

ANALYSIS, USING AND UNDERSTANDING FINANCIAL

STATEMENTS OF THE FIRM

Grzegorz Michalski

Introduction

Counterpart rating is a complex and important process. It is performed by the company on a regular basis, and - whether succeeding or whether our actions will end in failure - largely depends on it. On the one hand we are very concerned for obtaining customers. On the other hand, if we establish relationships with inappropriate actors, it may end badly. Contractors need to be assessed at the "start" (suppliers of materials and raw materials for production) and the end (the recipient of our products and services).

In assessing the contractor's company, we often use the information that he wants us to provide. They are therefore usually dependent on the documents that define the contractor's activities as an entrepreneur and in their form¹. Economic activity (according to the Bill of 19 November 1999 Law of economic activity) is, for economic reasons, carried out in a structured and ongoing activity of manufacturing, commercial, construction, services, and search, exploration and exploitation of natural resources.

The feature of continuity of economic activity means that it cannot be done incidentally, but may be seasonal. Entrepreneurs are three categories of subjects: physical entities, legal persons and

¹ See: G.Michalski, K.Prędkiewicz, *Tajniki finansowego sukcesu dla mikrofilm. Od uruchomienia do stabilnego wzrostu*, Vademecum Menedżera, CHBeck, Warszawa 2007, p. 127-148.

companies without legal personality of commercial law, who professionally and on their own behalf undertake and carry out economic activities. Entrepreneurs are now considered as members of a civil company (since 1 January 2001 entrepreneur was a company and not its shareholders) to carry out their business. Contractor assessed by us can carry out his activities in several basic forms: single company, companies, cooperatives. Most information can be expected from the company conducted on the basis of commercial law, such as a company or partnership, partnership, limited partnership, limited-partnership, limited liability company (referred to as Sp. z o.o. ltd), or joint stock company (hereafter SA). Depending on who is our contractor, we can expect from him other data. Financial and statistical reports are produced by the company depending on the legal form of its activity. Full accountancy concerns firms that pay income tax on individuals and legal persons determined by the records kept in accordance with the Accounting Act. The provisions of the Accounting Act apply, inter alia, to those established or to exercise the board on Polish territory: the commercial companies (personal and capital, including the organizations) and civil partnerships (subject to paragraph 2, as well as other legal persons, with the exception of the Treasury and the Polish National Bank) individuals, civil partnerships of individuals, partnerships of individuals and partner companies, if their net revenues from the sale of goods, products and financial operations for the previous financial year amounted to at least the equivalent of EUR 800 000² in Polish currency.

² Law of 29 September 1994. Accounting (Journal of Laws of 2002., No. 76, item. 694 as amended).

In case the evaluated contractor does business - whatever its form, you can expect additional documents such as a certificate from the Tax Office about lack of overdue tax (if it is up-to-date, not older than e.g. 30 days, this informs us that the contractor complies its obligations to the Tax Office if you have any arrears to the budget, it can be concluded that this is a very suspicious case, and this should be taken as a warning signal), a certificate from ZUS about lack of overdue insurance contributions (if it is up-to-date, no older than eg 30 days, has a similar meaning as a certificate from the Tax Office and our counterpart is some backlog in this respect, it can be concluded that this is a warning signal for the evaluation of the counterpart). With business using revenue and expense ledger, it is possible to ask for: company registry documents (REGON, NIP, the entry in the records of a business), a copy of the company agreement (on the basis of which you can sometimes find out that the person who signs with us some contract has no authority to do it), a copy of the PIT - 36, confirmed by the Tax Office for the last two years, PIT - 5, confirmed by the Tax Office from last month, a copy of the revenue and expense ledger from last month, a certificate from the Tax Office on derived income (not older than 30 days), authenticating that our contractor as an entity wishing to establish or continue the cooperation with us. If a contractor operates with a full accountancy, in addition to the above, we ask for a copy of the balance sheet F-02 for the last year, a copy of the declaration of the F-01 for the last year confirmed by the Tax Office, a copy of the CIT for the last year confirmed by the Tax Office. If your contractor is established on the basis of a lump sum, it is worth to supplement the documentation with a copy of PIT - 28 for the last two years, confirmed by the Tax Office, a certificate of costs incurred and revenue performance (contractor's own statement), certificate from the Tax Office for income derived (not older than 30

days). If our contractor does business with the use of a tax card, in addition to the aforementioned we obtain a copy of the decision from the Tax Office to grant the amount of your tax for the current year, a statement of costs incurred and income performance (contractor's own statement). Deciding on counterpart is not an easy task. In principle, any concluding on the counterpart bears the risk of errors in the assessment, even if it is carried out in accordance with all standards. Counterpart rating on the basis of information contained in the reports should be treated as one element of the whole puzzle. It must be considered as a basis for further, deeper analysis. This is because this tool is far from perfect. We can imagine the difficulty of this task, if we compare the actual state of the literary work, part of which is displayed, and the rest has to be guessed. Although the work may be the most inspiring of those we know, on the basis of fragments visible to us, we cannot say this for sure. At the same time, it is possible for us to see parts, which promise more than the same piece is worth.

The purpose of this guide is to present the most useful, known to the author tools that can be used to assess the counterpart. One should always remember that at no stage one couldn't fail to intuition and managerial experience of the assessor. Counterpart rating is an art, not a craft. It cannot be made by a computer system without checks and the final decision of the experienced man in the industry.

The guide in the first part deals with the financial objective of the action and essential elements of shaping the financial image of the company's counterpart. The purpose of this section is to show the main elements allowing the contractor to understand why we can behave in a certain way and how to interpret this behavior of the contractor and what will be the reflection in the information we receive from the counterpart.

The second part deals with a discussion of the financial reports of the contractor and the main conclusions that one can try to draw from them. The third part is devoted to the indicator analysis of with respect to those indicators, which often can help to assess the contractor. Since the indicator assessment itself is not enough to conclude, the fourth and fifth section describes two cases of contractors (this list could be extended, of course), recipients and providers. Counterpart rating of the user using deferred payment is based also on how accepting even the weaker counterparty affects the value of the company if the assessment is related to an increase in sales. Counterpart-supplier rating is also based on its impact on the value of the evaluating unit firm. Both approaches take into account a number of information from outside of the financial statements resulting from the contractor's bid. At the end one can find the appendix in the form of the basics of financial mathematics used in the course of the discussion contained in this guide. These are primarily basic models useful in the analysis value of money in time and financial tables.

* * *

My sincere thanks to professors: Professor Wiesław Pluta and Professor Bogumił Bernas, whose valuable and inspiring comments enabled the creation of this guide. I also thank my colleagues from the Department of Companies Finances and Value Management of Wrocław University of Economics for your help and discussions that was a valuable material useful in preparing the book. Developing of elaboration in such a form that we present today is the result of many inspiring questions from curious attendees of business training, participants in postgraduate studies and consultancy services clients, for which I would like to thank.

During the preparation of the book all the time I have received constant support from my beloved.

So I thank my wife Anna, and children: Samuel and Eunika. I am particularly grateful for their friendly warmth.

Grzegorz Michalski

<http://michalskig.com/>

1. The financial objective and essential elements of shaping the financial image of the counterpart's company.

Primary objective before the firm managers affects all economic parameters (and their interpretation) that describe both the contractor's business being evaluated as well as ours. The basic financial objective of company operation was defined differently and differently as a consequence of this, looked the picture of a company for players evaluating the company.

Among many areas of business management, one of the areas is management of its finances. This is a rather specific sphere of management of the resources of these stocks and flows generated by the company. Its performance decides whether success or failure is achieved. It is not enough, however, to manufacture and sell the products of which there is significant demand at a sufficiently high price. Bad financial management of company may destroy the benefits emerging from this fact. This raises immediately the first financial goal of the enterprise: do no harm. So the idea is to manage the assets and sources of business assets in a manner, which will not affect destructively the developed benefits in non-financial areas.

Doing-no-harm itself is not the primary financial objective of company management. To note it, just think about why people undertake any economic activity. They do this not just to protect them against not losing available resources, because then it would be enough to hide the assets held in a safe place, or simply deposit them in the bank. The aim of the people doing business is a profit

exceeding the minimum interest rate the bank³. These benefits would not necessarily have only a monetary dimension.

How do I set this goal? For a long time, this objective was determined briefly: to maximize profit. It can be achieved by the positive impact of the business owner, seeking to increase sales revenue through appropriate policies to finance their customers by means of trade credit granted to them through the relevant impact on reducing the costs of company activities, through the influence on the price of products offered, etc. But, you have to realize that in most cases companies do not have any possibility of influencing the price of their products (an exception may be those companies that operate in market niches). It should also be taken into account the fact that so-defined objective (maximizing profits) creates certain risks. To achieve maximum high current benefit, it should be done as much as possible to reduce costs and increase revenues. Reducing costs can be achieved by reducing spending on advertising, research, development and training. Increasing revenue can be achieved by reducing or even sale of assets. The objective set as such creates a danger of lack of investment in important areas of business, although probably protects against mistakes of overinvestment⁴.

Another well-known proposal of the company's purpose is 'operation continuity'. Such an approach to target is also unsatisfactory. The quest for the firm's survival at all costs, despite lack of benefits, it is not desirable. Similarly, it is difficult to imagine that a rational owner of the company operated just for the purpose of the continuity of company lasted, no matter how, but for ever.

³ This is obviously a simplification, because the conduct of their business is associated with a much higher level of risk than the risk of a bank deposit, it should be associated with much higher benefits compensating higher risk

⁴ Overinvestment which is not economically justified

You can meet several other proposals for the company activities financial purpose, which in fact cannot be it. These include: the defeat of the competition, maximizing sales, maximizing market share, and maintaining a stable revenue growth. You can beat the competition by trying to accede to the devastating price war, or otherwise lead to win leading to self-destruction. The next two goals, maximizing sales and maximizing market share, are similar in nature. This can be done by proposing too low selling prices, or by the use of too liberal policies of trade credit. The effect of such a target may be set too high charges, many of which would be irrecoverable, and hence will have effect only on paper.

Essentially, all of the earlier proposals for the financial target of management of an enterprise can be divided into two groups. The first group of proposals emphasizes on reducing the risk of the business. The other relates to the increasing profitability. Both of these groups are considered separately, may consequently lead to improper financial management of enterprises. Indeed, they are somewhat contradictory. Maximization of profit is usually closely associated with an increased risk activity. Similarly, excessive attention to reducing the risk at all costs, eliminates the possibility of generating profits from the use of such financial tools as a lever.

The owner of the company, as already mentioned, is trying to achieve with his wealth invested in the company, more benefits than those, he would obtain by investing his resources elsewhere. This suggests to us the financial objective of business management from the perspective of owners: maximizing its benefits. Any action in the financial management of enterprises should be evaluated

from this perspective. If an action increases the assets and / or non-material benefits of the owners - they should be undertaken if such action would destroy them - it should be abandoned.

The objective of financial management of the enterprise is to maximize its business value. There is probably no more true statement for the financiers, but one also needs to realize that it is very questionable to determine the target of the company actions. While, one can assume that there is relative agreement that maximizing the business value may be a target for big commercial companies, it is almost impossible to convince everyone that this objective can be set to any type of financial companies.

Most of the objections most often put forward is that most business owners primarily started the business on their own to achieve economic independence, not to have any boss above them, have more time for family and all the other reasons that may be important for the owners. This is often true. Therefore, the definition of the target we used was: to maximize the benefits (and not just property). The benefits of the owner consist of elements that both can easily be expressed in monetary form as well as those elements, which may try to be evaluated and expressed in the form of cash, only by the owner himself.

Value (price) of the company can be assessed from the point of view of its potential sellers and its potential buyer. Mentioning the value of the company for its owner, we will have in mind is, for what their owner would (or should be) willing to sell his business. Similarly, speaking of the value of the company (without additional definition for whom) we had in mind that, for what value he could be buying / selling of such a business. Potential buyer, especially if it is a big buyer, probably will not even pay attention to those elements of the company that are essential for the owner.

Value of the company to which the potential buyer mostly will pay attention to, usually is due to three main reasons:

- Current and future cash flows generated by the company⁵,
- Cost of capital which finances small and medium-sized enterprise,
- Volatility of current and future cash flows⁶ and the likelihood of disturbance in regular repayment of liabilities and the resulting likelihood of bankruptcy⁷.

For an action to contribute to the growth of the company's value and thus increase the wealth of its owners, it must cause an increase in the value of expected free cash flow (FCF_t), and / or the extension of period (t) in which expected regular positive cash flows will be generated and / or the interest rate resulting from the cost of capital of the company reduced (k).

However, as previously mentioned, these are not the only components of the company. They are accompanied by other elements, such as the subjective valuation of economic independence, and other similar items, which the owner considers relevant and actually make the company launched.

Therefore the value of enterprise in the view of its owner can be expressed as:

$$V_p = NEV + EV = NEV + \sum_{t=1}^n \frac{FCF_t}{(1+k)^t} \quad (1)$$

⁵ H. Rinne, R. A. Wood, N. C. Hill, *Reducing Cash Concentration Costs by Anticipatory Forecasting*, Journal of Cash Management, 1986, p. 44-50.

⁶ W. Tarczyński, M. Mojsiewicz, *Zarządzanie ryzykiem*, PWE, Warszawa 2001, p. 145.

⁷ C. W. Smithson, C. W. Smith, D. S. Wilford, *Zarządzanie ryzykiem finansowym, instrumenty pochodne, inżynieria finansowa i maksymalizacja wartości*, DW ABC, Kraków 2000, p. 135.

where: NEV – non-economy factors shaping the business value, EV – business value based on expected money flows, FCF_t – expected value of future free money flows generated by the enterprise, k – discount rate resulting from the cost rate of the enterprise's capital.

As is apparent from the above formula, the value of the company consists of two elements. The first one consists of non-economic factors shaping the value of companies. They are not the main subjects of discussion of this guide.

In conclusion, it must be assumed that the financial objective of the company is to maximize its value for the owner of that company (or in the wider sense to all stakeholders interested in the results of operations of the company)⁸. Both elements included in the value of the company are not in conflict.

It is obvious that maximizing the value of companies, thereby maximizing the property of the owner can take place when simultaneously are implemented, considered to be partial, other goals such as prestige of entrepreneur and its strong business position in the market, freedom in decision-making and quality decisions arising from the managerial talent of the owner, participation in the implementation of social needs and satisfaction of employees with their work.

After determining what the activity of the assessed contractor is, one should assess whether his business idea has a long-term chances of success, or rather there is a project that meets temporary needs and thus has a small possibility of a longer operation. It is a difficult and at the same time

⁸ W.Skoczylas, *Podjęcie deterministyczne w identyfikacji generatorów wzrostu wartości przedsiębiorstwa*, Zarządzanie Finansami, Finansowanie Przedsiębiorstw w Unii Europejskiej, D.Zarzecki [red.], Szczecin 2004, pp. 342-344.

important task to confront those executing the evaluation of the contractor, both at the start of cooperation with the contractor, and during the continuation of cooperation. The first element, which should be evaluated, is the future level of earnings resulting from the proceeds of the sale, which a contractor reaches, and comparing it to other elements affecting the economic shape of the rated company. The detail of dealing with such a contractor should be dependent also on how much percentage of our revenue from sales will be generated as a result of cooperation with the contractor.

In the assessment of future proceeds from the sales (cash proceeds of the sale) it may be helpful to reflect on such elements connected with the contractor being evaluated as to who the contractor's business leads and will lead, on which markets the evaluated contractor works and will work, products or services what he will offer on these markets, etc. Assessment of proceeds of sales and other items is needed to really evaluate the contractor's business and to respond appropriately to any deviations from our assessment in the future. If you notice that the contractor reports emerging in our estimation are a far too optimistic picture of the level of sales (and we can see that by how much materials for production, compared to the previous state contractor collects), it poses a threat that the contractor will bring together **too much** stock of raw materials for production, and when, he sees too late the mistake of overly optimistic sales forecasts, he can produce too much finished products. The consequences of such an error could be dire⁹. Apart from the losses resulting from over-investment (both shown in the reports and those alternatives), this situation is accompanied by the risk of loss of the ability to regulate the commitment to our company by the contractor.

⁹ D.Bernhardt, M.Campello, *The Dynamic of Earnings Forecast Management*, Review of Finance, nr 11, 2007, pp.287-324.

If, however, we find that the contractor is too cautious in his predictions as to the sales (by collecting too low level of current assets), this may also be a cause for concern. The result may be too low level of stocks of raw materials and, consequently, insufficient range of finished products. As a result, some unhappy customers of our contractor can switch to his competition, which may adversely affect our results, if the competition of our contractor supplies our competitors. If the contractor provides us with our services and / or products, you may find that due to this fact he predicted the sales too cautiously, you will not know how to meet our expectations¹⁰.

The value and possibilities of success of counterpart to a large extent depends on the values of people involved in its implementation. Good to know what intellectual capital is available to our contractor. It is the qualifications and how the workers are organized often decides of the success or failure of our contractor and indirectly affect on us. Information about what kind of people work in the contractor's company is not available directly. We can conclude it indirectly, if we learn how many (and which – the best), people are employed by our contractor, and what are his costs associated with salaries. Under-investment in employees can lead to excessive volatility of staff, and this may adversely affect the quality of our contractor's offer the may then adversely affect our results. Relatively high wage bill, may be good for contractors and generally should be construed as a positive signal about him.

Another element allowing evaluating the sales of the contractor is information derived from the analysis of the market on which the contractor operates. In this evaluation industries and business

objectives of the counterpart are important. It is important who are his clients . The next step in this regard is to identify certain relationships, trends and opportunities in the market.

Above information should be supplemented by examining the overall size of the industry in which our contractor works, including the potential revenues generated by the industry, the number and type of clients served by the industry. About the industry you need to know its character, and if and to what extent it is characterized by seasonal demand, since this will be reflected in our company if in any way it limits the ability to pay by our contractors. If the contractor's industry is sensitive to state policy, it may also affect quite significantly the sales forecast.

Paying attention to customers whom the contractor intends to provide his services and / or products for the assessment of sales such features as customer age, average income-earning opportunities and the nature of their residence may be relevant.

In assessing the sales of the contractor, one should take into account what competition is on the market of the contractor. Which entities and what is their share in the market and what market share can be expected in the nearest and further future. Will this share be stable, or in addition to previous parameters affecting the seasonality one also should take into account the periodicity resulting from the competitors impact on the market. Such a diagnosis should be followed by the analysis of strengths and weaknesses of the contractor against the competitors.

The stability of the sales will be affected by the problem of the barriers of entry / exit prevailing on the relevant market in which the contractor assessed by us operates. The bigger the barrier, the less the likelihood of threats arising from the invasion of other competitors. Lower barriers in turn will result in more frequent entries of new competitors on the market of the rated counterpart.

¹⁰ Comp. B.Dobiegała-Korona, *Zaufanie klienta*, Kwartalnik Nauk o Przedsiębiorstwie, nr 2, 2007, pp. 19-21.

When evaluating the cash flow, especially items related to costs associated with sales generating of the contractor, the important role is played by technological aspect of the manufacture of products or services proposed by the contractor. These aspects are related to prospects for development in the far future, and hence, the long-term generation of revenue from sales and costs relations.

Evaluation of proceeds from the sales will not be successful if in addition to defining what a product or service offered by the contractor is, we will not be aware of what makes his product or service different from competitive products. The level of future revenues from the sales also is affected by the physical characteristics of the product and the benefits of using this product or service and what distinguishes its service or product as compared to other market offers.

Similarly, the assessment of the sales may be affected by the fact of legal protection (patents, copyrights) of your product or service. In assessing the contractor we should be aware of how the sales and interest in the contractor's offer are affected by other characteristics such as packaging, quality, price, extra - related services and benefits that potential customers would be able to experience through the use of his offer (e.g., saving money, time, better well-being, intensive self-development of clients).

In addition, when assessing the income from the sales of the contractor, you should pay attention to the relation of products price to the cost of their manufacture. The level of sales of assessed contractor is shaped not only by the overall industry demand for an offer in which he operates but also by the contractor himself. This is possible by the pricing strategy pursued by him, possible to achieve unit cost (fixed, variable costs), competition price of the products or services, and additional costs not related to the competitors. Significant impact on sales may be due to offered

discounts and the group of customers, which they pertain to. Similar effect has information about refunds or products replacements - whether imposed by law to protect the position of consumers / customers or autonomously offered by the company. If the rated contractor implements relatively extreme policy in any field - including the price (compared with other companies in its sector), such a situation should be assessed as unsatisfactory.

The sales and distribution strategy implemented by the company plays important role in predicting the level of revenue from sales and associating parameters (especially cost). It is significant too, where a product or service will be sold, whether it's wholesale, retail, or the Internet will be used for it, or whether and with what the trader's trading partners he will cooperate. If such information about the evaluated contractor can be obtained, it can be concluded on their basis about how the expected by him revenues and other components of the flows are feasible. Such information will not be received from their financial statements.

Further puzzle elements giving rise to the information about possible future revenue from sales and other parameters that affect the cash flows are about how customers will pay, what guarantee terms will be offered to them, whether they are imposed by law or are an autonomous decision of an entrepreneur. Similarly, in predicting sales one needs to take into account the after-sales service, and whether free of charge or not, they are offered to the customers of the contractor being evaluated by us.

In the estimation of future sales revenues, and the parameters influencing the accompanying costs, there is a need to take into account the likely effectiveness of advertising and promotion. Observing

our contractor, we try to answer the question, what kind of policy he carries out in this area and how to evaluate it. Other cost-generating elements related to the project are the information about dissemination of the business run by a trader among the local community, about the use the website and other channels of promotion, such as telemarketing, conferences, etc. If our counterpart's company is well associated in its local community, it gives us a positive impulse of the greater confidence in our counterpart.

With information on sales, you can begin to assess the financial performance of rated counterpart companies. First one must focus on the expenditure side, which are divided into single items, such as the purchase of property, equipment, repair costs, etc., and operating, such as rental of assets, lease, costs of materials and raw materials, wages, insurance costs, promotion costs, energy costs, etc. Such estimation will allow the assessment of cash flow and operating cash flows. On this basis, you can specify whether the assets and liabilities are reasonable and whether they result from the firm operation. On this basis, you can try to assess whether the activities of the contractor are entitled to be profitable.

Based on this collected information, you can try to reproduce the estimate of cash (otherwise known as the cash budget) of the rated counterpart. The estimate reflects the trader's state of cash currency at the moment. Businessman using it constructs it for the future. Assessing the contractor, we can recall it for the past, in order to try to infer how well the contractor manages the cash. Such restoration can help us assess how the estimated contractor will handle the overlap liquidity if they

will occur in the future. If the proceeds exceed the cash outflows of cash flow is positive. Lack of such excess means greater cash outflows than proceeds. Such analysis can let us identify where and when there was the lack of cash and thus, enables the assessment of undertaken by the rated contractor actions driving away the cash excess or securing the lack of cash.

Assessment of the statement of assets and liabilities, called the balance sheet, is another piece of the puzzle. It is a kind of 'photo' of assets at the disposal of the contractor being evaluated at a given moment of the past activities, along with information about where the given property elements found financing¹¹. The list shall consist of the assets (expressed in value of stocks, i.e. the assessed contractor's property, equipment, cars, stocks, bank state, the expected payments, etc.) and liabilities (funding obtained by the contractor company i.e. their own funds, foreign loans, loans, other liabilities). The basic principle of such a statement (balance sheet) is the balance between assets and liabilities.

After the evaluation of the cash proceeds arising from the proceeds of the sales, the accompanying outflows arising from both the costs of expenditure (fixed and variable costs) and non-expenditure (such as depreciation, fixed assets, bad debts), you can determine the approximate level of free cash flow generated by company of the rated counterpart. Additionally, if you manage to determine the

¹¹ Por. J.Duda, *Finansowanie działalności inwestycyjnej przedsiębiorstw polskich z sektora MŚP w okresie integracji z Unią Europejską*, Zarządzanie finansami firm – teoria i praktyka, W.Pluta [red.], PN AE nr 1152, Wrocław 2007, ss. 120-123.

projected rate of cost of capital financing the company of the evaluated contractor, we can try to assess the impact on the value of his business and to evaluate his actions.

These elements are formed in reality in conditions of risks and uncertainties. We look at them as past, wanting simultaneously to assess how the future of the rated counterpart will look like. We have less information than the evaluated contractor has. We should try to assess how the rated counterpart coped with identification of unforeseen and often unforeseeable events both positive and negative. Information that he had trouble with this testifies negatively of him. If the contractor cannot draw conclusions, and he did not start to manage risk and protect against the negative effects of uncertainty, it may be a warning signal for us.

Another element of the contractor's initial assessment that can help us evaluate the remaining components (in conjunction with the information about cash receipts resulting from the proceeds of the sales) is the operating cycle of the rated contractor's company and its cash conversion cycle.

Drawing proper conclusions from these two parameters will let us advance in the assessment of working capital requirements, etc.

Example. 1. Enterprise 'IX-Pol' has a rotation of inventory period near 40 days¹², receivables for runoff forecasted close to 45 days¹³.

The period of rotation of stocks is information about how much time the entrepreneur takes to produce final product (final service) and then how much time will pass to sell it. If it takes

¹² The period of rotation of stocks (OKZAP) can be estimated as the ratio of inventory and daily sales.

¹³ Period of debt collection (OSN) can be estimated by dividing the duties and daily sales.

approximately 40 days, it will mean that the period since the receipt of raw materials for production, through the processing of these materials and products into the finished products / services, until the invoice for the customer is usually expected to end within about 40 days. The same applies to the period of debt collection. This information is about how long it will take to wait for the money from the buyers for sold products / services. Based on these two information items, you can estimate the operating cycle of the companies 'IX-Pol'. Operating cycle informs about how much time the contractor usually needs for the purchased raw and production materials to process them to finished goods / services, and then to sell them and get the cash flows from them. Thus, the operating cycle is the sum of the stocks conversion cycle and the period of debt collection. In our case, therefore, it will be approximately 85 days. Formally, such a calculation can be written as:

$$CO = OKZAP + OSN = 40 + 45 = 85 \text{ dni} \quad (1)$$

where: CO = operating cycle, OSN = period of debt collection, OKZAP = inventory conversion period

With information about the conversion of stocks and the duration of contractor's debt collection periods, we should try to assess whether these figures are relevant to the sector in which the company of the evaluated contractor operates. This information should be confronted with the information you will not find in the counterpart's financial statements. The point is in what "is said" about the contractor. I.e., whether good opinion about the contractor's product is circulating among

his recipients, whether employees believe that the contractor's company manages well the assets, etc.

Stocks conversion cycle shorter than that of the sector may be the result of both good and bad practices. On the one hand, it may provide that the work of the team executing the finished products / services performs its tasks more efficiently than its competitors. This may be the result of both good organizing of workers to and better equipment of rated counterpart's company. On the other hand, it may mean that production is carried out negligently, or that the stocks of materials and supplies are purchased in the last minute. This may result in that the business risk of rated counterpart will be higher.

Long stock conversion cycle, longer than in other businesses of the sector, may indicate a relatively inefficient production, resulting from excessively slow performance of subsequent stages of the production process. But it may also be the result of the fact that the evaluated contractor's company has a longer process of production due to higher-quality final product.

