) 2018	6 831 689	22 035 002	
6) 2019	6 831 689	28 866 691	
7) 2020	6 831 689	35 698 380	
8) 2021	6 831 689	42 530 069	
9) 2022	6 831 689	49 361 758	
10) 2023	6 831 689	56 193 447	

Source- own calculation

$$Payback\ Period = 3 + \frac{13\ 620\ 670 - 9\ 577\ 843}{5\ 625\ 470} = 3 + 0{,}72 = 3{,}72$$

To find B, we have to subtract the unrecovered cumulative cash flow from the capital expenditures. The result is telling that after 3 years and 9 months, the whole initial outlay will be recovered by the cash flows. When the payback period is shorter than the depreciation year, the investment is acceptable and profitable. The following graph shows the break-even point, the point where the cash flow will equal to the capital expenditures, which means that the initial outlay will be recovered at this point.

Graph 3- Break-even point



5.6. Discussion

The whole investment is focusing only the fourth line of MCS Coca Cola which was installed in the late 2013 and implemented in 2014. After calculating and appraising the investment progressively by using selected discounting and non discounting methods, the results have come out very effective. The following table is summarizing all the results, that would be essential for the overall assessment, whether the company has done well by capital budgeting this machinery.

Table 17- Summary of the results

Indicators	Value
Discount rate of the company	6,5 %
Net Present Value (NPV)	24 762 136 > 0
Profitability Index (PI)	1,82 > 1
Internal Rate of Return (IRR)	32,7 % > 6,5%
The Return On Investment (ROI)	32,16 % > 6,5%
The Payback Period (PP)	3,72 years < 10 years

Source- own calculation

In this appraisal, the net present value has come out as positive number. The amount of net present value extensively affects the profitability of the selected investment, or we could say the corporate discount rate. Thanks to this, the chosen corporate discount rate was calculated at a rate of 6.5% and is relatively low, which can be also reflected on the amount of net present value. As a supplement, I have calculated the profitability index, which was 1,82. It should be more than 1, because this indicator tells us the amount we will get from invested 1$.

The next method I used was internal rate of return, of which the result in our case is 32,7%. If we compare this rate with the discount rate (6,5%) it is evident that IRR is far higher, and that expresses the effectiveness of this project. Further, the payback period is much shorter than the amount of the depreciation years, which is evident why it will be profitable and the return on investment is as much as higher than the minimum return required by the company shows how the investment is remarkably lucrative. From these effective results, it has been proved that investing to this additional production line and equipments was very beneficial and good decision for the sake of the company.

Conclusion

The aim of this work was to appraise (evaluate the effectiveness) an already implemented (in 2014) investment project of the company "MCS Coca Cola", which involved a purchase of the production line. The reason of this investment was to expand their production and increase their sales revenue. My thesis was divided into two main parts. In the theoretical framework, I provided fundamental information of investment behavior, procedures and basic methods used for an appraisal. According to these factors and theorem, my practical part proceeds by using figures that were gained from the company. The practical framework starts by addressing all necessary information about MCS Coca Cola. Further I determined the preliminary data that will be used in the appraisal and then tried to capture the future revenue and expenses resulting from the investment. These values were calculated by analyzing the growth of production volume and the inflation of Mongolia. On the basis of these outcomes I calculated the prognosis of this project's cash flow and appraised the investment by applying four different methods. It is compulsory to note that restrictive conditions and probable risks, even if it was defined low, were all included in the calculation.

In this thesis, I tried to assess whether the investment was realized for the benefit of the company. All discounting and non discounting methods such as, net present value, internal rate of return, return on investment and payback period methods showed noticeably positive results, which indicates that the company made a right decision. From the executed evaluation, I have concluded that if the future progress of this investment imitates the current progress, the whole investment would be excessively profitable.

