FACULTY OF ECONOMICS
UNIVERSITY OF LJUBLJANA

MASTER'S THESIS

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AN ANALYSIS OF THE OPTIMAL CAPITAL STRUCTURE CHANGES OF SELECTED GENERIC PHARMACEUTICAL COMPANIES DURING THE CRISIS

Ljubljana, November 2012 TANJA GORENC

AUTHORSHIP STATEMENT

The undersigned Tanja GORENC, a student at the University of Ljubljana, Faculty of Economics, (hereafter: FELU), declare that I am the author of the master's thesis entitled An analysis of the optimal capital structure changes of selected generic pharmaceutical companies during the crisis, written under supervision of Aleš BERK SKOK, Ph.D., Assistant Professor.

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INTRODUCTION

A term capital structure presents company's different sources of funds, used to finance its projects. Generally, capital structure is composed of equity and debt capital. Equity capital stands for assets, owned by shareholders of the company. This is the money, which they invested in a company in exchange for shares or ownership. Another type of equity capital is retained earnings, which are profits from past years that were kept in order to strengthen a company's balance sheet or finance its growth. On the other hand, debt capital mostly stands for loans, a company obtains from its creditors, or bonds it issues in order to finance its business (Berk & DeMarzo, 2011, pp. 451–454).

Optimal capital structure of the company is such a mix of equity and debt that ensures a company to have weighted average costs of capital (hereinafter: WACC) at the minimum level. Optimal capital structure is not a static concept but a dynamic one, dependent on several variables, from company's operations to external market conditions. In reality, it is mostly not possible neither financially efficient to constantly adapt company's capital structure to its optimal level. If there is only a small deviation of actual firm's capital structure from its optimal level, the negative effect on its WACC is smaller from financial costs related to adjustment of capital structure to its optimal level. This is why in reality a term "optimal capital range" is used which means that there is a range, rather than a point, of debt/equity mix that minimizes company's WACC or keeps it close to the minimum level (Berk & DeMarzo, 2011, pp. 483–486, 542–543; Ju, Parrino, Poteshman & Weisbach, 2004, p. 3–4).

Optimal capital structure is a mix of debt and equity capital that minimizes WACC of a company. At the point where WACC is minimized, the value of the company reaches its highest level. Maximization of a company's value is one of the essential aims of each company since it is in its interest to maximize funds, owned by its stakeholders (shareholders and debt holders) (Berk & DeMarzo, 2011, p. 266). I have decided to study the optimal capital structure of selected generic pharmaceutical companies because it is one of the essential and basic concepts when deciding where to invest. It does not only influence the return a company gives to its shareholders but it is also one of the indicators to tell whether a company will operate successfully or have major problems in the following years. Since recent times are rather unstable considering the financial and economic crisis, I have also decided to study effects of the crisis on the optimal capital structure of selected companies.

The purpose of the master's thesis is to explore current economic and financial conditions in the market. I have explored whether and to what extent the economic and financial crisis affected the optimal capital structure of selected generic pharmaceutical companies. I have compared findings during the observation period for each company separately and I have compared companies with each other as well.

The objective of the master's thesis is, based on theoretical background and own calculations, to find out optimal capital structures of selected generic pharmaceutical companies in years 2006 and 2011 and to examine how the world's financial crisis affected it. Therefore, the comparison of the state from the end of 2011 with the state from the end of 2006 is done. I have taken the data from the end of year 2006 to make sure that the analysed data reflect the condition before the crisis began. Based on the study of calculated data and theoretical background, the second objective is to find out whether and in what way the empirical results fit into each theory, discussed in the thesis.

Hypothesis which I try to confirm or reject during the process of writing the thesis is that "optimal capital structure of selected European generic pharmaceutical companies has changed in favour of equity financing during the current economic and financial crisis". I have tried to confirm or reject the hypothesis based on the studying of theoretical background of capital structure concept which presents a basis for empirical part, composed of calculations of optimal capital structures before the crisis began and during the crisis (at the end of the year 2011).

The theoretical part of the master's thesis is based on usage of multiple research methods. The basic method used is general research method of cognitive process, which is used to collect facts, data and information about the research problem. A method of description is used to describe facts and processes connected to research problem. Another method used in the theoretical part is a method of compilation (summary of findings, observations and views of some authors). The first method used when working on the empirical part of the thesis is a deductive method – theoretical findings from the literature are used in a case of a company. I have also used a statistical method of secondary source of data analysis where I have analysed data, contained in annual reports of the companies.

The first part of the master's thesis presents the basic theoretical background for studying optimal capital structure. It consists of five important theories related to optimal capital structure, which are Modigliani-Miller theorem, Trade-off theory, Theory of the firm, Pecking order theory, and Market timing theory. Another section is dedicated to financial and economic crisis. First, I present the most important factors, causing financial crises. Next, I present current financial and economic crisis and the way it influenced particularly non-financial corporations. In the end of the section, I have focused on the current conditions in Slovene market. After observation of the crisis environment, I have presented generic pharmaceutical industry, where five companies, I have chosen to calculate their optimal capital structures, belong to. I have briefly presented some facts about generic pharmaceutical industry, some of the projections for the future and I have placed the selected companies within the industry. Before I have started with the empirical part, I have briefly presented the process of optimal capital structure calculation and most important variables, used in the calculations. In the empirical part of the master's thesis, I have presented each of the selected companies and I have calculated their optimal capital structures in the end of years 2006 and

2011. I have compared the results for each company between selected years and to their actual capital structures. In the end, I have also done a comparison among the companies. Last part of the thesis is dedicated to the comparison of theoretical findings with empirical results. I have tried to find out whether and to what extent the theories, presented in the beginning of the thesis, explain actual data and results, obtained from own calculations. In the end, I have completed the thesis with a conclusion, where I summarize main thoughts and findings, and confirm or reject the hypothesis.

1 THEORETICAL BACKGROUND

Optimal capital structure is one of the most theoretically developed topics in the field of business finance. There are several theories, studying and observing it from different angles. In the master's thesis, I have presented only few of these theories, which are Modigliani-Miller theorem, Trade-off theory, Theory of the firm, Pecking order theory, and Market timing theory.

1.1 MODIGLIANI-MILLER THEOREM

The Modigliani-Miller theorem (hereinafter: MM theorem) presents the basis for modern theory of capital structure. The fundamental theorem is based on the assumption about perfect capital markets: there are no corporate or personal taxes, no transaction costs, no asymmetric information, complete contracting and complete markets (Berk & DeMarzo, 2011, p. 455; Graham, 2003, p. 3). Under these assumptions, the value of the company is not affected by the way it is financed but rather equals market value of total cash flows generated by its assets:

$$V_U = V_L, \tag{1}$$

where V_U is the value of an unlevered company (a company with no debt) and V_L is the value of a levered company (a company, composed of mix of debt and equity). The company's dividend policy also does not affect its value. Therefore, another expression for MM theorem is also the capital structure irrelevance principle (Modigliani & Miller, 1958, p. 268; Miller & Modigliani, 1961, p. 429).

Considering the Law of one price, securities and assets of the company must have the same market value. The total cash flow paid out to company's security holders equals total cash flow generated by the company's assets, taking into account the absence of taxes and other transaction costs. It means that as long as the company's choice of securities does not affect cash flow generated by its assets, this decision does not influence total value of the company or the amount of money it can raise (Berk & DeMarzo, 2011, p. 455).

MM theorem shows that the value of the company remains the same despite different financing options. However, the cost of capital is different for different types of financing; the cost of equity is higher than the cost of debt since shareholders demand higher returns than debt holders do in order to compensate higher risk they are exposed to. While debt issuing might be cheaper, it increases the risk and therefore the cost of equity. It means that in the end savings from low expected return on debt are offset by a higher equity cost of capital, which means no net savings for the company (Berk & DeMarzo, 2011, p. 460).

Modigliani-Miller's second proposition states that the cost of capital of levered equity increases with the firm's market value debt-equity ratio. The proposition is illustrated in Equation 2:

$$r_E = r_U + \frac{D}{E}(r_U - r_D), \tag{2}$$

where r_E presents expected return on equity, r_U denotes expected return on unlevered equity, and $D/E\ (r_U - r_D)$ presents additional risk, due to leverage. It reveals the effect of leverage on the return on levered equity. Higher debt-equity ratio leads to a higher expected return on equity. The reason lies in higher risk for equity holders in a company with higher level of debt. Because of the additional risk due to leverage, returns on levered equity are higher when the company operates well (when return on unlevered equity is higher than return on debt) and lower when a company performs poorly (return on debt is higher than return on unlevered equity) (Berk & DeMarzo, 2011, p. 461).

Formula for the second Modigliani-Miller proposition is derived from the theory of WACC, which can be written as:

$$WACC = \frac{E}{D+E} r_E + \frac{D}{D+E} r_D \tag{3}$$

It explains that company's WACC is weighted average cost of its debt and its equity. The weight related to debt equals the proportion of debt in the capital structure and the weight, which refers to equity, equals the proportion of equity in the capital structure (Ross, Westerfield & Jaffe, 2002, p. 399).

The MM theorem reveals that managers cannot change the value of the company by transforming its capital structure. It indicates that WACC of the company cannot decrease as equity is substituted for debt, regardless the fact that debt itself is cheaper than equity. The reason for that lies in the fact that equity of the company becomes riskier when a company adds more debt to its capital. It means that cost of equity increases with increased proportion of debt financing which causes that savings from low-cost debt are exactly offset by higher cost of equity. To conclude, the value of the company and its WACC are independent on leverage (Ross, Westerfield & Jaffe, 2002, p. 405).

1.1.1 MODIGLIANI-MILLER THEOREM WITH CORPORATE TAXES

Assuming there are no corporate taxes, the company's value is unrelated to debt. However, in the presence of corporate taxes, its value is positively related to debt. When a company is all-equity financed, its value equals the amount owned by equity holders and the remaining part which is going to taxes is simply a cost. However, when a company is financed by both, equity and debt, its value increases due to interest tax shield, gained because of debt. Namely, a part of cash flow intended for shareholders is taxed before it is delivered, whereas the amount, which is intended for paying the interest on debt is tax deductible. Therefore, because of the leverage a company has savings called interest tax shield which equal the increase in the value of the company. For that reason, a company should choose capital structure that minimizes the amount paid in taxes and by that maximizes the value of the company (Ross, 1977, p. 24; Ross, Westerfield & Jaffe, 2002, p. 408).

A company has tax advantage to debt. The amount the company pays less due to debt is called interest tax shield from debt. Equation 4 presents interest payments (Ross, Westerfield & Jaffe, 2002, pp. 409–410):

$$Interest\ Payments = r_D \times D, \tag{4}$$

where r_D is interest rate on debt and D is amount borrowed.

Equation 5 presents interest tax shield from debt (Ross, Westerfield & Jaffe, 2002, pp. 409–410):

$$Interest\ Tax\ Shield = t_C \times r_D \times D, \tag{5}$$

where *tc* equals corporate tax rate and r_D*D equals the amount of interest payments.

Many companies maintain certain amount of debt, which means acquirement of new borrowings when the old debt matures. Assuming that outstanding debt remains at fixed level, present value of interest tax shield can be calculated as (Berk & DeMarzo, 2011, pp. 482-483):

$$PV\ (Interest\ Tax\ Shield) = \frac{t_C \times r_D \times D}{r_D} = t_C \times D \tag{6}$$

To calculate the value of levered company, considering the impact of taxes, first we have to look at the value of unlevered company, which equals the present value of the annual after-tax cash flow of an unlevered company (Ross, Westerfield & Jaffe, 2002, p. 410):

$$V_U = \frac{EBIT\ (1 - t_C)}{r_U}, \tag{7}$$

where V_U equals the present value of the unlevered company, *EBIT* equals earnings before interest and taxes, $EBIT(1 - t_C)$ equals firm cash flow after corporate taxes, t_C are corporate taxes and r_U is the cost of capital of an all-equity company.

Leverage increases value of the company for the amount which equals the present value of interest tax shield. Therefore, the value of levered company is (Ross, Westerfield & Jaffe, 2002, p. 410):

$$\begin{aligned} V_L &= \frac{EBIT\ (1 - t_C)}{r_U} + \frac{t_C \times r_D \times D}{r_D} \\ &= V_U + PV\ (Interest\ Tax\ Shield) \end{aligned} \tag{8}$$

Equation 8 states that the value of levered company equals the value of unlevered company plus present value of interest tax shield. To conclude, the value of the company increases by substituting equity for debt (Ross, Westerfield & Jaffe, 2002, pp. 410–411).

Modigliani-Miller Proposition II under no taxes proposes that return on equity is positively related to the level of leverage since equity becomes more risky when more debt is included in capital structure of the company. Modigliani-Miller Proposition II under taxes holds the same explanation extended for corporate taxes:

$$r_E = r_U + \frac{D}{E}(1 - t_C)(r_U - r_D) \tag{9}$$

Whenever $r_U > r_D$ it increases r_E – the same as is true for Modigliani-Miller Proposition II under no taxes. The company's cost of equity capital with no leverage is usually higher than required rate of return on debt since also non-leveraged equity is riskier than debt (Ross, Westerfield & Jaffe, 2002, pp. 412 – 413).

The WACC with corporate taxes is defined as:

$$WACC = \frac{E}{D+E} r_E + \frac{D}{D+E} r_D (1 - t_C) \tag{10}$$

From Equation 10 it is visible that interest is tax deductible at corporate level, which cannot be said for dividends. Therefore, since debt is tax-advantaged to equity the WACC declines with leverage when corporate taxes are included in the analysis while in a world of no corporate taxes, WACC is not affected by leverage (Ross, Westerfield & Jaffe, 2002, pp. 413–414).

1.1.2 PERSONAL TAXES

In capital structure analysis, we cannot take into account only taxes paid by a company but personal taxes as well. Lower tax liabilities of the company, which are due to interest tax shield, enable it to pay higher cash flows to investors. When a creditor receives interest payments from debt they are taxed as an income. On the other hand, equity investors also have to pay income taxes on dividends and capital gains. It means that personal taxes reduce cash flows to investors and decrease the firm value like corporate taxes do (Miller, 1977, pp. 266–270).

Presence of corporate and personal taxation leads to the fact that each company has its own optimal level of leverage which depends on corporate and personal tax treatment of debt and equity (DeAngelo & Masulis, 1980, p. 27). Since personal taxes do not affect my calculations in the empirical part of the thesis, I have not discussed it into details.

1.1.3 FINANCIAL DISTRESS

According to MM theorem, leverage can result in a bankruptcy of the company, but bankruptcy itself does not decrease value of the company. Under perfect capital market assumption, the only consequence of bankruptcy is shifting the ownership from equity holders to debt holders. Total value available to all investors does not change (Berk & DeMarzo, 2011, pp. 510–512).

In a real world, there is no such assumption as perfect capital market, which means there are several reasons, which make bankruptcy a very costly process (DeAngelo & Masulis, 1980, pp. 3–4). It imposes both, direct and indirect costs on a firm and its investors. Direct costs of bankruptcy cover the costs of experts and advisors such as lawyers, accountants, appraisers, and investment bankers engaged by the company (or its creditors) during the bankruptcy process (Berk & DeMarzo, 2011, pp. 513-514).

Indirect costs, on the other hand, include loss of customers, suppliers, employees, or receivables during the process of bankruptcy. Another kind of bankruptcy costs denotes fire sales of assets. It happens when a company, in an effort to avoid bankruptcy and associated costs, attempts to quickly sell its assets. Usually it means that a company receives less money for their assets as if it would sell them when it would be financially healthy and not in a hurry. Inefficient liquidation is another form of indirect costs. First form of an inefficient liquidation is when a bankruptcy protection is used in order to delay the liquidation of the company which should be shut down and it continues to make negative net present value (hereinafter: NPV) investments which eventually lower the value of the company even further. On the other hand, companies in liquidation process might be forced to liquidate assets which would be more valuable if held and therefore again additionally lower the value of the company. The last kind of indirect costs of bankruptcy are costs to creditors. In a process of default creditors

incur direct legal costs of bankruptcy but even more importantly, if the loan of the company presented a significant asset for the creditor, its bankruptcy may lead to a financial distress of the creditor as well. Indirect costs of financial distress play an important role in the process of bankruptcy of the company. When addressing them it is important to identify losses to total firm value not only losses to equity holders, debt holders or transfers between them (Berk & DeMarzo, 2011, pp. 514–517, Jensen & Meckling, 1976, pp. 50–51).

Under the assumption of fairly priced securities, the original shareholders of the company pay the present value of costs associated with bankruptcy and financial distress. A potential loss due to financial distress is estimated to 10% or even 20% of the company's value. Due to potentially huge costs of financial distress or bankruptcy companies usually have lower levels of debt as would be optimal not considering financial distress costs (Andrade & Kaplan, 1998, p. 1445; Berk & DeMarzo, 2011, pp. 518–519).

A possible way to avoid costs of bankruptcy is using mergers. It is a reasonable choice since reorganization costs represent only a part of the bankruptcy associated costs. The revenues and the operating costs of the company depend also on the probability of bankruptcy and on its capital structure. Since operating costs and revenues are negatively affected as the probability of bankruptcy increases, merger is taken into account as it can help to skip some of these costs (Jensen & Meckling, 1976, p. 50). There is another benefit from a merger when one company operates with a loss and another one is profitable. When a merger is accomplished, profits from one company are compensated by loss from another one and as a consequence, there is less taxable income and therefore taxes paid (Berk & DeMarzo, 2011, p. 897).

1.1.4 CRITICISMS OF MODIGLIANI-MILLER THEOREM

MM theorem raises concerns among academicians and executives who question its validity. The MM theorem under no taxes indicates that capital structure does not matter. Nevertheless, we observe systematic capital structure patterns within each industry. Next, assuming reasonable tax rates companies should use 100% debt financing which is not the case in reality either. There are six main objections against the validity of MM theorem (Brigham & Daves, 2004, pp. 535–537):

- MM theorem explains that personal and corporate leverage are perfect substitutes. It is not true since an individual investing in a levered company has less loss exposure as a result of corporate limited liability than if using homemade leverage.
- In case a leveraged company's operating income declined, it would sell assets to raise the cash necessary to pay interests and avoid bankruptcy. However, if a company would be unleveraged, it would not have to take such radical moves; dividends could be cut instead of selling assets. If dividends were cut, investors with homemade leverage would not be able to pay for interests on their debt which leads to a fact that homemade leverage is

more dangerous for stockholders considering the chances for bankruptcy than corporate leverage is.

- There is no such thing as absence of transaction costs in reality.
- MM theorem assumes that corporations and investors can borrow money at the same interest rate which is not realistic since most individual investors have to borrow at higher interest rates than large corporations do.
- To reach the equilibrium the tax benefit from corporate debt has to be the same for all companies, and it has to be constant for an individual company regardless of the amount of leverage used. This cannot be true since tax benefits for highly profitable companies are much higher than for those that are struggling to survive. Moreover, some companies also have other tax shields, such as high depreciation, pension plan contributions etc. It is also true that higher leverage increases probability of future unprofitability and consequently lower tax rates, which means that a company will not be able to use the full tax shield in the future. Generally, interest tax shield from corporate debt is more valuable to some companies than to others.
- In reality, assumptions such as the absence of financial distress costs, agency costs and asymmetric information are also unsustainable.

1.2 TRADE-OFF THEORY

Under perfect capital market assumption, basic Modigliani-Miller model argues there is no optimal capital structure a firm would choose to maximize its value since each debt-equity ratio equally affects the value of the company. Therefore, value of the company is independent on its debt-equity ratio (Berk & DeMarzo, 2011, p. 455).

However, adding benefits and costs of debt into the analysis, it turns out that debt-equity ratio influences the value of the company. Debt issuing has benefits, called interest tax shield, which marginal benefits decrease with increasing level of leverage, and costs, called financial distress costs, which marginal costs increase with increasing level of leverage. At this point, trade-off theory takes its role since it measures benefits from interest tax shield and costs of financial distress. According to trade-off theory, value of a leveraged company is a sum of value of an unleveraged company and present value of interest tax shield, less the present value of financial distress costs (Berk & DeMarzo, 2011, p. 520):

$$V_L = V_U + PV\ (Interest\ Tax\ Shield) - PV\ (Financial\ Distress\ Costs) \quad (11)$$

Financial distress costs include bankruptcy costs (direct and indirect costs of bankruptcy). Present value of financial distress costs is determined by three important factors, which are: the probability of financial distress, the size of costs if a company is in distress, and the appropriate discount rate for distress costs (Berk & DeMarzo, 2011, p. 520). I will not discuss interest tax shield and financial distress costs here further since they have already been presented into details in the previous section.

The aim of each company is to maximize its value. According to trade-off theory, it is achieved when marginal benefits of debt equal marginal costs of debt. This is the point at which tax savings, which occur due to additional amount of debt, are exactly offset by higher costs of debt because of higher probability of default. Therefore, companies should increase their level of leverage until they reach a degree of debt at which its marginal benefits equal its marginal costs. Optimal level of debt at which the value of the company is maximized, differs among companies since different companies have different magnitude of financial distress costs and different volatility of cash flows (Berk & DeMarzo, 2011, pp. 521–522).

There are two types of trade-off theory. The first one is a static model of trade-off theory. It assumes there are no transaction costs related to issuing or repurchasing securities. According to this model companies have a target leverage ratio which maximizes its value. On the other hand, dynamic model of trade-off theory predicts an existence of transaction costs in connection to issuing and repurchasing debt. In case of moderate deviations from optimal level of leverage, target the optimal level of leverage produces transaction costs which are higher than an increase in company's value. Therefore, company does not target its optimal leverage ratio with constant adjustments in the level of debt but does it only in case benefits of this action outweigh its costs (Dudley, 2007, pp. 1–4; Ju et al., 2004, pp. 3–4).

Trade-off theory can be extended for agency costs and agency benefits of debt, which are presented into details in the following section about the theory of the firm. However, additionally to interest tax shield and financial distress, agency costs and benefits of leverage also influence the value of the company – agency costs of debt decrease it and agency benefits of debt increase it (Berk & DeMarzo, 2011, p. 532):

$$V_L = V_U + PV\ (Interest\ Tax\ Shield) - PV\ (Financial\ Distress\ Costs) - \\ -PV(Agency\ Costs\ of\ Debt) + PV\ (Agency\ Benefits\ of\ Debt) \quad (12)$$

1.3 THEORY OF THE FIRM

An agency relationship is defined as a contract under which principals (owners), engage another person, called agent (manager), to execute some service on their behalf. Considering that both parties in the relationship are trying to maximize their utility it is to expect that the agent will not always perform in the best interest of the principal. In order for principle to limit divergences from his interest he should establish a set of incentives for the agent and incur monitoring costs to limit agent's possible inappropriate activities. In some situations he even offers the agent perks and benefits to guarantee he will not take actions, potentially harmful for the principal. It is actually impossible to ensure that agent makes optimal decisions from the viewpoint of principal at zero cost. Generally, in agency relationship principal and agent incur positive monitoring and bonding costs, which include monetary and non-monetary funds. Despite these actions there still remain some divergences between

decisions, taken by agent and those that would maximize welfare of the principal. A result of this divergence is another cost of the agency relationship and it is called the residual loss. To summarize, agency costs are the sum of monitoring expenditures, bonding expenditures, and the residual loss (Jensen & Meckling, 1976, pp. 5–6).

1.3.1 AGENCY COSTS OF LEVERAGE

Managers should make decisions that increase the value of the company. However, when a company has leverage, there is a possibility of a principal-agent conflict of interest between creditors and shareholders if investment decisions have different consequences for the value of debt and for the value of equity. Usually, this conflict appears when the risk of financial distress is high. In this kind of situation it is possible for a manager to take actions that benefit shareholders but harm the company's creditors and therefore lower total value of the company (Berk & DeMarzo, 2011, p. 523).

When facing a financial distress, shareholders can benefit from decisions, which increase the risk of the company, even if they have a negative NPV. This problem is called the asset substitution problem since leverage stimulates shareholders to replace low-risk assets with riskier ones. It can also lead to over-investment since potential shareholders' benefit from a risky and negative-NPV project significantly outweighs a potential loss. If a company increases risk through a negative-NPV decision, it reduces the total value of the company. Expecting this kind of behaviour, security holders pay less for the company initially (Berk & DeMarzo, 2011, pp. 523–524).

A company may decide not to finance new, positive-NPV projects when a company is facing a financial distress. When this occurs, we call it a debt overhang or under-investment problem. The decision of shareholders not to invest in positive-NPV projects is based on the fact that for them it presents a negative-NPV project but for debt holders and for the overall value of the company this is a costly decision because of giving up the NPV of missed opportunities. We can use Equation 13 to estimate debt overhang problem (Berk & DeMarzo, 2011, pp. 525–526; Myers, 1977, p. 149):

$$\frac{NPV}{I} > \frac{\beta_D D}{\beta_E E} \tag{13}$$

Equity holders benefit from new investment only in case when the project's profitability index *(NPV/I)* exceeds the relative riskiness of the firm's debt *(β_D/β_E)* multiplied with debt-equity ratio *(D/E)*. When a company has no debt or it is risk free then it is already beneficial for equity holders when *NPV>0*. However, when a company's debt is risky the relative riskiness of the firm's debt times debt-equity ratio is positive and increases with the company's leverage. This means that equity holders will reject also certain positive-NPV

projects, which causes under-investment and reduction in the value of the company (Berk & DeMarzo, 2011, pp. 525–526).

In both cases described above, equity holders benefit at the expense of debt holders. Anyway, even though they may benefit from negative-NPV decision in times of distress, debt holders are aware of this possibility and pay less for debt initially reducing the amount the company can spread out to shareholders. These agency costs of debt occur only in case of chance the company will default and enforce losses on its debt holders. Agency costs' magnitude increases with the amount and risk of the company's debt (Berk & DeMarzo, 2011, p. 526).