Another useful information we should take into account when assessing the contractor is the cash conversion period (cash conversion cycle).

Example. 2. Enterprise 'IX-Pol' regulates its obligations within 25 days¹⁴, which means that the period of deferred payment of obligations to suppliers is 25 days. On this basis we can estimate the cash conversion cycle, which informs about how much net time usually elapses from the moment when the company of the evaluated contractor pays for purchased materials and raw materials for production until the moment after processing them into finished goods / services after selling them, obtains cash flows from them. Thus, the cash conversion cycle is the difference between the total

¹⁴ Period of debt collection (OOSZwD) can be estimated as the ratio of liabilities to suppliers and daily sales.

stock conversion cycle and the period of debt collection and the period of obligations deferred payment. In our case, therefore, it will be 85 days, which can be summarized as follows:

$$CKG = OKZAP + OSN - OOSZwD = 40 + 45 - 25 = 60 \text{ dni} \quad (2)$$

where: OOSZwD = period of deferred obligations payment to suppliers, CKG = cash conversion cycle (monetary means conversion cycle), OSN = period of debt collection, OKZAP = inventory conversion period.

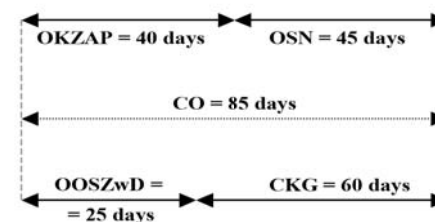


Figure 1 Cash conversion cycle and operating cycle of the company 'IX-Pol'.

Source: own.

Components of cash conversion cycle, and proceeds from the sales are related to the individual components of assets such as inventories, receivables and operating cash level of so-called automatic liabilities such as debts to suppliers.

Example. 3. Enterprise 'IX-Pol', generated annual sales revenue of 4320 000 per year. In such

conditions, the average level of receivables, inventories, automatic commitments (the level of commitments to suppliers, employees, budgets, etc.) will depend on the average daily sales¹⁵:

$$\text{Daily sales} = D_s = 4320\ 000 / 360 = 12\ 000\ \text{zł.}$$

The level of charges depends on how much daily on average the evaluated contractor sells and on how much time he is willing to input of the cash for this sale. It is therefore a product of the period of debt collection, and daily revenues resulting from the proceeds of the sale. This can thus be calculated on the basis of such estimates:

$$\text{Claims} = NAL = OSN \times D_s = 45 \times 12\ 000 = 540\ 000\ \text{zł.} \quad (3)$$

where: NAL = average level of receivables in the balance sheet, OSN = period of debt collection, DS = the average daily input resulting from the sale.

The level of inventories depends on how much per day the assessed contractor sells and how much time such production takes. It is a product of the inventories conversion period and daily receipts resulting from the proceeds of the sale. This figure can therefore be expressed as:

$$\text{Stocks} = ZAP = OKZAP \times D_s = 40 \times 12\ 000 = 480\ 000\ \text{zł.} \quad (4)$$

where: ZAP = average level of inventories in the balance sheet counterpart OKZAP = the contractor's inventory conversion period, DS = the average daily cash impact resulting from the sale.

The level of liabilities to suppliers results from how much we sell per day and from what time the suppliers are willing to wait for the contractor to pay them. It is a product of the period of deferment

¹⁵

Assuming that the number of days per year is 360 Adoption of the average daily sales, may be replaced by the adoption of the average daily cost. However, please note that the information on the sales of rated counterparty is definitely easier to obtain, so here to analyze we will use the level of sales

of obligations and daily receipts resulting from the proceeds of the sale. This amount can be expressed as:

$$\begin{aligned} \text{zobowiązania} & & (5) \\ \text{wobec} & = ZwD = OOSZwD \times D_s = 25 \times 12\ 000 = 300\ 000\ \text{zł.} \\ \text{dostawców} & \end{aligned}$$

where: ZwD = average level of liabilities to suppliers in the balance sheet of the counterpart, OOSZwD = period of deferred payment of obligations to suppliers, DS = the average daily cash receipt resulting from sales by the contractor.

In our considered case, the entrepreneur decided that he had wanted to keep the money more or less at the four-day rotation. Thus, in this context, the average level of cash means depends on how many he sells per day:

$$SP = 4 \times D_s = 4 \times 12\ 000 = 48\ 000\ \text{zł.} \quad (6)$$

where: SP = average level of cash and cash equivalents, DS = average daily levels of cash receipts from the sale.

The average level of cash depends on the businessman and requires a somewhat broader treatment here. It is dependent on his personal aversion to risk. Approach to cash management in a company should depend on the business motives behind their collection and holding. The primary objective of cash management is to set the cash resources of the enterprise at such a level that it contributes to an increase in the value of the company, which will be reflected in the increase of the wealth of the entrepreneur. In assessing the contractor's company one should also pay attention to

whether this level was set at an appropriate level. The aim is to verify that the cash resources kept in contractor's company are at a level that is optimal from the perspective of balancing the costs of maintaining cash and costs of having too small cash resources. The type and size of these costs is partly dependent on the specific financial strategy pursued by the evaluated entrepreneur.

Cash management affects the value of the company, by the fact that the level of investment in the funds held by the firm entails a rise in opportunity cost resulting from the freeze of the company resources and increases the level of net working capital. Both changes involve a modification of the projected free cash flows as a result of which, the value of the company is changing.

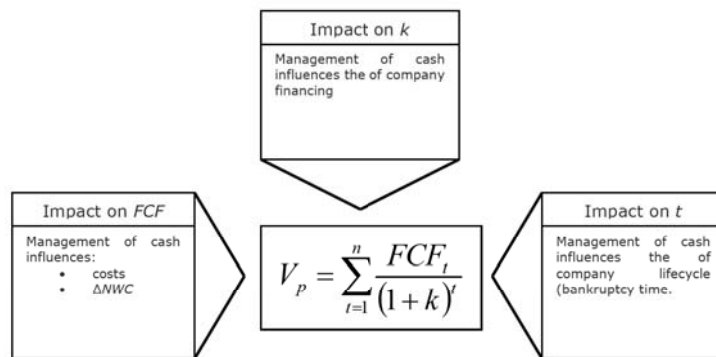


Figure 1. Impact of cash on the value of the company.
 Symbols: FCF = future free cash flow; ΔNWC = increase in demand for net working capital, k = cost of capital financing the company, t = the lifetime of the company.
 Source: G. Michalski, Risk Based Demand for Cash in a Business, [in:] D. Dluhošová [ed],

"Managing and modeling of financial risk," Vysoká škola báňská - Technická Univerzita Ostrava, Ostrava 2006, ISBN 80 -- 248-1159-6, pp 179-185.

If the benefits of keeping cash at the specified by the trader level will outweigh the negative effects of opportunity cost of maintaining them and the negative effects of increasing the level of working capital requirements, then we will observe that the value of the company will increase.

It is interesting from our point of view, resulting from the need for fundamental objective of financial management of the company, to determine how a change in the level of cash affects the value of a rated counterpart company. For this purpose, we use a formula, based on the assumption that the value of the company is the sum of the discounted free cash flows for the company:

$$\Delta V_p = \sum_{t=1}^n \frac{\Delta FCF_t}{(1+k)^t}, \tag{7}$$

where: ΔVp = increment of company value, ΔFCFt = increase of free cash flow generated by the firm in period t, k = The discount rate representing the cost of capital financing the company.

The numerator is the right side of the equation contains free cash flow generated by the company¹⁶. They are usually estimated on the basis of the formula:

¹⁶ To assess the impact of changes in the management of the cash the discount rate corresponding to the weighted average cost of capital (WACC) will be accepted, on the basis that such changes and their effects, although they relate to current asset management, are long-term, c MANESSE TS, JT Zietlow, Short-Term Financial Management, Dryden Press, Fort Worth, 1998, p. 62-63.

$$\begin{aligned}
 FCF_t &= (CR_t - CE - NCE) \times (1 - T) + NCE - \Delta NWC_t - Capex = \\
 &= (CR_t - FC - VC_t - NCE) \times (1 - T) + NCE - \Delta NWC_t - Capex
 \end{aligned}
 \tag{8}$$

where: FCF_t = free cash flow generated by the company in period t, CRT = revenues resulting from the proceeds of the sale, FC = expenses resulting from fixed costs, VCT = expenses resulting from the variable costs in period t, CE = cost expense, NCE = non expense cost decreasing the tax base (eg, depreciation) and constituting cash outflow, T = effective tax rate, ΔNWC = increase in demand for working net capital, Capex = expenditure on operating assets.

Businessmen usually maintain cash reserves because of three main reasons. First, they often are guided by transactional and intentional motive. It follows the need to provide resources to cover commonly occurring payments in an enterprise. The reason for their gathering is scheduled payment transactions for the purchase of raw materials and materials for production (transaction part) and the payments arising from liabilities to tax authorities, social insurance, etc., as well as payments resulting from investments (intentional part).

Secondly, there is a prudential reason¹⁷, also called precautionary. It is to protect the company from the negative consequences of risk, or from unexpected, negative payments, which may result from delays in runoff of cash fees or other expected revenues.

Thirdly, part of the businessmen is guided by speculative motive. Left, therefore, available to rated counterpart companies cash should allow the use of the positive part of the risk. Risk is understood here as the *probability of obtaining a result different than expected*. Therefore, what we define as a positive part of the risk is *opportunity, or likelihood of an outcome better than our expectations*,

¹⁷ J. Hromcova, *Precautionary Money demand In Cash-in-Advance Economy with Capital*, Computational Economics, nr 26, 2005, pp. 51-63

while the negative part of the risk corresponds to the risk, defined as the *probability of a result of worse than expected*. It's about having the possibility to make bargain purchases of assets at very attractive prices that depart from long-term prices of a particular type of assets.

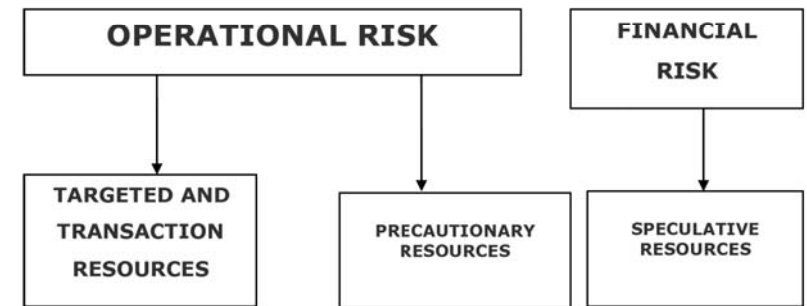


Figure 3 Reasons for keeping cash in the company and their relationship to the risk.

Source: own

Determination of target and transaction cash stocks is based on two approaches. Firstly, to provide targeted needs for cash the trader should use the anticipation of regular events such as the need to pay taxes and liabilities of social insurance. Subsequently, the need to service his obligations arising from investment purchases, repairs, etc. expenditure targeted and known in advance. Secondly, the transaction cash resources shall be determined, depending on what is his experience and predictions about the transaction receipts and cash outflows. There are periods in which no major problems can be predicted in inflows and outflows, and periods when it becomes very difficult if not impossible.

If we generally know the inflows and outflows of cash, that is, if we can put a fairly accurate forecast for a period longer than, say, 14 days, we can apply the model of Baumol and Beránek. If you expect that revenue will outweigh the outflows, we use the Beránek model. Forecast telling that outflows outweigh the inflows causes rather to suggest the Baumol model postulates. When we are not able to put such forecasts for longer than 14 day, we use Stone's model. If we cannot predict the future cash inflows and outflows, we use the Miller-Orr model.

The cash management models, such as the Baumol model, Beránek, Miller-Orr and Stone, do not present a concrete indication of the determination of the minimum level of cash, referring to the intuition of the Board. You can also use the formula:

$$LCL = \sqrt{-2 \times s^2 \times \ln \frac{k \times G^* \times s \times \sqrt{2\Pi}}{P \times K_{bsp}}} \quad (9)$$

where: LCL = lower level of cash (the prudential cash resources), k = cost of capital financing the company, G * = size of a funds¹⁸ transfer based on which standard deviation was estimated, P = sum of inflows and outflows of cash, s = standard deviation of daily revenue / net outflows, Kbsp = cost of the lack of cash.

As you can see, some of these data still requires the trader's "intuition" , since the cost of lack of funds, should include not only the costs of the accounts, but also opportunity costs to be incurred in the case of strain of contractors' confidence due to lack of funds cash.

¹⁸ For Beránek and Baumol models G * will be as much as twice the target level of cash, but for Stone's Miller-Orr's models determining of such an average transfer should be made for the actual or projected data. The average transfer are not to be confused with models proposed for the Miller-Orr and Stone's in case of the reduction beyond the point of return.

Prudential cash resources are primarily the result of fear of negative consequences of risk. Its measure is the standard deviation.

Example. 4. Trader estimated the cost of lack of funds at the level of 1000 PLN, the daily standard deviation of receipts / cash outflows at a level of 500 during the month, the average single receipt / outflow of cash 30 000, the monthly sum of all inflows and outflows of cash: 200 000, cost of capital financing the company 28% per annum.

For the companies concerned, prudential level of cash transaction will be around 2100 zł

$$LCL = \sqrt{-2 \times 500^2 \times \ln \frac{0.28}{360} \times 30\,000 \times 500 \times \sqrt{2\Pi}}{200\,000 \times 1\,000} = 2100 \text{ zł.}$$

If the assessed contractor usually maintains cash at a lower level than the level of LCL, it is for us to note that in the future probably he will have trouble with the timely settlement of his obligations.

Speculative cash resources are not necessarily held by all enterprises. They aim to exploit the positive part of the risk, which are opportunities due to price volatility. In practice, for the Polish companies to maintain such reserves, may be useful in case of payment transactions in foreign currencies. Then, it might be attractive to purchase the necessary resources at temporarily favorable foreign exchange rate. But at the same time such purchase is only possible if the company has adequate cash - derived from speculative stocks. Cash collected by the company for speculative reasons gives the ability to use their purchasing power at any time. This advantage of cash and cash

equivalents over other assets indicates the optional market value of those resources¹⁹. Cash can be compared to the American option of infinite duration, while other assets are close to the money options in Europe²⁰. The right of accelerated acquisition has a value and this value justifies the maintaining of speculative cash resources. The costs of waiting the implementation of other options can cause that the lost benefit of their rapid exploitation is not recovered in the income of the (less liquidative to cash) assets²¹.

The size of speculative stocks should result from the evidence of the activity led by the business and its actual demand. By contrast, reasons for maintaining the validity of speculative stocks and cash equivalents increases with the volatility of asset prices the company needed, and increases with the decrease in rate of cost of capital financing company.

Example. 5. We want to estimate the demand for capital (financial assets) and net working capital in the company assessed by us. Cash and cash equivalents correspond to the average level of sales in four days.

Net working capital (net working capital) is part of current assets, financed by fixed capitals. Net working capital is the difference of current assets and current liabilities, or the difference of constant assets and constant liabilities. This is due to lack of synchronization between the formal creation of the proceeds from sales and the actual cash inflow resulting from the recovery of

¹⁹ S. E. Beck, *The Option Value of Money*, Working Paper nr 93-15, University of Delaware, Newark 1993.

²⁰ comp. J. Ingersoll, S. A. Ross, *Waiting to Invest: Investment and Uncertainty*, Journal of Business, 1992, 65:1-29,p. 5-6.

²¹ comp. S. E. Beck 2005

liabilities and the differences in during costs formation, and the actual cash outflow related to the repayment of obligations. It can be determined on the basis of the formula:

$$\begin{aligned} WC = CA = NAL + ZAP + SP &= 540\,000 + 480\,000 + 48\,000 = 1068\,000 & (10) \\ NWC = CA - CL = NAL + ZAP + SP - ZWD &= 1068\,000 - 300\,000 = 768\,000 \end{aligned}$$

Where: WC - working capital, NWC - net working capital, CA - current assets, CL - current liabilities (excluding short-term financial obligations), NAL - charges, ZAP - stocks, SP - cash and cash equivalents, ZWD - short-term non-financial liabilities (excluding short-term financial commitments).

In assessing the free cash flow we should remember that the possession and the net increase in demand for working capital is associated with funds "freezing" for its creation. If this growth is positive, it means increased involvement of resources, which reduces free cash flow. The growth of production often entails an increase in inventories as well as receivables and cash. Part of this increase may be covered by the so-called automatic²² current liabilities (obligations to suppliers). The rest (made visible as an increase in net working capital) will require different types of financing.

Example. 6. We want to evaluate what strategy formulation net working capital, the company of the evaluated contractor implements.

²²

Their "automatism" stems from the fact that usually they change with the change in production, because most often, change of the level of production is associated with change in the level of purchases of materials and supplies, some of which is purchased on a deferred payment.

General approach to net working capital strategy can be estimated on the basis of information on cash conversion cycle, expected receipts from the proceeds of sales and the average level of operating cash²³.

$NWC > 0$ □ conservative strategy, (11)

$NWC = 0$ □ moderate strategy,

$NWC < 0$ □ aggressive strategy.

where: NWC = net working capital.

As seen in this case, the gross demand for working capital is 1068 000, out of which 300 000 is covered with obligations to suppliers. Thanks to that, the net demand for working capital is at 768 000. This information, provides reference on a conservative management strategy of net working capital (in the simplest terms, if the net working capital is less than zero, the strategy of the net working capital management is aggressive, but if the need for net working capital is greater than zero, we have a conservative strategy). This strategy has a lower expected profitability accompanied by lower risks. Lower operational risks of the rated counterpart arising from conservative strategy may be a positive signal if, the nature of the sector in which the contractor's company operates does not imply a need for a moderate approach, or even aggressive one. In this case, it could mean ordinary mismanagement and over-investment resulting from excessive funds freezing in the current assets.

²³ A. Wawryszuk-Misztal, Strategie zarządzania kapitałem obrotowym netto w przedsiębiorstwach. Studium empiryczno-teoretyczne. Wydawnictwo UMCS, Lublin 2007, pp. 77-81.

2. The financial statements of the counterparty

Analyzing the information obtained from financial statements of the rated counterpart, we should take into account the perspective from which we look, when assessing a contractor entity from outside. When doing such an assessment it is worth to remember the differences between prospect of rated company (looks into the future) and the prospect of reporting, which we use as a primary source (it says about the past). Accounting and reporting generated in accordance with its rules deal with the PAST. Assessment of the contractor's company finances deals with the FUTURE. The reason for assessing the contractor is that we want to know how our relationship with the contractor will be arranged in the future. How much of this future can be seen from the company's history as reflected in the reports? NOTHING, which would be perfectly certain. However, you can try to win on the basis LIKELY estimate of how the contractor assessed by us may behave in the future.

Accounting is essentially concerned with reporting what happened in the company. Such reporting is reflected in the financial statements of prior periods. Company's finances apply to decisions relating to the future of the company. Financial decisions are based on projections, the financial plan.

In the case of financial reports 1 zloty of 3rd of January 200X is equal to 1 zloty of November 30th, 200X r. In reality, however, as 1 zloty in November is less worth than 1 zloty in January. Thus, preparing reports in accordance with accounting principles does not take into account the changes in time value of money. In the company's finances we have also faced the decision-making under

conditions of risk and uncertainty. From the financial statements information on risk of counterpart's business can be read only in part.

Financial statements

Financial statement is the primary source of information constituting the foundation for decision-making in the management of finances of companies. The financial statements are usually conducted on a monthly and annual basis. Reports like balance sheet, profit and loss account and cash flow statement is prepared for the annual period. The Law on Accounting legally regulates their form²⁴. The financial statements are the basis for static and dynamic analysis and assessment, of company's financial performance.

Balance

Company's balance sheet is a synthetic, two-sided statement of all assets and liabilities prepared on a certain day. Assets are defined as all components of property, and liabilities are the amount of funding of these assets and non-financial liabilities (eg, payables).

The sum of all of assets at the company disposal is equal to their funding sources. For the average company, all assets such as land occupied by the company, production houses, machinery and equipment located inside, transport equipment, receivables from customers for the products and services provided by the company, cash, etc. are assets and their value is written on the left side of

²⁴ The Law on accounting matters. Laws 2002, No. 76, item 694

the balance sheet (or the upper part of the balance sheet) on the side of assets. While the liabilities inform about the origin of the funds, which the company gathered its assets for.

In the balance sheet assets are sorted by degree of liquidity, that is, from the least to the most liquid.

This is a liquidity in the sense of "exchangeability" of one asset for the second one, in particular this pertains to the case of realization of assets²⁵. For this reason, the fixed assets are located in the upper part of the assets, while cash can be found in the lower part of the assets.

Ordering criterion in the liabilities balance is their due term. Therefore, the presentation of the balance sheet is arranged from equity to liabilities.

The company's assets include:

A. Fixed assets:

Intangible assets

Tangible assets

Long-term receivables

Long-term investments

Long-term prepaid expenses

B. Current assets:

Stocks

²⁵ D.Kaiser, *Liquidity from a decision point of view – the walrasian and the austrian paradigm*, Evropske Finanční Systémy, Masarykova Univerzita, Brno 2007, ss. 132-135.

Short-term receivables

Short-term investments

Short-term prepayments

Table 2.1

Balance sheet

assets	liabilities

A. Fixed assets	A. Own Capital (fund)
I. Intangible assets	I. basic capital (fund)
1. The cost of completed development	II. Unpaid share capital (negative)
2. Company value	III. own Shares (shares) (negative value)
3. Other nonmaterial and legal values	IV. Reserve capital (fund)
4. Advances on intangible assets	V. capital (fund) from the revaluation
II. Tangible assets	VI. Other reserve capital (funds)
1. Fixed Assets	VII. Profit (loss) from previous years
a) land (including perpetual usufruct right)	VIII. Net profit (loss)
b) buildings, premises and facilities of water and civil engineering	IX. Write-offs of net profit during the financial year (negative value)
c) the equipment and machinery	B. Liabilities and reserves for liabilities
d) means of transport	I. Provisions for liabilities
e) other fixed assets	1. Deferred income tax reserve
2. Fixed assets under construction	2. Provision for pension and similar performances
3. Advances for fixed assets under construction	a) long-term
III. Long-term receivables	b) short-term
1. From related entities	3. Other reserves
2. From other entities	a) long
IV. Long-term investments	b) short-term
1. Real Estate	II. Long-term liabilities
2. Intangible assets	1. To related entities
3. Long-term financial assets	2. To other entities
a) in related entities	a) loans
- Shares	b) arising from debt securities
- Other securities	c) other financial liabilities
- Loans	d) other
- Other long-term financial assets	III. short-term liabilities
b) in other entities	1. To related parties
- Shares	a) for supplies and services, which fall due:
-other securities	- Up to 12 months
- Loans	- Over 12 months
- Other long-term financial assets	b) other
4. Other long-term investments	2. To other entities
	a) loans

All assets	All liabilities
------------	-----------------

Source : The Law on accounting matters. Laws 2002, No. 76, item. 694..

Table 2.1. presented the existing by Law on Accounting system for the balance of economic units that are not banks and insurers. Fixed assets are classified as first part of the assets. These include company's funds that are not used by it during the period of more than 12 months. The assets include intangible and legal²⁶ assets. These include the company's acquired property rights. These include: patents, licenses, computer software, trademarks, copyrights, concessions and company value.

The second element of fixed assets is tangible assets. They include ingredients that are owned or jointly owned by company. These include: buildings, structures, land, the right to perpetual usufruct of land, machinery, equipment, and transport means. They are, therefore, the components that the company intends to use in the course of its business for more than a year. Tangible fixed assets are valued in the balance sheet by net value. It is the difference of the gross value and volume of redemption.

Another component of the assets are long-term receivables. They are due a repayment period at the balance sheet of more than 12 months. The fourth element of the physical assets is long-term investments. These include real estate, intangible and legal assets and long-term financial assets.

The final component of the physical assets is long-term accruals. The accounting costs are tax deductible in future periods.

²⁶ G.Michalczyk, *Bilansowe aspekty pomiaru wartości niematerialnych*, Finanse Przedsiębiorstwa, P.Karpus [red.], UMCS Lublin 2006, ss. 63-68.

The second part of the assets is current assets. These are assets that within a period of one year may be converted into cash. The assets include stocks. These include: raw materials, intermediates and products in progress, finished products and goods, and advance of delivery. In examining the company, assets shall be commonly known as current assets. This is a simplification, because the stocks, especially those not readily disposed of, cannot be counted as the full amount of current assets. Inventories are valued at purchase prices or production cost not higher than their net selling price at the balance sheet day.

Another element of current assets is short-term receivables. These are amounts that customers owe for purchased and not paid goods (services, goods or finished products). Normal term of repayment is less than one year. In examining the company, the interpretation of this position is sometimes difficult. The reason is the difficulty in assessing revenue collection from debtors²⁷. In the balance sheet receivables are valued at the amount to be paid.

Short-term investments are another element of turnover asset. These include short-term financial and other assets. These include: shares, stocks, short-term debt (foreign), other securities, short-term loans, cash and cash equivalents such as checks and foreign drafts. These are, first of all investment of the company in financial assets. The company makes such investments in order to obtain additional benefits, often in the form of financial income. Short-term debt securities are disclosed in the balance sheet at purchase price. If they are sold, the difference between the sale price and the purchase price falls within the income or expense on financial operations. Cash are valued at

²⁷ G. Michalski, *Wartość płynności w zarządzaniu należnościami*, Zarządzanie i Marketing nr 22, Prace Naukowe AE nr 957, Wydawnictwo AE, Wrocław 2002, s. 144-159.

nominal value. Cash in foreign currencies are valued at the NBP average exchange rate on the balance sheet making day.

The final component of current assets is short-term accruals. These are the open accounts. They relate to inflows that were incurred during the period preceding the period in which they are accounted for as an expense. These include all kinds of expenses incurred in advance, which are accounted for in subsequent periods.

Analyzing the situation of the counterpart's company, one assesses the quality of assets. It is an attempt at answering the questions²⁸:

To what extent the assets are in a position to create future revenue, profits and the proceeds?

What is their actual market value?

The right side of Table 2.1 are the liabilities. They are the sources of financing assets (or assets).

The liabilities consist of:

A. Own capital (fund)

Basic Capital (fund)

Unpaid share capital

Own Shares (shares)

Reserve capital (fund)

Capital (fund) from the revaluation

²⁸ A. Rutkowski, *Zarządzanie finansami*, PWE, Warszawa 2000, p. 42.

Other reserve capital (funds)

Profit (loss) from previous years

Write-offs from net profit during the financial year

B. Liabilities and reserves for liabilities

Provisions for liabilities

Long-term liabilities

Current liabilities

Accruals

The first part of the liabilities is own capital (fund). They are the owners' original investment of capital. While the basic capital is present in each company of commercial law, the creation of a reserve capital for limited liability companies is voluntary.

Another item of equity is the revaluation surplus. It arises as a result of the revaluation of fixed assets. It aims to ensure a balance between assets and liabilities of the company. Reduction of this item occurs when the revalued assets are sold or liquidated.

Other reserves are created in the event of loss of assets value, known or expected losses or liabilities.