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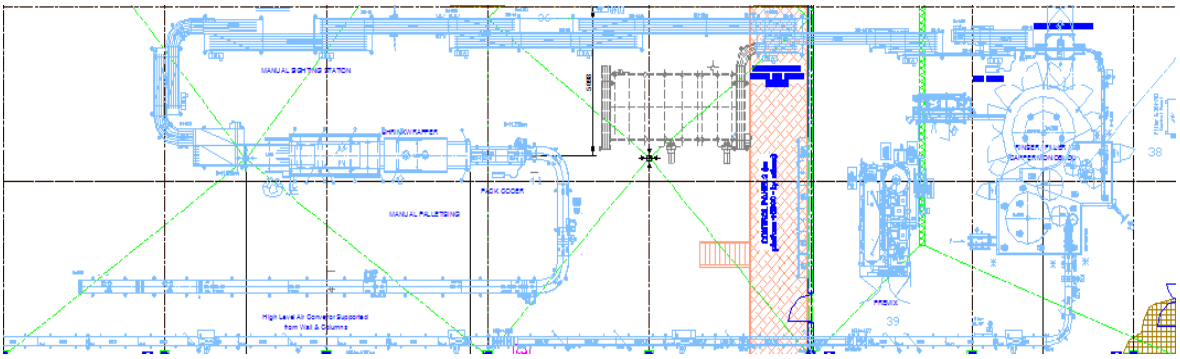
Appendix

Appendix 1 – Production lines

Appendix 1 – Production lines

Line 1



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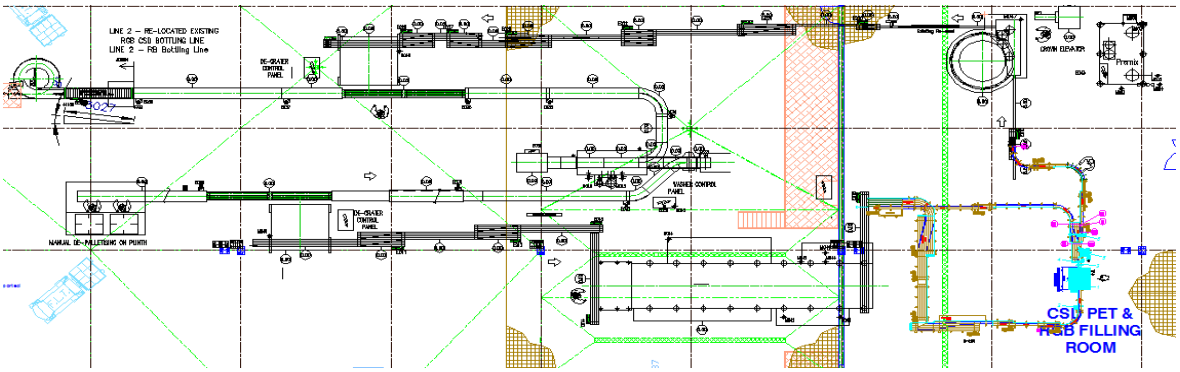
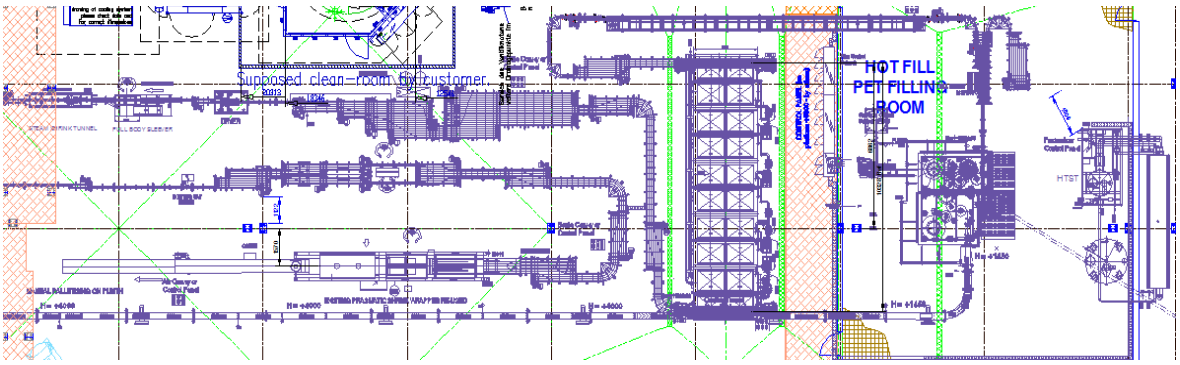


Line 3



Line 4