The magnitude of agency costs depends on maturity of debt as well; in case of long-term debt it is more likely for equity holders to profit at the expense of debt holders as it is in case of short-term debt. Therefore, agency costs for short-term debt are smaller since the company has to repay or refinance its debt more frequently and therefore has no such manoeuvre space for increasing risk, failing to invest, or cashing out. However, short-term debt also increases the possibility for a company to face financial distress or other associated costs since the possibility that debt holders will refuse to refinance it exists there (Johnson, 2003, pp. 209–213, 234).

Another type of agency costs of leverage is called debt covenants. It refers to restrictions creditors place on the actions the company takes and set it as a condition for making a loan. It is used to secure debt holders. Covenants usually prevent company from paying large dividends as well as restrict certain type of investment a company can take and harm debt holders with. On one hand these covenants help to reduce agency costs but on the other hand they have costs of their own since they limit management's flexibility and might as well limit some positive-NPV opportunities (Berk & DeMarzo, 2011, p. 527).

1.3.2 AGENCY BENEFITS OF LEVERAGE

Debt is important part of the company's capital structure also due to its benefits regarding motivation of managers and their organizations to be efficient. In case a company currently does not have high-return projects but significant amount of free cash flow it is better to use it to increase dividends or repurchase stocks than to invest it in low-return projects or waste it. Managers control the usage of future free cash flows. They can promise to pay out future cash flow announcing a permanent increase in the dividend but nothing obliges them to do that so they can easily decrease dividends in the future. If that happens large stock price reductions occur which is also known as the agency cost of free cash flow (Jensen, 1986, p. 324). However, if a company is levered, it bonds managers to keep their promise and pay out future cash flows to make the interest and principle payments. If they do not make these payments, the company may go bankrupt. It presents an effective motivation to make a company and managers perform efficiently. Therefore, debt reduces the agency costs of free cash flow by bringing down the cash flow available for spending at the discretion of managers (Harris &

Raviv, 1991, p. 300). Moreover, stock repurchases for cash or debt also have tax advantage since interest payments are tax deductible for corporations and since in many countries taxes on capital gains are lower than on dividends, thus making stock repurchases a tax-effective way to pay out investors (investors are paid through capital gains instead of dividends) (Jensen, 1986, p. 324).

Assuming that manager of the company is also its shareholder, the fact that original owners of the company maintain their equity stake is another benefit of using leverage. If they remain to be the major shareholders they are more interested in doing what is best for the company and not spending money on perks. Therefore, agency costs that emerge due to dilution of ownership when equity financing is used can be diminished using debt financing (Berk & DeMarzo, 2011, pp. 528–529).

Debt issuing does not have the same positive effects on different companies, operating within different industries. Companies, which grow rapidly, which have huge and profitable investments and no free cash flow, are not as influenced by effects of leverage as companies with huge free cash flows but low growth prospects. The most important are those effects on companies that must shrink since there the possibility of wasting cash flows by investing them in wasteful projects is the highest (Jensen, 1986, p. 324).

1.3.3 CORPORATE OWNERSHIP STRUCTURE

For the purpose of the corporate ownership structure explanation three variables are determined, namely: inside equity (held by managers), outside equity (held by anyone outside the firm) and debt (held by anyone outside the firm). The optimal capital structure is the one where each of these three variables presents such a proportion in total capital of the company that minimizes agency costs. In previous sections costs and benefits of keeping a debt are presented; the optimal level of debt in the capital structure is at the point where marginal costs of debt offset its marginal benefits (Jensen & Meckling, 1976, p. 53).

It is crucial that a company has so called inside equity – equity, held by managers. Certain proportion of inside equity in total equity ensures that managers do their job efficiently, not spending free cash flow on uneconomic projects and spending money on perks. Therefore, it is already incorporated in some larger corporations that managers, in addition to their salary, receive certain amount of company's shares as a bonus (Berk & DeMarzo, 2011, pp. 528–529).

1.4 PECKING ORDER THEORY

Pecking order theory of capital structure is one of the most influential theories of corporate leverage. It was introduced by Myers and Majluf and is based on three sources of funding for companies – retained earnings, debt, and equity. Due to adverse selection problem, companies

prefer internal to external financing (Frank & Goyal, 2003, pp. 218–220). Adverse selection problem is a consequence of asymmetric information before the transaction occurs. Potential borrowers with bad credit risk are those that most actively search for a loan and are therefore most likely to be selected. Since financial institutions are aware of this problem they could decide not to give loans at all even though there are also good credit risk companies present in the market. However, in case there would be no asymmetric information, if financial institutions would be perfectly informed about all potential borrowers, adverse selection problem would not exist because banks would be able to differentiate between good and bad credit risks (Mishkin, 2010, p. 41). Adverse selection is closely related to the "lemons principle", i.e. market of used cars principle. When buyers cannot verify the quality of the product they are offered, they will discount the price they are willing to pay due to adverse selection. Facing a risk of buying a lemon, they will demand a discount, which then discourages sellers who do not sell lemons, from selling. This principle can be applied for trading with cars as well as for trading with securities (Akerlof, 1970, pp. 489–490).

Since retained earnings have no adverse selection problem, they are most frequently used for financing new projects. Debt has minor adverse selection problem whereas equity is the most exposed to it. In case external financing is necessary, companies choose to issue debt first, then hybrid securities like convertible bonds, if possible, and the last option is equity issuing. The reason why companies prefer debt to equity is lower information costs associated with debt issuing. Looking from the outside investor's point of view, equity is undoubtedly riskier than debt. They both have an adverse selection risk premium, which is larger on equity. Therefore, when a company needs additional source of funds the first choice would be retained earnings, then debt would be issued and equity would be issued only as a last resort (Frank & Goyal, 2003, pp. 218–220; Myers, 1984, pp. 581–582).

There is no well-defined target debt-equity combination since there are two possible types of equity (internal and external) from which first is the most desirable and the second is chosen as a last option. Each company's observed debt ratio indicates its cumulative requirements for external finance (Myers, 1984, p. 581).

Taking a company with a valuable real investment opportunity, it has to issue common shares to raise a part or entire required money to undertake the investment project. In case a project is not launched in time the opportunity is missed. Considering there are no taxes, transaction costs or other capital market imperfections, it would be wise for a company to evaluate this investment opportunity as if it already possessed plenty of cash. Assuming market efficiency, securities can always be sold at a fair price. The NPV of selling securities is always zero since the cash raised balances the present value of the liability created. Therefore, it is wise for a company to take every positive-NPV project, no matter what type of funding is used to pay for it (Myers & Majluf, 1984, p. 187).

In real life, managers know more about the value of the company's assets and opportunities than outside investors do. However, as long as they invest in every positive NPV project they know, nothing radically changes. Shares investors buy are still fairly priced on average even if some individual issues are over- or under-priced. Inside information of managers create a side bet between old and new shareholders but still, the equilibrium price remains unaffected. There are also some cases when managers, having inside information, refuse to issue shares if they assume it is in the interest of the old stockholders, even if it is done on the account of a good investment opportunity. It happens when the cost of issuing shares at a bargain price may outweigh the project's NPV, looking from the old stockholders' point of view. This phenomenon is a cause that potential investors, aware of that problem, see a decision not to issue shares as a signal of good news. On the other hand, the issue of shares would symbolize less good or even bad news. This affects price investors are willing to pay for the issue in a negative way. If managers decide not to issue shares and not to invest, company's value will be reduced. This happens under the assumption that managers act in the interest of existing shareholders which are passive; that means they do not adjust their portfolios as a response to the company's issue-event decision (Berk, 2007, p. 124; Myers & Majluf, 1984, pp. 187–189).

Considering managers, companies hold financial reserves because they do not want to be forced to issue shares on short notice in order to conduct a valuable investment opportunity, especially not in a case when the company is undervalued by the market. A possible solution could be for a company to issue shares only in case a company is overvalued by the market. However, it is impossible to issue shares only when they are overvalued. Namely, investors are aware of the fact that due to reserves the company is not forced to issue stock to invest and therefore an attempt to issue sends out a strong pessimistic signal. Therefore, the stock price declines on the announcement of equity issue. Reserves are unnecessary in a case when old stockholders buy and hold the new issue. In this case there is no conflict between old and new stockholders. On the other hand, reserves are useful since they allow the company to avoid external financing which means avoiding possible conflicts of interest between old and new shareholders (Berk, 2007, p. 125; Myers & Majluf, 1984, pp. 194–195).

Value of the company often depends on proprietary information, which, if released to the market, would be released to competitors as well and can therefore reduce the value of company's assets, the NPV of its investment opportunity, or both. However, just saying that there are very optimistic information and expectations about future performance of the company is not enough, since it can be said whenever, whether true or not. Therefore, a company has to find a proper way to provide investors with reliable and sufficient information, which, on the other hand, cannot decrease its value; and this is very costly and fairly impossible to do. However, when managers are stockholders of the company as well, their inside information may be released by the amount of new issue they are willing to buy for their own portfolio. When an entrepreneur is looking for equity to finance the project, he knows its expected return, contrary to outside investors. Nevertheless, the outside investors

pay attention to the proportion of entrepreneur's personal wealth, committed to the project. The greater his willingness to contribute with his personal stake in the project is, the greater is the amount outside investors are willing to pay for their share since it announces a highly perspective project. Managers' information advantage is not only due to more facts they have about the business than outside investors do. Since they are insiders to the organization with everyday working experience, they also know better the meaning of specific information. When comparing a manager to an outside investor it is impossible for both of them to be equally informed about the situation. Therefore, the separation of ownership from professional management naturally produces asymmetric information (Leland & Pyle, 1977, pp. 371–372; Myers & Majluf, 1984, p. 197).

Based on the assumption that investors may over- or undervalue the company's assets or investment opportunities, an undervalued company will generally prefer debt over equity (Myers & Majluf, 1984, p. 197).

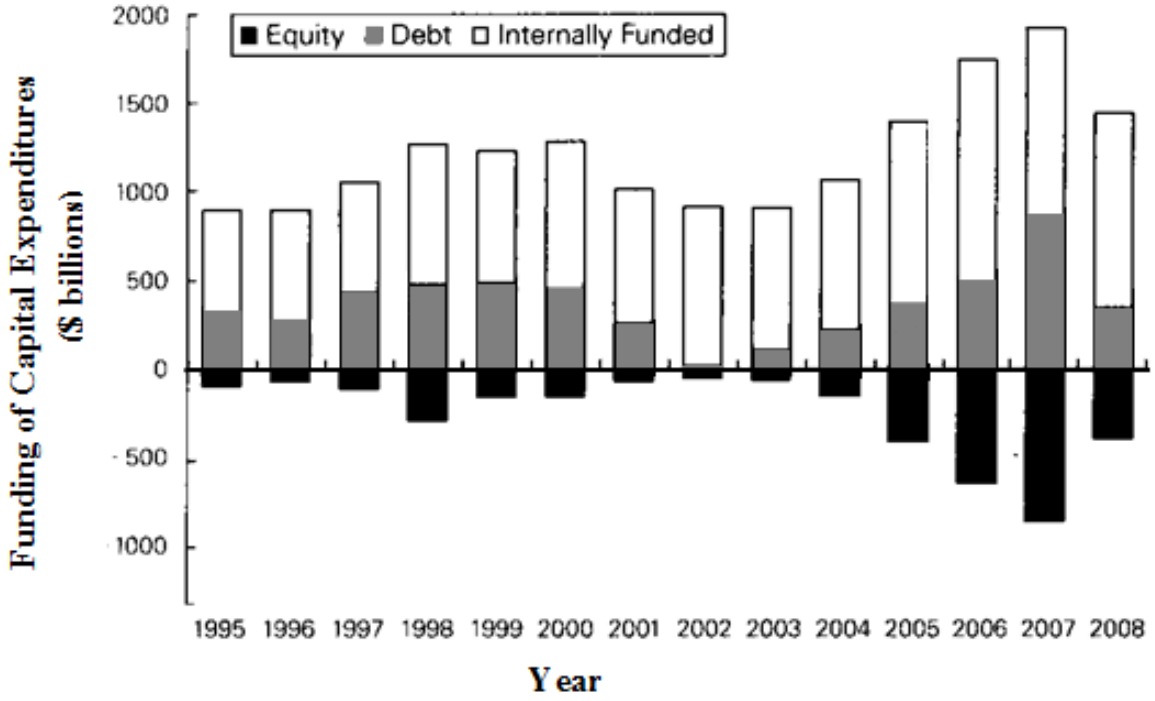
A model of dividend policy under asymmetric information suggests that in case the amount of investment and external financing is held fixed, the dividend the company pays discloses its operating cash flow. It means that when a dividend is larger than expected, investors know that cash flow is larger than expected as well. On the other hand, when external financing is larger than expected it means cash flow is lower than expected. It results in a statement that announcement of new security issues on average lower stock price (Miller & Rock, 1985, pp. 1036–1038).

Companies that have insufficient cash flow to finance current investment possibilities and do not have an option to issue low risk debt anymore may rather skip the investment opportunity than issue equity or debt with high risk. Usually stock price declines on the announcement of an equity issue and this loss increases with the size of required equity issue. However, the loss decreases when uncertainty about the value of assets is reduced or in case the expected NPV of the investment opportunity is higher. When the need for investment funds is modest, companies can also gain it by restricting dividends. Another way for a company to protect itself against significant stock price decline is to issue equity when information asymmetries are minimized. This condition is usually met immediately after earnings announcements. It often happens that stock price rises before the announcement of equity issue. It happens because managers tend to delay the issue until any potentially "price-rising" news come out. If this occurs, decrease in price on the announcement of the issue is not as large compared to the initial state. If a company has to sell stock or some other risky securities in order to pay dividends it is expected to reject paying dividends (Myers & Majluf, 1984, pp. 219–220).

The basic principle of pecking order theory is that companies tend to use retained earnings first, then issue debt and only as a last option issue equity. It is graphically presented in Figure 1, which shows that more than 70% of capital expenditures are financed from retained

earnings of the companies – they even tend to be net repurchasers of equity. These specific data are valid for American corporations.

Figure 1: Aggregate sources of Funding for Capital Expenditures, U.S. Corporations



Source: J. Berk & P. DeMarzo, Corporate Finance, 2011, p. 539.

1.5 MARKET TIMING THEORY

Managers of the company sometimes see their risky securities as misvalued by the market. According to market timing theory, companies prefer external equity when they perceive relative cost of equity as low and prefer debt when relative cost of debt is perceived to be low. According to this theory external equity is not necessarily more expensive than external debt. Therefore, equity issues are not as rare as some other theories predict. Sometimes it happens even if there is no immediate financing need but companies do it because issuing overvalued securities is a positive NPV project itself (Huang & Ritter, 2004, p. 3).

Issuing equity is quite frequent and is done even when companies could use internally generated funds or issue debt. External financing tools, such as stock-financed acquisitions and employee stock option plans, feature less information asymmetry, which leads to increased use of external equity financing over time. Most companies issue equity, repurchase it, or do both, every year. Repurchases by some companies offset equity issuing by others, which causes an aggregate annual net new equity to be small and gives an impression of low levels of equity issuing (Fama & French, 2004, pp. 2–6).

Lemmon and Zender (2002, p. 2) state that small, high-growth companies are debt-constrained and have to support their growth with external equity. On the other hand, Huang and Ritter (2004, p. 5) conducted a research and found out that small growth companies finance themselves usually with debt, and only rely on equity financing when the cost of equity is low. This coincides with the market timing theory rather than the debt market constraints view. According to market timing theory, companies were rather involved in stock-financed acquisitions when the relative cost of equity was low than when the relative cost of equity was high (Dong, Hirshleifer, Richardson & Teoh, 2003, pp. 6–13; Rhodes-Kropf, Robinson & Viswanathan, 2005, pp. 561–567).

If we want to explain properly the time-series variation of financing decisions of companies, the theory, which explains it the most properly, is market timing theory based on time-variation. When the cost of equity is low, there is a lot of companies which issue equity in a short period of time. Decision to issue equity depends on time-varying cost of equity (Huang & Ritter, 2004, pp. 27–29).

At the company's level, companies that are about to underperform are more likely to issue equity. Since market timing theory does not predict securities issues, particularly equity issues to be rare, it accepts debt and equity issues to play a relatively more important role in determining capital structure compared to some other theories. Market value's fluctuations have very long-run impacts on capital structure. Effects of equity and debt issues are strong and last for over a decade (Huang & Ritter, 2004, pp. 22–29).

Market timing theory states that capital structure develops as the cumulative outcome of past trials to time the equity market (Baker & Wurgler, 2002, p. 27). There exist two versions of equity market timing. The first one is a dynamic form with rational managers and investors and asymmetric information that vary across time and companies. Asymmetric information is inversely connected to market-to-book value; higher market-to-book ratio means lower asymmetric information. According to Korajczyk, Lucas and McDonald (1988, pp. 1–2) and to Bayless and Chaplinsky (1996, p. 253), companies tend to announce equity issues after information releases since it can reduce information asymmetry.

The second version of equity market timing includes irrational investors and managers and time-varying mispricing or perceptions of mispricing. Managers decide to issue equity in times they believe its cost is irrationally low and repurchase it when its cost is irrationally high. Market-to-book is inversely related to future equity returns as well as extreme values of market-to-book ratio have been connected to extreme investor expectations argue La Porta (1996, p. 1722), La Porta, Lakonishok, Shleifer and Vishny (1997, pp. 859–860), and Frankel and Lee (1998, pp. 283–287). When managers are trying to exploit investors' irrationality, equity issues will be positively related to market-to-book. The second version of market timing does not require inefficient market neither expects managers to predict stock returns; it is important that managers believe they can time the market (Baker & Wurgler, 2002, p. 28).

According to surveys by Graham and Harvey (2001, p. 219), in practice, corporate executives actively engage in market timing their financing decisions. A considerable number of corporate executives argue that the amount by which company's stock is overvalued or undervalued was an important consideration in equity issue decisions (Baker & Wurgler, 2002, p. 28).

Equity market timing is an important aspect of real financial policy. Low-leverage companies usually raise funds when their valuations are high and high-leverage companies usually raise funds when their valuations are low. Fluctuations in market valuations have large effects on capital structure that continue for at least a decade. Capital structure is mostly the cumulative outcome of past attempts to time the equity market. Considering market timing theory there is no optimal capital structure; market timing financing decisions just accumulate over time into the capital structure outcome (Baker & Wurgler, 2002, p. 29).

2 FINANCIAL AND ECONOMIC CRISIS

Financial crises are major disruptions in financial markets accompanied with firm failures and steep declines in asset prices. Financial crises are almost always followed by strong contractions in economic activity (Mishkin, 2010, p. 199). In this section, first, I present theoretical background of financial and economic crises, and then I write about actual implications of the current crisis on the world's and in particular Slovene economy.

2.1 FACTORS CAUSING FINANCIAL CRISES

Financial crisis starts when asymmetric information from a disruption in the financial system increases to the extent that causes severe adverse selection and moral hazard problems, which disable financial markets to channel funds efficiently from savers to households and companies with profitable investment opportunities. When financial markets are not able to function efficiently anymore it usually leads to sharp decrease in economic activity. There are six main categories of factors, which play an important role in financial crises, namely: asset market effects on balance sheets, increases in uncertainty, deterioration in financial institutions' balance sheets, banking crisis, increases in interest rates, and government fiscal imbalances (Mishkin, 2010, pp. 199–200).

One factor that causes a serious worsening in borrowing companies' balance sheets is severe decline in the stock market. It means that net worth of corporations falls which signals lenders that losses on loans might be more severe and consequently lenders are less willing to approve loans to companies. It causes a decline in investment and aggregate output. Moreover, it also increases moral hazard since companies have less to lose now and they are more prone to make risky investments which results in the fact that lenders are even less willing to make loans to such companies. Unexpected decline in aggregate price levels also

causes a decline in real net worth of the borrowing companies. Since debt payments are contractually fixed in nominal terms and debt contracts usually have long maturity, when a decline in prices occurs it increases the burden of debt for companies. Unexpected decline in the value of domestic currency has a similar effect on the real net worth of companies as unexpected decline in price level has. Company's assets are usually denominated in domestic currency. In case a company has debt denominated in a foreign currency when depreciation of domestic currency occurs, debt burden for such a company increases and it causes a real net worth decline of a company. Another reason for potential contraction of lending is also price decline of the company's assets. Since uncertainty in financial markets increases sharply it makes it hard for lenders to distinguish good from bad credit risks. This results in decrease of their willingness to lend money, which leads to a decline in investment and aggregate economic activity (Mishkin, 1992, pp. 119–122; Mishkin, 2010, pp. 200–201).

A cause for contraction in lending can also be on the side of financial institutions. In case a bank or some other financial intermediary suffers deterioration in its balance sheet it means it has no sufficient funds for lending. Since lending declines it leads to a decline in investment spending as well and in slowing down the economic activity. When deterioration in financial institutions' balance sheets is severe, they start to fail. Bank panic occurs when multiple banks fail approximately at the same time. It happens when depositors start withdrawing their deposits because they do not know how healthy banks' loans are due to information asymmetry. Simultaneous withdrawal of multiple depositors causes even healthy banks to fail. Due to decrease in lending and funds available to borrowers interest rates start to increase. Since companies with the riskiest investment projects are willing to pay higher interest rates than others it means that companies with lower credit risk are less likely to want to borrow money if interest rates increase sufficiently while companies with higher credit risk are still willing to borrow. Of course lenders are aware of adverse selection problem and they do not want to make loans anymore. Again, it leads to a decline in investment and aggregate economic activity. Increased interest rates affect also cash flows of the companies. When a company has a sufficient cash flow it can finance its projects internally and there is no asymmetric information since it knows how good its projects are. However, when interest rates increase it increases the interest payments of the companies and consequently decreases companies' cash flow. Since it is not able to finance its own projects internally anymore, it must raise funds from external sources, such as debt. Due to the fact that asymmetric information occurs, in this relationship, banks, due to adverse selection and moral hazard problems, may not be willing to lend money to companies, even to those with good credit risks and potentially profitable investments (Demirgüç-Kunt & Detragiache, 1998, pp. 81–87; Mishkin, 2010, pp. 201–202).

Especially in emerging market countries government fiscal imbalances can create fear of default on government debt. It causes a demand from individual investors for government bonds to fall and then usually government forces financial institutions to purchase their debt. If a government default is likely to occur, debt declines in price and financial institutions'

balance sheets weaken, causing their lending to contract. Possibility of default on government debt can also start a foreign exchange crisis when the value of domestic currency declines severely because investors pull their money out of the country. It causes balance sheet problems of companies with debt denominated in a foreign currency. This problem has already been described earlier (Allen, Rosenberg, Keller, Setser & Roubini, 2002, p. 21).

2.2 CURRENT FINANCIAL AND ECONOMIC CRISIS

Before current financial crisis began, interest rates were at historically low levels. Main reasons for such a state were Fed's fear of deflation after the bursting of internet bubble, "Great Moderation" period was characterised by low and stable inflation rates, and Asian countries bought US securities to protect export-friendly levels of exchange rate. An important reason for buying US securities by Asian countries were also excess savings, which could not be invested only in their domestic market because of less developed financial markets with a lack of profitable investment opportunities. Therefore, they transferred excess liquidity to rather risk-free US securities. There was also an increase in housing demand and housing investment and search for high-yield returns was even more attractive. Before 2000, only the most credit-worthy borrowers were able to obtain a loan. Banks had high incentives to select and monitor carefully their customers. Traditionally, banks originated and held loans till maturity. If loan succeeded, banks got principal back and made profit with interest payments. In case loan failed, if it was collateralized, bank repossessed and sold collateral but if it was not collateralized, bank made a loss. However, recently banks moved to the "Originate to distribute" model, i.e. mostly by securitization of loans, in which banks transfer credit risk of loans and mortgages to other financial investors (Mishkin, 2010, p. 207; Rupnik & Berk, 2009, p. 52).

One version of "Originate to distribute" model is to originate loan and sell it outright which includes a problem that loan is illiquid and risky and therefore not very attractive. Another option is securitization. It is a process of transforming illiquid financial assets, such as residential mortgages, auto loans, credit card loans, etc. into a marketable security. First step is to form portfolio of mortgages, other loans, credit card loans, corporate loans, etc. Then, slice this portfolio into different tranches. Portfolio was transferred to a special-purpose vehicle (SPV) which is a financial entity with only purpose to collect principal and interest from underlying portfolio and pass them to the various owners of tranches. Tranches are chosen to ensure specific credit rating from senior tranches, which are first to be paid out of the cash flows of the underlying portfolio and have the lowest risk but also the lowest expected return, to junior, sub-prime or toxic waste tranches, which only pay out after all other tranches have been paid and therefore have higher risk but also the highest expected return (Mishkin, 2010, pp. 207–210).

Advantages of securitization process are liquidity for originator banks; possibility of extending lending with other rounds of securitization (democratization of credit), reduced

capital requirements; capital requirements on loans held on balance-sheets are much higher than credit lines to SIVs (regulatory arbitrage), transfer of credit risk to who wishes to bear it, and diversification of portfolios for investors; e.g. pension funds can invest not only in AAA-rated fixed-income securities but also in AAA-rated senior tranches. However, there are also several disadvantages of securitization, namely agency problems; reduced incentives for originators to screen and monitor borrowers led to low lending standards (sub-prime mortgages like no-documentation mortgages, piggyback mortgages, "no income, no job, no assets" or NINJA loans), high complexity, conflict of interest and poor statistical models of credit-rating agencies which worked under the main assumption that house prices will increase forever, and maturity mismatch when commercial and investment banks are heavily exposed to liquidity risks. Reasons, why banks held some toxic tranches in the balance sheet were either that they could not sell them, however, the main reason was the behaviour of bank and fund managers whose performance was based on earnings they generated relative to their colleagues. Some managers ended up taking excessive risks to boost their performance. This trend was made even worse by bonus schemes based on short-term performance (Mishkin, 2010, pp. 207–210).