Profit (loss) from previous years is another component of equity. It is a subject to settlement in subsequent reporting periods.

Liabilities are foreign capital. Long-term liabilities are those whose due period is more than one year. These include, inter alia, long-term loans, bonds and long-term bank loans.

Another item of liabilities are short-term liabilities. These include: loans, bonds, short-term debt securities (own), bank loans, advances, loan sales, and other liabilities. Common feature of these commitments is a maturity of one year.

The last element of the liabilities is accruals. They are passive accruals. They result from a later settlement of liabilities, i.e., are associated with the need to incur later expense, despite the fact that the costs associated with them have already been accounted for in previous periods.

The table has been presented the current balance layout. Companies operating on a small scale can make a simplified balance sheet. It presents then the data relating to the items identified in the table in large letters and roman numerals. This law applies to companies that meet both criteria:

Number of employees in the company is no more than 50 people.

The total sum of assets of the company at the end of the year is less than the equivalent of 2 000 000 euros in Polish currency.

Net proceeds from the sale of goods and products, and financial operations for the fiscal year is less than 4 000 000 euros in Polish currency.

The basis for calculating the equivalent in Polish currency is determined by the NBP average euro exchange rate applicable on the balance sheet making day.

=====

Example. The table presents Sliver-Op sp z oo. company's balance sheet. Further on the subsequent reports and financial ratios will be calculated for this company.

Table

Company's balance sheet Sliver-Op Ltd. in the years 200 (X-2) - 200X.

ASSETS	200X-12-31	200(X-1)-12-31	200(X-2)-12-31
A. Fixed assets	3021063	3034079	3124135
I. Intangible assets	1004	6224	14347
II. Tangible assets	500499	710902	751825
1. Fixed Assets	498581	708984	748703
a) land (including perpetual usufruct right)			
	131869	148967	149734
b) buildings, premises and facilities of water and civil engineering	302344	458209	462441
c) the equipment and machinery	44064	77481	97152
d) means of transport	19406	2955	7182
e) other fixed assets	897	21372	32194
2. Fixed assets under construction	1918	1918	3122
III. Long-term receivables	0	0	0
IV. Long-term investments	2487946	2277138	2280588
3. Long-term financial assets	2487946	2277138	2280588
a) in related entities	2487734	2276928	2276928
- Shares	2487734	2276928	2276928
b) in other entities	212	210	3661
- Shares	212	210	3661
V. Long-term prepaid expenses	31614	39815	77375
1. Deferred tax liabilities	31614	39815	77375
B. Current assets	679669	503874	577696
I. Stocks	267944	291376	362540
1. Materials	91393	22570	39189
2. Intermediates and products in progress	13135	8335	8817
3. Finished products	148145	114340	152692
4. Goods	12837	137363	161840
5. Advances for delivery	2435	8768	3

II. Debts and claims	392426	173059	164994
1. Receivables from related entities	129451	1804	1804
a) for supplies and services, the repayment period::	129451	1804	1804
- Up to 12 months	129451	1804	1804
2. Receivables from other entities	262975	171255	163190
a) for supplies and services, the repayment period:	189225	132233	107365
- Up to 12 months	189225	132233	107365
b) taxes, subsidies, customs duties, social and health security, and other performances	23180	19757	33689
c) other	50569	19265	22137
III. Short-term investments	14030	36583	47559
1. Short-term financial assets	14030	36583	47559
c) cash and cash equivalents	14030	36583	47559
- Cash in hand and at bank	14030	23699	41824
- Other cash	0	12884	5735
IV. Short-term accruals	5270	2857	2603
SUM OF ASSETS	3700732	3537953	3701831
LIABILITIES	200X-12-31	200(X-1)-12-31	200(X-2)-12-31
A. Own Capital (fund)	2696361	2490979	2324234
I. basic capital (fund)	75275	75275	75275
III. own Shares (shares) (negative value)	-41603	0	0
IV. Reserve capital (fund)	1042102	1006448	997630
V. capital (fund) from the revaluation	1596478	1591481	1457141
VII. Profit (loss) from previous years	-182224	-205811	-157265
VIII. Net profit (loss)	206334	23587	-48546
B. Liabilities and reserves for liabilities	1004371	1046974	1377597
I. Provisions for liabilities	446918	451970	655262
1. Deferred income tax reserve	350210	340346	485209

2. Provision for pension and similar performances	24458	20811	23527
a) long-term	24458	20811	23527
3. Other reserves	72250	90813	146526
b) short-term	72250	90813	146526
II. Long-term liabilities and special funds	63000	0	0
1. To related entities	63000	0	0
III. Short-term liabilities and short term funds	494392	594907	722335
1. To related entities	311	159	167
a) for supplies and services, which are due:	311	159	167
- Up to 12 months	311	159	167
2. To other entities	310909	392764	482059
a) loans	96150	54446	118856
d) supplies and services, which are due:	122073	228392	274622
- Up to 12 months	122073	228392	274622
e) the advances received for deliveries	5898	0	0
g) taxes, duties, insurance and other performances	46226	49343	33881
h) for wages	34596	54819	50688
i) other	5967	5764	4013
3. Special funds	183172	201984	240108
IV. Accruals and income from future periods	61	96	0
2. Other accruals	61	96	0
- short-term	61	96	0
SUM OF LIABILITIES	3700732	3537953	3701831

Source: Based on: The Law on accounting matters. Laws 2002, No. 76, item. 694.

One simple firm's solvency measurement is based on the balance sheet. It is the indicator of the risk of liquidation.

It shall be calculated as follows:

Elimination of the risk factor = Equity / total assets

If in the company the equity amounts to 60 000 zł and total assets are equal to 100 000 PLN, an indicator of the risk of liquidation = 60000/100000 = 60%.

The risk factor associated with the liquidation is the maximum loss that could allow the sale of property companies, without incurring the loss of his creditors. This indicator shows how cheaper in relation to the price sheet the assets can be disposed of, to satisfy all creditors.

For companies Silver-Op sp z o. o. equity, total assets and liquidation of the risk factor were as follows:

	200X-12-31	200(X-1)-12-31	200(X-2)-12-31
Own capital (fund)	2696361	2490979	2324234
Total assets	3700732	3537953	3701831
Liquidation risk indicator	72,86%	70,41%	62,79%

As we see the liquidation risk indicator for Silver-Op sp. z o.o. seems to be better year by year.

Another method of assessing the contractor's business based on the balance sheet is Wilcox's method. This method gives the rules for determining projected liquidation value of the company in the event of bankruptcy. It is determined as follows:

100% cash and cash equivalents

+ 70% of accounting value of inventories, receivables and advances paid

+ 50% of accounting value of other assets

- Liabilities

- Long-term liabilities

= company value in case of liquidation

If a company has cash and cash equivalents at the level of 2000 PLN, inventories at 34,000 PLN, receivables at 19,000 PLN, the remaining assets of 16,000 PLN, short-term liabilities of 29,000 PLN and long-term liabilities of 41,000 PLN, how much will estimated liquidation value be?

Item	Solvency acc. to Balance	Liquidation value
Cash and cash equivalents	2000	2000
Stocks	34 000	23800
Claims	19 000	13300
Other assets	16 000	8000
Current liabilities	29 000	29000
Long-term liabilities	41 000	41000
Solvency [excess of assets over liabilities]	1000	-22900

As you can see, this company, although according to the book value holds solvency, according to the method of Wilcox has a liquidation value below zero, at the level of - 22 900 EUR.

For company Sliver-Op sp z oo liquidation value estimated on the basis of the method of Wilcox was as follows:

	200X-12-31	200(X-1)-12-31	200(X-2)-12-31
Cash and cash equivalents (100%)	14030	36583	47559
receivables (70%)	392426	173059	164994
Stocks (70%)	267944	291376	362540
Fixed assets (50%)	3021063	3034079	3124135
Short-term accruals (50%)	5270	2857	2603
Long-term liabilities and special funds(-100%)	63000	0	0
Short-term liabilities and special funds (-100%)	494392	594907	722335
Accruals (-100%)	61	96	0
Liquidation value acc. to Wilcox method	1432003	1285153	1257867

As you can see, the liquidation value of the company Sliver-Op sp z oo, in the entire presented period, was at above a million PLN each year and was growing, reaching in the end of 200 (X-2) year of 1,257,867 PLN at the end of 200 (X - 1) year 1,285,153 PLN and at the end 200X 1,432,003 PLN.

On the basis of balance, you can set structural balance. These include working capital ([KO] = resources (liabilities) fixed - Fixed assets), the demand for working capital ([ZKO] = (non-financial

assets) - (non-financial short-term obligations and reserves for liabilities)) and net balance of funding ([SNF] = (short-term investments) - (short-term financial commitments)).

In case of Sliver-Op sp z o o, the structural balance was as follows:

	200X-12-31	200(X-1)-12-31	200(X-2)-12-31
Own capital (fund)	2696361	2490979	2324234
(+) Long-term liabilities and special funds	63000	0	0
(-) Fixed assets	3021063	3034079	3124135
Current capital (KO)	- 261702	- 543100	- 799901
stocks	267944	291376	362540
(+) Receivables and claims	392426	173059	164994
(+) Short-term accruals	5270	2857	2603
(-)Short-term liabilities and special funds	494392	594907	722335
(+) Short-term loans	96150	54446	118856
(-) RMK short-term	61	96	0
(-)Provisions for liabilities	446918	451970	655262
Demand for current capital (ZKO)	- 179581	- 525235	- 728604
Short-term investments	14030	36583	47559
(-) Short-tem loans	96150	54446	118856

G. Other operating revenues	- Excise tax
I. Profit on disposal of non-financial assets	V. Wages
II. Grants	VI. Social insurance and other performances
III. Other operating revenues	VII. Other generic costs
H. Other operating expenses	VIII. The value of sold goods and materials
I. Loss on disposal of non-financial assets	C. Gross profit (loss) from sales (A-B)
II. Revaluation of non-financial assets	D. Other operating income
III. Other operating expenses	I. Profit on disposal of non-financial assets
I. Net profit (loss) from operations (F + G-H)	II. Grants
J. Financial revenues	III. Other operating income
I. Dividends and profit-sharing, including:	E. Other operating expenses
- From related entities	I. Loss on disposal of non-financial assets
II. Interest, including:	II. Revaluation of non-financial assets
- From related entities	III. Other operating expenses
III. Profit on disposal of investments	F. Profit (loss) from operations (C + D-E)
IV. Revaluation of investments	G. Financial income
V. Other	I. Dividends and profit-sharing, including:
K. Financial costs	- From related entities
I. Interest, including:	II. Interest, including:
- For related entities	- From related entities
II. Loss on disposal of investments	III. Profit on disposal of investments

III. Revaluation of investments	IV. Revaluation of investments
IV. Other	V. Other
L. Profit (loss) from ordinary activities (I + JK)	H. Financial expenses
M. result of extraordinary events (M.I. - M.II.)	I. Interest, including:
I Extraordinary profits	- For related entities
II. Extraordinary losses	II. Loss on disposal of investments
N. Net profit (loss) (L + / - M)	III. Revaluation of investments
A. Income tax	IV. Other
P. Other mandatory reduction of profit (loss increase)	I. Profit (loss) from ordinary activities (F + GH)
R. profit (loss) (N-O-P)	J. Result of extraordinary events (J.I. - J.II.)
	I Extraordinary profits
	II. Extraordinary losses
	K. Gross profit (loss) (I + / - J)
	L. Income Taxes
	M. Other mandatory reduction in profit (increase losses)
	N. Net profit (loss) (K-L-M)

Source: The Law on accounting matters. Laws 2002, No. 76, item. 694.

Other operating income is a result of non-core operating. They do not occur in all reporting periods as they do not belong to a typical business. They arise in connection with the sale of company assets, materials, and limitation commitments, etc.

Other operating expenses inform about costs associated with obtaining other operating income.

Profit (loss) from operating activities is the result of correcting the gain on the sale by the effects of other income and operating expenses. It reflects the effect of operating businesses without taking into account the financial costs.

Financial revenues and expenses are related to the company's financial activities, revenues arise in connection with investment by the company in various financial instruments, while financial costs are primarily the costs of external financing.

Profit (loss) on ordinary activities is carried out at three levels: basic and other operational activities and financial activities.

Extraordinary gains and losses result from unexpected events beyond the control of business decisions of managers losses such as losses resulting from negligence are not included here.

Profit (loss) is the subject of the tax and other burden , after their deduction the profit (loss) is obtained.

Example. The table shows a simplified diagram of the profit and loss for the company Sliver-Op sp z oo.

Table

Profit and loss account for the company Sliver-Op sp z oo for 200 (X-2) - 200X period.

RACHUNEK WYNIKÓW	200X	200(X-1)	200(X-2)
A. Net revenues from sales and aligned with them,	2128780	2280592	2686213
I. Net revenues from sales of products	1664107	1351896	1694008
II. Net revenues from sales of goods and materials	464672	928696	992206
B. Costs of sold products goods and materials	2101416	2315426	2736942
I. The value of goods and materials sold	252045	436206	507532
II. Cost of production of sold products	1091772	939496	1193553
III. Cost of sales	453586	589964	655048
IV. General administrative expenses	304013	349760	380809
C. Profit (loss) from sales	27363	-34834	-50729
D. Other operating revenues	264133	179576	76498
I. Profit on disposal of non-financial assets	166278	32195	0
III. Other operating revenues	97855	147380	76498
E. Other operating expenses	74867	68787	136264
I. Loss on disposal of non-financial assets	0	0	8299
II. Revaluation of non-financial assets	25872	39124	50327
III. Other operating expenses	48995	29663	77638
F. Net profit (loss) from operations	216629	75956	-110495

G. Financial revenues	14522	1329	3887
I. Dividends and profit-sharing	265	210	210
II. Interest received	647	826	1235
III. Profit on disposal of investments	0	115	0
V. Other	13610	178	2442
H. Financial costs	11200	17842	17261
I. Interest	9244	5590	9496
IV. Other	1956	12253	7765
I. Gross profit (loss) from ordinary activities	219951	59442	-123870
J. result of extraordinary events	0	0	0
K. Net profit (loss)	219951	59442	-123870
L. Mandatory reduction of profit	13617	35855	-75324
I. Income tax on legal persons or physical persons	13617	35855	-75324
N. profit (loss)	206334	23587	-48546

Source: The Law on accounting matters. Laws 2002, No. 76, item. 694.

Comparing the level of sales revenue (CR) with the previously discussed structural balances such as working capital (KO) and the demand for working capital (ZKO) one can diagnose increase of threat by one of the company crises, such crises as: (i) growth, (II) caused by an error in the management of operating cycle, (III) caused the financial error, (IV) linked with profitability and (V) activity.

The crisis of growth. If the proceeds from sales [CR] rapidly increase in proportion to their increase demand for net working capital increases [ZKO], and capital [KO] is stable. Corresponding increase in the crisis situation is shown in Figure.

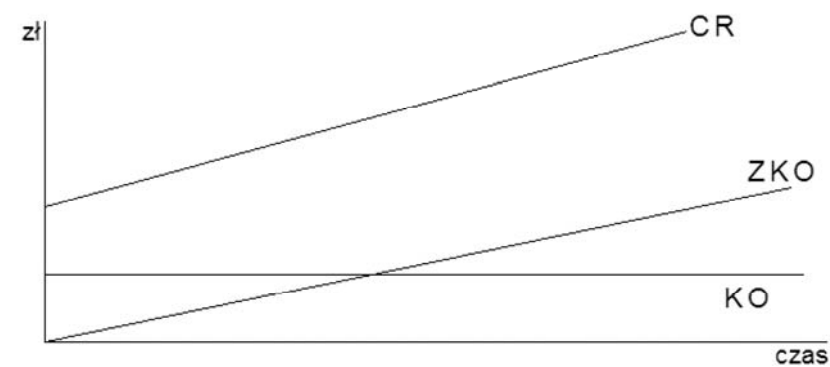


Figure growth crisis.

Source: Own

Symbols: CR – sales revenues, ZKO - the demand for working capital, KO - working capital.

Crisis caused by an error in the management of operating cycle, is that the demand for working capital [ZKO] is growing faster than revenues from sales [CR]. This is because of mismanagement of financial assets and current liabilities (such as too liberal recovery policy). Such crisis is experienced by companies, which focus on achieving revenue growth by extending the billing cycle

charges apart from the need to finance such growth²⁹. Situation corresponding to the crisis caused an error in the management of the company operating cycle is shown in Figure.

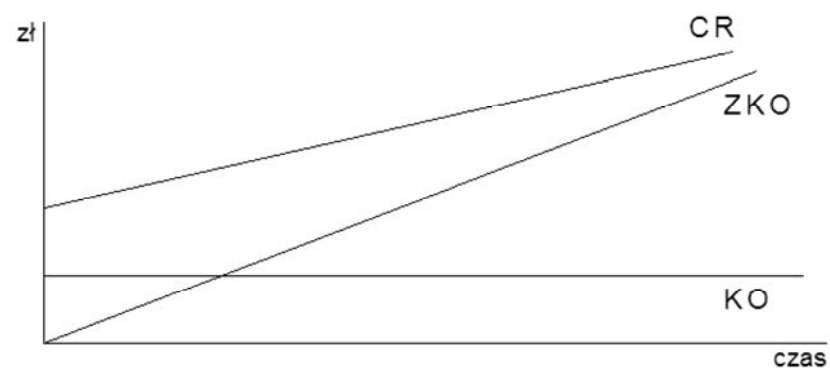


Figure. Crisis caused by a mistake in managing the business operating cycle.

Source: Own

Symbols: CR – revenues from sales, ZKO - the need for working capital, KO - working capital.

Financial crisis caused by a mistake. The decision of spending on assets (fixed assets under construction) "sucks" in the enterprise permanent resources and rapidly reduces the working capital [KO]. Demand for working capital [ZKO] vigorously grows. Situation corresponding to the crisis caused the financial error is shown in Figure.

²⁹ J.Franks, C.Mayer, H.F.Wagner, The origins of the german Corporation – Finance, ownership and control, Review of Finance, nr 10, 2006, ss. 558-560.

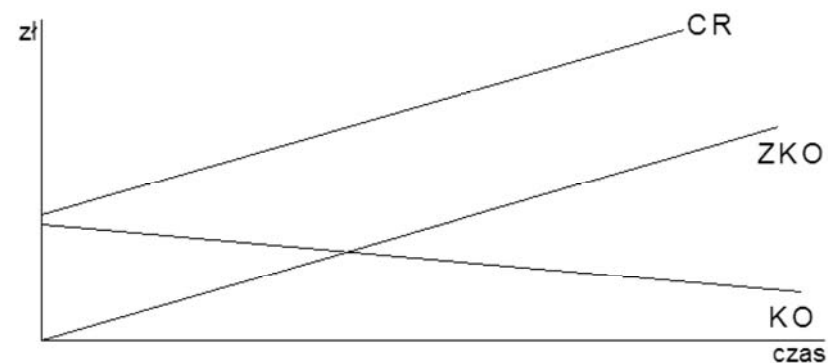


Figure. The crisis caused by an error in the company accounts.

Source: Own

Symbols: CR – sales revenues, ZKO - the need for working capital, KO - working capital.

Crisis caused a decrease in profitability. This crisis may have reasons in:

- Obsolete product, for which the company reduced prices to increase sales revenues and cannot reduce production costs,
- Forcing price cuts by competitors,
- Enforcing wage and labor costs increases by trade unions,
- Poor cost management.

Losses caused by the decline in profitability are covered in company threatened by a crisis by the equity capital, which causes the reduction in working capital (KO). At the same time there are problems with the financial cycle management (for example, there is deposition of stocks, etc.).

Situation corresponding to the crisis caused a decrease in profitability is shown in Figure.

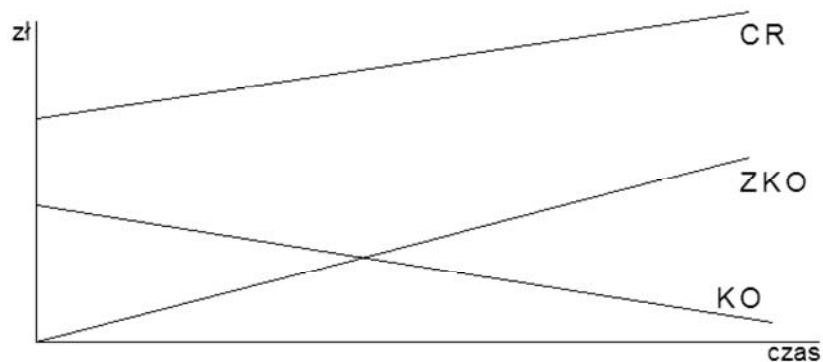


Figure. The crisis in the company caused a decrease in profitability.

Source: Own

Symbols: CR – sales revenues, ZKO - the need for working capital, KO - working capital.

Activities crisis. As a result of declining revenue from sales, in the company threatened by the occurrence of the crisis in the activities demand for working capital [ZKO] increases, while the capital [KO] decreases. This may for example result from the accumulation of unsold stocks of finished products [hence increase ZKO] and the depreciation of fixed assets and / or an increase in debt [hence decrease KO]. Situation corresponding to the crisis in the activities is shown on the drawing.

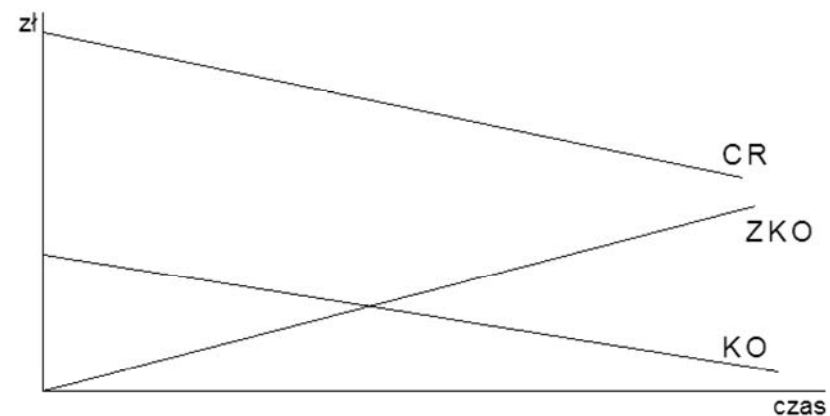


Figure. Crisis in activities.

Source: Own

Symbols: CR – sales revenues, ZKO - the need for working capital, KO - working capital.

For company Sliver-Op sp z oo, a the drawing was obtained as a result of comparison of structural balances in working capital balance (KO) and working capital requirements (ZKO), with revenues from sales (CR),.

	200X	200(X-1)	200(X-2)
sales revenues (CR)	2128780	2280592	2686213
working capital (KO)	- 261702	- 543100	- 799901
the need for working capital (ZKO)	- 179581	- 525235	- 728604

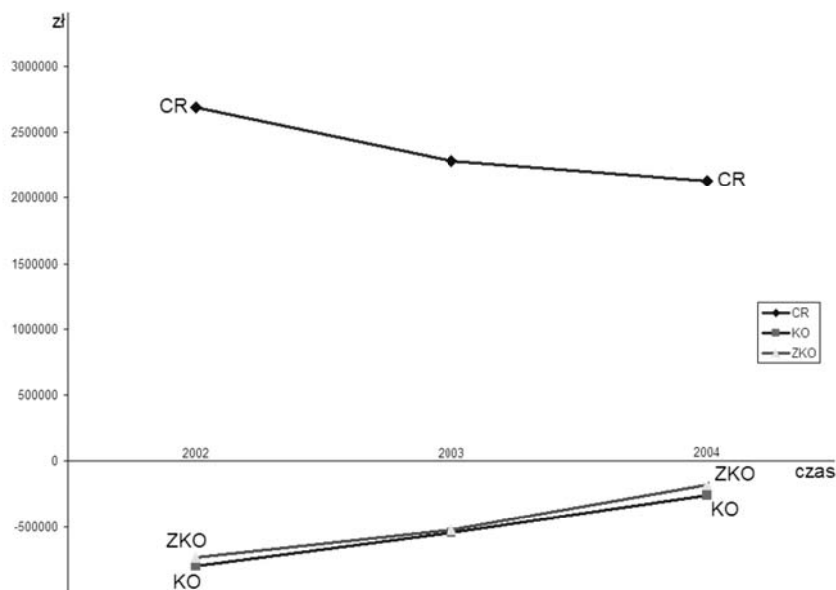


Figure. Proceeds from sale (CR) and the structural balance of the balance of the company Sliver-Op sp z oo.

Source: Own

Symbols: CR – sales revenues, ZKO - the need for working capital, KO - working capital.

As can be seen from the figure, the proceeds from sales (CR) of the company Sliver-Op sp z oo have decreased for several years, while demand for working capital (ZKO) and capital (KO) has increased. The demand for working capital (ZKO) is, however, higher than the working capital (KO). Situation Corresponding to the company Sliver-Op sp z oo seems to presage an increase in the risk of crisis in activities.

The company's activities can be represented by three cycles carried out by it: operating, investment and financial. The company acquires fixed assets and current assets to implement the operational

cycle. In carrying out basic activities it achieves certain financial results, which allows it to enlarge its wealth. For these purposes it can also use external financing. Business operations carried out by the company are reflected in a synthetic form in the balance sheet and income statement.

The balance includes resources, whereas in the income statement these are stream values. Flows shown in the income statement are not synchronized. Recipients usually perform the obligations with delay. Therefore, some flows that will actually take place will be displayed in the form of cash flow (indicated on the report of cash flows), and some as a resource in the form of receivables (shown in the balance sheet).

The difference between the flows of products, goods and materials, and the flow of funds at the end of the reporting period is visible in the resources of the company and in its funding sources included in the balance sheet. Profit and loss account reflects the physical flows. It presents the company operating cycle, and some operations of the investment and financial cycle³⁰.

Cash flow statement

Report known as a cash flow statement reflects the difference between profit and loss account and the balance sheet. This report describes the cash passing through the company in the period between the opening balance and closing balance. Report of the cash flow allows a closer assessment of the company's ability to generate cash. This report shows the relationship between the state capital, a

³⁰ M. Sierpińska, D. Wędzki, *Zarządzanie płynnością finansową w przedsiębiorstwie*, WN PWN, Warszawa 2002, s. 33.

surplus of revenue over costs and the level of liquidity. The report reflects all economic transactions involving cash receipts and expenses.

There are two methods of preparation of cash flow statement: direct and indirect. The former shows real revenue and real expenditure relating to each area separately. In order to calculate net cash flow in the area of operations, the total amount of expenses shall be deducted from spending cash receipts. Similarly, this is made in the areas of investing and financing activities. In the latter method - indirect, adjustments to net profit (loss) are made to get the spot level. Thus, in an indirect method we start from net income, which is adjusted to various flows isolated from it and supplemented with the flows not present in the profit and loss account. Generally, when reporting the cash flows by indirect method:

* The increase of active account is recognized with a minus sign [the expenditure of funds]

* Decrease of active account is recognized with a plus sign [the inflow of cash]

* Increase your passive account is recognized with a plus sign [the inflow of cash]

* Decrease of passive account is recognized with a minus sign [the expenditure of funds].