When the housing-market crisis unfolded agency problems have arisen. "Originate to distribute" model was subject to principal (investor) agent (mortgage broker) problem, borrowers had little incentive to disclose information about their ability to pay, and commercial and investment banks as well as rating agencies had weak incentives to assess the quality of securities. Beside the agency problem, housing price bubble burst, uncertainty increased since actual risk associated with structured products was recognized and rating agencies lowered its ratings, in some cases radically, from AAA to CCC. This situation caused a loss of confidence in rating agencies as well. Liquidity problems appeared along with central banks' intervention and insolvency problems along with government bailouts. Housing bubble burst because prices were at an all-time high and additionally, there was an increasing number of people that could not repay their (subprime) mortgage loans. Banks repossessed the houses underlying the mortgages and sold them off. From beginning of 2007, this started happening more often and house prices started to fall. With declining house prices there were more and more subprime borrowers with underwater mortgages. It means they had high incentive to walk away from their mortgages and just send their keys to the lender since new housing prices were lower than the residual mortgage value (Mishkin, 2010, pp. 208–211; Rupnik & Berk, 2009, p. 51).

Banks incurred losses themselves and therefore interbank market started drying up because banks needed liquidity themselves and trust between banks decreased. Then, crisis spread globally. Fire sales drove market prices of structured products down further, deteriorating balance sheets of banks. To ease the liquidity crunch, major central banks aggressively lowered interest rates, introduced new lending facilities, and broadened the type of collateral that banks could post (anonymously) or lengthen the maturity of lending. Banks in solvency troubles received government support, were taken over, or went bankrupt. Recession and

deflation risks led central banks to introduce additional non-conventional policies (enhanced credit support of ECB and quantitative easing of BoE and Fed (Mishkin, 2010, pp. 208–211; Rupnik & Berk, 2009, p. 53).

However, there are some lessons we could learn from the current crisis; avoid lending and housing booms with persistent and too low interest rates, improve (international) regulation and supervision of financial institutions, improve liquidity and credit risk management and higher capitalization, usage of better statistical model to evaluate risk of new products and independent rating agencies (Mishkin, 2010, pp. 207–211; Rupnik & Berk, 2009, pp. 50–54).

2.3 CORPORATE INDEBTEDNESS DURING THE CRISIS

Campello, Graham and Harvey (2010, pp. 470–471) have surveyed 1050 chief financial officers from non-financial companies in North America, Europe, and Asia, in December 2008. They studied whether corporate spending plans differ due to financial constraints a company is facing. They found out that constrained companies planned more severe cuts in tech spending, employment, and capital spending. More than half of the respondents also said that they will cancel or postpone their planned investments due to the inability to borrow externally. According to this survey, a typical constrained company in the sample was smaller, private, less profitable, less likely to pay dividends, and with slightly lower growth prospects than companies which were unconstrained. According to findings of the survey, the average constrained company planned to sharply decrease employment, technology spending, capital investment, marketing expenditures, and dividend payments. Unconstrained companies, on the other hand, planned smaller cuts. The results were approximately the same for the US companies, as well as for European and Asian companies.

It was observed that a typical US company had cash and marketable securities at about 15% of total assets in 2007. Unconstrained companies were able to maintain the same level of cash balances into late fall 2008 whereas constrained companies ended year with level of liquid assets at about 12% of asset value. The same patterns for constrained companies were found in European and Asian market. Financially constrained companies accumulate cash reserves in order to protect themselves from credit supply shocks. When unable to borrow, more than half of the US companies state they rely on internally generated cash flows to finance investment, and around 40% say they use cash reserves. More than half of constrained US companies cancel investment project when unable to get external funds compared to approximately a third of unconstrained companies that may do the same. Similar patterns are found in European and Asian companies. Some observed companies also sold assets in order to obtain cash. Majority of financially constrained companies did that in order to fund their operation in contrary to unconstrained companies, which had no intention to do that. One of the possible explanations why companies are cutting investments during the crisis is that companies, which do it the most radically, are those that were most likely to overinvest before the crisis began (Campello, Graham & Harvey, 2010, pp. 471–472).

Besides cutting on investments, technology, marketing, and employment during the crisis, constrained companies are also obliged to consume a sizeable portion of their cash savings and to cut sharply into planned dividend distributions in contrary to unconstrained companies, which do not have to do that. Constrained companies also tend to withdraw funds from their outstanding lines of credit due to concerns that their banks may restrict access to those lines. Again, this is not a typical behaviour for unconstrained companies. Almost 90% of constrained companies are negatively affected regarding their pursuit of attractive projects whereas more than half of them are obliged to cancel profitable investments. These companies are also more prone to sell off productive assets in order to generate funds during the crisis. Current financial crisis indeed affected real investment, but unequally across companies. However, cancelling positive NPV projects has a negative impact on future economic recovery. This is the reason why policy-makers took certain actions to unfreeze credit markets since it can help producing additional long-term growth opportunities in the economy (Campello, Graham & Harvey, 2010, p. 486).

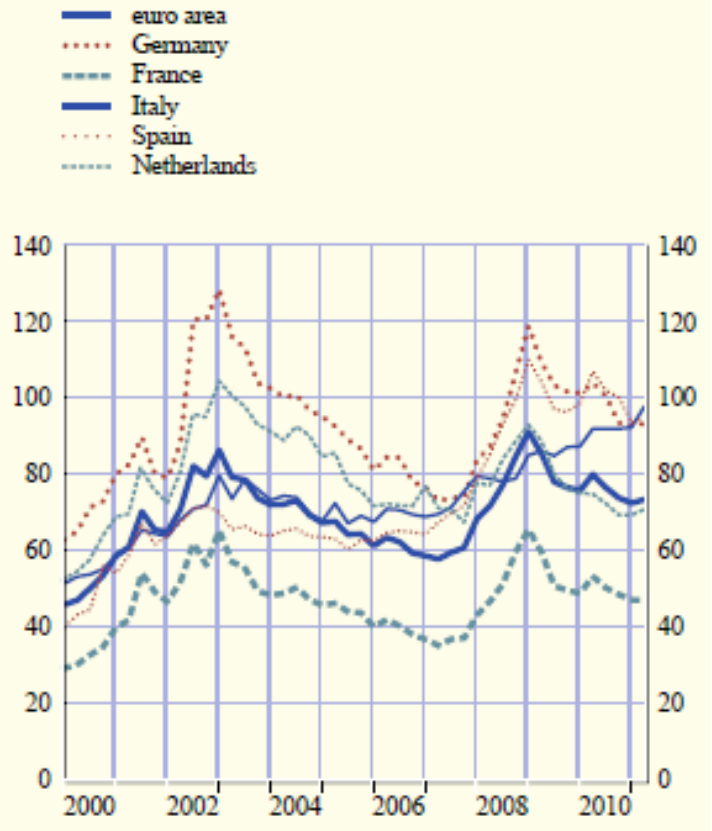
From 1999 to 2009, there was a steep increase in non-financial corporate debt in euro area; debt-to-GDP ratio in the first quarter of 1999 was 57% and reached its peak of 81% in the fourth quarter of 2009. Non-financial corporate debt ratios increased from the second half of 1990s until the beginning of 2002 due to "new economic boom" which provided good conditions for real and financial investments and also loan growth was high. A subsequent period of balance sheet consolidation followed after which non-financial corporate debt-to-GDP ratio increased again from 2005 to 2009 when it reached its peak. Debt-to-GDP ratio reflects corporate indebtedness relative to economic activity whereas the ratio of debt to gross operating surplus of non-financial corporations relates corporate debt to income generation and helps us to assess debt sustainability since gross operating surplus is used for debt repayment. This ratio also increased from 1999 until the fourth quarter of 2009 and fell after that. Increase from the second half of 2008 until the end of 2009 was caused mainly by a decline in gross operating surplus, which was due to weak economic activity. Most of debt ratios of non-financial corporations in euro area were the highest in year 2009 and then started falling down until 2011 when they seemed to stabilize to some extent (European Central Bank, 2012, pp. 88–89).

In 2008 and 2009 when there was a strong decline in economic activity companies decreased their demand for loans since there was less need for working capital on the side of non-financial corporations. Moreover, since merger and acquisition activity declined from 2008 until the beginning of 2010 it reduced the need for external financing of non-financial companies even further. As well, constraints in the supply of loans from the side of banks additionally contributed to deleveraging of the companies. One of the reasons for that was also to improve their creditworthiness. Before financial crisis began it was rather easy to obtain a loan. However, since the beginning of the crisis banks themselves came under pressure in their access to funding in relation to balance sheet concerns. Cost of funds and

balance sheet constraints they experienced were the main reason for tightening credit standards on loans to corporations. Moreover, several banks also widened margins on loans, especially for riskier loans. Deleveraging of the companies was easier due to the significant amount of internal funds that companies accumulated; from the third quarter of 2009 to the second quarter of 2010 non-financial corporations highly increased their retained earnings (European Central Bank, 2012, pp. 89–90).

By late summer of 2007, when current financial crisis emerged companies accumulated high level of debt which started to decline after the outbreak of a crisis. Deleveraging efforts seem to be stronger for large than for small and medium companies. However, in Spain and Italy companies were still increasing debt ratios during 2010 and 2011, in general. However, debt levels of the companies are still high, which has, along with increased costs of debt financing, a significant impact on the vulnerability of the companies (European Central Bank, 2012, pp. 95, 98, 103).

Figure 2: Debt-to-equity ratio of non-financial corporations in selected euro area countries (in %)



Source: European Central Bank, Monthly Bulletin February 2012, 2012, p. 96.

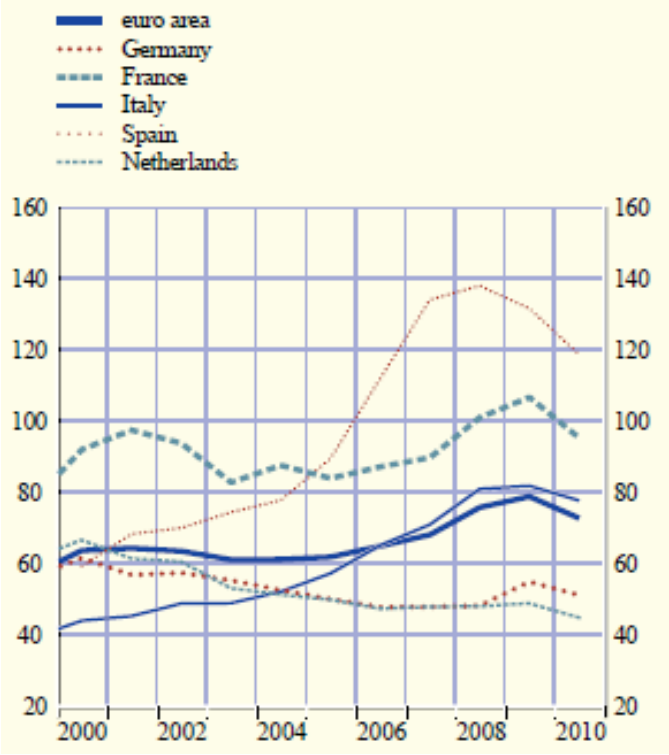
One of the most important decisions managers have to take is to determine the shape of a capital structure of a company. When considering the appropriate amount of debt it is important for a manager to focus on determinants of the target ratios, financial flexibility, credit ratings, earnings volatility, and tax advantages of interest expenses. In Figure 2 we can see debt-to-equity ratio of non-financial corporations for the last decade for few European

countries and euro area in general. It is noticeable that there is some heterogeneity in the capital structure among euro area countries (European Central Bank, 2012, pp. 95–96).

An important reason for heterogeneity in the capital structure across euro area countries is the size of companies. Small companies usually rely on external funds, especially bank loans, to finance their growth. In case of some major financing disruptions it is very challengeable for SMEs and it can also lead to credit risk increase in the corporate sector and negatively affect productivity in the economy. More than a third of companies are identified as not to have problems with receiving financing at the euro area level. Two most important difficulties that were reported are insufficient collateral or guaranties and too high interest rates (European Central Bank, 2012, pp. 97–98).

Debt service burden is characterized as a combine burden of interest payments and debt repayment obligations of the companies. Figure 3 presents its trend during the first decade in 21st century. It reached the peak in 2009 and afterwards started to decline, which was due to a decline in gross interest payments by euro area non-financial companies from the end of 2008 until mid-2010 and to recovering of the gross operating surplus in 2010. Meanwhile, debt repayment remained more or less at the same level (European Central Bank, 2012, p. 100).

Figure 3: Debt service burden of non-financial corporations in selected euro area countries (in % of gross operating surplus)

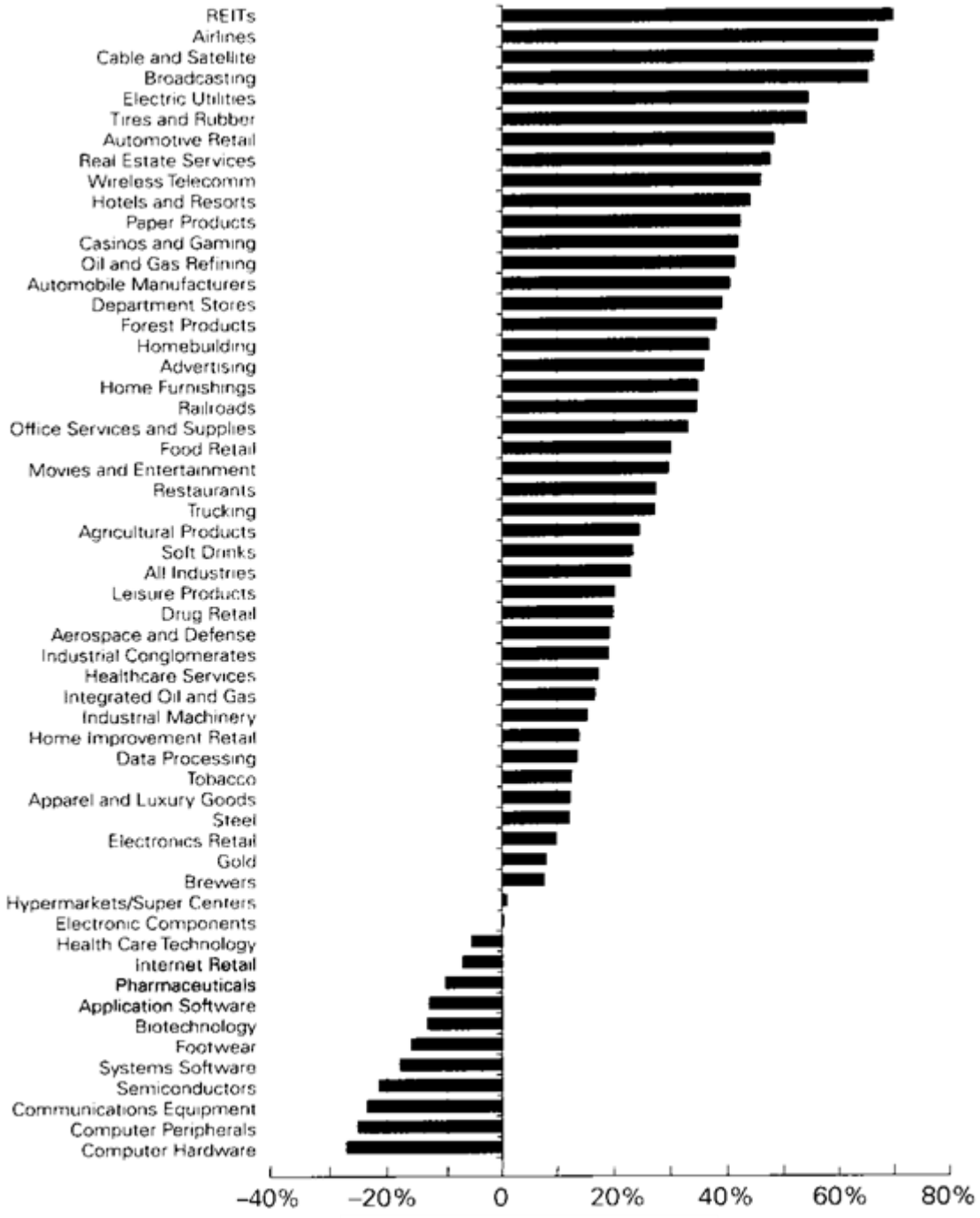


Source: European Central Bank, Monthly Bulletin February 2012, 2012, p. 100.

There is no equal leverage ratio in different countries which ensures sustainability. It differs from economy to economy due to country-specific institutional features regarding financial

system, or due to productivity differentials, which turns into higher relative economic growth; in the last case higher debt levels are allowed than otherwise. However, if an economy faces a significant or rapid increase in a leverage ratio comparing to historical trends or to countries alike it might denote a credit boom not justified by macroeconomic fundamentals (European Central Bank, 2012, p. 102).

Figure 4:Net Debt-to-Enterprise Value Ratio for Select Industries



Source: J. Berk & P. DeMarzo, Corporate Finance, 2011, p. 496.

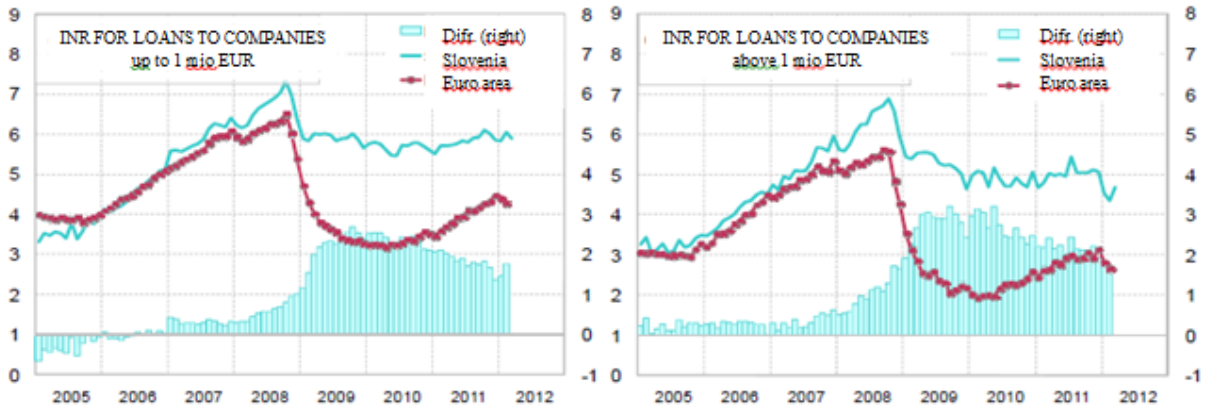
Before the outbreak of financial crisis most of euro-area non-financial corporations accumulated high levels of debt which they started gradually reducing since then. As well, the need for external financing of non-financial corporations has declined across sectors since 2009. Nevertheless, debt levels still remain at high levels. Comparing different euro-area countries and sectors, we notice that non-financial corporations' leverage ratios are heterogeneous. It is mainly due to the level at which it stood at the start of the crisis but also due to the pace of deleveraging since the mid-2009. Even though companies reduced their vulnerability when deleveraging, the considerable amount of debt that remained still presents an important source of vulnerability, in particular with respect to risks associated with increased costs of debt financing (European Central Bank, 2012, p. 103).

Leverage ratio varies substantially across industries. Figure 4 presents net debt as a share in a company's enterprise value for several industries and the overall market. It is obvious that there are huge differences in net leverage across industries. Companies in growth industries such as pharmaceuticals have very little debt and large cash reserves on the other side, which is not the case with airlines or automakers, which have high leverage ratios (Berk & DeMarzo, 2011, pp. 495–496).

2.4 CURRENT CONDITIONS IN SLOVENE MARKET

In Slovenia, companies face difficulties when asking for a loan – namely, banks are reducing volume of loans due to over-indebtedness of non-financial corporations and low capital adequacy of Slovene banking system. Differences in interest rates between banks in Slovenia and banks in euro area present a serious risk, related to low lending activity in Slovenia. As can be seen in Figure 5, average interest rate for loans to companies in value up to 1 million EUR in Slovenia equals 6% compared to 4% in the euro area which makes debt financing much more expensive for Slovene companies (Košak et al., 2011, p. vii ; Banka Slovenije, 2012, p. 4).

Figure 5: Comparison of Slovene interest rates with interest rates in the EMU (in %)



Source: Banka Slovenije, Poslovanje bank v tekočem letu, gibanja na kapitalskem trgu in obrestne mere, 2012, p. 4.

As a consequence of over-indebtedness of large share of Slovene companies, they have to direct a significant share of their cash flow for debt repayment which disables them to invest in order to grow and increase their market competitiveness. In the beginning of 2011, Slovene economy faced another slowdown, the second one since the beginning of financial and economic crisis. Towards the end of 2011 the negative trend became obvious since the share of investments in total GDP lowered additionally and reached the minimum level since the beginning of the crisis. The saving rate has slightly improved and, compared to the average of other euro area countries, has reached higher levels. Nevertheless, it has still been lower than before the crisis which presents a barrier for higher economic growth in Slovenia (Košak et al., 2011, p. 1).

Main problems Slovene banking system is facing are bad debts, low levels of equity and difficult access to new financial sources. In the past Slovene banks increasingly collected funds with foreign inter-bank loans and less with domestic deposits. However, due to decrease in rating, access to foreign financial sources is more difficult which forces banks to focus towards domestic savers again to collect new funds in order to be able to operate further normally (Košak et al., 2011, p. vii–viii).

According to governor of Bank of Slovenia (Banka Slovenije) there is no credit crunch in Slovenia. There are only companies unable to obtain a loan whereas "healthy" companies can get a loan. As Sibil Svilan said there is an ownership crunch, and companies still want to operate in an old manner, which means without equity. There are examples of companies where owners want a project to be financed entirely with debt; if owners do not show they believe in a successful implementation of a new project with their partly participation than also banks cannot lend the entire amount themselves (Jenko, 2012, p. 7).

Bank of Slovenia participated when an instrument for three-year long-term financing with 1% interest rate was adopted within the system of European central banks. It provided banks with long-term liquidity and allowed them to restructure liabilities. However, it is still not visible in private sector lending which is partly due to a recession in private sector and partly due to their portfolio "cleaning" (Jenko, 2012, p. 7).

Slovene banks have around 6% of so-called "risky assets" (loans that exceed their payment due for half a year or a year and more) which are even increasing and it is expected to increase in the future as well. Central bank lends money for 1% interest rate to every bank that needs it. It also lowered some capital and liquidity requirements; however, capital adequacy level cannot be lowered. Despite all these measures taken central banks cannot force banks to increase lending to companies. Comparing to the rest of the euro area countries Slovenia follows trends of the rest (Jenko, 2012, p. 7).

Results show that Slovene banks have poor performance recently. However, liquidity issue cannot be a reason for that. Moreover, banks have large amount of assets on deposit at central bank. Obviously, the problem is in the lack of investment opportunities. Besides that, also administrative procedures should be reduced and simplified in order for companies and individuals to be encouraged to do business. As long as portfolio of banks as well as companies will not be "cleaned", giving and obtaining loans will remain to be problematic. (Jenko, 2012, p. 7).

3 GENERIC PHARMACEUTICAL INDUSTRY

Pharmaceutical industry is divided into two types of business; originators, or innovators and generics. Originators are development-oriented corporations, which invest large amounts of money into new drugs development. Patent protection is essential for operating of these corporations since development of new active ingredients is a long-term, risky and financially demanding process (Sommerfeld & Schiffer, 2010, pp. 119–120, 139–144).

Generic pharmaceutical companies develop already known active ingredients which makes the process cheaper and less time consuming. Therefore, the price of a generic drug is lower from the originator's one. It is determined by a patent when generic companies are allowed to start production and sales of a selected drug. According to the U.S. Food and Drug Administration, generic drugs have to be identical in dose, strength, route of administration, safety, efficacy, and intended use, to the original medicine (Sommerfeld & Schiffer, 2010, pp. 11–12).

Generic pharmaceutical industry is an extremely important part of healthcare delivery in Europe. It improves the quality of healthcare across the region by contributing to savings in pharmaceutical expenditure and providing broader access to medicines. Without its presence, governments and payers would face severe difficulties sustaining the growing demand for medicines. Generic medicines ensure broad access to medicines at an affordable price since nowadays more patients who live longer, require chronic therapy and expect an improved quality of life (Sheppard, n.d., p. 14).

Generic medicines (Sheppard, n.d., p. 14):
- provide an affordable, gold standard medication for many major illnesses,
- allow access to medicines for a greater proportion of the population,
- stimulate healthy competition with the branded sector,
- deliver savings to national health bills,
- enable future long-term savings in the expanding role of medicines vs hospitalisation,
- are high quality products.

An existence of generic manufacturers is essential also due to the fact that originator may exit the market after loss of patent protection for several reasons and then generic medicine

remains on the market, meeting the needs of patients. To get the maximum benefit from a generic medicine it should be available from the day of the patent expiry. A pricing system of generic medicines varies greatly across countries. In some countries, it is directly linked to the originator price whereas in some others it is left to competitive market forces to form it. Independently on the system, potential savings are significant in all markets. Competition between generic producers leads to lower costs for patients, product improvements, distribution efficiencies and improved access to all medicines. Originator medicines come from a single source whereas generic products are typically multi-sourced, which means that several manufacturers produce the same product (Sheppard, n.d., p. 5).

Pharmaceutical market value, original and generic drugs together, is approximately 875 billion USD worth and is expected to grow from 3% to 6% annually over the next five years. Generic market value presents approximately one sixth of the global pharmaceutical market (Krka, Plc., Novo mesto, 2011, p. 16).

Due to current financial crisis several countries introduced austerity measures which slow down the value growth of generic markets and lower the margins. Savings will strengthen the position of generic manufacturers but at the same time it will cause the prices of generic medicines to fall. Competitiveness between international suppliers of generic medicines from Asia, which expand their business into Europe, and local companies, which also expand their markets, will increase. Price decrease pressures in past three years in European Union decreased the value of sales growth for 6 to 7 percentage points per year, which companies replaced with higher sales volume and less with new products. However, it is expected that also new products will become an important generator of sales growth value since many patents are about to expire in next years (Krka, Plc., Novo mesto, 2011, p. 16).

Table 1: Medicines market growth projections in 2012

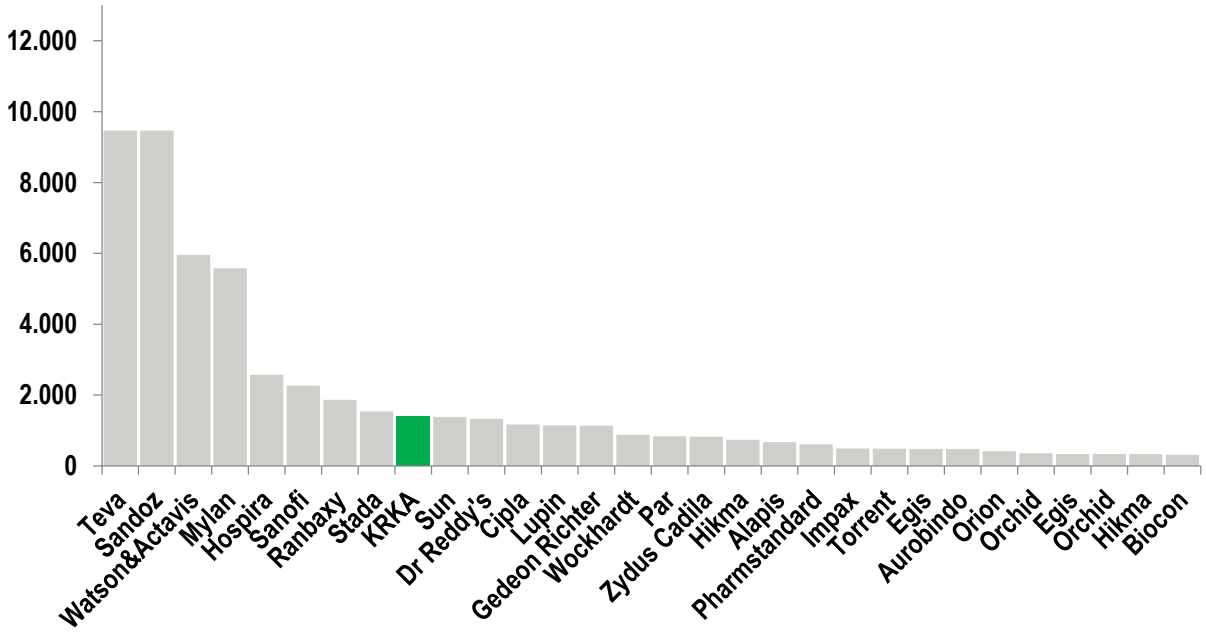
Country	Pharmaceuticals market growth (%)	Pharmaceuticals market value (EUR million), wholesale
Slovenia	-2	500
Croatia	-3	700
Romania	5	2,600
Russian Federation	5–10	11,500
Ukraine	5–10	2,000–2,200
Poland	0	5,160
Hungary	-8	1,970
Czech Republic	-2	2,190
Western Europe	-0.2	178,000

Source: Krka, Plc., Novo mesto, Annual Report of Krka, Plc., Novo mesto, 2011, p. 32.

Current debt crisis is one of the milestones in the history of European Union. Since most of the countries of the EU, including financially strongest, are facing significant public debt, which exceeds Maastricht criteria, most economies announced and already implemented austerity measures, especially in public sector, pension, and healthcare spending. While the euro area reached nearly 2% growth in 2011, the forecast for 2012 is about 0.5%. The value of pharmaceutical market in 2012 is expected to stagnate on average. Also in Slovenia the

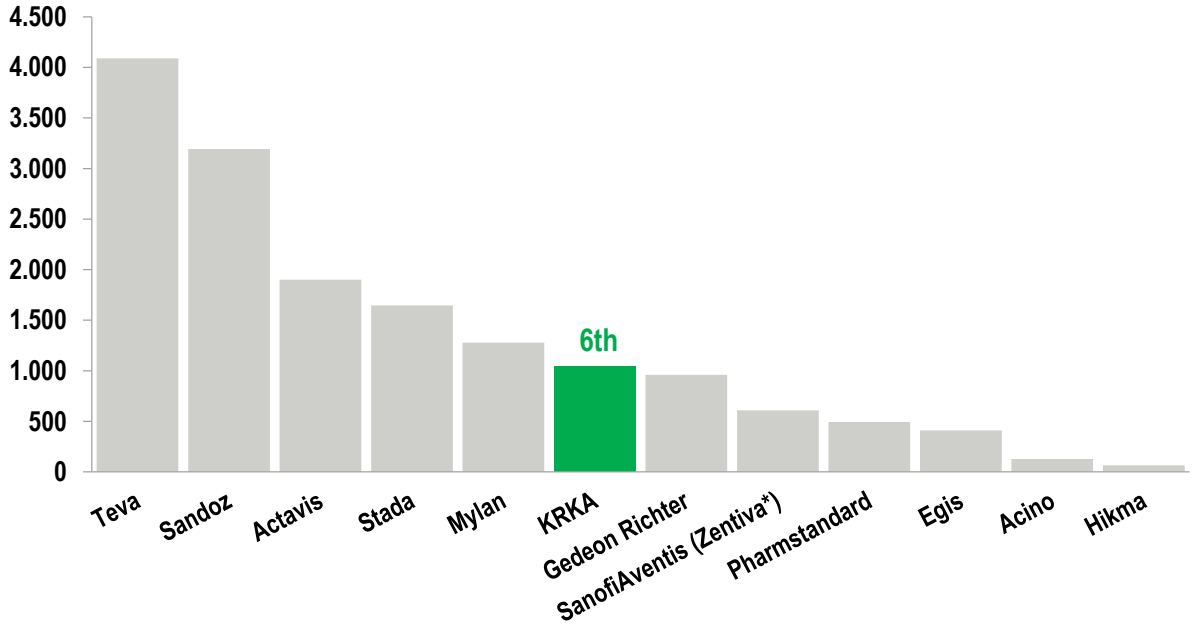
main concerns in 2012 will be savings, elimination of the persistent liquidity crunch, encouragement of foreign investment inflow, and reforms for economic stimulus. Further contraction of the construction sector are expected, uncertain business climate and limited investment and consumption. In Table 1 we can see medicines market growth projections for some of the European economies in year 2012 (Krka, Plc., Novo mesto, 2011, pp. 32–33).

Figure 6: World Generic Market in 2011 (generic sales in million USD)



Source: Krka, Plc., Novo mesto, Internal calculation based on annual reports of the companies, 2012.

Figure 7: European Generic Market in 2011 (generic sales in million EUR)



Source: Krka, Plc., Novo mesto, Internal calculation based on annual reports of the companies, 2012.

Figure 6 presents the biggest generic pharmaceutical companies in the world in 2011 in terms of sales. Figure 7 presents the biggest suppliers of generic prescription drugs in Europe in terms of sales. In the thesis, I have presented five European generic pharmaceutical companies and calculated their optimal capital structure in years 2006 and 2011 in order to explore how recent economic and financial conditions in the market affected the capital structure of selected companies.

4 OPTIMAL CAPITAL STRUCTURE

The optimal capital structure of a company is at the point where its debt and equity values are at the level that minimizes its WACC. At the point of minimum WACC, the value of the company reaches its maximum value, which is the basic purpose of each company in order for its investors (shareholders and debt holders) to maximize their assets.

In this chapter, I have presented the procedure of optimal capital structure calculation. First, I have described WACC and presented its role in optimal capital structure calculation. Then, I have presented and described in details different steps that present an important part in the final solution.

Companies finance their projects with equity and debt. Common shares are the most common form of equity capital and, to a small extent, preference shares whereas a company obtain debt capital with taking a loan or (less frequently) issuing bonds. Different means of financing affect the WACC; it is influenced by a capital structure and by costs of each financing instrument. Since interest is tax deductible at corporate level, WACC with corporate taxes is used in calculations in the thesis (Brealey & Myers, 2003, pp. 524-525):

$$WACC = \frac{E}{D+E} r_E + \frac{D}{D+E} r_D (1 - t_C) \qquad (14)$$

Equation 14 was already discussed into details in the beginning of the thesis, which is the reason why I do not explain it into details here. A reason for the usage of WACC in the optimal capital structure calculations lies in the assumption that the value of the company is maximized when WACC is minimized. This is the point of optimal capital structure of the company.

4.1 COST OF EQUITY

Capital asset pricing model (CAPM) presents an essential part of the Asset pricing theory. It determines an appropriate required rate of return on an asset, added to a well-diversified portfolio. The model includes the expected return on a risk free asset, added for an asset's sensitivity to non-diversifiable risk, represented as beta (ß), multiplied by the expected return on the market. Risk free rate of return (hereinafter: Rf) serves as a compensation for time-

value of the money whereas market risk premium presents a compensation for additional risk investor faces when investing in a risky asset (Berk & DeMarzo, 2011, pp. 359-360):

$$CAPM : r_E = R_f + (R_m - R_f)\beta_i \quad (15)$$

r_E presents an expected return on the capital asset, *Rf* is risk free rate of return, *(Rm–Rf)* is market risk premium (the difference between expected market rate of return and risk free rate of return), and *βi* presents sensitivity of the expected excess asset returns to the expected excess market returns.

4.1.1 RISK FREE RATE OF RETURN

Most models, which examine the relation between risk and return, are based on the assumption about an existence of a risk free investment in the market to which corresponds a return that can be estimated. Rf is therefore defined as an expected theoretical rate of return on a risk free investment. One of the essential criteria for an investment to be interpreted as a risk free is that it has an actual return, which equals the expected return. In order for this criteria to be met, an important condition has to hold. An investment should be default risk free, which generally implies that it has to be issued by a government since this is the only "organization", which is not expected to default at any time in the future – however, in reality this assumption does not hold completely since already several countries faced a default in the past (Damodaran, 2011, p. 101).

In the thesis, I have calculated an optimal capital structure of selected companies in years 2006 and 2011. Therefore, to get Rf I have used a 10-year German government bond; usually a 10-year American government bond is used but in this case all selected companies come from European countries which was the main reason why I have chosen a German government bond. A nominal rate of return for a 10-year German government bond at December 29, 2006 was 3,948% (Government Bonds yields, List by Country, 2012) and a nominal rate of return for a 10-year German government bond at December 30, 2011 was 1,829% (Markets Data – Stock market, equities, currencies and commodities performance – FT.com, 2012).

4.1.2 MARKET RISK PREMIUM

Market risk premium in CAPM model measures an additional return, demanded by investors, in order for them to be prepared to transfer their assets from a risk free investment to an investment with the average market risk. Market risk premium is defined as a difference between average returns on stocks and average returns on government bonds during the observation period (Berk & DeMarzo, 2011, pp. 320-321).

Market risk premium in CAPM model can be estimated in three ways (Damodaran, 2011, p. 106):

- large investors can be surveyed about their expectations for the future,
- actual premiums earned over a past period can be obtained from historical data,
- the implied premium can be extracted from current market data.

In the thesis, I have used the second method of estimating market risk premium. I needed data for selected countries with different market risk premiums and therefore used the basic proposition for the market risk premium in any equity market that equals (Damodaran, 2011, p. 110):

$$Market\ Risk\ Premium = Base\ Premium\ for\ Mature\ Equity\ Market + Country\ Premium \quad (16)$$

I have obtained the necessary data from the Damodaran Online: Home Page for Aswath Damodaran.

4.1.3 BETA COEFFICIENT

Beta coefficient is a measure of volatility of a security or a portfolio compared to the market as a whole. It is estimated using regression analysis where the x-axis measures market index returns, and the y-axis measures returns on selected security. Then, through the points on the graph, we draw a line and its slope corresponds to the beta coefficient of the security. A beta of one means that price of security will move the same as the market. When beta is less than one it indicates a security, which is less volatile than the market and a beta greater than one means that security is more volatile than the market. A beta greater than one indicates a riskier security and therefore demands a higher rate of return (Brealey & Myers, 2003, pp. 173-174).

Leverage has an influence on beta coefficient. Increased leverage increases beta coefficient as well. Equation 17 explains an influence of leverage on beta coefficient:

$$\beta_l = \beta_u \left(1 + (1 - T)\frac{D}{E}\right) \quad (17)$$

β_l presents leveraged beta, β_u presents unleveraged beta, and *D/E* is debt-equity ratio (Ross, Westerfield & Jaffe, 2002, p. 482). Since betas I have calculated for selected companies in selected time periods already presented leveraged betas, first I have used this formula to calculate unleveraged beta and then using it again I have calculated leveraged betas for different levels of leverage of the companies. All the data are presented further in the paper.

4.2 COST OF DEBT

Cost of debt measures current costs of borrowed funds of the company. It is influenced by three factors, namely: interest rates (higher the interest rates, higher the cost of debt), credit risk of the company (higher the credit risk, higher the cost of debt), and taxes (interests are tax deductible) (Brigham & Houston, 1998, pp. 354–355).

Generally, cost of debt should be lower than cost of equity. The main reason for that is higher risk for shareholders not to receive returns on their investment. If company has financial difficulties, debt holders are those that are repaid first (Berk & DeMarzo, 2011, pp. 452–454)

The cost of debt can be estimated in two ways. The first one is assessing the cost of debt on the basis of yield to maturity (YTM) of bonds issued (Ehrhardt, 1994, pp. 67–71). Another way, which has been used in this thesis, is to assess the cost of debt with synthetic ratings and credit spreads. That way we assess company's rating based on its financial position. Interest coverage ratio (ICR) has been used as an indicator, based on which we determine rating and spread. Interest coverage ratio has been used to determine the way a company can pay interest expenses on outstanding debt. Lower the ratio is, more difficult and more questionable it is for a company to meet its interest expenses. When interest coverage ratio is lower than 0 it indicates that a company is not able to meet the requirements anymore (Damodaran, 2011, pp. 156 – 158, 404–405).

$$Interest\ Coverage\ Ratio = \frac{Earnings\ Before\ Interest\ and\ Taxes\ (EBIT)}{Interest\ Expense} \quad (18)$$

When interest coverage ratio is calculated we use a table which can be seen in Appendix 11 and in Appendix 12 that relates it to a synthetic rating and a default spread that corresponds to that rating. Estimated default spread is than added to Rf and we get the pre-tax cost of debt for a selected company. Higher the interest coverage ratio of the company, lower the default spread and therefore lower cost of debt for a company (Damodaran, 2011, pp. 161–162).

$$r_D = R_f + Default\ Spread \quad (19)$$

Next, I present selected companies which I have chosen for calculating their optimal capital structure in years 2006 and 2011, and do all the calculation on the basis of the above described theoretical procedures.

5 SELECTED GENERIC PHARMACEUTICAL COMPANIES

In this section, five generic pharmaceutical companies are presented and then optimal capital structure is calculated for each of them and they are also compared among each other. I have chosen five companies which are comparable in the size, legal organizational form (each of them is a public limited company), and geographical area they originate from. Companies, studied in the thesis are Krka, Plc., Novo mesto, Acino Holding Plc., Richter Gedeon Plc., Hikma Pharmaceuticals Plc., and Stada Arzneimittel Plc.

5.1 KRKA, PLC., NOVO MESTO

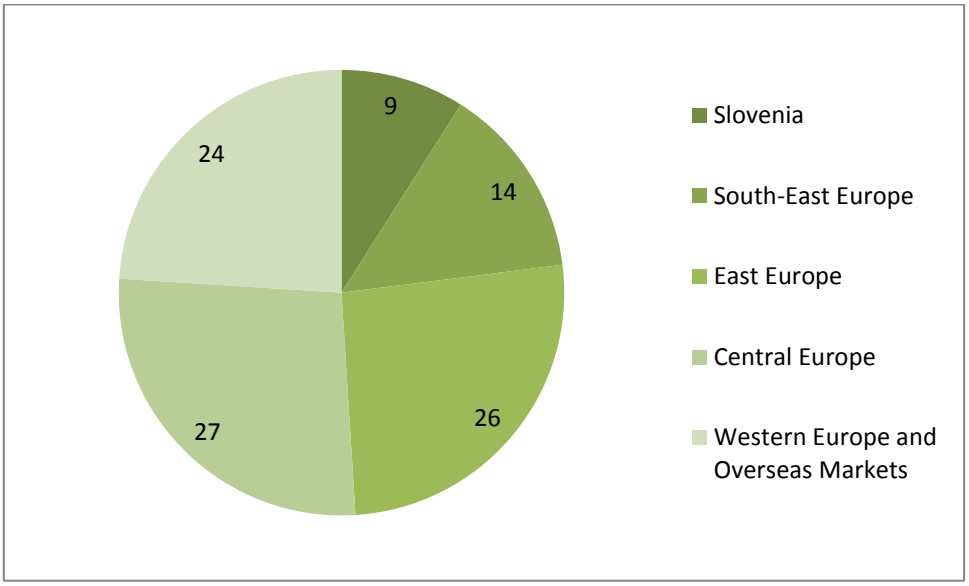
Krka, Plc., Novo mesto (hereinafter: Krka) is Slovenian generic pharmaceutical company, which was established in 1954 as a pharmaceutical laboratory. The basic line of business of the company is production and sales of prescription drugs, which represent the largest proportion of Krka's sales, OTC (over-the-counter) products and animal health products. Additionally to that, Krka operates within health resort and tourist services as well. Company is developing products in four key areas that cover most common diseases today. These are cardiovascular diseases, diseases of the alimentary tract and metabolism, infections, and diseases of the central nervous system (About Krka, 2012).

Krka's mission is "living a healthy life". In order to enable people to live healthy Krka is providing them with prescription drugs, OTC drugs, animal health products and health-resort services. Company's vision is to continually consolidating the position as one of the leading generic pharmaceutical companies in the world. This is achieved through strengthening long-term business partnerships in the fields of development, product supply and marketing. Values of the company, which present an essential part of its success, are speed and flexibility, partnership and trust, and creativity and efficiency (About Krka, 2012).

Company is selling its products all over the world. Sales are divided into five different regions, which are Slovenia, South-Eastern Europe, Eastern Europe, Central Europe, and Western Europe and Overseas markets. All together Krka's products are sold into more than 70 countries in the world. Its traditional markets reach the way from Vladivostok to Lisbon. Figure 8 presents the proportions of Krka's sales to each of the five regions it covers. Company has production facilities in Slovenia, Poland, Russia, Croatia, and Germany, whereas other affiliated companies and representative offices outside Slovenia focus on marketing and/or sales of its products (About Krka, 2012).

Krka is listed on Ljubljana Stock Exchange where I have also looked for the data, used in the analysis further. Since April 2012 the company is listed on Warsaw Stock Exchange as well (For investors, 2012; Media centre, 2012).

Figure 8: Krka Group sales by region in 2011 (in %)



Source: About Krka, 2012.

5.1.1 OPTIMAL CAPITAL STRUCUTRE

One of the essential components in optimal capital structure calculations is *Rf*. Most commonly used approximation for *Rf* is return on 10-year U.S. government bond. However, for the purpose of this thesis I use return on German government bond as a *Rf* since companies I am observing are European. A nominal rate of return for a 10-year German government bond at December 29, 2006 was 3.95% (Government Bonds yields, List by Country, 2012) and a nominal rate of return for a 10-year German government bond at December 30, 2011 was 1.83% (Markets Data – Stock market, equities, currencies and commodities performance – FT.com, 2012). I have used this data for all five selected companies.

Next information I need for the calculations is data for market risk premium (R_m-R_f). It has been calculated as a sum of base premium for mature equity market and country premium. It differs among selected companies since each of them comes from different country. Krka is a Slovene company and therefore its market risk premium in 2006 equals 5.66% and in 2011 it was 7.28% (Damodaran Online: Home Page for Aswath Damodaran, 2012).

Beta coefficient (*ß*) is a measure of volatility of a security or a portfolio, compared to the market as a whole (Brealey & Myers, 2003, p. 173). To calculate beta coefficient I have exported data for daily close prices of the company's shares and daily close market index values. I have used the data for a period from January 1 2004 to December 31 2006 to calculate ß for year 2006 and data for a period from January 1 2009 to December 31 2011 to calculate ß for year 2011. I have obtained data for Krka's share prices and Slovenian blue chip index (SBITOP) from Ljubljana Stock Exchange. The value of ß, obtained from these data, is

leveraged ß, which refers to the current level of the company's leverage. Therefore, from this data, first I have calculated unleveraged ß and then I have calculated ß for different levels of company's leverage, from 0% of debt capital to 90% of debt capital. The value of ß unleveraged for Krka in 2006 is 0.97 which means that Krka's share value increases for 0.97% when market value increases for 1% (in case company is all-equity financed) - it means that Krka's shares were less volatile than the market and therefore less risky than the market as a whole in 2006. The value of *ß* unleveraged for Krka in 2011 is 0.89 which means that Krka's shares increase for 0.89% when market as a whole increases for 1% and are therefore less volatile than the market. However, ß unleveraged for Krka in both years is close to 1, which is due to the fact that trading with Krka's shares represents the largest part of trading on the Ljubljana Stock Exchange and an important percentage of the SBITOP. When calculating ß we have to take into account that in order to get reliable information about ß, we have to observe data for longer period of time without major disturbances in the market. Since the purpose of this thesis is to compare data from the time of the crisis with data before the crisis began, we have to know that all the data for year 2011 are influenced heavily by the unstable times of a crisis.

When calculating *ß* I have used data for daily close prices of the company's shares and daily close market index values where I have used index that best presents market each company originates from. I could have used broader index, which covers larger than just a national market but I have decided to apply national indexes in order to gain local characteristics of the capital market.

As equity, I have used market capitalization of companies at the end of years 2006 and 2011. I have got the information by multiplying number of outstanding shares at the end of the year with share price at the stock exchange on the last working day in a year. As debt, I have used only data for total non-current liabilities of the company, obtained from the company's balance sheet. In calculations, I have also needed data for effective tax rate which I have calculated as a ratio between income tax and net profit before tax. I have obtained the necessary data from annual reports of the companies – consolidated income statement.

In calculations, as *Rf,* I have also used data for return on 10-year government bond of the country, a selected company comes from. I have needed this information in order to calculate a cost of debt of the company. The reason, why I have used a return on 10-year government bond of the country, an observed company comes from, and not a German one, lies in the assumption that each of these companies borrows funds at domestic market, in a country it comes from. On the other hand, to calculate a cost of equity, I have used return on 10-year German government bond as *Rf* since in this case, we are observing investors, who look at the European market as a whole, not specific countries within it, when deciding where to invest their funds. I would also like to point out that in case of Krka in year 2011 I have not used data for return on 10-year Slovene government bond from the end of the year, but I have calculated the average return for the entire year. I have done this because return on 10-year

Slovene government bond at the end of 2011 was extremely high due to specific situation in the country (temporarily without a government, early elections) and did not represent prevailing market conditions in 2011.

Using the data above I have calculated the cost of equity for Krka in years 2006 and 2011 at different levels of indebtedness of the company. Higher the level of indebtedness, higher the cost of equity since investors demand higher return on their investment because it is riskier.

In Table 3 and Table 6 in Appendixes values of the cost of debt for different levels of indebtedness for Krka in years 2006 and 2011 are presented, respectively. When calculating interest payments I have used circular reasoning. To calculate interest coverage ratio interest is needed, and vice versa, interest coverage ratio is needed to calculate interest. In order to overcome this burden I have assumed AAA rating when a company's level of indebtedness equals 10%. I have estimated the corresponding interest rate as a sum of Slovene *Rf* and a spread that belongs to rating AAA. The interest rate I have got was 4.25% in 2006 and 5.62% in 2011, respectively. Using this interest rate, I have calculated interest and interest coverage ratio. In the end I have checked if calculated interest coverage ratio fits into the allowed range for rating AAA. If it fits, rating remains AAA, as calculated. In case calculated interest coverage ratio is lower than it should be to correspond to rating AAA, we have to assume lower rating for the same level of indebtedness and repeat the whole process until the calculated interest coverage ratio and corresponding rating do not fit. I have done this for each level of indebtedness, from 10% to 90%, for both years examined (Damodaran, 2011, pp. 406–407).

Table 2: Optimal capital structure of Krka in 2006

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.97	3.95	5.66	9.43	3.20	9.43
10	1.05	3.95	5.66	9.89	3.20	9.22
20	1.15	3.95	5.66	10.46	3.47	9.06
30	1.28	3.95	5.66	11.20	3.69	8.95
40	1.46	3.95	5.66	12.18	5.39	9.47
50	1.70	3.95	5.66	13.56	8.97	11.26
60	2.06	3.95	5.66	15.63	11.98	13.44
70	2.67	3.95	5.66	19.07	11.98	14.11
80	3.89	3.95	5.66	25.95	11.98	14.78
90	7.54	3.95	5.66	46.61	11.98	15.44

Optimal capital structure for Krka in 2006 is 30% of debt and 70% of equity financing. However, the range within which WACC is still close to the minimum level goes from 20% of debt financing to 30% of debt financing. In 2011, the optimal capital structure of the company is with 100% equity financing but WACC is close to the minimum level to 20% debt and 80% equity financing. Optimal capital structure of Krka went towards 0% of debt

financing in 2011, which means that debt became relatively more expensive than equity comparing to the situation in 2006. In relative terms, debt became more expensive for several reasons; the most important reason is that return on 10-year Slovene government bond, which is used in calculations for cost of debt, increased due to the crisis that affected Slovenia rather strongly. Another reason is effective tax rate, which is lower in 2011 comparing to the data from 2006 and it causes less positive effects from interest tax shield. The calculations for optimal capital structure in years 2006 and 2011 can be seen in Table 2 and Table 3.

Krka's share of debt in its capital structure was 5.57% in 2006 and 7.64% in 2011. According to the data for optimal capital structure, we can see that the company is within the optimal range in 2011 and it could have obtained slightly more debt in 2006. However, even with this level of debt WACC has still been at a fairly low level.