Both methods of producing a report of cash flows have varying approaches to the valuation of individual cash flows from operating activities. By contrast, investment and financial flows must be determined in both methods the same way. The choice of method should depend on the feasibility of collecting the needed information.

Table

Methods of preparation of statement of cash flows

Direct method	Indirect method
A. Cash flow from operating activities	A. Cash flow from operating activities
I. Inflows	I. Net profit (loss)
1. Sales	II. Total adjustments
2. Other revenue from operating activities	1. Amortization
II. Expenditure	2. Profits (losses) on exchange differences
1. Supplies and services	3. Interest and participation in profits (dividends)
2. Net salaries	4. Profit (loss) from investment activities
3. Social and health insurance and other benefits	5. Change in reserves
4. Taxes and fees of a public character	6. Change in stocks
5. Other operating expenses	7. Change in receivables
III. Net cash flows from operating activities (I-II)	8. Change in current short-term liabilities excluding borrowings
B. Cash flow from investing activities	9. Change in accruals
I. Inflows	10. Other adjustments
1. Disposal of intangible and tangible fixed assets	III. Net cash flows from operating activities (I + / - II)
2. Disposal of investments in real estate and intangible assets	B. Cash flow from investing activities
	I. Inflows

3. From financial assets, including:	1. Disposal of intangible and tangible fixed assets
a) in related entities	
b) in other entities	2. Disposal of investments in real estate and intangible values
- Disposal of financial assets	3. From financial assets, including:
- Dividends and shares in profits	a) in related entities
- Repayment of long-term loans	b) in other entities
- Interest	- Disposal of financial assets
- Other income from financial assets	- Dividends and shares in profits
4. Other investment proceeds	- Repayment of long-term loans
II. Expenditure	- Interest
1. Acquisition of intangible and tangible fixed assets	- Other income from financial assets
2. Investments in real estate and intangible assets	4. Other investment proceeds
3. On financial assets, including:	II. Expenditures
a) in related entities	1. Acquisition of intangible and tangible fixed assets
b) in other entities	2. Investments in real estate and intangible assets
- Acquisition of financial assets	3. On financial assets, including:
- Long-term loans	a) in related entities
4. Other investment expenditure	b) in other units
III. Net cash flows from investing activities	

(I-II)	- Acquisition of financial assets
C. Cash flows from financing activities	- Long-term loans
I. Inflows	4. Other capital expenditure
1. Net proceeds from issue of shares (shares issued) and other capital instruments and additional capital	III. Net cash flows from investing activities (I - II)
2. Loans and advances	C. Cash flows from financing activities
3. Debt securities issue	I. Inflows
4. Other financial inflows	1. . Net proceeds from issue of shares (shares issued) and other capital instruments and surcharges to capital
II. Expenditure	2. Loans and advances
1. Acquisition of own shares	3. Issue of debt securities
2. Dividends and other distributions to owners	4. Other financial inflows
3. Other than payments to the owners expenses for profit sharing	II. Expenditures
4. Repayment of loans	1. Acquisition of own shares
5. Buying of debt securities	2. Dividends and other distributions to owners
6. With Other financial liabilities	3. Other than payments to the owners, expenses for profit sharing
7. Payment of financial lease agreements	4. Repayment of loans
8. Interest	5. Buying of debt securities
9. Other financial expenses	6. With Other financial liabilities
III. Net cash flows from financing activities	

(I-II)	7. Payment of liabilities from financial lease agreements
D. net cash flow, together (A. III + / - B. III + / - C. III)	8. Interest
E. Balance sheet change in cash, including:	9. Other financial expenses
- Change in cash in respect of exchange differences	III. Net cash flows from financing activities (I - II)
F. Cash in the beginning of period	D. Total net cash flow (A. III + / - B. III + / - C. III)
G. Cash at the end of period (F + / - D), including:	E. Balance sheet change in cash, including:
- With reduced availability	- Change in cash in respect to exchange differences
	F. Cash in the beginning of period
	G. Cash at the end of period (F + / - D), including:
	- With reduced availability of disposal

Source: The Law on accounting matters. Laws 2002, No.. 76, item. 694.

The table shows according to the Accounting Act Designs cash flow statements.

Example. Simplified cash flow diagram for a hypothetical company Sliver-Op sp z oo is shown in

Table.

Table.

Cash flow diagram for the company Sliver-Op Ltd. (indirect method).

A. Cash flow from operating activities	200X	200(X-1)	200(X-2)
I. Net financial result (profit / loss)	206334	23587	-48546
II. Total adjustments	-470121	39843	165754
1. Amortization	45879	88576	99346
2. Profits (losses) on exchange differences	0	0	0
3. Interest and participation in profits (dividends)	8940	5376	9277
4. Profit (loss) on investment activity	-168266	-29933	11000
5. Change in reserves	-14917	-203291	476067
6. Change in stocks	23432	71164	199491
7. Change in receivables	-226332	-1683	30604
8. Change in short-term liabilities (excluding borrowings)	-137729	-65239	-112013
9. Change in accruals	-2449	37402	-68534
10. Other adjustments	1320	137471	-479484
III. Net cash from operating activities	-263787	63430	117207
B. Cash flow from investing activities			
I. Inflows	228549,64	41386,851	18955,209
	9	2	8
1. Disposal of intangible and tangible fixed assets	228285	37592	18745

3. From financial assets, including:	265	3795	210
a) in related entities	0	252	0
b) in other entities:	265	3543	210
- Disposal of financial assets	0	3333	0
- Dividends and shares in profits	265	210	210
II. Expenditures	-40078	-45125	-40248
1. Acquisition of intangible and tangible fixed assets	-24807	-45125	-40248
3. On financial assets, including:	-15087	0	0
a) in related entities	-15087	0	0
4. Other investment expenditure	-185	0	0
III. Net cash from investing activities	188472	-3738	-21292
C. Cash flows from financing activities			
I. Inflows	104704	0	0
2. Loans	104704	0	0
II. Expenditure	-51943	-70668	-148737
1. Acquisition of own shares)	-41603	0	0
4. Repayment of loans	0	-64410	-135576
8. Interest	-9202	-5586	-9487
9. Other financial expenses	-1137	-672	-3674
III. Net cash from financing activities	52762	-70668	-148737
D. net cash flow, together	-22553	-10977	-52822

E. Balance sheet change in cash	-22553	-10977	-52822
F. Cash and cash equivalents in beginning of period	36583	47559	100382
G. Cash and cash equivalents at end of period	14030	36583	47559

Source: The Law on accounting matters. Laws 2002, No. 76, item. 694.

Because the cash flow statement is linked to the balance sheet and profit and loss account, the final amount of the statement must be identical to that which was revealed in the balance sheet closing.

Cash flow statement allows you to specify the quality of profits generated by the company, by disclosing their actual exchangeability to the transaction cash.

Example. The table below presents the "Ecco-Opol sp z oo" Ltd company's balance sheet., then the table shows the profit and loss for the company. Report of cash flow for the company "Ecco-Opol sp z oo" Ltd., for the year 200X by the indirect method (it will be shown in the table) should be made. It is known that the depreciation / remission in the 200X, was at the level of 30 400 PLN.

Table. Balance sheet for company „Ecco-Opol sp. z o. o.” Ltd

Assets	200(X-1)	200X r.	Liabilities	200(X-1)	200X r.
		r.		r.	
A. Fixed assets	150 000	151 000	A. Capital	100 000	105 250
Intangible assets	20 000	21 000	Core capital	90 000	90 000
Tangible assets	130 000	130 000	Retained earnings	5 000	10 000

			Net profit	5 000	5 250
B. Current assets	50 000	52 500	B. Liabilities and reserves for		
Stocks	22 000	23 100	liabilities	100 000	98 250
Short-term	26 000	27 300	Long-term liabilities	76 000	73 000
receivables	1 800	1 890	Trade payables	24 000	25 250
Short-term	200	210			
investments					
Short-term					
prepayments					
Assets together	200 000	203 500	Liabilities together	200 000	203 500

Source: The Law on accounting matters. Laws 2002, No. 76, item. 694.

Table. Profit and loss for the company "Ecco-Opol International, Ltd. Sp z o. o

		200(X- 1) r.	200X r.
A.	Proceeds from sales of products, goods and materials	300 00	315 00
B.	(-) Costs of sold products, goods and materials	0	0
		161 65	169 73
		0	0
C.	= Gross profit(loss) from sales (A-B)	138 35	145 27
D.	(-) Sales costs	0	0

E.	(-) Cost of general management	55 000	57 750
		48 000	59 680
F.	= profit(loss) from sales (C-D-E)	35 350	27 840
G.	(+) other operation proceeds	500	520
H.	(-) other operating costs	4 000	4 200
I.	= profit (loss) from operating activity (F+G-H)	31 850	24 160
J.	(+) Financial proceeds	0	0
K.	(-) Financial costs	25 000	17 680
L.	= profit (loss) from economic activity (I+J-K)	6 850	6 480
M.I.	(+) extraordinary profits	0	0
M.II.	(-) extraordinary losses	0	0
N.	= Gross profit (loss) (L+M.I.-M.II.)	6 850	6 480
O.	(-) Income tax	1 850a	1 230
P.	(-) Other mandatory profit reduction	0	0
R.	= Net profit (loss) (N-O-P)	5 000	5 250

Source: Based on: The Accounting Act, together with an index, CH Beck, Bydgoszcz 2002, p. 107-109.

Table. Report on Cash flows for company „Ecco-Opol sp. z o. o.”, for year 200X.

A.	Cash flow from operating activities	
I.	Net profit	5 250
II.	Adjustments for:	46 920

1.	Depreciation	30 400
2.	Gains / losses on exchange differences	
3.	Interest and dividends received and paid	17 680
4.	Provisions for receivables	
5.	Other reserves	
6.	Income tax on the Gross profit	
7.	Income tax paid	
8.	Result on sale of investment activity	
9.	Change in stocks	- 1 100
10.	Change in receivables and claims	- 1 300
11.	Change in current short-term liabilities (excluding loans)	1 250
12.	Change in accruals	- 10
13.	Change In income In future periods	
14.	Other items	
III.	Net cash from operating activities	52 170
B.	Cash flows from investing activities	
I.	Acquisition / sale of intangible assets	-1000
II.	Acquisition / Sale of tangible fixed assets	- 30 400
III.	Acquisition / Sale of shares in subsidiaries	
IV.	Acquisition / Sale of shares in associates	
V.	Acquisition / sale of other shares and securities	

VI.	Granted / Returned Loans	
VII.	Received / Returned dividends	
VIII.	Received / Returned interest on investments	
IX.	Other items	
X.	Net cash from investing activities	- 31 400
C.	Cash flows from financing activities	
I.	Signing / Repayment of long-term bank loans	- 3 000
II.	Signing / Repayment of long-term loans, issue / redemption of bonds	
III.	Signing / Repayment of short-term bank loans	
IV.	Signing / Repayment of short-term loans, issue / redemption of bonds	
V.	Dividends and other distributions to owners	
VI.	Payment of financial lease agreements	
VII.	Proceeds from issue of shares and surcharges	
VIII.	Paid / reimbursed interest	- 17 680
IX.	Other items	
X.	Net cash from financing activities	- 20 680
D.	Change in cash	90
E.	Cash and cash equivalents at the beginning of period	1 800
F.	Cash and cash equivalents at the end of period	1 890

Source: Developed by: R. Machała, Praktyczne zarządzanie finansami firmy, WN Warszawa

Score of incremental free cash flows of the contractor's company

The ability to assess the inflows resulting from the proceeds of the sale and outflows arising from the outflows determined on their basis and the ability to evaluate its free cash flow is essential for the proper application of the contractor company and realized his chances of success of the project. In the form of free cash flow one can practically express every activity undertaken by the evaluated trader. Evaluation of free flow can be the basis for an attempt to conclude on a future contractor.

Table. Cash flows: Operating cash flows (OCF) and free cash flow (FCF) for the company "Ecco-Opol sp z o.o., Ltd..

Components of cash flows	200X r.
Receipts associated with the revenue from sales and derivatives (CR)	315 520
Expenses related to the expense costs (CE = VC + FC)	260 960
Depreciation and other non-expenditure costs (NCE)	30 400
Profit before interest and taxes (CR – VC – FC – NCE = EBIT)	24 160
Hypothetical tax on EBIT (EBIT × T = TAX _{EBIT})	4 590
Net operating profit after tax (EBIT – TAX _{EBIT} = NOPAT)	19 570
Depreciation and other non-expenditure costs (NCE)	30 400
Operating cash flow (NOPAT + NCE = OCF)	49 970
Increase in net working capital (ΔNWC)	1250
Increase in capital expenditure on fixed assets (Capex)	31 400

Free cash flow (OCF – ΔNWC – Capex = FCF)

17 320

Source: hypothetical data

From a financial point of view, the inference is appropriate only on the basis of free cash flow. In assessing the contractor's company, ask yourself how free cash flow generated by the contractor may affect the value of his business. For this purpose you can use the most popular formula, based on the assumption that the value of the company is the sum of the discounted free cash flows for the company (FCF - called free cash flow):

$$\Delta V_p = \sum_{t=1}^n \frac{\Delta FCF_t}{(1+k)^t}, \quad (1)$$

where: ΔV_p - increase in value, ΔFCF_t - increase in free cash flows generated by the firm in period t, k - the discount rate (the price of money), the corresponding rate of cost of capital financing the company.

The numerator of the right side of equation is predicted to increase free cash flow generated by the company. Free flows often are estimated on the basis of the model (which we have just employed in the table):

$$FCF_t = (CR_t - FC - VC_t - NCE) \times (1 - T) + NCE - Capex - \Delta NWC_t, \quad (2)$$

where: CR_t - Cash proceeds from the sale, FC - expenses resulting from fixed costs, VC_t - expenses resulting from variable costs (in period t), NCE – non-expenditure costs, T - the effective

tax rate, ΔNWC - increase in net working capital, Capex -- increase in long-term investment operations.

If we manage to obtain information on the cost of capital financing the company of contractor rated by us, we can use this formula to assess the value the company would have if it continually had generated flows in such amount as was estimated in the table (the amount of free-flow was 17 320).

If the cost of capital for rated counterparty companies is about $k = WACC = 30\%$ (we tell in a moment how to evaluate this information), we can using information that the capital involved in the company rated "Ecco-Opol International, Ltd. is :

$$\frac{\text{kapital}}{\text{zaangazowany}} = 203\,500 - 25\,250 = 178\,250$$

calculate the increase in enterprise value by using the formula:

$$\Delta V_p = \sum_{t=1}^n \frac{\Delta FCF_t}{(1+k)^t} = -178\,250 + \frac{17\,320}{30\%} = -120\,517 < 0$$

The result is negative, and alerts us that if the contractor's company will continue to generate such low free cash flow it will be detrimental to the parties involved in the company's capital, and thus, may prophesy company liquidation because of "overeating" capital of the contractor involved in the undertaking. To find out what is the break-even for the given free flow and capital employed, you can solve the following equation:

$$-178\,250 + \frac{17\,320}{k^*} > 0 \Rightarrow k^* < 9,72\%$$

It follows from this that the rate of cost of capital financing the company of the contractor should be less than 9.72%, which is an unlikely result for the risk-free rate close to 6%.

Similar conclusions about the impact on company value, can be drawn based on the category of residual profit (also known as: economic value added), that indicates, what kind of residual profit (what added value) increased the value of the company during the period:

$$EVA = NOPAT - k \times \left(\frac{\text{kapital}}{\text{zaangazowany}} \right) = NOPAT - k \times (NWC + IO), \quad (3)$$

where: EVA - the residual profit (economic value added), k - cost of capital financing the company, DNWC - increase in net working capital, IO - long-term operational investment, NOPAT - Net operating profit after tax, estimated on the basis of the formula:

$$NOPAT = (CR_t - FC - VC_t - NCE) \times (1 - T) \quad (4)$$

where: CRT - Cash proceeds from the sale, FC - expenses resulting from fixed costs, VCt - expenses resulting from variable costs (in period t), NCE - non-expenditure costs, T - the effective tax rate.

Using information on the cost of capital financing the rated company, we can use this model to assess the value the company added due to generating NOPAT to such amount as it has been estimated in the table (the amount of NOPAT amounted to 19 570).

If the cost of capital for rated companies is about $k = WACC = 30\%$, using information that the capital involved in the company rated "Ecco-Opol International, Ltd. is 178 250, we can estimate the residual profit (economic value added):

$$EVA = NOPAT - k \times \left(\frac{\text{kapital}}{\text{zaangazowany}} \right) = 19\,570 - 30\% \times 178\,250 = -33\,905 < 0.$$

Although the contractor's company could boast of a positive accounting profit of 5 250, the economic profit (economic value added) is negative during the period. This is the year in which the evaluated company by its operations destroyed its value instead of generating it.

To estimate the cost of capital financing the rated company, you can use the weighted average cost of capital financing the company:

$$WACC = \sum_{i=1}^n w_i \times k_i, \quad ()$$

where: w_i = share of capital coming from i source, k_i = rate the cost of capital coming from i source, WACC = weighted average cost of capital³¹.

The most common form of this formula is the formula:

$$WACC = w_{e_i} \times k_{e_i} + w_{d_i} \times k_{d_i} \times (1 - T) \quad ()$$

where: $w_{e_i} = \frac{E_i}{E + D}$ = share (share weight) of capital from i source, $w_{d_i} = \frac{D_i}{E + D}$ = share (share weight) of capital from i source of debt, k_{e_i} = interest of cost of capital from i source, k_{d_i} = interest of cost of capital from i source of debt, T = effective company's tax rate.

³¹ Por. *Wskaźnik zwrotu kosztu zaangażowanego kapitału*, Dokument konsultacyjny URTiP, Warszawa 15.12.2004, p. 5-8.

If you know that the rate of cost of foreign capital for the rated counterparty (company "Ecco-Opole Sp. Ltd.") is about 24.2% and the rate of cost of equity is 37.3% what is the rate of the weighted average cost of capital?

From the statement of assets and liabilities of the company "Ecco-Opole Sp. Ltd." can be seen that the total capital employed (D + E) is at around 178 250. By contrast, foreign capital is 73 000, which is 41% of the entire capital.

In order to estimate the sought weighted average cost of capital, you can use the formula for the WACC:

$$WACC_{E-O} = \frac{105\,250}{178\,250} \times 37,3\% + \frac{73\,000}{178\,250} \times 24,2\% \times (1 - 0,19) = 30\%$$

For the company "Ecco-Opole Sp. z oo" rate of the weighted average cost of capital is around 30%.

1. The rate of cost of equity

The cost of capital determines the cost of capital from retained earnings, from the issue of ordinary shares or preference shares. In order to estimate the cost of normal capital (unprivileged), there are various models used such as the model for the steady growth of dividends (DCF method), the model of CAPM or the model of rate of return on government bonds plus a risk.

CONSTANT DIVIDEND GROWTH MODEL (called constant growth dividend valuation model) - is as follows:

$$V_e = \frac{D_1}{k_e - g} = \frac{D_0(1+g)}{k_e - g}$$

()

where D_0 = share of profits paid in the year 0, D_1 = the share of profits paid in year 1, P_e = the current market price of non-privileged share, k_e = the required rate of return on ordinary share capital, g = growth rate of profit share payments.

This model finds its application in estimating the cost of capital from retained earnings and the cost of capital from the previous issue of non-privileged shares - ordinary. The rate of return obtained by the current shareholders is also the cost of capital from retained earnings and is as follows³²:

$$k_{e,zz} = \frac{D_1}{P_e} + g = \frac{D_0(1+g)}{P_e} + g,$$

()

where $k_{e,zz}$ = rate the cost of capital derived from retained earnings and the previous issue of shares.

Example. At what level will be the cost of ordinary capital derived from retained earnings in the enterprise "Ecco-Opole Sp. z oo" if the share of profits (D_1) currently planned to pay, will be at a level 12.5 per share of the market value of 250? Enterprise of the contractor intends to pursue a policy of steady increase in shares of payments from the profit and projected growth rate of payments from profit will be at the level of 32.3% per annum. Hence, using the formula:

$$k_{e,zz} = \frac{D_1}{P_e} + g = \frac{12,5}{250} + 32,3\% = 37,3\%,$$

The rate of the normal cost of capital derived from retained earnings, are kept at the level of 37.3%.

³² Por. E.Najlepszy, P.Śliwiński, *Problemy z obliczeniem kosztu pozyskania kapitału w przypadku publicznej oferty akcji firmy z sektora MŚP*, EiOP, maj 2007, p. 53-55.

CAPITAL ASSET PRICING MODEL is a theoretical model describing the formation of prices of shares on the market.

Based on this model, you can estimate the cost of equity capital from ordinary shares. Rate of return requested by the owners is determined by the equation of the securities market line:

$$k_{e,zz} = k_{RF} + (k_M - k_{RF}) \times \beta_e$$

()

where: k_{RF} = risk-free rate, k_M = return rate on market portfolio, β_e = beta factor shares..

FACTOR BETA is the coefficient of individually assigned to a specific group of assets, informing about the extent to interest income from these assets changes, if the income rate characteristic of the market of these assets rises by one percentage point.

Example. Cost of equity "Ecco-Opole Sp. Ltd." can be estimated on the basis of information of similar company of whom we have information. If a company "Ecco-Opole Sp. Ltd." does not show a similar level of debt should be adjusted using the beta factor with application of Hamada's equation.

$$\beta_L = \beta_U \left[1 + (1 - T_c) \times \frac{D}{E} \right]$$

()

where: β_U = beta factor for the shares company without debts, β_L = beta factor for the company shares of the debtor, T_c = effective tax rate paid by the company.

It shows the relationship between debt level and growth rate of the cost of capital and, hence, increase in the cost of capital financing the company.

If you know a company similar to rated company, and we know that the beta factor is close to 2.03, we can use this information to estimate the cost of capital of assessed contractor. Moreover, it is known that the rate of return of the market portfolio will shape close to 25.64% and the risk-free rate is about 6.2%.

To estimate the cost of capital derived from normal retained profits on the basis of these data, use the capital market equilibrium model and use the formula:

$$k_{e,zz} = k_{RF} + (k_M - k_{RF}) \times \beta_e \Rightarrow k_{e,zz} = 6,2\% + (25,64\% - 6,2\%) \times 2,03 = 45,66\%.$$

Cost of equity derived from normal retained profits, estimated on the basis of the CAPM model, for companies similar to rated companies will be developed at around 45.66%.

However, the structure of debt should be noted. The contractor assessed by us has 41% of debt and 59% of equity. Similar company, whose level of beta was assessed at 2.03 is in 55%debt. In view of the higher debt, it has a higher risk and higher risk entails a higher bonus for the risk incurred. Hence, we can expect the contractor assessed by us is likely to be characterized by a lower rate of cost of equity. To estimate it, you must first estimate β_U , or beta factor for a company similar to "Ecco-Opole Sp. z o. o. "if it was not indebted:

$$\beta_U = \frac{\beta_{L, dla D/E=1,22}}{1 + (1 - T_c) \times \frac{D}{E}} = \frac{2,03}{1 + 0,81 \times \frac{55\%}{45\%}} = 1,02.$$

Using this information, β_L can be estimated for debt of 41%, or such as that which characterized our contractor.

$$\beta_{L, dla D/E=0,7} = \beta_U \left[1 + (1 - T_c) \times \frac{D}{E} \right] = 1,02 \times \left[1 + 0,81 \times \frac{41\%}{59\%} \right] = 1,6$$

Such a change in the coefficient β , is accompanied by a change in the interest cost of capital:

$$k_{e,zz} = 6,2\% + (25,64\% - 6,2\%) \times 1,6 = 37,3\%.$$

If we take into account also that, together with changes in debt, the interest cost of foreign capital also changes, it is evident that changes in the level of indebtedness is accompanied by a significant change in the cost of capital financing the company³³.

MODEL OF RETURN RATE ON BOND PLUS RISK PREMIUM is one of the methods for estimating the expected rate of return on shares, using the fact that on the financial market between risk and return there is a positive relationship. This relationship is also observed in case of investment in financial instruments sold by the company. Risks arising from investing in company bonds are less than with investing in ordinary shares of the company, the expected rate of return on bonds of the company is usually lower than the rate of return on common shares of the same company. The method of calculating rates of return uses a relationship characterizing the businesses between the rate of return on bonds and ordinary shares. Required rate of return on ordinary shares is calculated as the sum of the

³³ G.Hawavini, C.Viallet, *Finanse menedżerskie*, PWE, Warszawa 2007, p. 370-392.

actual rate of return on enterprise's bonds and risk premium. In order to estimate the cost of capital from retained earnings and the old issue of shares, you can use the formula:

$$k_{e,zz} = k_d + RP \quad ()$$

where: RP = risk premium.

Risk premium is paid to the investor for the risk taken, and this model, it is the average difference between the return on shares (shares) and debt securities (bonds) of the same company. Risk premium is estimated as the arithmetic mean, based on historical data.

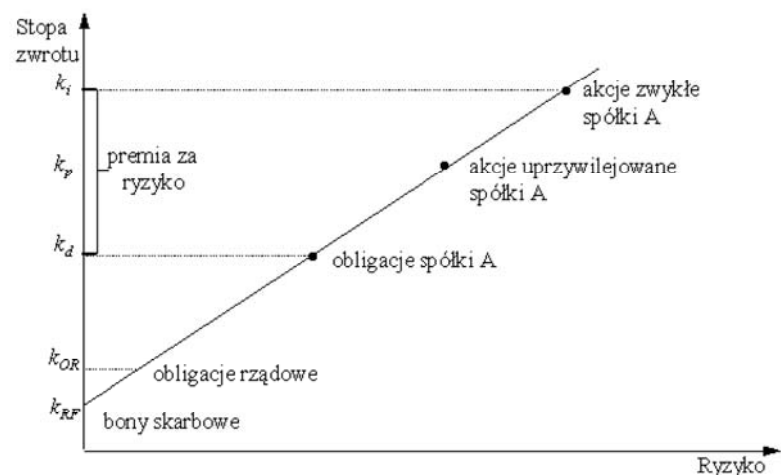


Figure. Risk premium for a company similar to the company "Ecco-Opole Sp. z o. o..

k_i = rate of the cost of capital from retained earnings in companies similar to company Ecco-Opole Sp. z o. o..

Source: Jajuga, T., T. Slonski, Finance companies. *Finanse spółek. Długoterminowe decyzje inwestycyjne i finansowe*, AE, Wrocław 1998, p. 161

The figure indicated rates of return and risk: Treasury bills and government bonds and securities issued by a company similar to the company "Ecco-Opole Sp. z o. o. Rate of return on ordinary shares is the highest since investing in the equity (or ownership of shares) is the most risky. Risk premium is generally the difference between the average rate of return of shares (shares) and debt securities (bonds) of companies in the past. It is calculated based on historical data as the arithmetic mean.

Example. At what level, in an "Ecco-Opole Sp. Ltd.," the cost rate of the normal capital from retained profits and past emissions of the equity interests will be, if it is known that the rate of cost of capital raised from the company bond similar to a company " Ecco-Opole Sp. Ltd. " is on the level close to 32.56%. Given that the cost of equity of the company is 45.66% obtain information on the risk premium:

$$RP = 45,66\% - 32,56\% = 13,1\%$$

By linking this information with the fact that the interest cost of debt "Ecco-Opole Sp. Ltd." is 24.2%, you can begin to estimate the rate of the normal cost of capital from retained earnings, using the formula:

$$k_{e,zz} = k_d + RP; k_{e,zz} = 24,2\% + 13,1\% = 37,3\%$$

The rate of cost of normal equity for the contractor being evaluated by us, estimated based on the model of the rate of return plus a risk premium, will be at the level of 37.3%.

3. Indication analysis

In the previous section we discussed the financial statements. They are used to evaluate the company's financial situation at that point. These reports also apply to the assessment of operations undertaken by the company during the period³⁴ described by them. In this section we will address another feature of the financial statements, namely their usefulness - by using indication analysis - to predict future profits and future situation of the company. Indication analysis is useful as a starting point for planning activities affecting the future situation of the company. In this section, we will discuss key financial indicators, namely: profitability, liquidity, debt, and market performance.

Profitability ratio

Profitability indicators are designed to measure the capacity of the firm (either as a whole and its individual components of property or capital) to generate a profit. Indirectly, may indicate growth potential of property owners. These indicators show the cumulative impact of liquidity, asset management and debt management, on the results of the business.

First ratio discussed in this section is the profit margin on sales, also known as return on sales. This is dividing of the net profit (net income), and proceeds from sales (cash revenues).

³⁴ K. Marecki, *Rachunkowość menedżerska w gospodarce finansowej przedsiębiorstwa*, Difin, Warszawa 2002, s. 162-165.

$$\left(\begin{array}{c} \text{marża} \\ \text{zysku} \end{array} \right) = \frac{\left(\begin{array}{c} \text{zysk} \\ \text{netto} \end{array} \right)}{\left(\begin{array}{c} \text{przychody} \\ \text{zespzedazy} \end{array} \right)}$$

$$PM = \frac{NI}{CR},$$

where: PM - profit margin, CR - sales, NI - net profit.

Example. At what level was in 200 (X-2)-200X the profit margin for the company Sliver-Op sp z

oo?

$$PM_{200(X-2)} = \frac{-48546}{2686213} = -1,8\%,$$

$$PM_{200(X-1)} = \frac{23587}{2280592} = 1,03\%,$$

$$PM_{200X} = \frac{206334}{2128780} = 9,7\%.$$

The profit margin developed in 200 (X-2)-200X at level - 1.8% + 1.03% and + 9.7%.

The size of the net profit and sales revenues were read from profit and loss account for the company Sliver-Op Ltd. (table). The results obtained for profit margin should be compared with the average profit margin for the industry in which the company operates. If they are lower than the industry average, it may mean that sales revenues are low and / or the costs too high. For company Sliver-Op sp z oo one may observe profit margins on sales increase, this is basically a positive phenomenon. It

indicates an increase in the profitability of sales in the company resulting from the fact that the ability of company to generate profit increased. However, remembering the lessons that have been learned by us on occasion of the discussion on business risks of crisis (see figure), we must not remain unrealistic optimists.

Another indicator of profitability is return on total assets (return on total assets). Its level is calculated by dividing the sum of net income and percentage of total assets (total assets).

$$\left(\begin{array}{c} \text{rentownosc} \\ \text{aktywow} \\ \text{calkowitych} \end{array} \right) = ROA = \frac{\left(\begin{array}{c} \text{zysk} \\ \text{netto} \end{array} \right) + (\text{odsetki})}{\left(\begin{array}{c} \text{aktywa} \\ \text{ogolem} \end{array} \right)}$$

$$ROA = \frac{NI + INT}{TA},$$

where: ROA - Return on total assets, TA - average level of total³⁵ assets, INT - the amount of interest (expressed in PLN).

Example. How much in the end of the year 200 (X-2), 200 (X-1) and 200X, in the company Sliver-Op sp z oo was the overall rate of return on assets?

$$ROA_{200(X-2)} = \frac{-48546 + 9496}{3701830} = -1,06\%,$$

$$ROA_{200(X-1)} = \frac{23587 + 5590}{3537952} = 0,83\%,$$

$$ROA_{200X} = \frac{206334 + 9244}{3700731} = 5,83\%.$$

³⁵ B.Byrcz, T.Dudycz, *Weryfikacja praktycznej przydatności tradycyjnego mierzenia rentowności względem liczenia jej w stosunku do kapitału zainwestowanego do prognozowania przyszłej sytuacji przedsiębiorstwa*, Strategie wzrostu wartości przedsiębiorstwa, E.Urbańczyk [red.], WNEiZ, Szczecin 2007, p. 26-27.

The level of total assets was read from the Sliver-Op Ltd company's balance sheet (table). The net profit and interest have been read from profit and loss account of company (Table 1.1.4, item Q and H.I.). For company Sliver-Op sp z oo profitability of assets in 200 (X-2)-200X was at: - 1.06%, 0.83% and 5.83%. In the company Sliver-Op Ltd. increase in return on total assets was observed. This ratio measures the ability of the company's assets to generate profit. It indicates the efficiency of all corporate resources regardless of their financing.

Return on equity (return on common equity) is dividing the net profit and equity.

$$\left(\begin{array}{c} \text{rentownosc} \\ \text{kapitalu} \\ \text{wlasnego} \end{array} \right) = ROE = \frac{\left(\begin{array}{c} \text{zysk} \\ \text{netto} \\ \text{kapital} \\ \text{wlasny} \end{array} \right)}$$

$$ROE = \frac{NI}{KW};$$

where: ROE – return on equity, KW – equity.

Example. How much was ROE by the end of year in 200(X-2) – 200X?

$$ROE_{200(X-2)} = \frac{-48546}{2324234} = -2,09\%;$$

$$ROE_{200(X-1)} = \frac{23587}{2490979} = 0,95\%;$$

$$ROE_{200X} = \frac{206334}{2696361} = 7,65\%.$$

For company Sliver-Op sp z oo return on equity was in the years 200 (X-2)-200X-at the level of - 2.09%, 0.95% and + 7.65%. This ratio measures the ability of the company's equity to generate

profit. In case of Sliver-Op sp z oo this ability in the observed period increased from - 2.09% to + 7.65%.

Liquidity indicators

Another group of indicators are indicators of liquidity. They play an important role in assessing the company's financial condition³⁶. The first question we will be discussing is an indicator current ratio.

Current ratio (current ratio) is the ratio of current assets and current liabilities.

$$\left(\begin{array}{c} \text{biezaca} \\ \text{plynosc} \end{array} \right) = WBP = \frac{\left(\begin{array}{c} \text{aktywa} \\ \text{biezace} \\ \text{pasywa} \\ \text{biezace} \end{array} \right)}$$

$$WBP = \frac{AB}{PB};$$

where: WBP - current liquidity ratio, AB - current assets, PB - Current liabilities (liabilities due soon).

Example. At what level in 200 (X-2)-200X has been the current liquidity ratio in an Sliver-Op sp z oo?

³⁶ Deeper discussion of liquidity measures can be found in: G. Michalski, *Informacyjna przydatność statycznych miar poziomu płynności finansowej*, Ekonometria nr 11, PN AE, Wydawnictwo AE, Wrocław 2003.

$$WBP_{200(X-2)} = \frac{577695 - 2603}{722335} = 0,796x;$$

$$WBP_{200(X-1)} = \frac{503874 - 36583}{594907} = 0,786x;$$

$$WBP_{200X} = \frac{679669 - 5270}{494392} = 1,36x.$$

Current assets consist of cash and cash equivalents, receivables and inventories, their composition does not include accruals. Current liabilities, in turn, are short-term liabilities, own short-term debt securities, due in a given period of long-term debt, accrued taxes, etc. These data are read from the Sliver-Op Ltd company's balance sheet (table).

This indicator measures the level of current assets to cover current liabilities. It is considered that this is a measure of the company's ability to repay current liabilities without the need for liquidation of fixed assets. The results obtained for the company Sliver-Op Ltd. in high rate are far from recommended (normative) level: from 1.5 x to 2,0x³⁷.

This could risk the company cash-flow troubles. However, the fact that in the last year, the level of the indicator rose to 1.36 x, may suggest that covering of current liabilities by current assets, will have an upward trend.

The adjusted index of liquidity (comprehensive liquidity index), is a measure of the denominator of which there are current liabilities, and the numerator contains current assets complemented by the

³⁷ E. Nowak, *Wskaźniki finansowe jako źródło informacji analitycznej*, Controlling i Rachunkowość zarządcza, nr 12 / 2000, p. 35.

postponement³⁸ coefficients. Postponement coefficients are due to the ease of obtaining the cash inflow from of the relevant assets, or how many "steps" should be performed in the direction of obtaining the cash inflow. This meter uses the fact that the cash-operative cycle is the time³⁹ that elapses, since the creation of stocks of materials and supplies, until the time the value derived from these products is carried out during the sale (after obtaining claims) in the form of the inflow of cash. Therefore, the meter shall assume that "stocks are about two steps away from the cash", and claims are separated from the cash by one step⁴⁰. Each such step has its own adjusting index.

$$\left(\begin{array}{c} \text{skorygowany} \\ \text{indeks} \\ \text{plynności} \end{array} \right) = CLI = \frac{\left(\begin{array}{c} \text{środki} \\ \text{pieniężne} \end{array} \right) + \left(\begin{array}{c} \text{papiery} \\ \text{wartościowe} \end{array} \right) \times \left(\begin{array}{c} \text{odroczenie} \\ \text{sprzedaży} \\ \text{papierów} \end{array} \right) + \left(\begin{array}{c} \text{zapasy} \\ \text{rzenia i} \\ \text{sprzedaży} \\ \text{zapasów} \end{array} \right) \times \left(\begin{array}{c} \text{odroczenie} \\ \text{przetwo-} \\ \text{żenia i} \\ \text{sprzedaży} \\ \text{zapasów} \end{array} \right) + \left(\begin{array}{c} \text{należności} \\ \text{ściągnięci a} \\ \text{należności} \end{array} \right)}{\left(\begin{array}{c} \text{pasywa} \\ \text{bezace} \end{array} \right)}$$

$$CLI = \frac{SP \times 1 + PW \times (1 - w_{pw}) + ZAP \times (1 - w_z - w_n) + NAL \times (1 - w_n)}{PB}$$

where: CLI - adjusted index of liquidity, NAL - claims, PW - a postponement factor stemming from the need to postpone the sale of securities, w_z - postponement rate resulting from the conversion of inventory into finished products and their sales, w_n - postponement coefficient of related to deferred charges, $w_i \in (0,1)$, $w_z + w_n \leq 1$.

³⁸ Z. L. Melnyk, A. Birati, *Comprehensive Liquidity Index as Measure of Corporate Liquidity*, Scientific and Behavioral Foundations of Decision Sciences, Southeastern Region of the American Institute for Decision Sciences, Atlanta 1974, p. 162-165.

³⁹ A. Adamska, T. Dąbrowski, *Marketing i finanse w przedsiębiorstwie. Od konfliktu do synergii*, Vademecum Menedżera, CHBeck, Warszawa 2007, p. 84-86.

⁴⁰ G. D. Pederson, M. Kowalewski, *Zarządzanie finansowe*, Wydawnictwo ART, Olsztyn 1998, p. 36.

The adjusted index of liquidity is an attempt to take into account the actual ability to discharge liabilities. However, it does not take into account the ability to generate cash inflows from activities undertaken on an ongoing business and does not take into account the available options for external financing.

Postponement factors included in this measure can be designated as follows (assuming that the year is 360 days):

$$w_{pw} = \frac{OSPW}{360}$$

where: OSPW - time (in days) required to sell securities.

$$w_z = \frac{OKZAP}{360}$$

where: OKZAP - time (in days) required to convert raw materials and stocks into finished products and selling them (the stocks conversion period).

$$OKZAP = \frac{zapasy}{dzienna\ sprzedaz} = \frac{ZAP}{D_s}$$

where: ZAP - stocks, D_s - the daily sales (i.e., annual sales / number of days per year).

To determine the liquidity adjusted index we use for the stocks conversion period [OKZAP] from the period immediately preceding the calculation.

$$w_n = \frac{OSN}{360}$$

where: UN - time (in days) needed to recover the charges (the period of debt collection).

$$OSN = \frac{naleznosci}{dzienna\ sprzedaz} = \frac{NAL}{D_s}$$

where: NAL - charges D_s - the daily sales (ie, annual sales / number of days per year).

To determine the adjusted liquidity index one uses period of debt collection [OSN] from the period immediately preceding the calculation.

Applying this measure of liquidity (as indeed any other) makes sense in terms of stable businesses that are characterized by the same period of obtaining receivables and inventory conversion period that $w_z + w_n \leq 1$; and: $w_i \in (0,1)$.

No correction of the denominator of the measure may distort information about the ability to regulate the level of commitments (on the level of liquidity). There is a danger that it will inform about a lower ability to regulate current liabilities than real.

Example. At what level will be the adjusted index of liquidity for the company Sliver-Op Ltd. in the years 200 (X-2)-200X?

In order to estimate the adjusted rate of liquidity for the company Sliver-Op Ltd. in the first place we will determine deferral rates, assuming that the number of days per year is 360

$$W_{pw;200(X-2)} = W_{pw;200(X-1)} = W_{pw;200X} = \frac{1}{360} = 0,003;$$

$$W_{z;200(X-2)} = \frac{OKZAP_{200(X-2)}}{360} = \frac{\frac{362539}{2686213}}{\frac{360}{360}} = 0,135;$$

$$W_{z;200(X-1)} = \frac{OKZAP_{200(X-1)}}{360} = \frac{\frac{291376}{2280592}}{\frac{360}{360}} = 0,128;$$

$$W_{z;200X} = \frac{OKZAP_{200X}}{360} = \frac{\frac{267944}{2128780}}{\frac{360}{360}} = 0,126;$$

$$W_{n;200(X-2)} = \frac{OSN_{200(X-2)}}{360} = \frac{\frac{164994}{2686213}}{\frac{360}{360}} = 0,061;$$

$$W_{n;200(X-1)} = \frac{OSN_{200(X-1)}}{360} = \frac{\frac{173059}{2280592}}{\frac{360}{360}} = 0,076;$$

$$W_{n;200X} = \frac{OSN_{200X}}{360} = \frac{\frac{392426}{2128780}}{\frac{360}{360}} = 0,184;$$

Then, using the model of the CLI, you can begin to estimate the adjusted index of liquidity:

$$CLI_{200(X-2)} = \frac{47559 \times 1 + 0 + 362539 \times (1 - 0,135 - 0,061) + 164994 \times (1 - 0,061)}{722335} = 0,684;$$

$$CLI_{200(X-1)} = \frac{36583 \times 1 + 0 + 291376 \times (1 - 0,128 - 0,076) + 173059 \times (1 - 0,076)}{594907} = 0,72;$$

$$CLI_{200X} = \frac{14030 \times 1 + 0 + 267944 \times (1 - 0,126 - 0,184) + 392426 \times (1 - 0,184)}{494392} = 1,05.$$

Comparing the level of this indicator in Sliver-Op Ltd. with the indicator of the current level of liquidity, it is apparent that the adjusted liquidity coefficient informs of a lower ability to regulate all current outstanding liabilities. At the same time one can see that $CLI_{200(X-1)} > CLI_{200(X-2)}$ ($0,72 > 0,684$), suggesting improvement in liquidity between year 200 (X-2) and 200 (X-1), while the current liquidity coefficients, pass different information that $WBP_{200(X-1)} < WBP_{200(X-2)}$

($0,786 < 0,796$). Since the rate of CLI, contains information about the postponement of non-cash current assets liquidation, it can be concluded that the information passed by the coefficient of CLI is closer to the truth, and since year 200 (X-2) to 200X, the company Sliver-Op Ltd. improves its liquidity in a regular manner.

Rapid indicator of liquidity (quick ratio) is the ratio of current assets less inventories and current liabilities.

$$\left(\begin{array}{c} \text{płynność} \\ \text{przyspieszona} \end{array} \right) = WPP = \frac{\left(\begin{array}{c} \text{aktywa} \\ \text{bieżące} \end{array} \right) - (\text{zapasy})}{\left(\begin{array}{c} \text{pasywa} \\ \text{bieżące} \end{array} \right)}$$

$$WPP = \frac{AB - ZAP}{PB},$$

where: WPP - accelerated the liquidity ratio, ZAP - stocks.

In view of the fact that stocks are often the least liquid current assets of the company and for this reason that the sale of stocks and raw materials for production could result in breaking the operating cycle of the company in the numerator of the accelerated rate of liquidity, inventories shall be deducted from current assets. The indicator of the accelerated liquidity measures the firm's ability to repay short-term obligations without having to liquidate stocks.

Example. How much in year 200 (X-2)-200X was accelerated indicator of liquidity?

$$WPP_{200(X-2)} = \frac{(577695 - 2603) - 362539}{722335} = 0,294x;$$

$$WPP_{200(X-1)} = \frac{(503874 - 36583) - 291376}{594907} = 0,296x;$$

$$WPP_{200X} = \frac{(679669 - 5270) - 267944}{494392} = 0,822x.$$

Data needed to calculate this coefficient are read from the balance sheet (table). Current amount of assets was obtained by deducting the value of assets by the amount of short-term accruals. Other magnitudes needed for the calculations are given in the balance directly. For company Sliver-Op sp z oo, this ratio was at the level: 0.294 x at the end of 200 (X-2), 0.296 at the end of x 200 (X-1) and 0.822 x at the end of the year 200X. It is generally accepted 41 that the level of this ratio should be not less than 1 For companies Sliver-Op sp z oo this condition is not fulfilled in all studied periods.

Cash funds coefficient is referred to as an indicator of liquidity as soon as possible.

$$\left(\begin{array}{c} \text{wskaznik} \\ \text{skrodkow} \\ \text{pienieznych} \end{array} \right) = WSP = \frac{\left(\begin{array}{c} \text{srodki pieniezne} \\ \text{i ich ekwiwalenty} \end{array} \right)}{\left(\begin{array}{c} \text{pasywa} \\ \text{biezace} \end{array} \right)}$$

$$WSP = \frac{SP + PW}{PB}.$$

where: WSP - the fastest rate of liquidity index, SP - cash, PW - securities (foreign) held for trading.

⁴¹ M. Sierpińska, *Problemy pomiaru płynności finansowej w przedsiębiorstwie w świetle znowej ustawy o rachunkowości*, w: Zarządzanie finansami firm – teoria i praktyka, red. W. Pluta, Prace Naukowe AE nr 974, t. 2, p. 175.

The numerator of this measure includes only those assets which have the greatest apparent ability to regulate the current liabilities.

Example .. At what level has been the ratio of cash in the company Sliver-Op Ltd. in the years 200 (X-2)-200X?

$$WSP_{200(X-2)} = \frac{47559}{722335} = 0,066x;$$

$$WSP_{200(X-1)} = \frac{36583}{594907} = 0,062x;$$

$$WSP_{200X} = \frac{14030}{494392} = 0,028x.$$

As you can see, the level of the indicators of the current liquidity and of accelerated liquidity in the years 200 (X-2) -200 (X-1), were lower than the same indicators in the year 200X. With the rate of the cash situation is different. In the 200 (X-2) -200 (X-1) it was at 0.066 x 0.062 x, while in the year 200X, fell even more, and fell to 0.028 x.

Indicator of net liquid resources (net liquid balance), was based on the belief that the only resources of cash and cash equivalents are the real "liquidity reserve" which is capable to cope with the unexpected and sudden demand for cash, because other sources of liquidity could prove too costly⁴². Indicator of net liquidity is the difference between inoperable current assets and inoperable current liabilities. Net liquid resources index is defined as the ratio of cash held at the

⁴² J. M. Shulman, R. A. K. Cox, *An Integrative Approach to Working Capital Management*, Journal of Cash Management, listopad/grudzień 1985.

disposal of the company plus a (foreign) securities held for trading and minus short-term debt securities own) and total assets⁴³:

$$\text{Wskaźnik} = \frac{\text{Środki pieniężne i ich ekwiwalenty} - \text{Własne krótkoterminowe papiery dłużne}}{\text{Aktywa całkowite}}$$

plynnych zasobów netto

$$NLB = \frac{SP + PW - KPD}{TA}$$

where: NLB - ratio of net liquid resources, NAPs - short-term debt securities (own), TA - total assets.

The downside of this index is that it does not take into account the external opportunities for feeding the company arising from the inflow of claims and access to credit lines.

Example. At what level has been the ratio of net liquid resources index in the enterprise Sliver-Op Ltd. in the years 200 (X-2) - 200X.

$$NLB_{200(X-2)} = \frac{47559}{3701830} = 1,29\%$$

$$NLB_{200(X-1)} = \frac{36583}{3537952} = 1,03\%$$

$$NLB_{200X} = \frac{14030}{3700731} = 0,38\%$$

⁴³ W polskiej literaturze nazwa niniejszego wskaźnika występuje także jako: *saldo płynności netto*, por. D. Wędzki, *Strategie płynności finansowej przedsiębiorstwa. Przepływy pieniężne a wartość dla właścicieli*, Oficyna Ekonomiczna, Kraków 2002, s.85-86.

This is another measure, informing of the lowering of the level of the immediate sources of liquidity in the company Sliver-Op Ltd. (like cash funds index).

It is commonly observed that the level of liquidity indicators such as the indexes of current liquidity, accelerated liquidity, and the rate of cash, in smaller firms are relatively higher than the corresponding rates for larger companies⁴⁴. It happens that from such observation there is a conclusion of sufficiently high ability of small businesses to adjust their current obligations. One should refrain from too quick conclusions under such conditions. Consider the reasons why we observe higher liquidity ratios (and also why we should expect the contractor to have relatively lower the than the larger one), which also can not be regarded as a clear indication of the safe level of liquidity in smaller companies. The reasons for this stem from the specific characteristics of smaller companies. Higher levels of these indicators, do not necessarily speak about objectively higher level of ability to adjust the current obligations of smaller companies⁴⁵.

⁴⁴ A.Skowronek-Mielczarek, *Wybory źródeł finansowania w małych i średnich przedsiębiorstwach*, Finansowe aspekty funkcjonowania małych i średnich przedsiębiorstw, E.Orechwa-Maliszewska, A.Kopczuk [red.], WSFiZ, Białystok, pp. 84-87.

⁴⁵ G. Michalski, *Optymalny poziom płynności finansowej w MŚP*, w: „Uwarunkowania rynkowe rozwoju mikro i małych przedsiębiorstw”, A. Bielawska [red.], US, Szczecin 2005, t. 571, p. 185-194 (electronic copy: <http://michalski.com/oppfinniejszychprzedsiębiorstwach2005.pdf>).

Liquidity managing is dependent on whether the owner of the company knows at what level it is. The level of liquidity is potentially realizable in the short term purchasing power. These are resources of such companies assets, which without too much time and financial losses can be mobilized in order to complete the transaction resulting from normal activities or unforeseen events, or attractive income opportunities appearing "suddenly".

Among the different methods of measurement of liquidity they can be divided into two groups of measures: static and dynamic. The first is those that use data from the moment of time for which the level of liquidity is determined, and therefore essentially use data from present and past. Dynamic measurements, in turn, try to base on the forecast figures. Traditional measures of the level of liquidity are based on data obtained directly from financial statements, mostly from the balance sheet. Such measurements are constructed in such a way to be independent on the size of the enterprise and could be used to compare many different types of players. Such decoupling also allows the observation of changes in the level of liquidity in time, while at the same company, even if the size of the company changes.

The most commonly used indicators of the level of liquidity in the company are: current liquidity ratio (WBP), accelerated liquidity ratio (WPP) and the immediate liquidity ratio (WSP). Information communicated by these indicators, largely depends on the evolution of the operating cycle of the rated companies.

The oldest, dating from the first decade of the twentieth century is the indicator of the current liquidity ratio (defined also as an indicator of liquidity of the third degree ⁴⁶). It is accepted that the size of this ratio should be between 1,5-2,0⁴⁷. However, this is an average for all companies. This index for smaller companies in non-pathological conditions, should be at a slightly higher level. WBP, if would be assessed in isolation from the supplements used in practice, does not take into account the negative impact of any attempts to obtain money from the stocks of raw materials for production (which are included in the numerator as a source of cash) on normal business activities. Indeed, if a company wanting to pay off its urgent current commitments, that it divests itself of stocks of raw materials for production, this will lead to the discontinuation of its operating cycle. Thus, one can say that the rate of WBP = w_{iii} in reality informs only about the size of the level of liquidity in the enterprise that can be taken into account when one intends to liquidate the entity, because interrupting the operating cycle only then⁴⁸ makes sense. Estimating the level of indicator w_{iii} one is taking into account the ratio of current assets (current assets) and current liabilities (short-term liabilities). Those categories are followed by different magnitudes than those that are used to calculate net working capital. Current assets only included the liquid ingredients, which, as we usually take, are easy cash. They do not include the overdue debts, costs outstanding at the time

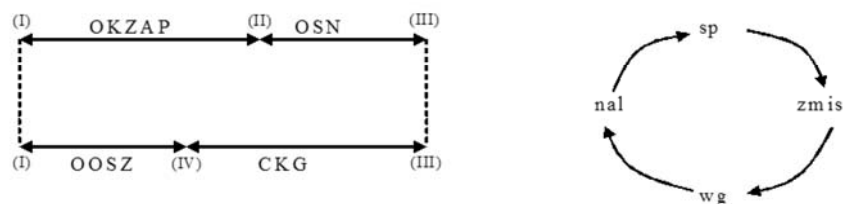
⁴⁶ J. W. Henderson, T. S. Maness, *The Financial Analyst's Deskbook: A Cash Flow Approach to Liquidity*, Van Nostrand Reinhold, New York 1989, s. 100; and: M. Lipiec-Zajchowska, E. Sikora, J. Zajchowski, M. Koślacz, P. Koślacz, D. Steciuk, Z. Więclaw, *Modele podejmowania decyzji - zarządzanie płynnością WN Wydziału Zarządzania UW, Warszawa 1997*, p. 9.

⁴⁷ E. Nowak, *Wskaźniki finansowe jako źródło informacji analitycznej*, Controlling i Rachunkowość zarządcza, nr 12/2000, s. 35; G. Michalski, *Płynność finansowa w małych i średnich przedsiębiorstwach*, WN PWN, Warszawa 2005, p. 55-67.

⁴⁸ Other situations such as restructuring and similar events are possible to consider.

and stocks impossible to liquidate in the market. Current liabilities (current liabilities) include short-term debts with payment deadlines (including short-term loans), commitments to: suppliers, employees, budgets, social security and others, attributable to the period of repayment of installment and long-term loans. By contrast, the current liabilities do not include passive accruals, deferred revenue, short-term provisioning and liabilities of special funds⁴⁹.

Most considered ingredients, shaping the level of WBP, strongly depend on the relationships that shape business cash conversion cycle. As shown in Figure 1, these components are cash, stocks (both production materials and finished products), and charges arising from the granting of trade credit to counterparties. The average stock level is multiplied by average daily sales and inventory conversion period (OKZAP). The average level of charges is the result of multiplying the average daily sales for the period of debt collection (OSN). The period of deferment of its current liabilities (OOSZ), in turn, affects the average level of these obligations (current liabilities is the product of OOSZ and average daily sales)⁵⁰.