Table 3: Optimal capital structure of Krka in 2011

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.89	1.83	7.28	8.28	4.57	8.28
10	0.97	1.83	7.28	8.87	4.57	8.44
20	1.07	1.83	7.28	9.59	4.57	8.59
30	1.20	1.83	7.28	10.53	5.10	8.90
40	1.37	1.83	7.28	11.78	5.39	9.22
50	1.61	1.83	7.28	13.53	5.39	9.46
60	1.97	1.83	7.28	16.16	8.93	11.82
70	2.57	1.83	7.28	20.53	9.54	12.84
80	3.77	1.83	7.28	29.28	11.17	14.79
90	7.38	1.83	7.28	55.54	11.17	15.60

5.2 ACINO HOLDING PLC.

Acino Holding Plc. (hereinafter: Acino) is a pharmaceutical company, based in Switzerland. It specializes in development, registration and production of pharmaceuticals. The company's operations focus on the peroral segment, which includes complex solid oral dosage forms (tablets and dry suspension) and on the parenteral segment, which provides transdermal therapeutic systems, and biodegradable and subcutaneous implants. Acino is a partner of different pharmaceutical companies worldwide and offers a range of services, such as supplies of finished in-house developed products, provides customized one-stop solutions from product development, registration, contract manufacturing, packaging, and logistics (About Acino, 2012; Stock Quotes & Company News, 2012).

Acino Group's headquarters are in Basle. The company is listed on the SIX Swiss Exchange. In February 2012, Acino has completed the acquisition of Mepha company. It has financed the acquisition through the issuance of shares from authorized capital, cash and cash equivalents, and a bank loan (About Acino, 2012; Investors & Media, 2012).

The company's vision is: "Acino Pharma – delivering health". They intend to reach it through (About Acino, 2012):

- sophisticated drug delivery technologies,
- own strong development and production capabilities,
- effective and value-added drugs to improve patients' quality of life,
- innovation, highest quality products and best-in-class services for patients, health care professionals and business partners worldwide,
- open communication, mutual respect, professionalism, effective decision making, and
- creativity and flexibility – serve customers with passion.

Before September 2008, Acino Holding's name was Schweizerhall Holding. At that time combined business units Cimex and Novosis and their parent company Schweizerhall started to operate under the new name Acino (EvaluatePharma – "Acino" – New Name for the Schweizerhall Group, 2012). That is the reason why the name of the company is different in the calculations of optimal capital structure of the company for year 2006 from year 2011.

5.2.1 OPTIMAL CAPITAL STRUCTURE

The value of ß unleveraged for Acino in 2006 is 0.15 which means that Acino's share value increases for 0.15% when market value increases for 1% (in case company is all-equity financed) – it means that Acino's shares were less volatile than the market and therefore less risky than the market as a whole in 2006. The value of ß unleveraged for Acino in 2011 is 0.52 which means that Acino's shares increase for 0.52% when market as a whole increases for 1% and are therefore less volatile than the market. The value of ß unleveraged increased significantly from 2006 to 2011 and consequently, investing in Acino's shares became riskier, even though it still remained to be about half less risky than the market as a whole.

As can be seen from Table 4 and Table 5, Acino's optimal capital structure in 2006 is 10% of debt capital and 90% of equity whereas in 2011 Acino has an optimal capital structure when it is 20% debt financed and 80% equity financed. WACC that corresponds to it equals 4.59% in 2006 and 4.70% in 2011. However, since WACC remains at a low level for more than just at the point where it reaches the minimum level, there exists a range within which it is still good for a company to have its capital structure. In 2006, a range where the company has low levels of cost of capital is from 0% of debt capital to 10% of debt capital and the range for 2011 is from 10% of debt capital to 30% of debt capital. In 2011, it is better for Acino if it finances itself with more debt than in 2006. It means that relatively debt is cheaper for a company in 2011 as it used to be in 2006. The major reason for that is R_{fCH} which decreased from 2.52% in 2006 to 0.66% in 2011 (Government Bonds yields, List by Country, 2012) and substantially lowers the cost of debt for a company. The reason why Rf_{CH} lowered to that extent from 2006 to 2011 lies in the fact that investing in Swiss government bonds in 2011 is far less risky than investing in most of other countries' bonds, which were severely hit by the

crisis. Another example of a significant decrease in the level of return on 10-year government bond, also used in this thesis, is Germany, which presents another safe haven for investors in these turbulent times. On the other hand, market risk premium increased from 2006 to 2011 because of the riskier environment due to the crisis and it increased the cost of equity.

I have obtained company data for the calculations from its annual reports. In 2006, data in annual report were stated in currency CHF whereas in 2011 they were stated in EUR. However, share prices and index values, used for ß calculations, were in CHF in both years. Since all the data, needed for the analysis are ratios, I have not converted currencies except for equity in 2011 in order for it to match the other data for this year. Exchange rate I have used in the calculations for December 30, 2011 equals 1.2156 CHF/EUR (ECB: Statistics, 2012).

Table 4: Optimal capital structure of Schweizerhall in 2006

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.15	3.95	4.91	4.68	2.55	4.68
10	0.16	3.95	4.91	4.76	3.13	4.59
20	0.18	3.95	4.91	4.85	12.89	6.46
30	0.21	3.95	4.91	4.96	12.89	7.34
40	0.24	3.95	4.91	5.12	12.89	8.23
50	0.28	3.95	4.91	5.34	20.00	12.67
60	0.35	3.95	4.91	5.66	20.00	14.26
70	0.46	3.95	4.91	6.21	20.00	15.86
80	0.68	3.95	4.91	7.30	20.00	17.46
90	1.35	3.95	4.91	10.56	20.00	19.05

Table 5: Optimal capital structure of Acino in 2011

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.52	1.83	6.00	4.96	1.08	4.96
10	0.57	1.83	6.00	5.25	1.08	4.83
20	0.63	1.83	6.00	5.61	1.08	4.70
30	0.71	1.83	6.00	6.07	1.90	4.82
40	0.81	1.83	6.00	6.68	9.16	7.67
50	0.95	1.83	6.00	7.54	9.16	8.35
60	1.17	1.83	6.00	8.82	9.16	9.03
70	1.52	1.83	6.00	10.97	9.16	9.71
80	2.24	1.83	6.00	15.26	9.16	10.38
90	4.38	1.83	6.00	28.12	9.16	11.06

Considering the actual data of the company, Acino has 24.51% of debt capital in 2006 and 6.17% of debt capital in 2011. According to the results of the analysis, Acino stands close to the optimal range of capital structure in 2011 but it had too high level of debt capital in 2006.

The company should have lowered its debt level in order to decrease its cost of capital, which in turn it did, considering the results in 2011.

5.3 RICHTER GEDEON PLC.

Richter Gedeon Plc. (hereinafter: Gedeon Richter) is a Hungarian pharmaceutical company, founded in 1901, which activities include research, development, production, and marketing of human finished drugs, active substances and intermediates. The company produces gynaecological, cardiovascular and gastroenterological products, antibiotics, antimicotics, over-the-counter medicines, and medicines for treatment of motor organs and central nervous system (Gedeon Richter today, 2012; Stock Quotes & Company News, 2012).

"Gedeon Richter's mission is to improve standards of healthcare by supplying modern and affordable products, and, through its business operations, to contribute to the growth of the Hungarian economy and help to boost the nation's competitiveness" (Gedeon Richter today, 2012).

The company is directly present in 30 countries, has manufacturing subsidiaries in 4 countries, 30 representative offices and 14 commercial subsidiaries and wholesalers. Through its own distribution network, its products are present in almost 100 countries in five continents around the world (Gedeon Richter today, 2012).

Gedeon Richter actively participates in education of young and talented specialists and therefore runs joint research programs with over 30 leading university faculties and academic research institutes in Hungary (Gedeon Richter today, 2012).

The company is listed on the Budapest Stock Exchange where I have also looked for the data, used in the analysis further.

5.3.1 OPTIMAL CAPITAL STRUCTURE

Rf, used in optimal capital structure calculations for Gedeon Richter is the same as it is for other four companies – return on 10-year German government bond as of December 29, 2006, and December 30, 2011. Market risk premium for Gedeon Richter is quite high due to relatively high Hungarian country risk premium, especially in 2011. It is due to the fact that Hungary was strongly hit by the world crisis.

Gedeon Richter's optimal capital structure in 2006 is 100% equity financing. However, since WACC does not start increasing sharply immediately, the optimal range of debt financing for a company is from 0% to 10% of debt financing. In 2011, it is optimal for a company to finance itself exclusively with equity. According to the results we can assume that obtaining a loan is highly expensive for Gedeon Richter both, in year 2006 and in 2011. The reason for

that is rather high Hungarian *Rf*, especially in 2011, when Hungary was severely hit by the crisis and it makes debt financing for Hungarian companies rather expensive. The results of the calculations are presented in Table 6 and Table 7.

Comparing the actual data of the company with the calculated ones we can see that in year 2006 Gedeon Richer's actual capital structure was optimal since the company had only 0.31% of debt financing. However, it was not true in year 2011 when the company financed itself with 12.65% of debt even though its optimal level would be close to 0% as well.

Effective tax rate for Gedeon Richter in both observed years is quite low due to corporate "tax heaven" in Hungary which means that interest tax shield is rather small and does not have an important effect on the cost of capital. It is another reason why Gedeon Richter does not have higher level of debt in its optimal capital structure.

Table 6: Optimal capital structure of Gedeon Richter in 2006

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.93	3.95	6.11	9.65	6.96	9.65
10	1.04	3.95	6.11	10.28	6.96	9.95
20	1.16	3.95	6.11	11.06	7.61	10.37
30	1.33	3.95	6.11	12.07	8.59	11.02
40	1.55	3.95	6.11	13.41	14.51	13.85
50	1.85	3.95	6.11	15.28	14.51	14.90
60	2.32	3.95	6.11	18.10	18.46	18.31
70	3.08	3.95	6.11	22.79	18.46	19.75
80	4.62	3.95	6.11	32.17	18.46	21.20
90	9.22	3.95	6.11	60.31	18.46	22.64

Table 7: Optimal capital structure of Gedeon Richter in 2011

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.63	1.83	9.60	7.88	10.52	7.88
10	0.70	1.83	9.60	8.55	11.02	8.79
20	0.79	1.83	9.60	9.39	11.52	9.81
30	0.90	1.83	9.60	10.46	15.36	11.93
40	1.05	1.83	9.60	11.90	16.61	13.78
50	1.26	1.83	9.60	13.91	18.61	16.26
60	1.57	1.83	9.60	16.93	19.35	18.38
70	2.10	1.83	9.60	21.95	20.35	20.83
80	3.14	1.83	9.60	32.01	20.35	22.68
90	6.29	1.83	9.60	62.17	20.35	24.53

Company's unleveraged ß decreased from year 2006 to 2011 from 0.93 to 0.63 which means that in 2006 Gedeon Richter was slightly less risky as the market as a whole but in 2011 it

became almost half less risky as the market. In case that market as a whole would increase for 1% Gedeon Richter would increase for only 0.63%. The same, only vice versa, would happen in case the entire market decreases. It is a good sign for the company since it means that it was not affected by the crisis as severely as the market as a whole.

5.4 HIKMA PHARMACEUTICALS PLC.

Hikma Pharmaceuticals Plc. (hereinafter: Hikma) is a pharmaceutical company, founded in 1978 in Amman, Jordan by the current Chairman, Mr. Samih Darwazah which develops, produces and markets generic and in-licensed pharmaceutical products in solid, semi-solid, liquid and injectable final dosage forms. It operates in branded, injectables and generics business segments. The company operates in more than 45 countries, mostly in the Middle East, North Africa, the United States, and Europe. In the beginning, its focus was on developing branded pharmaceuticals business across the Middle East and North Africa (i.e. MENA region), but in the early 1990s it acquired a generic pharmaceuticals business in the United States and started an injectable pharmaceutical operation in Portugal, which was a beginning of its continuous expansion (Stock Quotes & Company News, 2012; Who we are, 2012). Since December 2005, Hikma is listed on London Stock Exchange.

Hikma's mission is to improve people's lives. Their goal is to ensure patients with better access to high-quality, cost-effective medicines in key therapeutic areas through their products and with 633 pending approvals across their markets. Their vision is to build a company into a world class and leading specialty pharmaceutical company, which is present all over the world. Moreover, through organic growth and by acquisitions, they continue to develop the business and maintain high standards of ethics and responsibility (Who we are, 2012).

The strategy of the company is based on strengthening their leading position in the MENA region, on developing their global product range in growing therapeutic areas, on extending their reach and diversity through partnerships, on increasing the scale of their speciality injectables business, on leveraging their expertise and capacity in the US market, and on maintaining their world-class manufacturing capabilities (Who we are, 2012).

5.4.1 OPTIMAL CAPITAL STRUCTURE

Hikma would have an optimal capital structure in 2006 when it would be 100% equity financed. Since WACC is close to the minimum level for a wider range it would be optimal for a company to have wherever between 0% and 20% of debt financing. In 2011 the optimal capital structure of Hikma is at 0% of debt as well, with an allowed extension up to 20% of debt financing. From these results, which can also be seen in Table 8 and Table 9, we can see that the optimal capital structure of Hikma did not change between years 2006 and 2011. However, WACC lowered from 2006 to 2011 because cost of equity decreased in contrary to

cost of debt, which slightly increased. There are several possible explanations for a decrease in the cost of equity; the first one is decrease in *Rf* – return on 10-year German government bond, and the second one is a decrease in ß. Both, in year 2006 and in 2011, Hikma's shares were less risky to invest into than British market as a whole, but a riskiness of Hikma's shares even decreased comparing to the entire market in 2011. At this point, I would like to stress that Hikma is listed on London Stock Exchange since December 2005, which means that to calculate the value of ß in 2006 I have only had share price data for slightly more than a year. Since share price data are in GBP whereas other data, needed in calculations are in USD I have converted share price data into USD for the purpose of optimal capital structure calculations.

Table 8: Optimal capital structure of Hikma Pharmaceuticals in 2006

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.68	3.95	5.93	7.98	5.24	7.98
10	0.74	3.95	5.93	8.32	5.24	8.01
20	0.81	3.95	5.93	8.73	5.72	8.13
30	0.90	3.95	5.93	9.27	6.46	8.42
40	1.02	3.95	5.93	9.98	10.90	10.35
50	1.19	3.95	5.93	10.97	10.90	10.94
60	1.44	3.95	5.93	12.47	13.86	13.30
70	1.86	3.95	5.93	14.96	13.86	14.19
80	2.70	3.95	5.93	19.94	13.86	15.08
90	5.22	3.95	5.93	34.88	13.86	15.97

Table 9: Optimal capital structure of Hikma Pharmaceuticals in 2011

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.47	1.83	8.07	5.60	5.61	5.60
10	0.51	1.83	8.07	5.97	6.05	5.98
20	0.57	1.83	8.07	6.44	6.50	6.45
30	0.65	1.83	8.07	7.04	11.03	8.24
40	0.74	1.83	8.07	7.84	12.81	9.83
50	0.88	1.83	8.07	8.96	13.48	11.22
60	1.09	1.83	8.07	10.63	14.37	12.87
70	1.44	1.83	8.07	13.43	14.37	14.08
80	2.13	1.83	8.07	19.02	14.37	15.30
90	4.21	1.83	8.07	35.78	14.37	16.51

The actual capital structure data for Hikma is 2.58% of debt financing in 2006 and 17.01% of debt financing in 2011. Comparing the results to the optimal capital structure calculations we can see it stands within an optimal range.

When calculating optimal capital structure for Hikma, as *Rf*, used for the cost of debt calculations, and for market risk premium, I have not used data just for United Kingdom, but they were composed 50% from Jordan data and 50% from British data. The reason, why I have decided to do this, is the fact that Hikma is a company that originates from Jordan.

5.5 STADA ARZNEIMITTEL PLC.

Stada Arzneimittel Plc. (hereinafter: Stada) is a German pharmaceutical company which focuses on development and marketing of products with off-patent active pharmaceutical ingredients. Its core business segments are generics, and branded products, focusing on multisource products, accessible without active ingredient research. Marketing of generic drugs is done by the Group subsidiary, STADApharm LLC. Generics have presented 69% of the Group sales in financial year 2011 whereas branded products have presented 28% of the Group sales (About Stada, 2012; Stock Quotes & Company News, 2012).

Strategic success factors of the company are (About Stada, 2012):

- positioning in long-term growth markets,
- traditionally strong presence in Europe and continuous internationalization with a focus on Eastern Europe,
- extensive generics portfolio complemented by high-margin branded products business,
- functionally organized Group with close to market sales companies,
- successful product development with the "time and cheap to market" strategy,
- organic growth complemented by acquisitions with concentration on high-growth emerging markets and high-margin branded products segment,
- efficient cost management and further consistent implementation of the program "STADA – build the future" with the aim of strengthening the mid and long-term earnings potential.

Stada's mission statement is based on the term "all the best" and it states that the centre of Stada's activities is care for people's health and well-being. The company is represented by 54 sales companies in 33 countries in the world. The largest national market for Stada is Germany. Outside Europe, the company has 6 sales companies (Australia, China, Kazakhstan, Vietnam, the Philippines, and Thailand). Stada has been publicly listed company on the Deutsche Börse Plc. since 1997 (About Stada, 2012).

5.5.1 OPTIMAL CAPITAL STRUCTURE

In order to minimize its WACC Stada would have to have between 20% and 40% of debt in 2006 and between 0% and 20% of debt in 2011. An increase in company's ß means that company's securities were riskier in 2011 than in 2006 whereas in both years it was less risky than the market as a whole. In Table 10 and Table 11 can be seen data about optimal capital structure for Stada in 2006 and in 2011.

In 2006 Stada was 23.90% debt financed which is within the range of optimal capital structure whereas in 2011 it was 52.73% debt financed which exceeds the range of optimal capital structure. In 2011, Stada's debt consisted of bonds as well, which mature in April 2015. Its aggregate principal amount stands at 350 million EUR; its market value on December 30th, 2011 was 361.41 million EUR.

There is another fact about Stada that needs to be additionally explained. It is highly leveraged comparing to other firms in the industry and thus perceived as financially more risky which makes its borrowing more expensive as otherwise. According to this fact, cost of debt for Stada in 2011 should be significantly higher than in 2006. It is indeed higher, but not as much as one would expect. It is due to extremely high effective tax rate in 2011, which causes high interest tax shield that lowers the cost of debt of the company.

Table 10: Optimal capital structure of Stada Arzneimittel in 2006

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.52	3.95	4.91	6.52	2.74	6.52
10	0.56	3.95	4.91	6.71	2.74	6.31
20	0.61	3.95	4.91	6.93	2.96	6.14
30	0.67	3.95	4.91	7.23	3.15	6.00
40	0.75	3.95	4.91	7.62	3.79	6.09
50	0.86	3.95	4.91	8.16	7.61	7.89
60	1.03	3.95	4.91	8.98	10.16	9.69
70	1.30	3.95	4.91	10.35	10.16	10.22
80	1.86	3.95	4.91	13.09	10.16	10.74
90	3.53	3.95	4.91	21.29	10.16	11.27

Table 11: Optimal capital structure of Stada Arzneimittel in 2011

D/(D+E) (in %)	ßl	Rf (in %)	Rm-Rf (in %)	r_E (in %)	$r_D(1-t_{ef})$ (in %)	WACC (in %)
0	0.68	1.83	6.00	5.90	3.32	5.90
10	0.70	1.83	6.00	6.04	3.64	5.80
20	0.73	1.83	6.00	6.22	5.28	6.03
30	0.77	1.83	6.00	6.46	6.17	6.37
40	0.82	1.83	6.00	6.77	6.49	6.66
50	0.90	1.83	6.00	7.20	6.49	6.85
60	1.00	1.83	6.00	7.86	6.49	7.04
70	1.19	1.83	6.00	8.95	6.49	7.23
80	1.55	1.83	6.00	11.13	6.49	7.42
90	2.64	1.83	6.00	17.67	6.49	7.61

5.6 COMPARISON AMONG SELECTED COMPANIES

After completing the optimal capital structure calculations, we can see that generally, optimal capital structure of pharmaceutical companies includes low levels of debt. In this industry, it is necessary for companies to have high levels of free cash flow because they need large amount of cash in order to invest it in new production capacities to offset pricing pressures with larger sales volumes, and for research and development. As soon as the patent of the drug expires generic pharmaceutical companies have to enter the market with their own product since given price-erosion, which is typical for the industry, the first few months are crucial. Namely, as soon as generics launch their products into the market, due to the competition their price starts decreasing rapidly, especially in western markets. Therefore, it is crucial for a company to be one of the first players since in first few months after patent expiry price level decreases the most. It means that companies, which do not have enough resources to react quickly, will soon be overtaken. Therefore, as we can see, not only optimal capital structures, but also actual capital structures of selected companies consist of rather low levels of debt capital.

As we can see from the results of the analysis, except for Acino, optimal capital structure of other companies moved in favour of equity financing in year 2011, or remained at the same level. It is most probably due to the fact that debt financing became more expensive in the times of crisis, especially in Hungary and Slovenia, where Gedeon Richter and Krka come from, because return on 10-year government bond, which is a base for calculation of cost of debt, increased in these countries recently since they were severely hit by the crisis. On the other hand, return on 10-year government bond of Switzerland (Acino) and Germany (Stada) decreased from 2006 to 2011 due to the fact that investments in these countries' securities are seen to be the closest proxy to risk free investment, with low possibilities of default and present a place where to move one's investments from countries that have higher possibilities of default, especially in these critical times. Hikma presents a special case since it is a company, which originates from Jordan, but now has headquarters in London and is listed on London Stock Exchange, and therefore as its *Rf* I have taken return on 10-year British and Jordan government bond, each representing an equal part in *Rf*. However, Hikma's and Stada's optimal capital structures moved in favour of equity financing as well, despite the fact that their *Rf* decreased. In case of Hikma, the reason lies in the fact that the cost of equity for this company decreased in comparison to the cost of debt which slightly increased during the observation period due to lower effective tax rate. A decrease in unleveraged β can be one of the reasons for decreased cost of equity capital. At this point, I would like to stress that in order to get reliable information about β, observation period has to last for a longer period of time and the environment has to be stable. However, this assumption does not hold for results about β in 2011, when I have observed data in the period 2009–2011 when the times were rather turbulent. When observing and interpreting the data for year 2011 we have to always have in mind that the data were obtained in times of the crisis, of constant ups and downs in the world markets. Additionally to that, I would like to add that Hikma is listed on London

Stock Exchange only since December 2005. Therefore, I have used the daily data to calculate its ß in 2006 only for slightly more than a year comparing to other companies for which I have observed share price and index value data on a daily basis from January 2004 until December 2006. In case of Stada, in 2011 its cost of debt increased because a company is perceived to be financially riskier because it is highly leveraged relatively to other comparable companies.

6 EMPIRICAL RESULTS AND THE THEORY

MM theorem states that under the assumption about perfect capital markets, the value of the company and therefore the WACC as well are independent of its leverage, they remain the same despite different financing options. Even though debt is cheaper than equity, adding debt increases the risk of equity and therefore savings from debt are exactly offset by more expensive equity. When taxes are added to the theorem, debt financing becomes even cheaper due to interest tax shield and therefore it would be optimal for companies to finance themselves exclusively with debt, if there would not exist a possibility of default which prevents companies from taking excessive amount of debt into their financing mix.

However, MM theorem does not hold in reality for several reasons. First one is that assumption about perfect capital markets does not hold in reality. Therefore, a level of leverage does influence company's WACC and its value. The same as in the theory, also in reality debt is mostly cheaper than equity – in the thesis this is not the case only for Gedeon Richter and Hikma, both in 2011. The reason for higher cost of debt lies in high level of return on 10-year Hungarian government bond in 2011 in case of Gedeon Richter because a country is severely hit by a crisis. Additionally, it is influenced by low effective tax rate. In case of Hikma, this could be due to low level of unleveraged *ß* and low *Rf*, which lower the cost of equity on one side, and rather low level of effective tax rate, which has less effect on lowering the cost of debt on the other side. When debt levels are higher, debt becomes more expensive and also equity is more expensive because of the increase in risk of the investment. However, cheaper debt is not exactly offset by higher cost of equity and therefore WACC is not constant during different levels of a company's leverage. The interest tax shield is not the same for different companies in reality since it relies heavily on the level of profit – more profitable companies have more benefits from interest tax shield than less profitable companies, or even companies with a loss, which have absolutely no benefits from interest tax shield.

To implement MM theorem in the calculations, I could say that there is not one optimal level of leverage for all companies since each of the companies has its own optimal capital structure which differs even between different years.

Theory of the firm states that companies need certain level of debt financing since it helps to control the principal–agent problem. In case a company obtains certain level of debt managers

are forced to plan regular amounts of cash flow which is spent in order to repay a loan and therefore they cannot spend funds on possible less attractive investments. Payment of dividends could have the same effect but it can be problematic because companies can decide not to pay-out dividends.

This theory is the most applicable on companies with large amounts of free cash flows. Pharmaceutical companies are not significantly affected by principal-agent problem since they have to have high investment rates if they want to operate successfully, develop themselves and remain competitive. Drug prices start decreasing immediately after new generic drug enters the market. Therefore, a company should be fast placing a new drug on the shelves – immediately after patent protection expires and before price erosion sets in. Generic producers have to invest in production capacities to offset price erosion with higher quantities of produced and sold products, process development, new technology and advanced, innovative solutions. Additionally, when a patent protection for a new drug expires, many different companies place their generic products on the shelves. In order to have a competitive edge over other products, it has to have innovative characteristics, like more conventional pharmaceutical forms (like ODT tablets etc.). Due to the fact that generic pharmaceutical companies are forced to have high investments in order to maintain or improve their position in the market, they do not have large amounts of free cash flow. Principal-agent problem does not have a significant role in the case of generic pharmaceutical industry and therefore such companies also do not need certain amount of debt just to control free cash flow.

Pecking order theory states that, when companies need funds for new projects, they prefer retained earnings over debt and debt over equity. The basis for this structure is asymmetric information, which was explained into details in the section about pecking order theory. If a company uses retained earnings to finance its new project, there is no asymmetric information and this is the reason why it is the preferable financing option. In case company is issuing debt or equity there exists asymmetric information, in case of equity issuing even more than in case of debt issuing.