Rys. Fig cash conversion cycle

⁴⁹ U. Wojciechowska, *Płynność finansowa polskich przedsiębiorstw w okresie transformacji gospodarki. Aspekty mikroekonomiczne i makroekonomiczne*, SGH, Warszawa 2001, s. 256.

⁵⁰ W. Pluta, G. Michalski, *Krótkoterminowe zarządzanie kapitałem. Jak utrzymać płynność finansową?*, CH Beck, Warszawa 2005, s. 53.

Symbols: (I) - the purchase of materials and raw materials for production, (ii) - the sale of finished products (III) – inflow of the money for finished goods sold, (IV) - an outflow of funds resulting from the settlement of obligations to suppliers, OKZAP - inventory conversion period , OSN - the period of debt collection, OOSZ - the period of deferment of current liabilities, CKG - cash conversion cycle, sp - Operating cash and cash equivalents, zm is - inventories of raw materials and raw materials for production, according to - finished products, nal - receivables.
Source: own.

For the average company in normal terms the postulated WBP size is usually about 2.0. This applies to companies with a sustainable position in relation to suppliers and customers. It's about a situation in which the firm has a similar length of period of deferred payment obligations to suppliers and for debt collection. If we assume for such an enterprise that it shall purchase materials and resources at level 1, then the finished products will be worth 1 + (value of materials and raw materials plus the value added during the manufacturing process), and charges will be priced at a level 1 + + (the value of finished goods plus the margin), debts to suppliers will correspond to the value of materials and supplies, namely 1 Cash and cash equivalents arising from the needs of the transaction, may be assumed close to 0. With such assumptions, WBP will be:

$$WBP = w_{III} = \frac{\text{zapasy} + \text{należności} + \text{środki pieniężne}}{\text{zobowiązania wobec dostawców}} = \frac{1^+ \times w_{OKZAP} + 1^{++} + 0^+}{1} > 2$$

where: WOKZAP - ratio of stocks conversion period, dependent on the conversion of inventories period (the longer the period from the purchase of raw materials and finished products for sale, the higher this is) to simplify our discussion, we assume that is 1. This assumption is based on the fact that the result of the use of trade credit is commitments to suppliers, and the result of it are charges.

In addition to the matching of the planned length of trade credit granted to customers to its own degree of utilization of production capacity, the company should take into account compliance period of the average run-off of charges with the actual capabilities of its customers. Firm granting the trade credit should take into account the client's inventory conversion period and the period of debt collection. These two elements make up the operating cycle of the buyer. The shorter it is, the shorter should be the entitlement of the buyer to a period of deferred obligations payment. Dependence is shown in figure, it shows that the period of deferred payment obligations for the buyer is a period of debt collection for the seller.

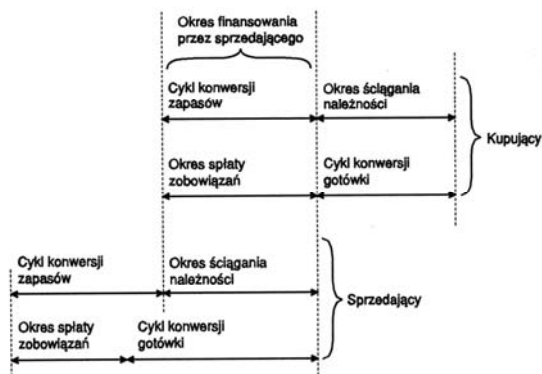


Fig. Relationships between sellers and buyers when granting trade credit

Source: W. Pluta, financial planning in the company, PWE, Warsaw 1999, p. 95.

Smaller companies will have components of WBP on other than the average level. You can expect:

- As entities with less bargaining power to customers, they will have longer than average period of debt collection. As a result, their level of charges will be higher than similar companies with greater economic strength.

- They are often perceived as entities with less reliability and a lower volume of purchases, which results in less motivation of suppliers to provide smaller enterprises with deferred payment obligations for the purchase of raw materials.

Therefore, if we assume for such an enterprise that it shall purchase materials and resources at level 1, then the finished products will be worth 1^+ , receivables are valued at a higher level than in the same larger companies 1^{+++} , debts to suppliers will be lower than for the corresponding larger enterprises $1^{(-)}$. Cash resulting from the transactional needs can be taken as close to 0, although it must be remembered that in the Minor enterprises, due to higher operational risks they are higher than in the same larger companies. With such assumptions WBP for Minor enterprises will be more than for similar larger companies:

$$WBP = w_{III} = \frac{\text{zapasy} + \text{należności} + \text{srodki pieniężne}}{\text{zobowiązania wobec dostawców}} = \frac{1^+ \times w_{OKZAP} + 1^{+++} + 0^{++}}{1^{(-)}} \gg 2$$

Another traditional and based on the balance sheet measure of the level of liquidity is the liquidity ratio of the second degree - - w_{II} ⁵¹ or else: rate of accelerated liquidity.

Similarly, for the average company:

$$WPP = w_{II} = \frac{\text{należności} + \text{srodki pieniężne}}{\text{zobowiązania wobec dostawców}} = \frac{1^{+++} + 0^+}{1} > 1$$

However, in smaller companies:

$$WPP = w_{II} = \frac{\text{należności} + \text{srodki pieniężne}}{\text{zobowiązania wobec dostawców}} = \frac{1^{+++} + 0^+}{1^{(-)}} \gg 1$$

Another measure of the level of liquidity is the first degree liquidity ratio W_I , also known as index of cash funds or as an indicator of immediate liquidity. The numerator of this measure includes only

⁵¹ J. G. Siegel, J. K. Shim, S. W. Hartman, *Przewodnik po finansach*, WN PWN, Warszawa 1999, p. 36.

those assets whose ability to regulate the current liabilities is instantaneous⁵². You may also note that for the average company:

$$WSP = w_l = \frac{\text{środki pieniężne}}{\text{zobowiązania wobec dostawców}} = \frac{0^+}{1} > 0$$

By contrast, for the average smaller companies:

$$WSP = w_l = \frac{\text{środki pieniężne}}{\text{zobowiązania wobec dostawców}} = \frac{1^{+++} + 0^+}{1^{(-)}} \gg 0$$

The indexes of the level of liquidity for smaller companies based on the cash conversion cycle reach a higher level than those for similar larger companies. Therefore, analyzing the level of liquidity ratios for smaller firms one can not draw overly optimistic conclusions, even if they are higher⁵³ than the average levels of about 2 for WBP, about 1 for WPP, and about 0.3 for the WSP, postulated in the literature.

Debt indicators

The degree of financing the company by debt, is known as leverage. The borrowing of debt results in following facts:

firm earning on investments financed by debt more than its interest, provides the owners with 'leveraged' return on equity,

⁵² M. Sierpińska, D. Wędzki, *Zarządzanie płynnością finansową w przedsiębiorstwie*, WN PWN, Warszawa 1997, p. 61.

⁵³ por. K. Prędkiewicz, *Płynność finansowa przedsiębiorstw z sektora MSP – wyniki badań empirycznych*.

business owners are able to control the company's own resources by involving fewer own resources than in the case they did not benefit from debt

lenders analyze the firm's own capital in order to determine the risk of financing such an enterprise.

The first indication of this group is the ratio of total debt to total assets (debt ratio). It is the ratio of total debt and total assets.

$$\text{wskaznik zadłużenia} = \frac{\text{kapitał obcy}}{\text{aktywa całkowite}}$$

$$DR = \frac{KO}{TA},$$

where: DR - debt ratio, TA - total assets, KO - total debt

Example. At what level has been the debt ratio in the company Sliver-Op Ltd. in the years 200 (X-2)-200X?

$$DR_{200(X-2)} = \frac{1377597}{3701830} = 37,2\%;$$

$$DR_{200(X-1)} = \frac{1046974}{3537952} = 29,6\%;$$

$$DR_{200X} = \frac{1004371}{3700731} = 27,1\%.$$

Total debt appearing in the numerator includes short-and long-term commitment. This volume was read from the liabilities side of balance sheet (table), it is the difference of total liabilities and equity. The level of total assets (as at determining the volume ratio) should be read similarly from the balance sheet. For company Sliver-Op sp z oo this ratio was at a level of 37.2% in the year 200 (X-2), 29.6% in 200 (X-1) year and 27.1% in the year 200X. You can see here the tendency to reduce total debt company.

Interest coverage (times - interest - earned ratio) is obtained by dividing earnings before interest and taxes by interest expense.

$$\left(\begin{array}{c} \text{pokrycie} \\ \text{odsetek} \\ \text{zyskiem} \end{array} \right) = \frac{\left(\begin{array}{c} \text{zysk} \\ \text{brutto} \end{array} \right) + (\text{odsetki})}{(\text{odsetki})};$$

$$TIE = \frac{EBIT}{INT}$$

where: TIE - interest coverage ratio, EBIT - earnings before interest and taxes, INT - interest payments.

This indicator informs on the border of reduction of profit from its core business (approximately identical with EBIT) without exposing the company to a lack of ability to pay interest.

Example. What was the interest coverage in the enterprise Sliver-Op Ltd. in the years 200 (X-2)-200X?

$$TIE_{200(X-2)} = \frac{-123870 + 9496}{9496} = -12,04x;$$

$$TIE_{200(X-1)} = \frac{59442 + 17842}{17842} = 4,33x;$$

$$TIE_{200X} = \frac{219951 + 9244}{9244} = 23,8x.$$

Enterprise Sliver-Op sp z oo had negative interest coverage: -12.04 x in the year 200 (X-2), positive: 4.33x in 200 (X-1) and 23.8 x in 200X. As you can see, the situation of businesses in terms of EBIT interest coverage, seems to improve.

Another indicator measures the ability to repay all its liabilities arising from incurred debt. It is the ratio of debt service. It is calculated by dividing EBIT by the sum of the installment of principal and interest.

$$\text{obsługa} \\ \text{zadłużenia} = WOZ = \frac{\left(\begin{array}{c} \text{zysk} \\ \text{brutto} \end{array} \right) + (\text{odsetki})}{\left(\begin{array}{c} \text{rata} \\ \text{kapitalowa} \end{array} \right) + (\text{odsetki})};$$

$$WOZ = WPDZ_I = \frac{EBIT}{RK + INT}$$

where: Woz - ratio of debt-servicing, RK - Capital installment, WPDZI - debt coverage ratio by profit-1st.

Debt service indicator, also referred to as the debt coverage ratio by profit I(WPDZI). According to the standards of the World Bank, it is desirable that its size ranged between 1.0 and 2.5. The World Bank considers the volume of 1.0 to be critical.

Example. At what level was the ability to repay all obligations arising from debt incurred in an Sliver-Op Ltd. in the years 200 (X-2)-200X?

$$WOZ_{200(X-2)} = WPDZ_{I,200(X-2)} = \frac{-123870 + 9496}{135576 + 9496} = -0,79x;$$

$$WOZ_{200(X-1)} = WPDZ_{I,200(X-1)} = \frac{59442 + 17842}{64410 + 17842} = 0,94x;$$

$$WOZ_{200X} = WPDZ_{I,200X} = \frac{219951 + 9244}{0 + 9244} = 23,8x.$$

For company Sliver-Op sp z oo debt service ratio was at the level: $-0.79x$ in year 200 (X-2) , $0.94x$ in year 200 (X-1) and $23.8x$ in year 200X. As it can be seen, in year 200 (X-2) and 200 (X-1), this indicator was below the recommended size. In 200X it was at the same level as the rate of TIE. This is because he company Sliver-Op Ltd. in that year had no repayments to repay.

Debt coverage ratio by profit II. By world standards, it is recommended that its volume exceeded

$$1.0. \left(\begin{array}{c} \text{pokrycie} \\ \text{dlugu} \\ \text{zyskiem} \end{array} \right) = \frac{\left(\begin{array}{c} \text{zysk} \\ \text{netto} \end{array} \right)}{\left(\begin{array}{c} \text{rata} \\ \text{kapitalowa} \end{array} \right) + (\text{odsetki})};$$

$$WPDZ_{II} = \frac{NI}{RK + INT} > 1,0$$

Example. At what level was the debt coverage by profit estimated based on the ratio of the WPDZII

in company Sliver-Op Ltd. in the years 200 (X-2)-200X?

$$WPDZ_{II,200(X-2)} = \frac{-48546}{135576 + 9496} = -0,33x;$$

$$WPDZ_{II,200(X-1)} = \frac{23587}{64410 + 17842} = 0,29x;$$

$$WPDZ_{II,200X} = \frac{206334}{0 + 9244} = 22,32x.$$

Debt coverage ratio by financial surplus. This ratio should be higher than 1.5. Among other things,

it shall inform you about how many times the total financial surplus covers the total debt.

$$\left(\begin{array}{c} \text{pokrycie dlugu} \\ \text{nadwyżka finansowa} \end{array} \right) = \frac{(\text{zysk netto}) + (\text{amortyzacja})}{(\text{raty kapitalowe}) + (\text{odsetki})};$$

$$WPDNF = \frac{NI + Dep.}{RK + INT} > 1,5$$

$$WPDNF_{200(X-2)} = \frac{-48546 + 99346}{135576 + 9496} = 0,35x;$$

$$WPDNF_{200(X-1)} = \frac{23587 + 88576}{64410 + 17842} = 1,36x;$$

$$WPDNF_{200X} = \frac{206334 + 45879}{0 + 9244} = 27,28x.$$

Performance indicators

Indicators of performance are defined as a market rate or rates of activity. They determine the efficiency of revolving of stocks, receivables and total assets.

Inventory turnover rate (inventory turnover ratio) indicates how many times during the reporting period, raw materials and materials inventories held by company are transformed into finished sold products.

This ratio is determined by dividing own cost of sales and mid-sized stocks.

$$\left(\begin{array}{c} \text{rotacja} \\ \text{zapasow} \end{array} \right) = \frac{\left(\begin{array}{c} \text{przychodyze} \\ \text{sprzedazy} \end{array} \right)}{(\text{zapasy})},$$

$$WRZAP = \frac{CR}{ZAP},$$

where: WRZAP - inventory turnover rate, CR – sales revenue, ZAP - stocks.

Example. What has been the turnover rate of stocks in a company Sliver-Op Ltd. in the years 200

$$WRZAP_{200(X-2)} = \frac{2686213}{362539} = 7,41x$$

$$WRZAP_{200(X-1)} = \frac{2280592}{291376} = 7,83x$$

$$(X-2) - 200X? \quad WRZAP_{200X} = \frac{2128780}{267944} = 7,95x.$$

The level of sales revenue for the period 200 (X 2) -200X is read from the profit and loss account (table), while the denominator contains the level of stocks, was read from the balance sheet (table). For company Sliver-Op sp z oo inventory turnover rate in this period is on the level of the 7.41 x thru 7.83 to 7.95. This means that the company has transformed its stocks into finished goods and sold them in the year 200 (X-2) during $(360 / 7.41) = 48.6$ days, the year 200 (X-1) during $(360 / 7.83) = 46$ days and in the 200X during $(360 / 7.95) = 45.3$ days. As you can see, the efficiency of trading stocks, in an Op-sp Sliver Ltd. has grown over the past three years.

Another indicator of the efficiency is charges rotation index. It shall inform about how many times during the reporting period the turnover of receivables takes place. The greater the turnover of receivables, the less the company's own resources must be involved in charges from customers.

This indicator is calculated as the ratio of sales revenue and the average level of receivables.

$$\left(\begin{array}{l} \text{rotacja} \\ \text{naleznosci} \end{array} \right) = \frac{\left(\begin{array}{l} \text{przychodyze} \\ \text{sprzedazy} \end{array} \right)}{\left(\begin{array}{l} \text{naleznosci} \end{array} \right)} ;$$

$$WRNAL = \frac{CR}{NAL}$$

where: WRNAL - rotation rate of charges, NAL - the level of charges.

Example. At what level has been the rate of rotation of charges in the company Sliver-Op Ltd. in

$$WRNAL_{200(X-2)} = \frac{2686213}{164994} = 16,3x$$

$$WRNAL_{200(X-1)} = \frac{2280592}{173059} = 13,2x$$

$$\text{the years 200 (X-2)-200X?} \quad WRNAL_{200X} = \frac{2128780}{392426} = 5,4x.$$

Numerator of this ratio has been read from the profit and loss account (table, position A), while data for the denominator come from the balance sheet (table). Enterprise Sliver sp-Op Ltd. has a turnover rate of charges of 16.3 x in the year 200 (X-2), 13.2 x in the year 200 (X-1) and 5.4 x in the year 200X. This means that the rotation of charges in the company was $(360/16, 3) = 22.1$ days in the year 200 (X-2), $(360/13, 2) = 27.3$ days in the year 200 (X-1) and $(360 / 5.4) = 66.7$ days in 200X year, respectively As you can see, the period of debt collection grows. Despite extending the period of debt collection there is no increase in sales revenue. This can be a confirmation of the before stated increase of threat of crisis in operations (see figures).

Another indicator of efficiency is the turnover rate of liquid assets. It is the quotient of the proceeds from sales and the amount of charges, cash and cash equivalents.

$$\left(\begin{array}{l} \text{rotacja} \\ \text{aktywow} \\ \text{plynnych} \end{array} \right) = \frac{\left(\begin{array}{l} \text{przychody} \\ \text{ze sprzedazy} \end{array} \right)}{\left(\begin{array}{l} \text{naleznosci} \\ \text{+} \\ \text{(\text{ srodki pieniezne} \\ \text{ i ich ekwiwalenty} \end{array} \right)}$$

$$WRAP = \frac{CR}{NAL + SP}$$

where: WRAP - the rate of rotation of the liquid assets; PA - cash and cash equivalents.

Example. At what level has been the rate of turnover of liquid assets in the company Sliver-Op Ltd.

$$WRAP_{200(X-2)} = \frac{2686213}{164994 + 47559} = 12,6x$$

$$WRAP_{200(X-1)} = \frac{2280592}{173059 + 36583} = 10,9x$$

$$WRAP_{200X} = \frac{2128780}{392426 + 14030} = 5,2x$$

in the years 200 (X-2)-200X?

The amounts included in the numerator come from the profit and loss account (table, position A), state of charges and state funds contained in the denominator, are disclosed in the balance sheet (table). In the company Sliver-Op sp z oo this rate was 12.6 x in 200 (X-2), 10.9 in x 200 (X-1) and 5.2 x in the year 200X. This indicator is used to measure the ability of the liquid assets (charges and cash) to generate revenue from the sale. It is assumed that the higher the level of this ratio the more efficiently the company manages its liquid assets, and therefore its decrease should be interpreted as a negative phenomenon.

The last of thee discussed performance indicators, an indicator to measure the ability of the company's assets to generate revenue from the sale, is the turnover rate of total assets, also called the efficiency index of property. It is the quotient of the proceeds of the sale and the level of total assets.

$$\left(\begin{array}{c} \text{efektywnosc} \\ \text{majatku} \end{array} \right) = \left(\begin{array}{c} \text{rotacja} \\ \text{aktywow} \end{array} \right) = \frac{\left(\begin{array}{c} \text{przychodyze} \\ \text{sprzedazy} \end{array} \right)}{\left(\begin{array}{c} \text{calkowite} \\ \text{aktywa} \end{array} \right)}$$

$$WRCA = \frac{CR}{TA}$$

where: WRCA - turnover rate of total assets, TA - total assets.

Example. What has been the turnover rate of total assets in the company Sliver-Op Ltd. in the years

$$WRCA_{200(X-2)} = \frac{2686213}{3701830} = 0,73x$$

$$WRCA_{200(X-1)} = \frac{2280592}{3537952} = 0,65x$$

$$WRCA_{200X} = \frac{2128780}{3700731} = 0,58x$$

200 (X-2)-200X?

The numerator of the index was read from profit and loss account (table, position A), while the denominator is the total assets from the company's balance sheet Sliver-Op Ltd. (table). For company Sliver-Op sp z oo turnover rate of total assets, was at 0.73 in the year x 200 (X-2) x 0.65 in 200 (X-1) and 0.58 x in the year 200X. This means that the ability of the company's assets to generate revenue from sales is attaining a lower level. As the level of this index depends on the business sector in which the firm operates, it is difficult to fully assess the quality of assets held by the Sliver-Op sp z oo, since the need for expensive equipment is associated with relatively lower levels of WRCA. However, the increasing trend, namely the lower efficiency of these assets can mean higher risk of operations crisis.

Market indicators

The common feature of market indicators, also known as indicators of market value (market value ratios) is to relate the market price of the company to its earnings and book value. These indicators serve as information for the board about the perception of the company by potential investors.

Price / earnings ratio (price / earning ratio) is the quotient of the price of one share to the earnings per share.

$$\left(\begin{array}{l} \text{wskaznik} \\ \text{cena do zysku} \end{array} \right) = \frac{\left(\begin{array}{l} \text{cena jednej} \\ \text{akcji (udzialu)} \end{array} \right)}{\left(\begin{array}{l} \text{zyskprzypadajacy} \\ \text{na jedna akcje (udzial)} \end{array} \right)}$$

$$P/E = \frac{P}{E}$$

where P / E - price / earnings, P - the price per share, E - earnings per share.

Example. What was the relation P / E in an Sliver Op-sp z oo at the end of the year 200 (X-2), 200 (X-1) and 200X, assuming that the market value of equity at year end was 200 (X -2) equaled 2,500,000 zł, 200 (X-1) zł year was 2,600,000 and in the year 200X amounted to 2,750,000 zł?

$$P/E_{200(X-2)} = \frac{\frac{2500000}{\text{liczba akcji/udzialow}}}{\frac{48546}{\text{liczba akcji/udzialow}}} = -51,5;$$

$$P/E_{200(X-1)} = \frac{\frac{2600000}{\text{liczba akcji/udzialow}}}{\frac{23587}{\text{liczba akcji/udzialow}}} = 110,2;$$

$$P/E_{200X} = \frac{\frac{2750000}{\text{liczba akcji/udzialow}}}{\frac{206334}{\text{liczba akcji/udzialow}}} = 13,33.$$

Companies with better prospects of development are characterized by a higher level of the P / E indicator. Positive results in this rate, inform you about how many PLN for one PLN of profit, are able to offer potential buyers of shares. The size of this indicator for the enterprise Sliver-Op sp z oo means that in 200 (X-2), investors, despite the losses, were ready to offer for the shares a higher amount. As you can see from the results, their expectations, after two years seemed to confirm the correctness of such valuations.

Another market indicator is the index market value / book value. This indicator is about how a company is judged by potential investors. The book value is book value of equity.

$$\left(\begin{array}{l} \text{relacja wartosci} \\ \text{rynkowej do ksiegowej} \end{array} \right) = \frac{\left(\begin{array}{l} \text{rykowa wartosc} \\ \text{przedsiębiorstwa} \end{array} \right)}{\left(\begin{array}{l} \text{ksiegowa wartosc} \\ \text{przedsiębiorstwa} \end{array} \right)}$$

$$M/B = \frac{M}{B}$$

where: M / B - ratio market value / book value, M - the market value of company B - the book value of the company.

Example. How was the M / B relationship developing for firm Sliver-Op sp z oo at the end of 200 (X-2), 200 (X-1) and 200X, assuming that the market value of equity at year 200 (X -2) end was equal to 2,500,000 zł, year 200 (X-1) zł was 2,600,000 and for the 200X year amounted to

$$M/B_{200(X-2)} = \frac{2\,500\,000}{2\,324\,234} = 1,076;$$

$$M/B_{200(X-1)} = \frac{2\,600\,000}{2\,490\,979} = 1,044;$$

$$M/B_{200X} = \frac{2\,750\,000}{2\,696\,361} = 1,02.$$

2,750,000 zł?

For company Sliver-Op sp z oo M / B ratio in 200 (X-2) - 200X was little more than 1 This means that the market slightly higher measured the value of equity than is apparent from the book record.

Du Pont Analysis

Du Pont analysis is mainly based on the equation of the total rate of return on assets - ROA. In this equation the numerator and denominator can be divided by sales. Then we receive the formula:

$$\left(\begin{array}{c} \text{rentownosc} \\ \text{aktywow} \\ \text{calkowitych} \end{array} \right) = \frac{\left(\begin{array}{c} \text{zysk} \\ \text{netto} \end{array} \right)}{\left(\begin{array}{c} \text{przychody} \\ \text{zesprzedazy} \end{array} \right)} \times \frac{\left(\begin{array}{c} \text{przychody} \\ \text{zesprzedazy} \end{array} \right)}{\left(\begin{array}{c} \text{aktywa} \\ \text{calkowite} \end{array} \right)}$$

$$ROA = \frac{NI}{CR} \times \frac{CR}{TA}$$

It informs that the profitability of the assets can be influenced by changing the margin, forming the first part of the equation, and the change in assets trading.

If the rate of return on assets is multiplied by a factor of equity (ie the ratio of total assets and equity), we will receive a return on equity ROE:

$$\left(\begin{array}{c} \text{rentownosc} \\ \text{kapitalu} \\ \text{wlasnego} \end{array} \right) = \frac{\left(\begin{array}{c} \text{zysk} \\ \text{netto} \end{array} \right)}{\left(\begin{array}{c} \text{przychody} \\ \text{zesprzedazy} \end{array} \right)} \times \frac{\left(\begin{array}{c} \text{przychody} \\ \text{zesprzedazy} \end{array} \right)}{\left(\begin{array}{c} \text{aktywa} \\ \text{calkowite} \end{array} \right)} \times \frac{\left(\begin{array}{c} \text{aktywa} \\ \text{calkowite} \end{array} \right)}{\left(\begin{array}{c} \text{kapital} \\ \text{wlasny} \end{array} \right)}$$

$$ROE = \frac{NI}{CR} \times \frac{CR}{TA} \times \frac{TA}{KW}$$

It can be seen that the ROE is affected⁵⁴ by:

operating performance (represented by the profit margin),

efficient use of assets (represented by the rotation of total assets),

⁵⁴ S. A. Ross, R. W. Westerfield, B. D. Jordan, *Finanse przedsiębiorstwa*, DW ABC 1999, s. 87.

leverage (represented by the equity multiplier).

Low operating performance and / or low efficiency in the use of assets is likely to affect the lower return on equity. You can see here also that the increase in debt levels will affect the growth of ROE. However, in view of the fact that the net income (NI) appearing in the numerator ROE is affected by the financial costs (interest), an increase in ROE will take place only if the ROA is higher than the rate of debt.

Analysis of costs and revenues

The very first glance at the profit and loss account reveals that the profit of the company and its profitability depends on the level of costs, prices, production levels and sales revenues. Business costs can be divided to: the costs of fixed and variable costs and: the costs of operating and financial costs. Both of these divisions will be important to the considerations contained in this section.

Variable costs change with a change in production levels. Their size is zero, if the level of production is also zero. Variable costs usually include such costs as labor costs and material costs.