From the annual reports of selected companies, it is visible that Krka and Gedeon Richter increased their retained earnings during the whole period 2006-2011. The level of total liabilities just slightly increased for Krka from 2006 to 2011 whereas the company did not issue equity in this period of time. Gedeon Richter increased the level of total liabilities through entire period. However, the company also holds significant amount of cash and cash equivalents, which holds its net debt at minimal or even negative level. Gedeon Richter, as well, did not issue equity in period 2006–2011. During the observation period Acino lowered level of its total liabilities on average. The amount of equity remained unchanged except in April 2008 when Acino Holding took over registered shares from Dr. Wilfried Fischer, who is the founder of Novosis Plc., which was partly (49%) acquired by Schweizerhall (now Acino) in March 2006, and in April 2008, Schweizerhall has bought the remaining shares of the

company (Wer zu Wem Firmenverzeichnis, 2012). Besides that, company did not have any equity issuing in the period 2006–2011. On the other hand, Hikma and Stada were issuing equity during the observation period; Stada issued only small amount of share capital whereas Hikma issued larger amount of new equity. The changes in share price of these two companies will be discussed next, when explaining the market timing theory. In April 2010 Stada, as the only out of five selected companies, issued bonds as well, which mature in April 2015. One of the possible explanations for this decision could be the fact, that after mid-2007, when its share price reached the peak, its value decreased for about 40% and it would not be an optimal decision, to issue equity under these circumstances.

Market timing theory predicts that, in contrary to other theories, debt is not necessarily preferred financing option over equity. Companies issue such kind of securities which present better option at that time; in case debt issuing is cheaper, companies issue debt, and in case equity issuing is cheaper companies would prefer equity over debt (when managers believe it is overvalued, they can also raise equity just because it is a positive NPV project).

According to financial statements of selected companies, in years 2006 to 2011, only Hikma and Stada were issuing equity (Acino have just taken over the remaining part of Novosis, which presents a business unit in the company). Stada issued only small amount of new equity whereas Hikma issued larger amount of new equity. As already stated before, in a period 2006–2011, Stada's share price first increased and reached its peak in mid-2007, but after that it fell sharply and reached the bottom level in March 2009. After that, it increased again, but it has not reached the level from 2007. On the other hand, Hikma is issuing larger amounts of equity. Its share price increased on average during the observation period, reaching the bottom level at the end of 2008 and its peak value in the beginning of 2011, which could speak in favour of new equity issuing.

At this stage, I would like to point out one methodological issue, which appeared in the thesis. *Rf* is defined as an expected theoretical rate of return on a risk free investment which implies that it should be default risk free. However, in times of the crisis several countries face severe problems which reflect on the value of *Rf* as well. Therefore, country risk also has an impact on *Rf*. In some cases, it can occur that a company, which is well positioned within the market, is less risky and pays lower interest rate on its debt compared to the country it comes from. When calculating cost of debt for the purpose of the thesis, I have used *Rf* of the country a company originates from. Therefore, when interpreting data from the calculations in the thesis, one has to keep in mind that this methodological issue is incorporated in the results. Calculations in the thesis are based on the assumption that companies take a loan on a domestic market. Domestic banks know the company and its performance better and in case it is a company that operates successfully it can usually get a loan on the domestic market under better terms. In the future this is expected to become even more pronounced since foreign markets might become more closed due to the effects of the crisis.

CONCLUSION

Capital structure reveals information about company's way of financing its operations and growth. It is a mix of non-current liabilities (long-term debt) and equity. A decision about a company's capital structure is one of the essential financial decisions in a company, especially in a public limited company since these are under constant evaluations from the side of current and potential investors. The main goal of each company is to maximize its value which is directly dependent on WACC. Therefore, capital structure of each company has to be carefully planned in order to be within an optimal range.

There were numerous theoretical and empirical research done about the capital structure. Several different theories describe it from different angles, based on different background and different assumptions. In the master's thesis, I have presented five theories, which describe capital structure, which are Modigliani-Miller theorem, Trade-off theory, Theory of the firm, Pecking order theory, and Market timing theory. I have begun with the presentation of selected theories in order to get some basic information on decision making about optimal capital structure of the companies. Different theories present different aspects and background information for managers to help them decide for optimal capital structure, considering specific characteristics, valid for specific company, operating in a specific industry, and within specific environment.

MM theorem is a theoretical concept, which, in its primary meaning, argues that, under the assumption about perfect capital markets capital structure does not influence the value of the company. However, extended for taxes, taking into account interest tax shield, it speaks in favour of debt financing. If there would not exist disadvantages such as financial distress costs it would be optimal for a company to fully finance its projects with debt, according to MM theorem with corporate taxes. Trade-off theory is one of the basic theories about capital structure and embraces characteristics of some other theories. It denotes optimal capital structure equilibrium, which is at the point where marginal benefits of debt equal marginal costs of debt. Theory of the firm and pecking order theory speak in favour of debt financing over equity financing, first one because of the principal-agent problem and the second one due to asymmetric information issue. On the other hand, market timing theory does not take debt financing as a first choice but prefers the option, which is relatively cheaper at the moment; prefers debt financing when debt is relatively cheaper than equity and prefers equity financing when equity is relatively cheaper than debt.

An important part of the thesis has been dedicated to current financial and economic crisis since it is of a crucial meaning for the purpose and objective of the thesis. I have decided to compare optimal and actual capital structures of selected companies before the crisis began and at present when majority of the markets are deeply affected by it already, whether directly or indirectly. I have learned that high leverage influences operations of corporations

significantly since debt has become more expensive and riskier than in times before the crisis began. Particularly, I have observed situation in Slovenia as well and learned that the crisis emerged in Slovenia with a slight delay. Nevertheless, it affected it rather strongly. Many Slovene companies face financial problems due to their high leverage. Times of the crisis are also known to be rather unstable which affects my calculations about optimal capital structure. In order to get reliable results the condition is to observe the situation in a longer, stable period of time, which could not be met in this case. However, one of the main points of the thesis has been to include the effects of the crisis into the calculations.

The empirical part of the thesis has been done on the example of five generic pharmaceutical companies, namely Krka, Plc., Novo mesto, Acino Holding Plc., Richter Gedeon Plc., Hikma Pharmaceuticals Plc., and Stada Arzneimittel Plc. In order to explain and understand the results of calculations better it is important to know and understand the basic characteristics of generic pharmaceutical industry and what position its products take in times of the crisis. Pharmaceutical products are less affected in a crisis environment in comparison to some others since they present a commodity which demand is rather stable and not affected much by the environment. Nevertheless, also a generic pharmaceutical industry is affected by the crisis, especially through austerity measures, taken by several European countries which will have an influence in future sales growth in this industry as well.

I have been calculating optimal capital structure for selected companies in year 2006, before the beginning of current financial and economic crisis, and in year 2011, when effects of the crisis have already been felt intensively in most of the economies. Through the work, I have confirmed the hypothesis, set at the beginning of the thesis that optimal capital structure of selected European generic pharmaceutical companies has changed in favour of equity financing during the current economic and financial crisis. Namely, all calculated optimal capital structures, except for Acino, have changed in favour of equity financing or remained at a minimum level of debt financing in both observed years. These results were expected since in times of the crisis debt financing becomes relatively more expensive due to higher risk and higher demanded returns related to debt issuing. The reason why Acino's optimal capital structure has not moved in favour of equity financing in the observation period lies in the fact that it is a Swiss company and Switzerland is perceived to present a safe haven for investors in these critical times. It means that it is one of the rare countries investors believe it is rather riskless to invest in, which decreases *Rf* on its government bonds strongly. Along with Switzerland, Germany is perceived to present an investors' safe haven as well but Stada, a German company, included in the calculations, has not showed the same results as Acino since it presents a special case because it is highly leveraged and effects of its high leverage outweigh effects of *Rf* on German government bond. *Rf* on government bond of United Kingdom lowered from 2006 to 2011 as well but Hikma is another special case in the calculations since it is taken as a half British-half Jordan company which influences *Rf* and market risk premium as well. Another reason why its optimal capital structure has remained at the minimum level of debt financing is that its cost of equity lowered from 2006 to 2011

whereas its cost of debt increased; not cost of debt before taxes but cost of debt after taxes. In 2011, effective tax rate for Hikma lowered more than half times which caused that cost of debt slightly increased in year 2011, compared to year 2006.

Observing optimal and actual capital structures of selected generic pharmaceutical companies we can conclude that their debt levels are set at rather low level, in year 2006 as much as in year 2011. The reason for that lies in specific characteristics of pharmaceutical industry, in this case generic pharmaceutical industry. In order for these companies to remain competitive in the market they need to invest constantly into new production capacities, innovative solutions, etc. Therefore they need to have large amounts of cash flow always at their disposal and not bounded to debt repayment or refinancing. Since generic pharmaceutical companies do not have large amounts of free cash flow, which could be misused, they do not face principal-agent problem to such extent as some other industries do. Therefore, theory of the firm is not the one that best describes the current conditions related to optimal capital structure within that industry. Taking into consideration that generally companies within this industry finance their projects with equity and that during the crisis optimal capital structure of these companies moved even further towards equity financing, I would say that market timing theory describes best what is happening in that industry. Namely, market timing theory states that companies prefer equity financing when it is perceived to be relatively cheaper than debt financing which is definitely true in this case. Calculated costs of equity capital have decreased for all selected companies, except for Acino, in observation period, and meanwhile costs of debt capital have increased.

To conclude, I confirm the hypothesis that optimal capital structure of selected European generic pharmaceutical companies has changed in favour of equity financing during the current economic and financial crisis. Market timing theory would be the most applicable theory to the current conditions in the market and special characteristics of the industry.

POVZETEK

Pod pojmom kapitalska struktura razumemo različne vire, ki jih podjetja uporabljajo za financiranje svojih projektov. V splošnem je kapitalska struktura podjetja sestavljena iz lastniškega in dolžniškega kapitala (Berk & DeMarzo, 2011, str. 451–454). Optimalna struktura kapitala je takšno razmerje med lastniškim in dolžniškim kapitalom, ki minimizira tehtano aritmetično povprečje stroškov kapitala (v nadaljevanju: WACC) podjetja in s tem maksimira njegovo vrednost. Maksimiranje vrednosti podjetja pa je eden od osnovnih ciljev vsakega podjetja, kajti s tem se maksimirajo sredstva, ki so v lasti deležnikov podjetja (delničarjev in upnikov) (Berk & DeMarzo, 2011, str. 266).

Namen magistrskega dela je predstaviti trenutne ekonomske in finančne razmere na trgu ter raziskati, ali in do katere mere ekonomska in finančna kriza vpliva na optimalno strukturo kapitala izbranih generičnih farmacevtskih podjetij (Krka, d.d., Novo mesto, Acino Holding d.d., Richter Gedeon d.d., Hikma Pharmaceuticals d.d. in Stada Arzneimittel d.d.). Dobljene rezultate najprej primerjam na časovni ravni (pred pričetkom aktualne ekonomske in finančne krize ter v obdobju krize) za vsako posamično podjetje ter nato še med podjetji.

Cilj magistrskega dela je na podlagi teoretičnih dognanj in lastnih izračunov ugotoviti, kakšna je optimalna struktura kapitala izbranih generičnih farmacevtskih podjetij v letih 2006 in 2011 ter oceniti, kakšen je pri tem vpliv finančne krize, zato primerjam stanje leta 2011 s stanjem iz leta 2006. Razlog za uporabo podatkov iz leta 2006 je v tem, da le-ti odražajo stanje, kot je bilo pred pričetkom krize. Drugi cilj magistrskega dela pa je, na podlagi preučevanja izračunanih rezultatov in teoretičnih osnov ugotoviti, ali in v kolikšni meri se empirični rezultati ujemajo s teoretičnimi dognanji.

Hipoteza, ki jo skušam skozi magistrsko delo potrditi ali ovreči, se glasi: »Optimalna struktura kapitala izbranih evropskih generičnih farmacevtskih podjetij se je pomaknila v korist lastniškega financiranja v obdobju aktualne ekonomske in finančne krize.«

V teoretičnem delu magistrskega dela uporabljam različne raziskovalne metode. Osnovna metoda, ki jo uporabljam, je splošna raziskovalna metoda spoznavnega procesa, s pomočjo katere zbiram podatke, informacije in dejstva o raziskovalnem problemu. Metoda deskripcije je uporabljena za opis dejstev in procesov, povezanih z raziskovalnim problemom. Poleg teh dveh metod je v teoretičnem delu uporabljena tudi metoda kompilacije, na podlagi katere povzamem spoznanja, opazovanja in stališča nekaterih avtorjev. V praktičnem delu pa je uporabljena deduktivna metoda – teoretična spoznanja iz literature so uporabljena na primerih podjetij, ter statistična metoda analize sekundarnega vira podatkov – analiza podatkov, pridobljenih iz letnih poslovnih poročil podjetij.

1 TEORETIČNA OSNOVA

Optimalna struktura kapitala je eden izmed teoretično najbolj raziskanih konceptov na področju poslovnih financ. Obstaja več različnih teorij, ki preučujejo in opisujejo tematiko z različnih vidikov. V magistrskem delu predstavljam le nekaj izmed teorij, in sicer Modigliani-Millerjev teorem, teorijo glavnega toka, teorijo podjetja, teorijo vrstnega reda in teorijo tempiranja trga.

Modigliani-Millerjev teorem (v nadaljevanju: MM teorem) predstavlja osnovo moderni teoriji kapitalske strukture. Podlaga za teorem je predpostavka o popolnem trgu kapitala, na podlagi katere na vrednost podjetja ne vpliva način financiranja le-tega, temveč je enaka tržni vrednosti denarnih tokov, generiranih na osnovi sredstev:

$$V_U = V_L \tag{1}$$

Dividendna politika podjetja prav tako ne vpliva na njegovo vrednost. Tako lahko MM teorem imenujemo tudi načelo irelevantnosti kapitalske strukture (Berk & DeMarzo, 2011, str. 455; Graham, 2003, str. 3; Modigliani & Miller, 1958, str. 268; Miller & Modigliani, 1961, str. 429).

MM teorem navaja, da je strošek lastniškega kapitala podjetja, ki ima v svoji strukturi tudi dolžniški kapital, linearna funkcija finančnega vzvoda; strošek lastniškega kapitala narašča sorazmerno z razmerjem med dolžniškim in lastniškim kapitalom. Razlog za to je dejstvo, da je lastniški kapital podjetja z višjim deležem dolžniškega kapitala bolj tvegan kot v podjetju z nižjim deležem dolžniškega kapitala (Berk & DeMarzo, 2011, str. 461):

$$r_E = r_U + \frac{D}{E}(r_U - r_D) \tag{2}$$

Managerji torej ne morejo spremeniti vrednosti podjetja s preoblikovanjem njegove kapitalske strukture. Vrednost in WACC podjetja sta neodvisna od deleža dolžniškega kapitala v kapitalski strukturi podjetja (Ross, Westerfield & Jaffe, 2002, str. 405).

Upoštevajoč davke, vrednost podjetja narašča z naraščajočim deležem dolžniškega kapitala podjetja, in sicer v vrednosti davčnega ščita. Del denarnih tokov, namenjen delničarjem, je namreč predhodno obdavčen, medtem ko je del, namenjen plačilu obresti na dolg, neobdavčen. Zato ima podjetje prihranke, imenovane davčni ščit (Ross, 1977, str. 24; Ross, Westerfield & Jaffe, 2002, str. 408).

V primeru, da ima podjetje v svoji kapitalski strukturi preveč dolžniškega kapitala, lahko to povzroči stečaj podjetja. MM teorem pravi, da sam stečaj ne vpliva na vrednost podjetja, kajti povzroči samo premik lastništva od delničarjev k upnikom, pri čemer se kumulativna

vrednost podjetja ne spremeni (Berk & DeMarzo, 2011, str. 510–512). Vendar pa v realnosti to ne drži, in sicer zaradi obstoja posrednih in neposrednih stroškov stečaja (predpostavka o popolnem trgu kapitala ni izpolnjena), zaradi katerih je le-ta finančno zahteven proces (DeAngelo & Masulis, 1980, str. 3–4).

MM teorem pod predpostavko o popolnem trgu kapitala pravi, da se vrednost podjetja ne spremeni, čeprav spreminjamo delež lastniškega in delež dolžniškega kapitala. Vendar pa se situacija spremeni ob upoštevanju koristi (davčni ščit) in stroškov dolžniškega financiranja podjetja (stroški finančne stiske). Teorija glavnega toka meri koristi davčnega ščita in stroške finančne stiske v primeru, da je podjetje poleg lastniškega financirano tudi z dolžniškim kapitalom, lahko pa jo razširimo še za stroške in koristi agentov (Berk & DeMarzo, 2011, str. 455, 520, 532):

$$\begin{aligned} V_L = V_U + PV\ (Davčni\ ščit) - PV\ (Stroški\ finančne\ stiske) - \\ -PV\ (Stroški\ agentov\ pri\ dolžniškem\ financiranju\ podjetja) + \\ +PV\ (Koristi\ agentov\ pri\ dolžniškem\ financiranju\ podjetja) \end{aligned} \quad (3)$$

Teorija agenta pravi, da lahko udeležence v podjetju razdelimo na dve interesni skupini, in sicer na agente (managerje) in principale (lastnike). Principali (lastniki) pooblastijo agente (managerje), da opravljajo določene funkcije v njihovem imenu. Vendar pa je potrebno upoštevati dejstvo, da poskuša vsaka interesna skupina maksimirati svojo koristnost, kar pomeni, da managerji ne delujejo vedno v korist lastnikov podjetja. Z namenom zmanjšanja razlik med interesi managerjev in lastnikov slednji uporabijo vrsto spodbud, ki bi managerje odvrnile od dejanj, škodljivih lastnikom podjetja. Tako nastanejo stroški agentov, ki so vsota izdatkov za nadzor, izdatkov za vezavo (denarne in nedenarne nagrade) ter preostale izgube (Jensen & Meckling, 1976, str. 5–6).

Naloga managerjev je sprejemanje odločitev, ki povišujejo vrednost podjetja. Vendar pa lahko pride v primeru, ko je podjetje financirano tudi z dolžniškim kapitalom, do konflikta interesov med delničarji in upniki, kadar imajo investicijske odločitve različne posledice za vrednost dolga in vrednost lastniškega kapitala. Najpogosteje se ta konflikt pojavi, kadar je delež dolžniškega financiranja podjetja relativno visok in je posledično tveganje za nastanek finančne stiske podjetja visoko. Takrat lahko manager sprejema odločitve, ki koristijo delničarjem in škodujejo upnikom podjetja. Stroški agentov pri dolžniškem financiranju podjetja so lahko sledeči: problem substitucije sredstev, problem prenizkega investiranja, dolžniške zaveze itd. (Berk & DeMarzo, 2011, str. 523–527).

Dolg predstavlja pomemben del kapitalske strukture podjetja tudi zato, ker pripomore k učinkovitosti organizacije in dela managerjev. Kadar ima podjetje veliko prostih denarnih tokov, se lahko managerji obvežejo, da bodo delničarjem izplačali višje dividende, vendar pa tega ob koncu obdobja nujno ne storijo. V primeru, da je podjetje zadolženo, pa je manager primoran del prostih denarnih tokov nameniti poplačilu glavnice dolga in obresti, če ne želi,

da se podjetje znajde v finančni stiski in posledično lahko tudi v stečaju. Dolg v tem primeru predstavlja varnostni mehanizem, da se prosti denarni tok ne nameni za manj donosne projekte (Jensen, 1986, str. 324; Harris & Raviv, 1991, str. 300).

V primeru, ko je manager podjetja tudi njegov delničar, ga dejstvo, da obdrži enak delež lastništva v podjetju, vzpodbuja k sprejemanju odločitev, ki so v dobro podjetja. V kolikor se podjetje namreč zadolži in tako pridobi nova sredstva za poslovanje, namesto da bi izdalo nove delnice, to pomeni, da relativni delež lastništva obstoječih delničarjev ostane enak, v primeru izdaje novih delnic pa bi se obstoječi delež lastniškega kapitala relativno gledano zmanjšal (Berk & DeMarzo, 2011, str. 528–529).

Osnovo teoriji vrstnega reda predstavljajo tri vrste financiranja v podjetju – zadržani čisti dobiček, dolžniški in lastniški kapital. Zaradi problema negativne selekcije podjetja dajejo prednost notranjemu pred zunanjim financiranjem. Problem negativne selekcije se pojavi kot posledica asimetričnih informacij (Frank & Goyal, 2003, str. 218–220; Mishkin, 2010, str. 41).

Zadržani čisti dobiček je najpogosteje uporabljen za financiranje novih projektov, ker ni izpostavljen problemu negativne selekcije. Naslednja izbrana možnost je dolžniško financiranje projektov in zadnja izbrana možnost je lastniško financiranje novih projektov z novo izdajo delnic, kajti tu je problem negativne selekcije največji (Frank & Goyal, 2003, str. 218–220; Myers, 1984, str. 581–582). Ob novi izdaji delnic se njihova cena praviloma zniža, zato je eden izmed načinov, kako se podjetja pred tem zaščitijo, izdaja delnic takrat, ko so asimetrične informacije najmanjše, to pa je takoj po objavi rezultatov poslovanja podjetja (Myers & Majluf, 1984, str. 219–220).

Managerji občasno dojemajo vrednostne papirje podjetja kot napačno ovrednotene s strani trga. Ob upoštevanju teorije tempiranja trga se podjetja odločijo za izdajo novih delnic kadar menijo, da je relativni strošek lastniškega kapitala v primerjavi z dolgom nizek, in obratno, odločijo se za financiranje podjetja z dolgom, kadar je strošek dolga nizek v primerjavi s stroškom lastniškega kapitala. Teorija tempiranja trga razlaga, da lastniški kapital ni nujno dražji kot dolžniški kapital. Izdaja novih delnic torej ni tako redek pojav kot predvidevajo nekatere druge teorije, saj včasih podjetja izdajo nove delnice izključno zaradi pozitivne neto sedanje vrednosti izdaje, čeprav podjetje še ne čuti potrebe po novih finančnih sredstvih (Huang & Ritter, 2004, str. 3). Če povzamemo, odločitev podjetja o izdaji novih delnic je odvisna od časovnega gibanja stroška lastniškega kapitala (Huang & Ritter, 2004, str. 27–28). Upoštevajoč teorijo tempiranja trga, optimalna struktura kapitala ne obstaja, ampak se finančne odločitve na podlagi tempiranja trga skozi določeno obdobje akumulirajo v kapitalsko strukturo podjetja (Baker & Wurgler, 2002, str. 29).

2 FINANČNA IN EKONOMSKA KRIZA

Pred pričetkom finančne krize so bile obrestne mere na rekordno nizkih ravneh. Glavni razlogi za to so bili strah Fed-a pred deflacijo po poku internetnega balona, obdobje velike zmernosti je bilo zaznamovano z nizkimi in stabilnimi obrestnimi merami, azijske države pa so kupovale ameriške vrednostne papirje, da bi tako zaščitile izvozu prijazne ravni deviznih tečajev. Tudi povpraševanje po nepremičninah in investicije vanje so bile naraščajoče. Pred letom 2000 so kredit lahko dobili le zaupanja vredni izposojevalci. Banke so veliko pozornosti namenile izbiranju in kasneje nadzorovanju dolga, katerega so obdržale v svojem portfelju do dospetja. Pred nedavnim pa so banke začele z listinjenjem dolgov, kar pomeni, da so prenesle kreditno tveganje posojil in hipotek na druge investitorje. Listinjenje je proces, pri katerem se nelikvidna finančna sredstva, kot so hipoteke, posojila za avtomobile, dolgovi na kreditnih karticah itd., pretvori v tržne vrednostne papirje (Mishkin, 2010, str. 207–210; Rupnik & Berk, 2009, str. 52).

Ob pričetku krize na trgu nepremičnin se je pojavil problem agentov v povezavi z modelom »ustvari in prenesi«, kajti posojilojemalci niso želeli razkriti informacij o svoji sposobnosti poplačila dolgov, komercialne in investicijske banke ter ratinške agencije pa niso imele interesa oceniti dejanske kvalitete vrednostnih papirjev. Ob poku nepremičninskega balona pa se je močno povišala negotovost, kajti dejanska tveganja, povezana s strukturiranimi produkti, so bila prepoznana, ratinške agencije pa so v določenih primerih radikalno znižale njihove ratinge. To pa je povzročilo tudi padec zaupanja v ratinške agencije. Pojavile so se težave z likvidnostjo, solventnostjo, na trgu so začele posredovati centralne banke, vlade pa so ponudile državno pomoč (Mishkin, 2010, str. 208–211; Rupnik & Berk, 2009, str. 51).

Pred pričetkom finančne krize so nefinančna podjetja v evroobmočju nakopičila veliko količino dolgov, katero so nato začela postopoma zmanjševati. Med krizo se je zaradi zmanjšane ekonomske aktivnosti zmanjšala tudi potreba podjetij po zunanjem financiranju. Kljub temu pa je raven dolgov ostala na rekordno visokih ravneh. Podjetja v različnih industrijah in različnih državah evroobmočja so v povprečju različno zadolžena. Razlog za to je deloma v višini dolgov, ki so jih podjetja imela pred pričetkom krize, pomembno pa je tudi, kako hitro podjetja poplačujejo svoje dolgove in s tem zmanjšujejo stopnjo zadolženosti. Čeprav so podjetja s poplačilom dela dolgov zmanjšala svojo izpostavljenost, pa so predvsem zaradi tveganj, povezanih z višjimi stroški dolžniškega financiranja, še vedno ranljiva (European Central Bank, 2012, str. 103).

Kot sem že omenila, je stopnja zadolženosti podjetja odvisna tudi od industrije, znotraj katere posluje. Podjetja v industrijah, ki rastejo, kot je tudi farmacevtska industrija, imajo manj dolgov in več denarnih rezerv kot na primer podjetja v avtomobilski industriji, ki so bolj zadolžena (Berk & DeMarzo, 2011, str. 495–496).