Variable costs are constant per unit of production. It follows that the total variable cost is the product of unit cost and manufactured units of product.

$$\left(\begin{array}{c} \text{koszty} \\ \text{zmienne} \end{array} \right) = \left(\begin{array}{c} \text{wielkosc produkcji} \\ \text{w jednostkach naturalnych} \end{array} \right) \times \left(\begin{array}{c} \text{jednostkowy} \\ \text{koszt zmienny} \end{array} \right);$$

$$VC = Q \times v$$

where: VC - the total variable cost,

Q - the total volume of production,

v - unit variable cost.

Fixed costs are constant during the given period. They do not depend on the total volume of production. These costs are: rent, management salary, etc. The fixed costs are to some character called so called sunk costs. This follows from the fact that they must be incurred regardless of any other circumstances.

With information about fixed and variable costs, we are able to determine total costs:

$$\begin{pmatrix} \text{koszty} \\ \text{całkowite} \end{pmatrix} = \begin{pmatrix} \text{koszty} \\ \text{zmiennie} \end{pmatrix} + \begin{pmatrix} \text{koszty} \\ \text{stale} \end{pmatrix};$$

$$TC = VC + FC = Q \times v + FC$$

where: TC - total costs

FC - Fixed costs.

The division into variable and fixed costs is related to the concept of the accounting break-even⁵⁵.

The figure shows the fixed and variable costs, and proceeds from the sale. Revenues from sales are determined by the formula:

$$\begin{pmatrix} \text{przychody} \\ \text{ze sprzedaży} \end{pmatrix} = \begin{pmatrix} \text{wielkość produkcji w} \\ \text{jednostkach naturalnych} \end{pmatrix} \times \begin{pmatrix} \text{cena} \\ \text{jednostkowa} \end{pmatrix};$$

$$CR = Q \times p$$

where: p – unit price.

⁵⁵ M. Sierpińska, T. Jachna, *Ocena przedsiębiorstwa według standardów światowych*, WN PWN, Warszawa 1996, p. 160-161.

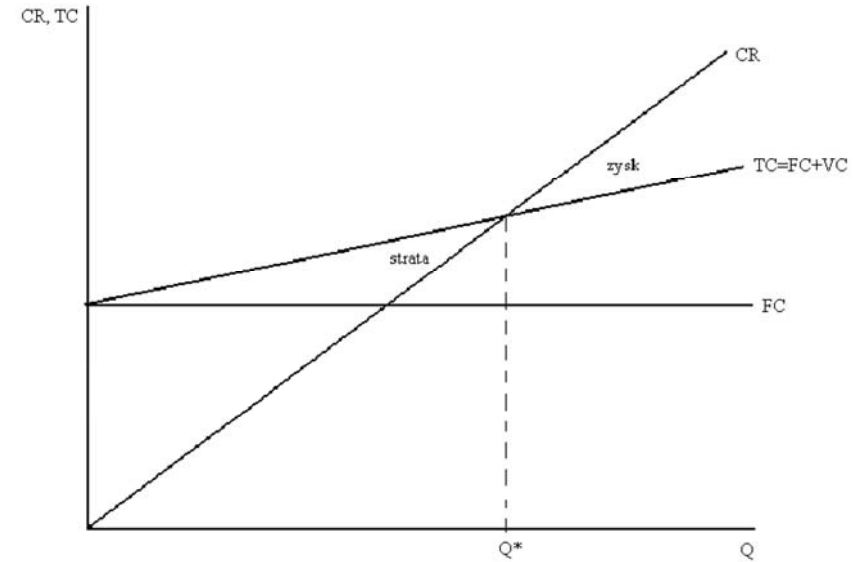


Figure costs, revenues and the accounting break-even.

Source: own.

The figure shows that if the sales revenues are below the total cost, the company recorded a loss in a given activity. On the other hand, if the proceeds from the sale are higher than total costs, we are dealing with a profit. Equalization of the total costs and revenues is the break even. Amount corresponding to the break even is determined by the formula:

$$\begin{pmatrix} \text{prog} \\ \text{rentowności} \end{pmatrix} = \frac{\begin{pmatrix} \text{koszty} \\ \text{stale} \end{pmatrix}}{\begin{pmatrix} \text{cena} \\ \text{jednostkowa} \end{pmatrix} - \begin{pmatrix} \text{jednostkowe} \\ \text{kosztyzmiennie} \end{pmatrix}};$$

$$Q^* = \frac{FC}{p - v}$$

The breakdown to variable and fixed costs concerns operating cost. The division is also related to the existence of operating leverage. Operating leverage is the ratio between profit margins and profit before interest and tax.

$$\left(\text{dzwignia} \right)_{\text{operacyjna}} = \frac{\left(\text{wielkosc produkcji w} \right)_{\text{jednostkach naturalnych}} \times \left[\left(\text{cena} \right)_{\text{jednostkowa}} - \left(\text{koszt zmienny} \right)_{\text{jednostkowy}} \right]}{\left(\text{wielkosc produkcji w} \right)_{\text{jednostkach naturalnych}} \times \left[\left(\text{cena} \right)_{\text{jednostkowa}} - \left(\text{koszt zmienny} \right)_{\text{jednostkowy}} \right] - \left(\text{koszty} \right)_{\text{stale}}}$$

$$DOL = \frac{Q \times (p - v)}{Q \times (p - v) - FC}$$

where: DOL - operating leverage.

From the formula it is visible that operating leverage is positive if the quantity of goods sold exceeds the accounting break-even point. Under the accounting break-even point it is negative.

Above all, growth in fixed costs is accompanied by an increase of leverage. This implies a very high sensitivity of the profitability to sales level in enterprises characterized by relatively high fixed cost.

Example. Eurus and Mixit companies operate in the same industry and are comparable in terms of all its economic parameters with the exception of the cost. Both produce good X, whose price is 60 PLN per piece. In the year 200 (X-1), both companies sold 8 000 X units goods. Companies differ in the structure of operating costs. Eurus firm bears only the variable costs of 40 gold per piece. Enterprise Mixit bears the fixed costs of 240 000 PLN and variable costs in the amount of PLN 10 per head. How will the profit shape before interest and tax (EBIT) and what will be the operating leverage (DOL) in 200 (X-1) and in 200X if we know that in the year 200X, the quantity of the

goods sold will be increased by half compared to the previous year? At what level has been the accounting break-even point?

Table

EBIT and DOL in enterprises Eurus and Mixit.

	200(X-1) r.		200X r.	
	Eurus	Mixit	Eurus	Mixit
Revenues from sales (in thousand Zł.)	480	480	720	720
Fixed costs (in thous. Zł.)	-	240	-	240
Variable costs (in thous. Zł.)	320	80	480	120
EBIT (in thous. Zł.)	160	160	240	360
DOL	1,00	2,50	1,00	1,67

Source: own.

DOL indicator at the bottom of the table, has been calculated on the basis of the formula.

$$DOL_{Eurus, 200(X-1)} = \frac{8000 \times (60 - 40)}{8000 \times (60 - 40) - 0} = 1; \quad DOL_{Mixit, 200(X-1)} = \frac{8000 \times (60 - 10)}{8000 \times (60 - 10) - 240000} = 2,5;$$

$$DOL_{Eurus, 200X} = \frac{12000 \times (60 - 40)}{12000 \times (60 - 40) - 0} = 1; \quad DOL_{Mixit, 200X} = \frac{12000 \times (60 - 10)}{12000 \times (60 - 10) - 240000} = 1,67.$$

As seen in the table, EBIT by Mixit businesses rose more rapidly than EBIT of company Eurus.

This is because the Mixit company was incurring the fixed costs. In determining the level of earnings before interest and tax for the following year, i.e. at the "transition" from 200 (X-1) to the year 200X, the degree of operating leverage DOL for the year 200 (X-1) applies:

$$EBIT_{Eurus,200X} = EBIT_{Eurus,200(X-1)} \times (1 + \Delta\% \times DOL_{Eurus,200(X-1)}) = 160 \times (1 + 0,5 \times 1) = 240;$$

$$EBIT_{Mixit,200X} = EBIT_{Mixit,200(X-1)} \times (1 + \Delta\% \times DOL_{Mixit,200(X-1)}) = 160 \times (1 + 0,5 \times 2,5) = 360.$$

Of course, the degree of operating leverage works both ways. If we have the EBIT for the year 200X, and we want to know EBIT for the previous year, it is enough to apply the degree of operating leverage for the year 200X:

$$EBIT_{Eurus,200(X-1)} = EBIT_{Eurus,200X} \times (1 + \Delta\% \times DOL_{Eurus,200X}) = 240 \times (1 - 0,33 \times 1) = 160;$$

$$EBIT_{Mixit,200(X-1)} = EBIT_{Mixit,200X} \times (1 + \Delta\% \times DOL_{Mixit,200X}) = 360 \times (1 - 0,33 \times 1,67) = 160.$$

Of course keep in mind that if sales revenue from the year 200 (X-1) to 200X increased by half (ie, $\Delta\% = 0.5$), then "going back" from the year 200X to the 200 (X-1) it is necessary to lower sales revenue by 33% (hence $\Delta\% = -0.33$).

Accountant profitability threshold is calculated based on the 1.3.4 formula:

$$Q_{Eurus}^* = \frac{0}{60 - 40} = 0, \quad Q_{Mixit}^* = \frac{240000}{60 - 10} = 4800.$$

It turns out that for the company Eurus profitability threshold is 0 units. Thus, each level of production above 0 items is associated with obtaining a positive EBIT. However, for company Mixit, the accounting break-even point is 4800 pieces. If the production would be lower than 4800 items, EBIT would have been negative.

Costs related to financial activities are any kind of interest on borrowed capital financing the company. Their existence implies the phenomenon of financial leverage⁵⁶. It is calculated by the formula:

⁵⁶ A.Damodaran, *Finanse korporacyjne. Teoria i praktyka*, One Press, Gliwice 2007, pp. 338-339.

$$\left(\begin{array}{l} \text{dzwignia} \\ \text{finansowa} \end{array} \right) = \frac{\left(\begin{array}{l} \text{wielkosc produkcji w} \\ \text{jednostkach naturalnych} \end{array} \right) \times \left[\left(\begin{array}{l} \text{cena} \\ \text{jednostkowa} \end{array} \right) - \left(\begin{array}{l} \text{jednostkowy} \\ \text{koszt zmienny} \end{array} \right) \right] - \left(\begin{array}{l} \text{koszty} \\ \text{stale} \end{array} \right)}{\left(\begin{array}{l} \text{wielkosc produkcji w} \\ \text{jednostkach naturalnych} \end{array} \right) \times \left[\left(\begin{array}{l} \text{cena} \\ \text{jednostkowa} \end{array} \right) - \left(\begin{array}{l} \text{jednostkowy} \\ \text{koszt zmienny} \end{array} \right) \right] - \left(\begin{array}{l} \text{koszty} \\ \text{stale} \end{array} \right) - \left(\begin{array}{l} \text{koszty finansowe} \\ \text{(odsetki)} \end{array} \right)}$$

$$DFL = \frac{Q \times (p - v) - FC}{Q \times (p - v) - FC - INT}$$

where: DFL - leverage,

INT - financial costs (interest).

Analysis of the formula shows that the leverage is higher if the financial costs borne by the company are higher. If EBIT is higher than the interest rate, leverage is positive.

Example. Miral and Fusalka companies differ only by the fact that the Fusalka company is financed only by equity capital, and liabilities of the company Miral in 50% are foreign capital, whose cost is 10%. Total liabilities of both companies are at 500 000 PLN. At what level will be the ROE indicators in 200 (X-1) and 200X? In 200 (X-1) year EBIT for both companies was at a level of 100 000 zł., and in year 200X at level of 200 000 zlotys. Companies pay 25% tax. The solution is presented in the table.

Table

Levels of ROE and DFL in Miral and Fusalka enterprises between 200 (X-1) and 200X.

	200(X-1) r.		200X r.	
	Fusalka	Miral	Fusalka	Miral
EBIT (in thous. Zł.)	100	100	200	200
INT (in thous. Zł.)	-	25	-	25

EBT (in thous. Zł.)	100	75	200	175
Tax (in thous. Zł.)	25	18,75	50	43,75
Net profit (in thous. Zł.)	75	56,25	150	131,25
ROE	15%	22,5%	30%	52,4%
DFL	1,00	1,33	1,00	1,14

Source: own.

Miral firm uses financial leverage. See higher ROE for this company and its steeper increase for the company's Miral with the same EBIT increment for both companies.

DFL indicator at the bottom of the table 1.3.2 was calculated on the basis of formula 1.3.6.

$$DFL_{Fusalka,200(X-1)} = \frac{EBIT}{EBT} = \frac{100}{100} = 1; \quad DFL_{Miral,200(X-1)} = \frac{100}{75} = 1,33;$$

$$DFL_{Fusalka,200X} = \frac{200}{200} = 1; \quad DFL_{Miral,200X} = \frac{200}{175} = 1,14;$$

As seen in the table, ROE of the Miral company increased more rapidly than the ROE of the Fusalka company. This is because the company Miral bears the financial costs. In determining the level of return on capital for the following year, i.e. the "transition" from 200 (X-1) to the year 200X, the degree of financial leverage DFL for the year 200 (X-1) applies:

$$ROE_{Fusalka,200X} = ROE_{Fusalka,200(X-1)} \times (1 + \Delta\% \times DFL_{Fusalka,200(X-1)}) = 15\% \times (1 + 1 \times 1) = 30\%;$$

$$ROE_{Miral,200X} = ROE_{Miral,200(X-1)} \times (1 + \Delta\% \times DFL_{Miral,200(X-1)}) = 22,5\% \times (1 + 1 \times 1,33) = 52,4\%.$$

The degree of financial leverage also works both ways. If we are given the ROE for the year 200X, and we want to know the ROE for the previous year, it is enough to apply the degree of financial leverage for the year 200X:

$$ROE_{Fusalka,200(X-1)} = ROE_{Fusalka,200X} \times (1 + \Delta\% \times DFL_{Fusalka,200X}) = 30\% \times (1 - 0,5 \times 1) = 15\%;$$

$$ROE_{Miral,200(X-1)} = ROE_{Miral,200X} \times (1 + \Delta\% \times DFL_{Miral,200X}) = 52,4\% \times (1 - 0,5 \times 1,14) = 22,5\%.$$

You also should remember that if EBIT from the year 200 (X-1) to 200X increased by 100% (thus $\Delta\% = 1$), then the transition from the year 200X to the year 200 (X-1) EBIT should be reduced by 50% (ie $\Delta\% = -0.5$).

If the company is able to bear the fixed costs and to finance itself by foreign capital, we can talk about the use its overall leverage⁵⁷. Overall leverage is the product of the operating and financial leverage:

$$\left(\begin{array}{l} \text{dzwignia} \\ \text{calkowita} \end{array} \right) = \frac{\left(\begin{array}{l} \text{wielkosc produkcji w} \\ \text{jednostkach naturalnych} \end{array} \right) \times \left[\left(\begin{array}{l} \text{cena} \\ \text{jednostkowa} \end{array} \right) - \left(\begin{array}{l} \text{jednostkowy} \\ \text{koszt zmienny} \end{array} \right) \right]}{\left(\begin{array}{l} \text{wielkosc produkcji w} \\ \text{jednostkach naturalnych} \end{array} \right) \times \left[\left(\begin{array}{l} \text{cena} \\ \text{jednostkowa} \end{array} \right) - \left(\begin{array}{l} \text{jednostkowy} \\ \text{koszt zmienny} \end{array} \right) \right] - \left(\begin{array}{l} \text{koszty} \\ \text{stale} \end{array} \right) - \left(\begin{array}{l} \text{koszty finansowe} \\ \text{(odsetki)} \end{array} \right)}$$

$$DTL = \text{DOL} \times \text{DFL} = \frac{Q \times (p - v)}{Q \times (p - v) - FC - INT}$$

where: DTL - total leverage.

Example. Eurus and Mixit companies operate in the same industry and are comparable in terms of all their economic parameters with the exception of the cost. Both produce good X, whose price is 60 PLN per piece. In the year 200 (X-1), both companies sold 8 000 units of good X. Companies differ in the structure of operating costs. Eurus firm bears only the variable costs of 40 PLN per piece. Enterprise Mixit bears the fixed costs of 240 000 zlotys and variable costs in the amount of PLN 10 per head. How much will the return on equity (ROE) be and how much the combined leverage (DTL) from 200 (X-1) the 200X if we know that in the year 200X, the quantity of the goods sold will be increased by half compared to the previous year? We assume that the companies also differ in that the Eurus company finances itself by equity capital only, and liabilities of the Mixit company are in 50% foreign capital, whose cost is 10%. Total liabilities of both companies

⁵⁷ R. Machała, *Praktyczne zarządzanie finansami firmy*, WN PWN, Warszawa 2001, p. 326-327.

are at 500 000 PLN. The effective tax rate for these companies is 25%. The solution is presented in the table.

Table.

DTL in enterprises Eurus and Mixit in 200 (X-1) and 200X.

	200(X-1) r.		200X r.	
	Eurus	Mixit	Eurus	Mixit
Revenues from sales (in thousand. Zł.)	480	480	720	720
Fixed costs (in thous. Zł.)	-	240	-	240
Variable costs (in thous. Zł.)	320	80	480	120
EBIT (in thous. Zł.)	160	160	240	360
INT (in thous. Zł.)	-	25	-	25
EBT (in thous. Zł.)	160	135	240	335
Tax (in thous. Zł.)	40	33,75	60	83,75
Net profit (in thous. Zł.)	120	101,25	180	251,25
ROE	24%	40,5%	36%	100,5%
DOL	1	2,5	1	1,67
DFL	1	1,19	1	1,08
DTL	1	2,96	1	1,79

Source: own.

Mixit firm uses both operating leverage and financial leverage. See higher ROE for this company, and a steeper increase for the company's Mixit with the same increased sales revenue for both companies.

DTL indicator at the bottom of the table 1.3.3 is calculated based on 1.3.7 formula.

$$DTL_{Eurus,200(X-1)} = \frac{8000 \times (60 - 40)}{8000 \times (60 - 40) - 0 - 0} = 1;$$

$$DTL_{Mixit,200(X-1)} = \frac{8000 \times (60 - 10)}{8000 \times (60 - 10) - 240000 - 25000} = 2,96;$$

$$DTL_{Eurus,200X} = \frac{12000 \times (60 - 40)}{12000 \times (60 - 40) - 0 - 0} = 1;$$

$$DTL_{Mixit,200X} = \frac{12000 \times (60 - 10)}{12000 \times (60 - 10) - 240000 - 25000} = 1,79.$$

The solution presented in the table shows that the ROE of the Mixit company increased more rapidly than the ROE of the company Eurus. This is because the Mixit company is incurring both operational fixed costs of and financial costs. In determining the level of return on capital for the following year, i.e. passing from the year 200 (X-1) to the year 200X, the degree of the total leverage to for the year DTL 200 (X-1)

$$ROE_{Eurus,200X} = ROE_{Eurus,200(X-1)} \times (1 + \Delta\% \times DTL_{Eurus,200(X-1)}) = 24\% \times (1 + 0,5 \times 1) = 36\%;$$

$$\text{applies: } ROE_{Mixit,200X} = ROE_{Mixit,200(X-1)} \times (1 + \Delta\% \times DTL_{Mixit,200(X-1)}) = 40,5\% \times (1 + 0,5 \times 2,96) = 100,5\%.$$

Degree of combined leverage also works the other way. If we are given the ROE for the year 200X, and we want to know the ROE for the previous year it is enough to apply the degree of the total leverage of for the year 200X:

$$ROE_{Eurus,200X} = ROE_{Eurus,200(X-1)} \times (1 + \Delta\% \times DTL_{Eurus,200(X-1)}) = 36\% \times (1 - 0,33 \times 1) = 24\%;$$

$$ROE_{Mixit,200X} = ROE_{Mixit,200(X-1)} \times (1 + \Delta\% \times DTL_{Mixit,200(X-1)}) = 100,5\% \times (1 - 0,33 \times 1,79) = 40,5\%.$$

Please note that if sales revenue from the year 200 (X-1) to 200X increased by 50% (thus $\Delta\% = 0.5$), then with the transition from the year 200X, to 200 (X-1) revenue sales should be lowered by 33% (ie $\Delta\% = - 0.33$).

Total lever can be used in predicting the profitability of certain well-known volume sales. In addition, it is believed that the amount of leverage is a measure of overall business risk.

4. Rating of counterparty - user using the deferred payment

Receivables are due to a deferral of payment for products supplied to customers. Such deferral is for the customer a kind of public loan / credit. It can manifest itself in the form of the manipulative loan, when the deferral is very short and is due to activities related to the regulation of charges by the payee (this form of credit is often treated as equivalent to the cash sale), or trade credit. Trade credit is characterized by a deferred payment greater than those resulting from handling operations. Its use can revitalize sales. Therefore, considering the impact of the credit level on the level of liquidity, which a firm has, one must also include besides the direct cost of its awarding, the benefits for the company resulting from higher sales revenues.

Consequence of high levels of duties is significant demand, mostly external financing of the business. The cost of granting trade credit is associated with high costs of such financing, plus the costs of monitoring fees and costs arising from undue regulation, or loss of income due to providing a trade credit to insolvent customers. However, these high costs with proper management duties are compensated by a higher level of sales, which with the growing benefits of scale of production has a positive effect on the profitability of the company. In addition, the granting of trade credit results in benefits for the company, namely the fact that really, the cost of trade credit is built into the price of finished products. Therefore, the firm granting the trade credit, in fact, benefits, thanks to its award. Implementation of sales under the terms of trade credit allows for the recipient, if it considers the

received goods less valuable than it appeared from the contract, to reduce the amount owed. That option saves time and reduces the costs of sale.

Despite these reasons meant to encourage enterprises to sell on credit, they prefer to sell for cash, and ultimately it is the competitive pressure forces that force them to propose their commercial loan to customers.

To ensure an adequate level of liquidity in the company, the board may acquire it in normal conditions, either by a faster recovery of dues, or through external financing. Level of costs and benefits from maintaining the stocks of liquidity has a decisive influence on the nature of credit policy undertaken by the company. If this policy is restrictive, a small group of customers will benefit from it. The result may be a low level of sales revenue and the related low level of debt. The loosening of credit policy could result in higher sales and result in increasing levels of debt. There may then be a possibility to receive higher profits, but this will be accompanied by increased risk of bad debts and the appearance of additional (often higher than before policy liberalization) costs of debt financing⁵⁸.

Credit Policy

The firm using the credit policy must define:

- Credit standards for evaluating customers
- Limits to the awarded credits,

⁵⁸ A. Gropelli, E. Nikbakht, Wstęp do finansów, WIG-Press, Warszawa 1999, s. 346

- Conditions of sale,
- Ways of recovery of delayed debts.

In determining the creditworthiness of customers, thus setting the credit standards, one aims to describe the "marginal" contractor, whom we can still provide with trade credit. This is done through both financial and non-financial analysis. Mostly for the smallest companies, this analysis will be made on the basis of general impression that a customer made on the person responsible for marketing the company. But the general principles remain unchanged here. Every applicant for a loan is subjected to such analysis. If it exceeds all standards for credit, he obtains a trade credit. Marginal customer, receives the credit for the probationary period, a small amount, or if it has additional security. The traditional method used in assessing the credit quality is to examine potential borrowers according to five factors known as the five "C" credit⁵⁹:

character of the client (how in the past client behaved in relation to its creditors and whether regulated all its obligations timely and in full)

customer capacity – (the lender's subjective feeling and expectations towards the borrower on the possibility of obligations repayment),

customer capital (capital - how much net worth are the assets of the borrower),

client security (collateral - assets owned by the borrower securing payment commitments)

general conditions (conditions - conditions in the economic environment of the transaction).

The first of these factors concerns the nature of the potential recipient. This is a qualitative measure, which tells whether the contractor will try honestly to repay debt on time. The nature of the

⁵⁹ B. Dickerson, B. J. Campsey, E. F. Brigham, Introduction to Financial Management, Dryden Press, Fort Worth, 1995, pp. 347-348

contractor is evaluated on the basis of his previous behavior. The second factor is a subjective measure. It applies to assessment of the ability of the contractor to repay the debt. The potential, productivity, capacity of the client, as well as his character can be concluded based on information about his past behavior, and of his actions at the time of applying for a loan. Capital of the counterparty results from the overall situation of the company being evaluated. It is determined on the basis of its financial statements and other available economic data, with particular emphasis on speaking about risk factors: the ratio of debt and total assets, current liquidity ratio and multiplicity of interest coverage by profit. The fourth factor relates to the contractor's security (called collateral) is determined by the value of the assets proposed by the customer to secure debt. The last factor determining the quality of the charges are the general conditions supporting the transaction. They relate to the economic slump in the economy, which may affect the ability to repay the loan by the contractor.

Establishment of credit standards makes it possible to create a risk classification system. It includes the designation of classes of risks, description of the types of customers assigned to each class, and ways to determine the credit policy for each risk class. Risk classification system may be formed of several classes, e.g. three risk classes: high, medium, low.

High-risk classes includes financially weak contractors. It rather does not allow them to purchase with the deferred payments. Sales are rather made only for cash. You can even request them to make a prepayment. The medium class of risk contains users who have 4 C at the appropriate level, and one C at a slightly unsatisfactory level. Small orders for such contractors are implemented automatically. Bigger, however, before granting the deferral of sales, are analyzed and require

additional approval.
Low-risk clients meet all of Cs. Each of them has a granted limit of the sale with the deferral, and within its borders it can buy without the need for additional controls..

The limit of granted credit depends on the grades obtained by the contractor. Particular attention is paid to two of the C. Solvency and character. Firm granting trade credit limit determines the level to which the purchaser can buy with a deferral of payment. There are no rigid rules for determining such a limit and it is often dependent on intuition and own assessment of the counterparty's solvency made by the company management.

Terms of sale (called the terms of trade credit) are to define the length of the loan and the appointment of skönt by determining its interest and duration. These are the parameters of the granted trade credit. Length of the crediting period provides details of how long maximum payment the company offers its customers. After this period, interest will be charged for late payment. These conditions shall be recorded as follows:

ps / os, net ok ,

where: ps - the percentage of skönt, os - skönt period, about - crediting period.

Terms of sale are the result of the company's management taking account of factors such as:

- a) the level of competition,
- b) the nature and sustainability of the offered goods or services,
- c) seasonality and elasticity of demand,
- d) the price of the product,

e) the type of customer,

f) the profit margin on sales.

Granting trade credit resulting from the possibility of deferral of payment for purchased goods (or services) arises from the terms of the sale. The result of the use of trade credit is commitments to suppliers, charges are a result of its awarding.

In addition to the matching of the planned length of trade credit granted to customers to its own degree of utilization of production capacity, the company should take into account compliance of period of the average run-off of charges to the actual capabilities of its customers. Firm granting the trade credit should take into account the client's inventory conversion period and the period of debt collection. These two elements make up the operating cycle of the buyer. The shorter it is the shorter should be the entitlement of the buyer to a period of deferred payment of obligations. Period of deferred payment of obligations for the buyer is a period of debt collection for the seller.

Granting of trade credit is related to the cost of trade credit, which the recipient not using the unpaid deferment, or paying at the end of the crediting period is charged with.

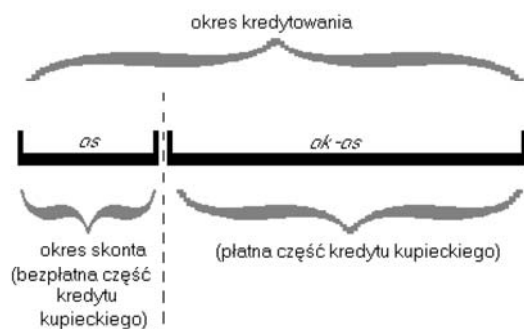


Figure. Trade credit.

Symbols: os - skönt period, about - crediting period.

After a period of skönt. The cost of trade credit can be determined using the formula:

$$kkk = \frac{ps}{100 - ps} \times \frac{360}{ok - os}$$

where kkk - The cost of withdrawal from skönt per year (the cost of trade credit); os - period of skönt, ok - crediting period.

You can also calculate the real size of the resignation from skönt cost (the cost of trade credit) on the basis of the effective annual interest rate paid for extra credit. It is calculated by the formula:

$$kkk_{ef} = \left(1 + \frac{sk}{100\% - sk} \right)^n - 1$$

where: kkk_{ef} - the effective cost of the resignation from skönt per year, n - number of periods in the year in which the entity uses the loan loaded by costs, n = 360 / (ok - os)

Example. Executive Board of the company X resigned from skönt. What is the cost of trade credit and its actual size, if the average state of its obligations to the company Y is 25 000 zł, and credit conditions are 8 / 15, net 40? The cost of trade credit, calculated on the basis of the formula () is

$$kkk = \frac{3}{100 - 3} \times \frac{360}{40 - 15} = 44,54\%$$

By contrast, to estimate the actual annual (shown in zł) value, we use the previous models:

$$TC = 25\,000 \times \left[\left(1 + \frac{3\%}{100\% - 3\%} \right)^{\frac{360}{40-15}} - 1 \right] = 13\,764$$

It follows that company X, due to the continued use of trade credit granted by the Y, bears the cost of 13 764 zł per year. The nominal cost of trade credit expressed as a percentage is 44.54%, while the actual rate of this loan is:

$$kkk_{ef} = \left[\left(1 + \frac{3\%}{100\% - 3\%} \right)^{\frac{360}{40-15}} - 1 \right] = 55,1\%$$

Both of these values greatly exceed the normally applicable market interest rates linked to obtaining bank loans. Also, this parameter is usually higher than the weighted average cost of capital of the

company providing trade credit. Enterprises engaged in the purchase, should favor the use of skönt. So if company X, until the 15th day does not make the payments, it will signal the company Y, which provided trade credit under such conditions that the company X is probably not able to obtain cheaper funds. It is possible that due to credit risk associated with that enterprise, the cost of such a loan would be for it a lot higher than the cost of the resignation from skönt. Both of these possibilities may provide evidence of the contractor's poor condition - the buyers allow the company making the sale with deferment prepare to start the procedures associated with recovery of charges⁶⁰.

The primary financial objective of company management, is to maximize its value, and thus, a search for determinants of growth of the company is of great importance, both theoretical and practical. Literature contains information about many factors affecting the value. Such factors include, inter alia, the net working capital, and thus, the elements that shape it, such as the level of charges, inventory levels, the level of commitments to suppliers, the level of cash etc. A significant part of the classical proposals for the optimal current financial management was constructed on the assumption of maximizing the accounting profit, therefore there is a requirement to reconstruct them for carrying out another objective, which is to maximize the value of the company. Estimation of the impact of changes in company policy in the provision of trade credit (and thus the level and quality of charges), which is a compromise between the risk reduction of deferred payment awarding to deficient recipients and gaining new customers thanks to a more liberal policy of the company in the recovery of charges, is an important issue of management of company finances. If among its potential customers a company can extract more than one homogeneous group of contractors, when assessing their attractiveness as purchasers on the basis of deferred payment, there are possibilities of using the portfolio theory. It is possible that customers rejected due to significant operational risk, because their results are negatively correlated with the results of other public company's recipients, after including their charges to the portfolio of company's charges, they could contribute to creating value. If the benefits of maintaining the charges at the level specified by the enterprise will outweigh the negative effects of alternative cost of their maintenance, and increase of net working capital, the increase in value of the company will be recorded. Interesting from our point of view, resulting from the need for fundamental objective of company financial management, is to determine how a change in the level of charges caused by increased liberalization of the sales process with a deferment of payments may affect the value of the

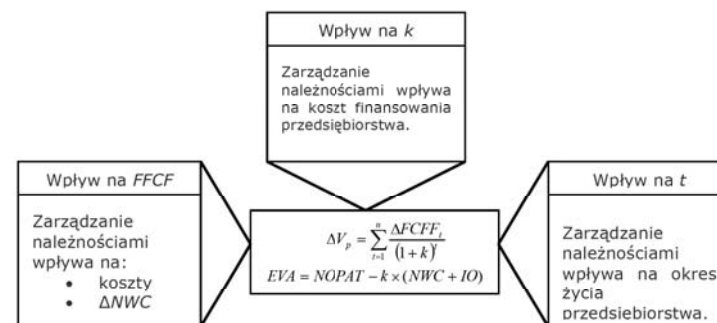
⁶⁰ Por. też: B. Nita, *Rachunkowość w zarządzaniu strategicznym przedsiębiorstwem*, Oficyna a Wolters Kluwer business, Kraków 2008, ss. 204-233.

company. For this purpose we use a formula, based on the assumption that the value of the company is the sum of the discounted free cash flows for the company::

$$\Delta V_p = \sum_{t=1}^n \frac{\Delta FCF_t}{(1+k)^t}, \quad ()$$

where: ΔV_p - rise in company value, ΔFCF_t - increase in the future free cash flows generated by the firm in period t, k - the discount rate (the price of money) corresponding to rate of cost of capital financing the company⁶¹.

In the course of estimating the free cash flow, ownership and increase of net working capital is associated with the "freezing" of funds for its creation. If this growth is positive, it means increased involvement of resources, which reduces cash flow. The growth of production often entails an increase in inventories, charges and cash. Part of this increase will most likely be financed by current liabilities (which also usually "automatically" increase with the increase of production). The rest (made visible as an increase in net working capital) will require different types of financing. Decisions regarding the granting of trade credit shape the level of charges of the company. Charges management has an impact on the value of the company, by the fact that the level of investment in charges held by the firm entails a rise in alternative cost resulting from the freezing of the company means and increase in the level of net working capital. Both changes involve a modification of the projected free cash flow, resulting in the change of the value of the company. The diagram below shows the impact of changes in the level of charges on the value of the company. These changes are shaped by free cash flow (FCF), the horizon of the company that generates the free-flow (t), and the rate of cost of capital financing the company (k). Changes in these three components affect the value of the company (V_p).



⁶¹ To assess the impact of changes in the management of the cash we will accept the discount rate corresponding to the weighted average cost of capital (WACC) on the grounds that such changes and their effects, although they relate to current asset management, are long-term. [T.S. Maness 1998, s. 62-63].

Fig. Influence of decisions on the value of business related to charges management.

Source: own study.

Symbols: ΔVp - increase of the value of the enterprise; ΔFCF - increase in the future free cash flow; ΔNWC - increase in net working capital, k - cost of capital financing the company, t - the life of the company.

Changes in the level of debt (due to changes in company policy in the provision of trade credit the contractors) have an impact on the level of net working capital and the size of the cost of undertaking maintenance duties (both in terms of charges and monitoring of their recovery). Conditions of sale (called the terms of trade credit) decide of the kind of policy for the granting of trade credit. These are the parameters of trade credit granted. Their function is to define the length of the loan and the appointment of skönt by determining its rate and duration. Length of the crediting period informs of how long a maximum payment the company offered its customers. After this period, interest will be charged for late payment. These conditions shall be recorded as follows:

ps/os, net ok,

where: ps - the percentage of skönt, os - skönt period, $about$ - crediting period.

Terms of sale are the result of taking into account by the company's management applying for granting of trade credit factors such as the level of competition, the nature and sustainability of the offered goods or services, seasonality and elasticity of demand, the price of the product, the type of customer, and the profit margin on sales. In addition to the matching of the planned length of trade credit granted to customers to its own degree of utilization of production capacity, the company should take into account compliance period, the average run-off due to the actual capabilities of its customers. Firm granting of trade credit should take into account the client's inventory conversion period and the period of debt collection. These two elements make up the operating cycle of the buyer. The shorter it is the shorter should be the entitlement of the buyer to period of deferred payment obligations. Period of deferred payment obligations for the buyer is a period of debt collection for the seller. In order to select which terms of sale by way of trade credit should be offered to customers, the company's management can use as a criterion for determining the increment analysis, and compare the impact of these proposals on the value of the company. Incremental analysis is a tool to evaluate the effects of changes in the firm's credit policy. This analysis usually takes into account three basic elements: (1) estimation of the effects of changes on sales revenue, on period of charges repayment and losses arising from bad debts. (2) Calculation of the changes in involvement of company funds in the level of charges. It is made on the basis of the formula:

$$\Delta AAR = (DSO_1 - DSO_0) \times \frac{CR_0}{360} + VC \times DSO_1 \times \frac{CR_1 - CR_0}{360}, \text{ dla } CR_1 > CR_0 \quad (0)$$

$$\Delta AAR = (DSO_1 - DSO_0) \times \frac{CR_1}{360} + VC \times DSO_0 \times \frac{CR_1 - CR_0}{360}, \text{ dla } CR_1 \leq CR_0$$

where: $\Delta NAL = \Delta AAR$ - increase of the level of average charges, $OSN0 = DSO0$ - the period of debt collection before the change in credit policy, $DSO1$ - the period of debt collection after a change of policy, $CR0$ - proceeds from sales before the change in credit policy, $CR1$ - proceeds from sale after a change of policy credit, VC - the percentage of variable costs (expressed as a percentage of sales revenue). (3) Calculation of the expected benefits from the change in credit policy. This is done using the formula:

$$\Delta EBIT = [(CR_1 - CR_0) \times (1 - VC) - k_{AAR} \times \Delta AAR + (I_1 \times CR_1 - I_0 \times CR_0) - (sp_1 \times CR_1 \times w_1 - sp_0 \times CR_0 \times w_0)] \quad (0)$$

where: $\Delta EBIT$ - benefit from a change in credit policy (the increase in earnings before interest and tax), $Kaar$ - cost of maintenance duties in the company, $I0$ - the average loss from bad debts before the change in credit policy, $I1$ - the average loss from bad debts after a change of policy credit $SP0$ - skönt percent before the policy change, $sp1$ - skönt percent after a change of policy, $w0$ - Percentage of all customers benefiting from skönt before changing policies, $w1$ - Percentage of all customers benefiting from skönt after a change of policy. Achieving a positive level of expected benefits is a prerequisite for acceptance of changes in credit policy.

To see then how changes in the level of duties and EBIT affect the value of the company, you can use the fact that, free flows immediately after the change in the policy of granting trade credit, due to changes in the level of net working capital, which in turn is conditioned on the change in the level of funds frozen in the charges

$$\Delta FCF_0 = -\Delta NWC = -\Delta AAR \quad (0)$$

By contrast, free flows in subsequent periods (from 1 to n) of the impact of policy changes for granting trade credit, are due to changes in earnings before interest and taxes EBIT:

$$\Delta FCF_{1..n} = \Delta NOPAT = \Delta EBIT \times (1 - T) \quad (0)$$

The example below illustrates application of the foregoing.

Example. The company has an annual revenue from the sale of 300 000 zł. Variable costs represent 45% of the proceeds of the sale. Cost of charges service is 36%, the interest cost of capital financing the company is 30%, while the effective tax rate is 19%. Currently, half of the customers pay the company before the acceptance of the product, 20% of customers pay on the 15th day, using 3% skönt, while others regulate the payment in 40th day. Losses arising from bad debts amount to 2% of sales revenues. The company's management is considering making changes in credit policy.

After making the appropriate diagnosis among many current and potential customers and analyzing of collected data, various options for change emerged, out of which one is to propose a 4% skönt for customers paying within 15 days and extending it to other clients with the payment deadline to 42 days. As a result, 45% of sales would be made for cash, 28% of customers would use the skönt paying in 15th day, while the rest of the customers would make payments till 42nd day. The share of bad debts amount to 3%. Projected revenues from the sale, were at 380 000 zł. Effects of changes in the policy of granting trade credit, would be felt for 5 years.

Since 50% of sales before the change in policy is made for cash, 20% on the basis of the charges are regulated till 15th day and 30% on the basis of charges are regulated till 40th day, the period of debt collection (DSO) before the change will be:

$$DSO_0 = 0,5 \times 0 + 0,2 \times 15 + 0,3 \times 40 = 15 \text{ days.}$$

Similarly, the estimated period of debt collection after the change:

$$DSO_1 = 0,45 \times 0 + 0,28 \times 15 + 0,27 \times 42 = 15,54 \text{ days.}$$

Therefore, the projected increase in the average level of charges will be:

$$\Delta AAR = (15,54 - 15) \times \frac{300\,000}{360} + 0,45 \times 15,54 \times \frac{80\,000}{360} = 2004 \text{ zł.}$$

Thus, by extending the period of crediting of recipients to 42 days, the average state of charges will increase by 2004 zł.

Then, we need to estimate the change in earnings before interest and tax. As the basis for this, will we use the formula:

$$\Delta EBIT = 80\,000 \times 0,55 - 36\% \times 2004 - (3\% \times 380\,000 - 2\% \times 300\,000) + \\ - (4\% \times 380\,000 \times 73\% - 3\% \times 300\,000 \times 70\%) = 33\,083$$

On this basis, it is possible to calculate the impact of this change in policy on the recovery value of the company:

$$\Delta V = -2004 + \frac{33\,083 \times 0,81}{0,30} \times \left(1 - \frac{1}{1,30^5}\right) = 78\,572 \text{ zł}$$

As you can see, the value of the company will increase, and hence, the proposed amendment should be considered advantageous. Similar information is provided by calculation of growth economic value added (ΔEVA resulting from the proposed change):

$$\Delta EVA = 0,81 \times 33\,083 - 30\% \times 2004 = 26\,196 \text{ zł.}$$

As shown in the present case, the first half and then 45% of sales, is implemented on a cash sale. This follows from the fact that customers, to which the company sells only for cash, did not meet the requirements for risk, considered as a percentage of late payments. Therefore, the company ceased to offer the sale to purchasers on the basis of trade credit, although in the case of funding

them by trade credit, we have seen, a lot more activity and higher levels of revenue from the sale than with the failure of trade credit.

For the evaluation of the contractors - buyers, you can use elements borrowed from portfolio theory. Sometimes contractors, who themselves may have characteristics that at first glance do not allow them to buy by way of deferral of trade credit, after taking into account their impact on the risk of the payment postponement business, it may turn out that, paradoxically, they will reduce or stabilize the level of risk⁶².

Portfolio is a set of assets (for example, amounts due from customers). Receivables portfolio management theory is based on the rate of benefit from sales by way of charges informing about the relationship between benefits generated by such sales to the effort of offering sales on credit terms. Profit rate (the rate of the benefits of the assets) is one of the basic criteria, which should be followed by the entrepreneur in the course of its decisions, while the providing trade credit to its customers⁶³. Rate of benefits from the granting of trade credit can be summarized as follows:

$$R_{nAR} = \left(\frac{\text{stopa korzyściz udzielenia}}{\text{kredytokupieckiego}} \right) = \frac{\Delta CR - \Delta Koszty}{\Delta Koszty} \quad ()$$

where: R_{nAR} is the rate the benefits from trade credit granted to recipients n, ΔCR the sales revenue growth achieved by a sale under the terms of trade credit to customers n (usually less liked by the recipients) instead of selling for cash; $\Delta Koszty$, in turn, costs related the fact of granting the trade credit to recipient n.

This rate of benefit is realized under conditions of uncertainty and risk. Therefore, in reality it is a random variable. Rate of return can take on different values with different probabilities of their occurrence. This probability results from the public market situation, which affects their ability to timely regulate their obligations under trade credit. Measure allowing to measure the risks associated with the charges from the purchaser may be the variance:

$$V = \sum_{i=1}^m p_i \times (R_i - R)^2 \quad ()$$

where: p - the probability of a given situation occurrence estimated based on historical data. Measure of risk may also be the standard deviation:

⁶² C.L. Pritchard, *Zarządzanie ryzykiem w projektach. Teoria i praktyka*, MT&DC, Wig-Press, Warszawa 2001, pp. 48-52.

⁶³ Jajuga K., T. Jajuga, *Jak inwestować w papiery wartościowe*, WN PWN, Warszawa 1994, pp. 80-110.

$$s = \sqrt{V} = \sqrt{\sum_{i=1}^m p_i \times (R_i - R)^2} \quad ()$$

Both variance and standard deviation can be estimated for the historical data of the buyer (unfortunately for the new or occasional buyers such a possibility does not exist, which makes it necessary to base on the expertise of people deciding to grant trade credit). In conjunction with information on what potential benefits may be brought by granting trade credit to a purchaser, it is possible to estimate the coefficient of variation:

$$c = \frac{s}{R} \quad ()$$

Another element is the correlation of the benefits of trade credit granted to customers (group of customers) with the benefits of such a credit given to other customers (different groups of customers).

Entrepreneurs tend to transact with more than one group of customers. If among the recipients two or more homogeneous in terms of risks and benefits of granting trade credit groups will be selected, there is the possibility of using suggestions from the portfolio theory. These groups may belong to specific sectors (for example, in practice, it is noted that customers from one industry group have similar payment habits resulting, inter alia, that serve the same market and have a similar group of recipients). The charges of these target groups may be linked. The measure of such a link is usually a correlation coefficient:

$$\rho_{1,2} = \frac{\sum_{i=1}^m p_i \times (R_{1i} - R_1) \times (R_{2i} - R_2)}{s_1 \times s_2} \quad ()$$

where: $\rho_{1,2}$ - the correlation coefficient of the first and second group of charges; R_1 - expected benefit from the rate of charges from the first group of customers; R_2 - the expected benefit from the rate of charges from the second group of customers; s_1 - standard deviation for the first group, s_2 - standard deviation for the second group; R_{1i} - possible benefit interest from the charges from the first group; R_{2i} - possible benefit interest from the charges from the second group, p - the probability of the possible benefits interest from charges.

Portfolio of charges of two groups of recipients

Example. A company has two quite uniform group of customers. One group of customers of the company provides its services to the industry A, second group, in turn, supports customers in the B

industry. Creating a portfolio of duties makes sense if the correlation between benefits from the granting trade credit to these groups is negative. We can trace it in the following figures.

Case 1 The correlation coefficient between benefits of granting the trade credit to Group A and to Group B is equal to 1

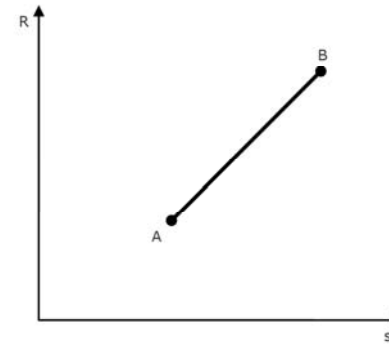


Figure. Relation benefit - the risk to the portfolio of charges for the two groups of customers with a correlation coefficient equal to 1.

Source: own study based on [Jajuga K., T. Jajuga, Jak inwestować w papiery wartościowe, WN PWN, Warszawa 1994].

The figure shows that with the positive correlation close to 1 there are no benefits of diversification.

Case 2 Correlation coefficient (-1). Perfect negative correlation.

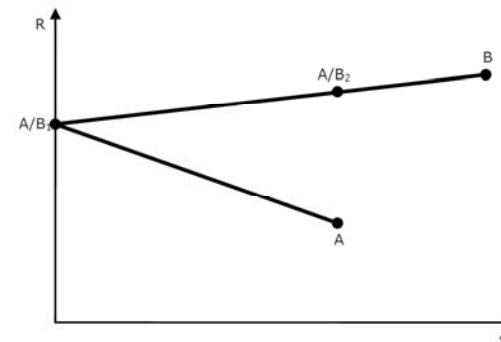


Figure. Relation benefit - the risk for the portfolio of charges for the two groups of customers with a correlation coefficient equal to (-1).

Source: own study based on [Jajuga K., T. Jajuga, Jak inwestować w papiery wartościowe, WN PWN, Warszawa 1994].

All possible portfolios with a correlation coefficient equal to (-1) are contained within the polygon: AA/B1-A/B2-B. Points "A" and "B" correspond to a one-piece portfolios (for example, only group A obtains trade credit and B can only purchase for cash). As can be seen, with moving from point "A" and increasing the portfolio share of receivables from customers in Group 'B', the risks are decreasing, and the benefit of R increases. This is up to the point A/B1. If one exceeds that percentage, the risk of the portfolio will grow with the increase of income. As you can see it does not make any sense to have in your portfolio only recipients of group A, because with identical risk, portfolio A/B2 offers higher benefits.

Case 3 Correlation coefficient is 0. It is a situation in which the benefits of trade credit granting to Group A and Group B are not in any way related.

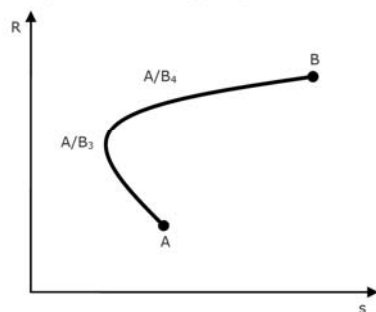


Figure. Relation benefit - the risk for the portfolio of receivables for the two groups of customers with a correlation coefficient equal to 0

Source: own study based on [Jajuga K., T. Jajuga, Jak inwestować w papiery wartościowe, WN PWN, Warszawa 1994].

In such a situation only partial reduction of risk is possible. A prudent trader should not choose any portfolio lying on the arc due A-A/B3, because you can always find preferable equivalent on the arc: A/B3 - A/B4, which at the same risk s provides higher R benefits. Skilful construction of the portfolio of two groups of receivables may lead to a significant reduction in risk. Inclusion in the portfolio of single component (which, as in Example 1 so far contains only one group - group A - of less risky debts, but it also generating less benefits,) the second

component, almost always leads to a lower risk, sometimes even with growth of portfolio rates of benefits [Jajuga K., T. Jajuga, Jak inwestować w papiery wartościowe, WN PWN, Warszawa 1994, s. 119; Jajuga K., K. Kuziak, P. Markowski, Inwestycje finansowe, Wydawnictwo AE, Wrocław 1997; Jajuga K., Zarządzanie kapitałem, Wydawnictwo AE, Wrocław 1993; Czekaj J., Z. Dresler, Zarządzanie finansami przedsiębiorstw. Podstawy teorii, WN PWN, Warszawa 2002.; Fabozzi F. J., G. Fong, Zarządzanie portfelem inwestycji finansowych przynoszących stały dochód, WN PWN, Warszawa 2000; Jajuga K., T. Jajuga, Inwestycje. Instrumenty finansowe. Ryzyko finansowe. Inżynieria finansowa, WN PWN, Warszawa 2002].

Example. (This is a continuation of the previous example) After analyzing the historical data, we noticed that the benefits of granting trade credit to customers who so far have made purchases for cash (due to excessive delays in the charges) are negatively correlated with the benefits achieved through the granting of trade credit group currently benefiting from deferred payment. Thus, one can expect (with the allowance of inclusion sales on the basis of charges of the two groups at the same time) a decrease of the risk of payment recovery and simultaneous increase in the benefits of total sales (sales benefit from the same credit terms will be lower). Two groups were proposed a 4% skönt for customers paying within 15 days and extended to other clients of the payment deadline to 42 days. As a result, 5% of sales would be made for cash, 30% of customers would benefit from paying skönt till 15th day, while the rest of clients (65% of sales) would make payments till 42nd day. The share of bad debts would be 1%. Projected revenues from the sale, were at 460 000 zł. Effects of changes in the policy of granting trade credit, would be felt for 5 years. In addition, it is known that the percentage of variable cost per unit of production decreased from 45% to 44% due to positive benefits of scale resulting from higher sales (and higher production).

Because after the change 5% of the sale is made for cash, 30% on the basis of charges regulated till 15th day and 65% on the basis of charges collected within 42 days, the period of debt collection (DSO₂) after the change will be:

$$DSO_2 = 0,05 \times 0 + 0,30 \times 15 + 0,65 \times 42 = 31,8 \text{ days.}$$

Therefore, the projected increase in the average level of charges will be:

$$\Delta AAR = (31,8 - 15) \times \frac{300\,000}{360} + 0,44 \times 31,8 \times \frac{160\,000}{360} = 20\,219 \text{ zł.}$$

Thus, by extending the period of recipients' credit to 42 days, the average state of charges will increase by 20 219 zł.

Then, estimate the change in earnings before interest and tax. As the basis for this, this formula will serve:

$$\Delta EBIT = 160\,000 \times 0,56 - 36\% \times 20\,219 - (1\% \times 460\,000 - 2\% \times 300\,000) + \\ - (4\% \times 460\,000 \times 35\% - 3\% \times 300\,000 \times 70\%) = 83\,581$$

On this basis, it is possible to calculate the impact of this change and allow contractors to date is not entitled to trade credit to the value of the company:

$$\Delta V = -20\,219 + \frac{83\,581 \times 0,81}{0,3} \times \left(1 - \frac{1}{1,3^5}\right) = 144\,671 \text{ zł}$$

As you can see, the value of the company will increase, and hence, the proposed amendment should be considered as favorable and, in fact, more favorable to the situation of the previous example (authorizing the sale with trade credit terms only to a group of lower risk associated with futures payments). Similar information is brought by calculation of growth of economic value added (ΔEVA resulting from the proposed change):

$$\Delta EVA = 0,81 \times 83\,581 - 30\% \times 20\,219 = 61\,635 \text{ zł.}$$

As seen in this case in conjunction with a negative correlation between the benefits of granting trade credit to both groups of recipients, we were able to obtain better results than only in circumstances of permission of the credit sale to customers with lower risk (without regard to linkages between groups of customers). Decisions on the management of charges and the selection of clients, for which charges will be formed, are fairly complex process. Excess of charges resulting from too liberal policy of granting trade credit charges the company with high costs of charges maintenance and additional high alternative costs resulting from the freezing of capital. Additional costs are generated by clients missing their obligations, which the company has granted trade credit to. On the other hand, liberal policy of granting trade credit, may be of importance for increasing sales revenue. Problem with operational risk of entrepreneurs being customers who are interested in trade credit who, as a group considered separately, may have a relatively high risk⁶⁴. By contrast, if we consider them as one of several groups of business customers, and also if we notice that their payment habits are negatively correlated with the habits of payment of other groups, what was impossible starts to become acceptable, and may even be beneficial. This is because the portfolio of assets which is a portfolio of charges, has a (with negative correlations of the benefits held in the portfolio of components) lower risk with acceptable benefits than the charges group considered alone.

⁶⁴ P.Mackay, S.B.Moeller, *The Value of Corporate Risk Management*, Journal of Finance, nr 3/62, 2007, ss. 1410-1415.