2.1 AKTUALNE RAZMERE NA SLOVENSKEM TRGU

Podjetja v Sloveniji se soočajo s težavami, ko želijo zaprositi za posojilo, kajti banke zmanjšujejo obseg kreditov, in sicer zaradi prezadolženosti slovenskih podjetij, prav tako pa tudi zaradi nizke kapitalske ustreznosti slovenskega bančnega sistema. Razlike v obrestnih merah, danih s strani slovenskih bank, in s strani bank evroobmočja, predstavljajo dodatno tveganje v povezavi z nizko kreditno aktivnostjo v Sloveniji. Povprečna obrestna mera na posojila podjetjem v Sloveniji v vrednosti do 1 milijona EUR je enaka 6%, medtem ko je le-ta v evroobmočju na ravni 4%, kar pomeni, da je dolžniško financiranje bistveno dražje za slovenska podjetja. Ker so le-ta v Sloveniji relativno visoko zadolžena, so primorana nameniti znaten del denarnih tokov poplačilu dolga, kar jim onemogoča investicije, ki bi pospešile njihovo rast in jim omogočile višjo konkurenčnost na trgu (Košak et al., 2011, str. vii; Banka Slovenije, 2012, str. 4).

V začetku leta 2011 se je slovensko gospodarstvo soočilo z drugim padcem od pričetka ekonomske in finančne krize. Glavne težave, s katerimi se sooča slovenski bančni sistem, so slaba posojila, nizek kapital in otežen dostop do novih finančnih virov. V preteklosti so slovenske banke pospešeno pridobivale sredstva s tujimi medbančnimi krediti in manj z domačimi depoziti. Vendar pa je sedaj dostop do tujih finančnih virov zaradi znižanja ratinga otežen, kar sili banke k pridobivanju sredstev od domačih varčevalcev (Košak et al., 2011, str. vii–viii, 1).

Guverner Banke Slovenije je v intervjuju dejal, da v Sloveniji ni kreditnega krča, obstajajo samo podjetja, ki niso sposobna pridobiti posojil, medtem ko za zdrava podjetja to ni težava. Po besedah Sibila Svilana se v Sloveniji soočamo z lastniškim krčem, kar pomeni, da obstajajo podjetja, ki želijo nove projekte financirati izključno z dolgom, medtem ko vanj ne vložijo nič lastniškega kapitala. Seveda je to slab znak, saj v primeru, da lastniki podjetja sami ne verjamejo v uspeh projekta in to pokažejo s sofinanciranjem le-tega, tudi banke ne morejo prispevati vseh sredstev (Jenko, 2012, str. 7).

3 GENERIČNA FARMACEVTSKA INDUSTRIJA

Farmacevtska industrija je sestavljena iz dveh vrst podjetij – originatorji ali inovatorji in generiki. Generična farmacevtska podjetja razvijajo že znane aktivne učinkovine, kar pomeni, da je proces cenovno in časovno manj zahteven. Zaradi tega je tudi cena generičnega zdravila nižja od zdravila originatorja. S patentom je določeno, kdaj lahko generična farmacevtska podjetja pričnejo s proizvodnjo in prodajo določenega zdravila. Določeno s strani ameriške Agencije za hrano in zdravila (FDA) morajo biti generična zdravila enaka originalnim v doziranju, moči, načinu uporabe, varnosti, učinkovitosti in namembnosti zdravila (Sommerfeld & Schiffer, 2010, str. 11–12).

Generična farmacevtska industrija igra pomembno vlogo v evropskem zdravstvenem sistemu,

kajti s svojim prispevkom k varčevanju in omogočanju dostopa do zdravil širši populaciji pomembno izboljšuje kvaliteto le-tega v regiji. Brez njihove prisotnosti bi se vlade in plačniki soočali z velikimi težavami pri obvladovanju povečanega povpraševanja po zdravilih (Sheppard, b.l., str. 14).

Tržna vrednost farmacevtske industrije (originalna in generična zdravila skupaj) znaša približno 875 milijard USD, njena pričakovana rast v prihodnjih petih letih pa znaša od 3% do 6% letno. Tržna vrednost generične farmacevtske industrije predstavlja približno šestino vrednosti celotne farmacevtske industrije (Krka, Plc., Novo mesto, 2011, str. 16).

V magistrski nalogi predstavim pet evropskih generičnih farmacevtskih podjetij in izračunam njihovo optimalno strukturo kapitala v letih 2006 in 2011 ter skušam ugotoviti, kako trenutne ekonomske in finančne razmere na trgu vplivajo na njihovo kapitalsko strukturo.

4 OPTIMALNA STRUKTURA KAPITALA

Optimalna struktura kapitala podjetja je v točki, kjer sta dolžniški in lastniški kapital v takšnem razmerju, da je WACC minimalen. To pa pomeni, da je v tej točki vrednost podjetja maksimalna, kar je eden izmed osnovnih ciljev vsakega podjetja, saj pomeni največjo vrednost sredstev v rokah njegovih investitorjev (delničarjev in upnikov).

Podjetja financirajo svoje projekte z lastniškim in dolžniškim kapitalom. Najpogostejša oblika lastniškega kapitala so navadne delnice, manj pogosta oblika pa so prednostne delnice. Dolžniški kapital podjetje pridobi na podlagi posojila, lahko pa se odloči tudi za izdajo obveznic, kar sicer ni tako pogost pojav. Različni načini financiranja podjetja vplivajo na njegov WACC, in sicer preko kapitalske strukture in stroškov vsakega izmed posameznih finančnih instrumentov. V magistrskem delu pri izračunih uporabljam WACC z davki, kajti obresti zmanjšujejo vrednost le-teh (Brealey & Myers, 2003, str. 524-525):

$$WACC = \frac{E}{D+E} r_E + \frac{D}{D+E} r_D (1 - t_C) \qquad (4)$$

5 IZBRANA GENERIČNA FARMACEVTSKA PODJETJA

V tem poglavju so predstavljena izbrana generična farmacevtska podjetja, za katera je izračunana optimalna struktura kapitala, nato pa je narejena tudi primerjava med njimi. Izbrala sem pet podjetij, ki so primerljiva po velikosti, pravnoorganizacijski obliki (vsa so delniške družbe) ter geografski legi sedeža družbe. Podjetja, obravnavana v delu, so Krka, d.d., Novo mesto, Acino Holding d.d., Richter Gedeon d.d., Hikma Pharmaceuticals d.d. in Stada Arzneimittel d.d.)

5.1 KRKA, D.D., NOVO MESTO

Krka, d.d., Novo mesto (v nadaljevanju: Krka) je slovensko generično farmacevtsko podjetje, ustanovljeno leta 1954 kot farmacevtski laboratorij. Podjetje proizvaja in prodaja zdravila na recept, ki predstavljajo največji delež prodaje, ter izdelke brez recepta in veterinarske izdelke. Poleg tega pa se Krka ukvarja tudi z zdraviliško-turistično dejavnostjo. Podjetje razvija zdravila na štirih glavnih področjih, ki pokrivajo najpogostejše bolezni sodobnega časa; bolezni srca in ožilja, prebavil in presnove, okužb ter bolezni osrednjega živčevja (About Krka, 2012).

Krka prodaja svoje izdelke po vsem svetu, v več kot 70 različnih držav. Prodaja je razdeljena na pet regij: Slovenija, Jugovzhodna Evropa, Vzhodna Evropa, Srednja Evropa ter Zahodna Evropa in čezmorska tržišča. Proizvodne kapacitete podjetja so locirane v Sloveniji, Poljski, Rusiji, Hrvaški in Nemčiji, medtem ko se druge odvisne družbe in predstavništva v tujini ukvarjajo predvsem s trženjem in/ali prodajo izdelkov (About Krka, 2012).

Optimalna struktura kapitala Krke v letu 2006 je v točki, kjer je podjetje financirano s 30% dolžniškega in 70% lastniškega kapitala. Razpon, v katerem je WACC še blizu minimalne vrednosti, pa sega od 20% do 30% financiranja z dolžniškim kapitalom. V letu 2011 je optimalna struktura kapitala v točki, kjer je podjetje financirano izključno z lastniškim kapitalom, vendar pa meja, do katere je WACC blizu minimuma, sega do 20% dolžniškega in 80% lastniškega kapitala. Optimalna struktura kapitala se je v letu 2011 pomaknila v korist financiranja z lastniškim kapitalom, kar pomeni, da je postal dolg relativno gledano dražji kot lastniški kapital v primerjavi z letom 2006. Najpomembnejši razlog za to pa je donos do dospetja 10-letne slovenske obveznice, ki se je v času krize precej povišal. Poleg tega pa na rezultat vpliva tudi efektivna davčna stopnja, ki je v letu 2011 nižja kot v letu 2006, kar pomeni manj pozitivnih učinkov na podlagi davčnega ščita.

Dejanski delež dolga v Krkini kapitalski strukturi je v letu 2006 znašal 5,57% in 7,64% v letu 2011. Iz podatkov je razvidno, da se podjetje v letu 2011 nahaja znotraj razpona optimalne strukture kapitala, v letu 2006 pa bi imelo v svojem portfelju lahko malenkost višji del dolga, vendar tudi ta raven zagotavlja, da se WACC podjetja nahajajo na relativno nizki ravni.

5.2 ACINO HOLDING D.D.

Acino Holding d.d. (v nadaljevanju: Acino) je švicarsko farmacevtsko podjetje, specializirano za razvoj, registracijo in proizvodnjo farmacevtskih izdelkov. Podjetje se osredotoča na poslovanje v okviru peroralnega in parenteralnega segmenta. Sedež podjetja je v Baslu (About Acino, 2012; Stock Quotes & Company News, 2012).

V letu 2006 je optimalni razpon v strukturi kapitala podjetja od 0% do 10% dolžniškega financiranja, medtem ko je ta razpon v letu 2011 od 10% do 30% dolžniškega kapitala. V letu

2011 se je optimalna struktura kapitala pomaknila v korist dolžniškega financiranja, kar pomeni, da je postal dolg relativno cenejši kot lastniški kapital. Glavni razlog za to lahko pripišemo švicarski netvegani obrestni meri, ki je bila leta 2011 precej nižja kot leta 2006, in sicer zato, ker so v letu 2011 investitorji dojemali Švico kot eno redkih držav, v katero je varno investirati, saj je netvegana obrestna mera na državne obveznice večine ostalih držav v obdobju krize precej narasla. Na drugi strani pa se je strošek lastniškega kapitala v letu 2011 glede na leto 2006 povišal zaradi povišane tržne premije za tveganje, na povišanje katere je vplivalo bolj tvegano okolje v času krize.

Na podlagi dejanskih podatkov o strukturi kapitala podjetja (24,51% dolžniškega kapitala v letu 2006 in 6,17% dolžniškega kapitala v letu 2011) lahko rečemo, da se podjetje nahaja blizu optimalnega razpona v letu 2011, medtem ko je imelo v letu 2006 višjo raven dolžniškega financiranja od optimalne. Vendar pa je iz rezultatov razvidno, da je podjetje delež dolžniškega kapitala v opazovanem obdobju zmanjšalo, saj je bil delež le-tega v letu 2011 bistveno nižji kot v letu 2006.

5.3 RICHTER GEDEON D.D.

Richter Gedeon d.d. (v nadaljevanju: Gedeon Richter) je madžarsko farmacevtsko podjetje, ustanovljeno leta 1901. Ukvarjajo se z raziskavami, razvojem, proizvodnjo in trženjem zdravil za humano uporabo, aktivnih učinkovin in polizdelkov. Podjetje proizvaja izdelke za ginekološko, kardiovaskularno in gastroenterološko uporabo, antibiotike, antimikotike, izdelke brez recepta ter zdravila za zdravljenje motornih organov in centralnega živčnega sistema (Gedeon Richter today, 2012; Stock Quotes & Company News, 2012).

Optimalna struktura kapitala podjetja Gedeon Richter v letu 2006 je 0-odstotno do 10-odstotno financiranje z dolžniškim kapitalom, medtem ko je v letu 2011 optimalno 100-odstotno financiranje z lastniškim kapitalom. Dolg v kapitalski strukturi je za Gedeon Richter drag v obeh opazovanih letih, za kar najdemo razlog v madžarski netvegani obrestni meri, ki je precej visoka, predvsem v letu 2011, ko se je na madžarskem trgu močno poznal vpliv krize. Gedeon Richter ima v obeh opazovanih letih precej nizko efektivno davčno stopnjo, kar pomeni relativno majhen davčni ščit. To je tudi eden izmed razlogov, zakaj v optimalni strukturi kapitala podjetja ni večjega deleža dolga.

V letu 2006 se je Gedeon Richter tudi dejansko nahajal znotraj optimalne strukture kapitala, saj je imel v svoji kapitalski strukturi le 0,31% dolga. V letu 2011 pa je bil 12,65-odstotno financiran z dolžniškim kapitalom, kar je višje od optimalnega.

5.4 HIKMA PHARMACEUTICALS D.D.

Hikma Pharmaceuticals d.d. (v nadaljevanju Hikma) je farmacevtsko podjetje, ustanovljeno leta 1978 v Ammanu v Jordaniji. Posluje v več kot 45 državah sveta, predvsem na Bližnjem

Vzhodu, Severni Afriki, Združenih državah Amerike in Evropi (Stock Quotes & Company News, 2012; Who we are, 2012).

V letih 2006 in 2011 je za Hikmo Pharmaceuticals optimalen 0-odstoten do 20-odstoten delež dolga v kapitalski strukturi. Vendar pa se je v letu 2011 v primerjavi z letom 2006 WACC zmanjšal, in sicer zaradi zmanjšanja stroška lastniškega kapitala v primerjavi s stroškom dolžniškega kapitala, ki se je rahlo povišal. Prvi razlog za zmanjšanje stroška lastniškega kapitala lahko najdemo v nižji nemški netvegani obrestni meri v letu 2011 v primerjavi z letom 2006, drugi razlog pa je zmanjšanje vrednosti ß. V letih 2006 in 2011 je bilo investiranje v delnice Hikme Pharmaceuticals manj tvegano kot investiranje v povprečno tvegano naložbo na angleškem trgu, poleg tega pa se je tveganost delnic podjetja v letu 2011 v primerjavi z letom 2006 še zmanjšala.

Dejanski delež dolga v kapitalski strukturi podjetja je znašal 2,58% v letu 2006 in 17,01% v letu 2011, kar pomeni, da se je podjetje nahajalo znotraj optimalne strukture kapitala v obeh opazovanih letih.

5.5 STADA ARZNEIMITTEL D.D.

Stada Arzneimittel d.d. (v nadaljevanju: Stada) je nemško farmacevtsko podjetje, ki se ukvarja z razvojem in trženjem proizvodov, ki vsebujejo aktivne učinkovine, katerim je patent že potekel. Njihov glavni segment poslovanja je generika, ki je v finančnem letu 2011 predstavljala 69% prodaje skupine (About Stada, 2012; Stock Quotes & Company News, 2012).

V letu 2006 je bilo optimalno za Stado imeti v svoji kapitalski strukturi med 20% in 40% dolga, medtem ko je ta razpon v letu 2011 znašal od 0% do 20% dolga. V letu 2011 je bilo vlaganje v vrednostne papirje podjetja bolj tvegano kot leta 2006, kar je razvidno iz *ß* podjetja.

V letu 2006 je imela Stada 23,90-odstotni delež dolga v svoji kapitalski strukturi in se je nahajala znotraj razpona optimalne kapitalske strukture, medtem ko je delež dolga leta 2011 znašal 52,73%, kar presega izračunano optimalno strukturo kapitala podjetja. V letu 2011 je imela Stada med svojimi obveznostmi poleg posojila tudi obveznice, ki zapadejo leta 2015.

5.6 PRIMERJAVA IZBRANIH PODJETIJ

Optimalna struktura kapitala izbranih podjetij vključuje nizko stopnjo dolžniškega financiranja. Za generično farmacevtsko industrijo je značilno, da podjetja posedujejo višje ravni prostih denarnih tokov, kajti za investicije v nove proizvodne zmogljivosti (z večjo količino prodaje je potrebno nadomestiti erozijo cen) ter za raziskave in razvoj potrebujejo večje količine denarja. Ne samo izračunana optimalna struktura kapitala, temveč tudi

dejansko stanje vključuje pretežno nižje ravni dolžniškega kapitala.

Za vsa izbrana podjetja, razen za švicarski Acino, se je optimalna struktura kapitala v opazovanem obdobju pomaknila v korist lastniškega financiranja ali pa ostala na isti ravni. Najverjetnejši razlog za to je dejstvo, da se je v času krize dolžniško financiranje podjetij podražilo. Kljub splošnemu trendu povečevanja stroška dolžniškega financiranja se to ni zgodilo v primeru podjetja Acino, za kar pa razlog najdemo v švicarski *Rf*. Švicarska *Rf* se je namreč v proučevanem obdobju močno znižala, kar pa je posledica dejstva, da investitorji v času krize Švico dojemajo kot varen pristan za svoje naložbe v primerjavi z večino drugih držav, ki so močneje občutile posledice krize in so zaradi tega postale precej bolj tvegane.

6 EMPIRIČNI REZULTATI IN TEORIJA

MM teorem pravi, da je ob predpostavki o popolnem trgu kapitala vrednost podjetja neodvisna od njegove kapitalske strukture. Ko v teorijo dodamo še davke, pa bi bilo zaradi davčnega ščita teoretično najbolj optimalno, da bi bilo podjetje v celoti financirano z dolgom. V realnosti to seveda ne drži, kajti tudi predpostavke o popolnem trgu kapitala vzdržijo le v teoriji. Ob višjih stopnjah zadolženosti se namreč strošek dolga, prav tako kot strošek lastniškega kapitala, povišata zaradi povečanega tveganja finančne stiske podjetja. Davčni ščit pa se prav tako razlikuje od podjetja do podjetja in celo znotraj podjetja v različnih časovnih obdobjih, odvisno od višine dobička – podjetja z višjimi dobički imajo več koristi od davčnega ščita, medtem ko podjetjem z izgubo le-ta popolnoma nič ne koristi. Na podlagi izračunov v magistrskem delu je razvidno, da se optimalna struktura kapitala podjetja razlikuje tako med podjetji kot tudi znotraj podjetja v različnih časovnih obdobjih.

Teorija podjetja pravi, da podjetje potrebuje določeno raven dolga, ki pomaga pri obvladovanju principal-agent problema. Vendar pa generična farmacevtska podjetja niso pod močnim vplivom principal-agent problema, ker nimajo velikih količin prostih denarnih tokov, ki bi morali biti pod nadzorom. Ta podjetja morajo namreč velike količine denarja nameniti v investicijske projekte, če želijo uspešno poslovati, se razvijati in ostati konkurenčni na trgu, kajti v tej industriji je prisotna močna erozija cen, ki mora biti nadomeščena z večjo količino prodanih proizvodov visoke kvalitete.

Teorija vrstnega reda razlaga, da podjetja v primeru potrebe po finančnih sredstvih pri financiranju novih projektov dajejo prednost uporabi zadržanih čistih dobičkov, nato se odločijo za financiranje z dolžniškim kapitalom in šele kot zadnjo možnost povečajo lastniški kapital. Izmed petih obravnavanih podjetij sta v opazovanem obdobju le dve, in sicer Hikma in Stada, izdali nove delnice. Stada je v istem obdobju izdala tudi dolžniški kapital v obliki obveznic. Podjetju Gedeon Richter so se v tem obdobju povišale obveznosti do virov sredstev, vendar pa podjetje razpolaga z veliko količino denarnih sredstev, kar drži neto dolg podjetja na minimalni ali celo na negativni ravni. Krka in Gedeon Richter sta v tem obdobju povišala količino zadržanega čistega dobička.

Upoštevajoč teorijo tempiranja trga, ni vedno nujno, da se podjetja odločajo za izdajo dolžniškega kapitala pred lastniškim kapitalom, kot razlagajo nekatere druge teorije. Podjetja namreč izdajajo tisto vrsto kapitala, ki predstavlja boljšo možnost v izbranem časovnem obdobju. V opazovanem obdobju 2006–2011 sta od petih izbranih podjetij le dve izdali nove delnice, in sicer Hikma in Stada, Acino pa je le povečal število delnic na podlagi prevzema preostalega dela Novosisa, poslovne enote podjetja (Wer zu Wem Firmenverzeichnis, 2012). Stada je izdala le manjšo količino delnic, medtem ko je Hikma močneje povečala lastniški kapital podjetja. Cena delnice tega podjetja se je v opazovanem obdobju v povprečju povišala, kar je lahko razlog za izdajo delnic, konec leta 2008 je cena delnice dosegla dno, v začetku leta 2011 pa je dosegla najvišjo raven v opazovanem obdobju.

SKLEP

Struktura kapitala razkrije informacije o načinu financiranja poslovanja in rasti podjetja. Predstavlja skupek dolgoročnih obveznosti do virov sredstev (dolgoročni dolg) in lastniškega kapitala. Odločitev o strukturi kapitala je ena najpomembnejših finančnih odločitev podjetja, predvsem delniških družb, kajti le-te so nenehno ocenjevane s strani trenutnih in potencialnih investitorjev. Glavni cilj vsakega podjetja pa je maksimiranje lastne vrednosti, kar je neposredno povezano z WACC. Kapitalska struktura podjetja mora biti torej natančno načrtovana, da ostane znotraj optimalnega razpona.

Uvodni del magistrskega dela je namenjen predstavitvi posameznih teorij, ki opisujejo strukturo kapitala podjetja z različnih vidikov, z namenom pridobitve osnovnih informacij o sprejemanju odločitve o oblikovanju kapitalske strukture podjetja. Pomemben del magistrskega dela je namenjen opisu aktualne finančne in ekonomske krize, saj le-ta igra pomembno vlogo pri izračunih optimalne strukture kapitala. V delu sem namreč izračunavala optimalno strukturo kapitala izbranih podjetij v letu 2006, pred pričetkom krize, in v letu 2011, ko je imela le-ta že močan vpliv na praktično vseh svetovnih trgih. Spoznala sem, da so se v času krize bolj zadolžena podjetja znašla v večjih težavah, ker je dolg postal dražji in bolj tvegan kot pred tem. Posebej sem se osredotočila na situacijo v Sloveniji, kjer se je kriza pojavila malo kasneje, vendar zato nič manj močno, saj ima veliko slovenskih podjetij finančne težave zaradi prekomernih dolgov. Čas krize je tudi bolj nestabilen kot sicer, kar vpliva na izračune optimalne strukture kapitala. Eden izmed osnovnih pogojev za pridobitev zanesljivih rezultatov je namreč opazovanje situacije na daljši rok, v stabilnem okolju, kar v danem primeru ni bilo izvedljivo. Vendar pa je ključnega pomena za magistrsko delo ravno opazovanje situacije v kriznem obdobju.

Empirični del magistrskega dela je izveden na primeru petih generičnih farmacevtskih podjetij, in sicer so to Krka, d.d., Novo mesto, Acino Holding d.d., Richter Gedeon d.d., Hikma Pharmaceuticals d.d. in Stada Arzenimittel d.d. Generična farmacevtska industrija ima specifične lastnosti, saj so farmacevtski proizvodi v času krize manj izpostavljeni njenemu

vplivu kot večina drugih proizvodov. Povpraševanje po farmacevtskih proizvodih je namreč bolj stabilno in ni toliko odvisno od zunanjega okolja, kljub temu pa se tudi na tem področju pozna vpliv krize, predvsem kar se tiče varčevalnih ukrepov, sprejetih v nekaterih evropskih državah, kar vsekakor vpliva na nadaljnji razvoj te industrije.

Za izbrana generična farmacevtska podjetja sem izračunala optimalno strukturo kapitala v letih 2006 in 2011 ter potrdila hipotezo, postavljeno v uvodu, da se je optimalna struktura kapitala izbranih evropskih generičnih farmacevtskih podjetij pomaknila v korist lastniškega financiranja v obdobju aktualne ekonomske in finančne krize. Optimalne strukture kapitala vseh izbranih podjetij, razen podjetja Acino, so se namreč pomaknile v korist lastniškega financiranja oziroma so ostale na minimalni ravni dolžniškega financiranja. Ti rezultati so bili pričakovani, kajti v času krize postane dolžniški kapital dražji zaradi večjega tveganja in večjih zahtevanih donosov, povezanih z izdajo dolžniškega kapitala.

Raven dolga izbranih generičnih farmacevtskih podjetij v letih 2006 in 2011 je bila na relativno nizki ravni. Razlog za to leži predvsem v specifičnih lastnostih generične farmacevtske industrije; v kolikor želijo ta podjetja ostati konkurenčna na trgu, morajo nenehno investirati v nove proizvodne kapacitete, inovativne rešitve itd. Zaradi tega potrebujejo velike količine denarja, ki jim je na razpolago in ni vezan na poplačilo dolgov. Če poleg tega upoštevamo tudi dejstvo, da se je v času krize optimalna struktura kapitala pomaknila še bolj v korist lastniškega financiranja, menim, da teorija tempiranja trga najbolje opisuje razmere v tej industriji. Teorija tempiranja trga namreč zagovarja dejstvo, da se podjetja odločajo za lastniško financiranje projektov, kadar je lastniški kapital relativno cenejši od dolžniškega, kar vsekakor drži v tem primeru. V opazovanem obdobju se je namreč strošek lastniškega kapitala vseh podjetij, razen podjetja Acino, znižal, medtem ko se je strošek dolžniškega kapitala v istem obdobju povišal.

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APPENDIXES

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Appendix 1: Optimal capital structure calculation for Krka, Plc., Novo mesto in 2006

Table 1: Data used in optimal capital structure calculation for Krka in 2006

E (in SIT)	666,212,984,884.00
D (in SIT)	39,286,629,000.00
V (in SIT)	705,499,613,884.00
D/V (in %)	5.57
t_{ef} (in %)	24.65
Rf (in %)	3.95
Rm-Rf (in %)	5.66
ßl	1.01
ßu	0.97
Rf_{SLO} (in %)	3.90
EBIT (in SIT)	36,064,659,000.00

Source: Krka, Plc., Novo mesto, Annual Report of Krka, Plc., Novo mesto, 2006, pp. 85–86; Damodaran Online: Home Page for Aswath Damodaran, 2012; Government Bonds yields, List by Country, 2012; Ljubljanska borza d.d., 2012; My Selected Search Results - ECB Statistical Data Warehouse, 2012.

Table 2: Cost of equity for Krka in 2006 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	24.65	0.97	3.95	5.66	9.43
10.00	24.65	1.05	3.95	5.66	9.89
20.00	24.65	1.15	3.95	5.66	10.46
30.00	24.65	1.28	3.95	5.66	11.20
40.00	24.65	1.46	3.95	5.66	12.18
50.00	24.65	1.70	3.95	5.66	13.56
60.00	24.65	2.06	3.95	5.66	15.63
70.00	24.65	2.67	3.95	5.66	19.07
80.00	24.65	3.89	3.95	5.66	25.95
90.00	24.65	7.54	3.95	5.66	46.61

Table 3: Cost of debt for Krka in 2006 for different levels of leverage

D/(D+E) (in %)	Debt value (in SIT)	EBIT (in SIT)	Interest (in SIT)	Profit before taxes (in SIT)	Tef (in SIT)	Profit after taxes (in SIT)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	36,064,659,000	0	36,064,659,000	8,889,938,444	27,174,720,557		AAA	4.25	24.65	3.20
10.00	70,549,961,388	36,064,659,000	2,998,373,359	33,066,285,641	8,150,839,411	24,915,446,230	12.03	AAA	4.25	24.65	3.20
20.00	141,099,922,777	36,064,659,000	6,490,596,448	29,574,062,552	7,290,006,419	22,284,056,133	5.56	A+	4.60	24.65	3.47
30.00	211,649,884,165	36,064,659,000	10,370,844,324	25,693,814,676	6,333,525,318	19,360,289,358	3.48	A-	4.90	24.65	3.69
40.00	282,199,845,554	36,064,659,000	20,177,288,957	15,887,370,043	3,916,236,716	11,971,133,327	1.79	B+	7.15	24.65	5.39
50.00	352,749,806,942	36,064,659,000	41,977,227,026	-5,912,568,026	0	-5,912,568,026	0.86	CCC	11.90	24.65	8.97
60.00	423,299,768,330	36,064,659,000	67,304,663,165	-31,240,004,165	0	-31,240,004,165	0.54	C	15.90	24.65	11.98
70.00	493,849,729,719	36,064,659,000	78,522,107,025	-42,457,448,025	0	-42,457,448,025	0.46	C	15.90	24.65	11.98
80.00	564,399,691,107	36,064,659,000	89,739,550,886	-53,674,891,886	0	-53,674,891,886	0.40	C	15.90	24.65	11.98
90.00	634,949,652,496	36,064,659,000	100,956,994,747	-64,892,335,747	0	-64,892,335,747	0.36	C	15.90	24.65	11.98

Appendix 2: Optimal capital structure calculation for Krka, Plc., Novo mesto in 2011

Table 4: Data used in optimal capital structure calculation for Krka in 2011

E (in €)	1,874,041,748.00
D (in €)	155,092,000.00
V (in €)	2,029,133,748.00
D/V (in %)	7.64
t_{ef} (in %)	18.62
Rf (in %)	1.83
Rm-Rf (in %)	7.28
ßl	0.95
ßu	0.89
Rf_{SLO} (in %)	4.97
EBIT (in €)	214,006,000.00

Source: Krka, Plc., Novo mesto, Annual Report of Krka, Plc., Novo mesto, 2011, pp. 102–103; Damodaran Online: Home Page for Aswath Damodaran, 2012; Ljubljanska borza d.d., 2012; Markets Data – Stock market, equities, currencies and commodities performance – FT.com, 2012; My Selected Search Results - ECB Statistical Data Warehouse, 2012.

Table 5: Cost of equity for Krka in 2011 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	18.62	0.89	1.83	7.28	8.28
10.00	18.62	0.97	1.83	7.28	8.87
20.00	18.62	1.07	1.83	7.28	9.59
30.00	18.62	1.20	1.83	7.28	10.53
40.00	18.62	1.37	1.83	7.28	11.78
50.00	18.62	1.61	1.83	7.28	13.53
60.00	18.62	1.97	1.83	7.28	16.16
70.00	18.62	2.57	1.83	7.28	20.53
80.00	18.62	3.77	1.83	7.28	29.28
90.00	18.62	7.38	1.83	7.28	55.54

Table 6: Cost of debt for Krka in 2011 for different levels of leverage

D/(D+E) (in %)	Debt value (in €)	EBIT (in €)	Interest (in €)	Profit before taxes (in €)	Tef (in €)	Profit after taxes (in €)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	214,006,000	0	214,006,000	39,847,917	174,158,083		AAA	5.62	18.62	4.57
10.00	202,913,375	214,006,000	11,403,732	202,602,268	37,724,542	164,877,726	18.77	AAA	5.62	18.62	4.57
20.00	405,826,750	214,006,000	22,807,463	191,198,537	35,601,168	155,597,369	9.38	AAA	5.62	18.62	4.57
30.00	608,740,124	214,006,000	38,168,006	175,837,994	32,741,035	143,096,960	5.61	A+	6.27	18.62	5.10
40.00	811,653,499	214,006,000	53,731,462	160,274,538	29,843,119	130,431,419	3.98	A-	6.62	18.62	5.39
50.00	1,014,566,874	214,006,000	67,164,327	146,841,673	27,341,920	119,499,753	3.19	A-	6.62	18.62	5.39
60.00	1,217,480,249	214,006,000	133,557,583	80,448,417	14,979,495	65,468,922	1.60	B	10.97	18.62	8.93
70.00	1,420,393,624	214,006,000	166,470,133	47,535,867	8,851,178	38,684,689	1.29	B-	11.72	18.62	9.54
80.00	1,623,306,998	214,006,000	222,717,720	-8,711,720	0	-8,711,720	0.96	CCC	13.72	18.62	11.17
90.00	1,826,220,373	214,006,000	250,557,435	-36,551,435	0	-36,551,435	0.85	CCC	13.72	18.62	11.17

Appendix 3: Optimal capital structure calculation for Schweizerhall Holding Plc. (now Acino Holding Plc.) in 2006

Table 7: Data used in optimal capital structure calculation for Schweizerhall in 2006

E (in CHF)	451,200,000.00
D (in CHF)	146,510,000.00
V (in CHF)	597,710,000.00
D/V (in %)	24.51
t_{ef} (in %)	11.21
Rf (in %)	3.95
Rm-Rf (in %)	4.91
ßl	0.19
ßu	0.15
Rf_{CH} (in %)	2.52
EBIT (in CHF)	8,107,000.00

Source: Schweizerhall Holding Plc., Annual Report of Schweizerhall Holding Plc., 2006, pp. 22–23; Damodaran Online: Home Page for Aswath Damodaran, 2012; Government Bonds yields, List by Country, 2012; SIX Swiss Exchange – Statistics, 2012; Stock Research Center - Yahoo! Finance – Company Reports, Analyst Research, Screeners, 2012.

Table 8: Cost of equity for Schweizerhall in 2006 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	11.21	0.15	3.95	4.91	4.68
10.00	11.21	0.16	3.95	4.91	4.76
20.00	11.21	0.18	3.95	4.91	4.85
30.00	11.21	0.21	3.95	4.91	4.96
40.00	11.21	0.24	3.95	4.91	5.12
50.00	11.21	0.28	3.95	4.91	5.34
60.00	11.21	0.35	3.95	4.91	5.66
70.00	11.21	0.46	3.95	4.91	6.21
80.00	11.21	0.68	3.95	4.91	7.30
90.00	11.21	1.35	3.95	4.91	10.56

Table 9: Cost of debt for Schweizerhall in 2006 for different levels of leverage

D/(D+E) (in %)	Debt value (in CHF)	EBIT (in CHF)	Interest (in CHF)	Profit before taxes (in CHF)	Tef (in CHF)	Profit after taxes (in CHF)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	8,107,000	0	8,107,000	908,795	7,198,205		AAA	2.87	11.21	2.55
10.00	59,771,000	8,107,000	2,103,939	6,003,061	672,943	5,330,118	3.85	A-	3.52	11.21	3.13
20.00	119,542,000	8,107,000	17,357,498	-9,250,498	0	-9,250,498	0.47	C	14.52	11.21	12.89
30.00	179,313,000	8,107,000	26,036,248	-17,929,248	0	-17,929,248	0.31	C	14.52	11.21	12.89
40.00	239,084,000	8,107,000	34,714,997	-26,607,997	0	-26,607,997	0.23	C	14.52	11.21	12.89
50.00	298,855,000	8,107,000	67,302,146	-59,195,146	0	-59,195,146	0.12	D	22.52	11.21	20.00
60.00	358,626,000	8,107,000	80,762,575	-72,655,575	0	-72,655,575	0.10	D	22.52	11.21	20.00
70.00	418,397,000	8,107,000	94,223,004	-86,116,004	0	-86,116,004	0.09	D	22.52	11.21	20.00
80.00	478,168,000	8,107,000	107,683,434	-99,576,434	0	-99,576,434	0.08	D	22.52	11.21	20.00
90.00	537,939,000	8,107,000	121,143,863	-113,036,863	0	-113,036,863	0.07	D	22.52	11.21	20.00

Appendix 4: Optimal capital structure calculation for Acino Holding Plc. in 2011

Table 10: Data used in optimal capital structure calculation for Acino in 2011

E (in €)	264,149,391.00
D (in €)	17,355,000.00
V (in €)	281,504,391.00
D/V (in %)	6.17
t_{ef} (in %)	17.88
Rf (in %)	1.83
Rm-Rf (in %)	6.00
ßl	0.55
ßu	0.52
Rf_{CH} (in %)	0.66
EBIT (in €)	6,680,000.00

Source: Acino Holding Plc., Annual Report of Acino Holding Plc., 2011, pp. 6, 8; Damodaran Online: Home Page for Aswath Damodaran, 2012; Markets Data – Stock market, equities, currencies and commodities performance – FT.com, 2012; SIX Swiss Exchange – Statistics, 2012; Stock Research Center - Yahoo! Finance – Company Reports, Analyst Research, Screeners, 2012.

Table 11: Cost of equity for Acino in 2011 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	17.88	0.52	1.83	6.00	4.96
10.00	17.88	0.57	1.83	6.00	5.25
20.00	17.88	0.63	1.83	6.00	5.61
30.00	17.88	0.71	1.83	6.00	6.07
40.00	17.88	0.81	1.83	6.00	6.68
50.00	17.88	0.95	1.83	6.00	7.54
60.00	17.88	1.17	1.83	6.00	8.82
70.00	17.88	1.52	1.83	6.00	10.97
80.00	17.88	2.24	1.83	6.00	15.26
90.00	17.88	4.38	1.83	6.00	28.12

Table 12: Cost of debt for Acino in 2011 for different levels of leverage

D/(D+E) (in %)	Debt value (in €)	EBIT (in €)	Interest (in €)	Profit before taxes (in €)	Tef (in €)	Profit after taxes (in €)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	6,680,000	0	6,680,000	1,194,384	5,485,616		AAA	1.31	17.88	1.08
10.00	28,150,439	6,680,000	368,771	6,311,229	1,128,448	5,182,781	18.11	AAA	1.31	17.88	1.08
20.00	56,300,878	6,680,000	737,542	5,942,458	1,062,512	4,879,947	9.06	AAA	1.31	17.88	1.08
30.00	84,451,317	6,680,000	1,950,825	4,729,175	845,576	3,883,598	3.42	A-	2.31	17.88	1.90
40.00	112,601,756	6,680,000	12,566,356	-5,886,356	0	-5,886,356	0.53	C	11.16	17.88	9.16
50.00	140,752,196	6,680,000	15,707,945	-9,027,945	0	-9,027,945	0.43	C	11.16	17.88	9.16
60.00	168,902,635	6,680,000	18,849,534	-12,169,534	0	-12,169,534	0.35	C	11.16	17.88	9.16
70.00	197,053,074	6,680,000	21,991,123	-15,311,123	0	-15,311,123	0.30	C	11.16	17.88	9.16
80.00	225,203,513	6,680,000	25,132,712	-18,452,712	0	-18,452,712	0.27	C	11.16	17.88	9.16
90.00	253,353,952	6,680,000	28,274,301	-21,594,301	0	-21,594,301	0.24	C	11.16	17.88	9.16

Appendix 5: Optimal capital structure calculation for Richter Gedeon Plc. in 2006

Table 13: Data used in optimal capital structure calculation for Gedeon Richter in 2006

E (in HUF)	809,462,132,880.00
D (in HUF)	2,485,000,000.00
V (in HUF)	811,947,132,880.00
D/V (in %)	0.31
t_{ef} (in %)	1.36
Rf (in %)	3.95
Rm-Rf (in %)	6.11
ßl	0.94
ßu	0.93
Rf_H (in %)	6.71
EBIT (in HUF)	49,527,000,000.00

Source: Richter Gedeon Plc., Annual Report of Richter Gedeon Plc., 2006, pp. 78–79; Damodaran Online: Home Page for Aswath Damodaran, 2012; Government Bonds yields, List by Country, 2012; BSE – Statistics, historical data, downloads, 2012 .

Table 14: Cost of equity for Gedeon Richter in 2006 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	1.36	0.93	3.95	6.11	9.65
10.00	1.36	1.04	3.95	6.11	10.28
20.00	1.36	1.16	3.95	6.11	11.06
30.00	1.36	1.33	3.95	6.11	12.07
40.00	1.36	1.55	3.95	6.11	13.41
50.00	1.36	1.85	3.95	6.11	15.28
60.00	1.36	2.32	3.95	6.11	18.10
70.00	1.36	3.08	3.95	6.11	22.79
80.00	1.36	4.62	3.95	6.11	32.17
90.00	1.36	9.22	3.95	6.11	60.31

Table 15: Cost of debt for Gedeon Richter in 2006 for different levels of leverage

D/(D+E) (in %)	Debt value (in HUF)	EBIT (in HUF)	Interest (in HUF)	Profit before taxes (in HUF)	Tef (in HUF)	Profit after taxes (in HUF)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	49,527,000,000	0	49,527,000,000	673,567,200	48,853,432,800		AAA	7.06	1.36	6.96
10.00	81,194,713,288	49,527,000,000	5,732,346,758	43,794,653,242	595,607,284	43,199,045,958	8.64	AAA	7.06	1.36	6.96
20.00	162,389,426,576	49,527,000,000	12,520,224,789	37,006,775,211	503,292,143	36,503,483,068	3.96	A-	7.71	1.36	7.61
30.00	243,584,139,864	49,527,000,000	21,216,178,582	28,310,821,418	385,027,171	27,925,794,247	2.33	BB+	8.71	1.36	8.59
40.00	324,778,853,152	49,527,000,000	47,774,969,299	1,752,030,701	23,827,618	1,728,203,084	1.04	CCC	14.71	1.36	14.51
50.00	405,973,566,440	49,527,000,000	59,718,711,623	-10,191,711,623	0	-10,191,711,623	0.83	CCC	14.71	1.36	14.51
60.00	487,168,279,728	49,527,000,000	91,149,185,137	-41,622,185,137	0	-41,622,185,137	0.54	C	18.71	1.36	18.46
70.00	568,362,993,016	49,527,000,000	106,340,715,993	-56,813,715,993	0	-56,813,715,993	0.47	C	18.71	1.36	18.46
80.00	649,557,706,304	49,527,000,000	121,532,246,849	-72,005,246,849	0	-72,005,246,849	0.41	C	18.71	1.36	18.46
90.00	730,752,419,592	49,527,000,000	136,723,777,706	-87,196,777,706	0	-87,196,777,706	0.36	C	18.71	1.36	18.46

Appendix 6: Optimal capital structure calculation for Richter Gedeon Plc. in 2011

Table 16: Data used in optimal capital structure calculation for Gedeon Richter in 2011

E (in HUF)	637,402,021,200.00
D (in HUF)	92,291,000,000.00
V (in HUF)	729,693,021,200.00
D/V (in %)	12.65
t_{ef} (in %)	0.24
Rf (in %)	1.83
Rm-Rf (in %)	9.60
ßl	0.72
ßu	0.63
Rf_H (in %)	9.90
EBIT (in HUF)	60,927,000,000.00

Source: Richter Gedeon Plc., Annual Report of Richter Gedeon Plc., 2011, pp. 70–71; Damodaran Online: Home Page for Aswath Damodaran, 2012; Government Bonds yields, List by Country, 2012; Markets Data – Stock market, equities, currencies and commodities performance – FT.com, 2012; BSE – Statistics, historical data, downloads, 2012.

Table 17: Cost of equity for Gedeon Richter in 2011 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	0.24	0.63	1.83	9.60	7.88
10.00	0.24	0.70	1.83	9.60	8.55
20.00	0.24	0.79	1.83	9.60	9.39
30.00	0.24	0.90	1.83	9.60	10.46
40.00	0.24	1.05	1.83	9.60	11.90
50.00	0.24	1.26	1.83	9.60	13.91
60.00	0.24	1.57	1.83	9.60	16.93
70.00	0.24	2.10	1.83	9.60	21.95
80.00	0.24	3.14	1.83	9.60	32.01
90.00	0.24	6.29	1.83	9.60	62.17

Table 18: Cost of debt for Gedeon Richter in 2011 for different levels of leverage

D/(D+E) (in %)	Debt value (in HUF)	EBIT (in HUF)	Interest (in HUF)	Profit before taxes (in HUF)	Tef (in HUF)	Profit after taxes (in HUF)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	60,927,000,000	0	60,927,000,000	146,224,800	60,780,775,200		AAA	10.55	0.24	10.52
10.00	72,969,302,120	60,927,000,000	8,063,107,884	52,863,892,116	126,873,341	52,737,018,775	7.56	AA	11.05	0.24	11.02
20.00	145,938,604,240	60,927,000,000	16,855,908,790	44,071,091,210	105,770,619	43,965,320,591	3.61	A-	11.55	0.24	11.52
30.00	218,907,906,360	60,927,000,000	33,711,817,579	27,215,182,421	65,316,438	27,149,865,983	1.81	B+	15.40	0.24	15.36
40.00	291,877,208,480	60,927,000,000	48,597,555,212	12,329,444,788	29,590,667	12,299,854,121	1.25	B-	16.65	0.24	16.61
50.00	364,846,510,600	60,927,000,000	68,043,874,227	-7,116,874,227	0	-7,116,874,227	0.90	CCC	18.65	0.24	18.61
60.00	437,815,812,720	60,927,000,000	84,936,267,668	-24,009,267,668	0	-24,009,267,668	0.72	CC	19.40	0.24	19.35
70.00	510,785,114,840	60,927,000,000	104,200,163,427	-43,273,163,427	0	-43,273,163,427	0.58	C	20.40	0.24	20.35
80.00	583,754,416,960	60,927,000,000	119,085,901,060	-58,158,901,060	0	-58,158,901,060	0.51	C	20.40	0.24	20.35
90.00	656,723,719,080	60,927,000,000	133,971,638,692	-73,044,638,692	0	-73,044,638,692	0.45	C	20.40	0.24	20.35

Appendix 7: Optimal capital structure calculation for Hikma Pharmaceuticals Plc. in 2006

Table 19: Data used in optimal capital structure calculation for Hikma Pharmaceuticals in 2006

E (in $)	1,203,194,847.00
D (in $)	31,831,000.00
V (in $)	1,235,025,847.00
D/V (in %)	2.58
t_{ef} (in %)	25.98
Rf (in %)	3.95
Rm-Rf (in %)	5.93
ßl	0.69
ßu	0.68
$Rf_{GB+JORD}$ (in %)	6.73
EBIT˜(in $)	75,247,000.00

Source: Hikma Pharmaceuticals Plc., Annual Report of Hikma Pharmaceuticals Plc., 2006, pp. 46–47; Statistical Databases, 2012; Damodaran Online: Home Page for Aswath Damodaran, 2012; Government Bonds yields, List by Country, 2012; Investors, 2012.

Table 20: Cost of equity for Hikma Pharmaceuticals in 2006 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	25.98	0.68	3.95	5.93	7.98
10.00	25.98	0.74	3.95	5.93	8.32
20.00	25.98	0.81	3.95	5.93	8.73
30.00	25.98	0.90	3.95	5.93	9.27
40.00	25.98	1.02	3.95	5.93	9.98
50.00	25.98	1.19	3.95	5.93	10.97
60.00	25.98	1.44	3.95	5.93	12.47
70.00	25.98	1.86	3.95	5.93	14.96
80.00	25.98	2.70	3.95	5.93	19.94
90.00	25.98	5.22	3.95	5.93	34.88

Table 21: Cost of debt for Hikma Pharmaceuticals in 2006 for different levels of leverage

D/(D+E) (in %)	Debt value (in $)	EBIT (in $)	Interest (in $)	Profit before taxes (in $)	Tef (in $)	Profit after taxes (in $)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	75,247,000	0	75,247,000	19,549,171	55,697,829		AAA	7.08	25.98	5.24
10.00	123,502,585	75,247,000	8,743,983	66,503,017	17,277,484	49,225,533	8.61	AAA	7.08	25.98	5.24
20.00	247,005,169	75,247,000	19,093,500	56,153,500	14,588,679	41,564,821	3.94	A-	7.73	25.98	5.72
30.00	370,507,754	75,247,000	32,345,327	42,901,673	11,145,855	31,755,818	2.33	BB+	8.73	25.98	6.46
40.00	494,010,339	75,247,000	72,767,723	2,479,277	644,116	1,835,161	1.03	CCC	14.73	25.98	10.90
50.00	617,512,924	75,247,000	90,959,654	-15,712,654	0	-15,712,654	0.83	CCC	14.73	25.98	10.90
60.00	741,015,508	75,247,000	138,792,205	-63,545,205	0	-63,545,205	0.54	C	18.73	25.98	13.86
70.00	864,518,093	75,247,000	161,924,239	-86,677,239	0	-86,677,239	0.46	C	18.73	25.98	13.86
80.00	988,020,678	75,247,000	185,056,273	-109,809,273	0	-109,809,273	0.41	C	18.73	25.98	13.86
90.00	1,111,523,262	75,247,000	208,188,307	-132,941,307	0	-132,941,307	0.36	C	18.73	25.98	13.86

Appendix 8: Optimal capital structure calculation for Hikma Pharmaceuticals Plc. in 2011

Table 22: Data used in optimal capital structure calculation for Hikma Pharmaceuticals in 2011

E (in $)	1,884,984,614.00
D (in $)	386,425,000.00
V (in $)	2,271,409,614.00
D/V (in %)	17.01
t_{ef} (in %)	11.10
Rf (in %)	1.83
Rm-Rf (in %)	8.07
ßl	0.55
ßu	0.47
$Rf_{GB+JORD}$ (in %)	5.66
EBIT (in $)	118,688,000.00

Source: Hikma Pharmaceuticals Plc., Annual Report of Hikma Pharmaceuticals Plc., 2011, pp. 99–100; Statistical Databases, 2012; Damodaran Online: Home Page for Aswath Damodaran, 2012; Government Bonds yields, List by Country, 2012; Investors, 2012; Markets Data – Stock market, equities, currencies and commodities performance – FT.com, 2012.

Table 23: Cost of equity for Hikma Pharmaceuticals in 2011 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	11.10	0.47	1.83	8.07	5.60
10.00	11.10	0.51	1.83	8.07	5.97
20.00	11.10	0.57	1.83	8.07	6.44
30.00	11.10	0.65	1.83	8.07	7.04
40.00	11.10	0.74	1.83	8.07	7.84
50.00	11.10	0.88	1.83	8.07	8.96
60.00	11.10	1.09	1.83	8.07	10.63
70.00	11.10	1.44	1.83	8.07	13.43
80.00	11.10	2.13	1.83	8.07	19.02
90.00	11.10	4.21	1.83	8.07	35.78

Table 24: Cost of debt for Hikma Pharmaceuticals in 2011 for different levels of leverage

D/(D+E) (in %)	Debt value (in $)	EBIT (in $)	Interest (in $)	Profit before taxes (in $)	Tef (in $)	Profit after taxes (in $)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	118,688,000	0	118,688,000	13,174,368	105,513,632		AAA	6.31	11.10	5.61
10.00	227,140,961	118,688,000	15,468,299	103,219,701	11,457,387	91,762,314	7.67	AA	6.81	11.10	6.05
20.00	454,281,923	118,688,000	33,208,009	85,479,991	9,488,279	75,991,712	3.57	A-	7.31	11.10	6.50
30.00	681,422,884	118,688,000	84,564,580	34,123,420	3,787,700	30,335,720	1.40	B-	12.41	11.10	11.03
40.00	908,563,846	118,688,000	130,924,050	-12,236,050	0	-12,236,050	0.91	CCC	14.41	11.10	12.81
50.00	1,135,704,807	118,688,000	172,172,849	-53,484,849	0	-53,484,849	0.69	CC	15.16	11.10	13.48
60.00	1,362,845,768	118,688,000	220,235,876	-101,547,876	0	-101,547,876	0.54	C	16.16	11.10	14.37
70.00	1,589,986,730	118,688,000	256,941,856	-138,253,856	0	-138,253,856	0.46	C	16.16	11.10	14.37
80.00	1,817,127,691	118,688,000	293,647,835	-174,959,835	0	-174,959,835	0.40	C	16.16	11.10	14.37
90.00	2,044,268,652	118,688,000	330,353,814	-211,665,814	0	-211,665,814	0.36	C	16.16	11.10	14.37

Appendix 9: Optimal capital structure calculation for Stada Arzneimittel Plc. in 2006

Table 25: Data used in optimal capital structure calculation for Stada Arzneimittel in 2006

E (in €)	2,531,240,580.00
D (in €)	795,038,000.00
V (in €)	3,326,278,580.00
D/V (in %)	23.90
t_{ef} (in %)	36.30
Rf (in %)	3.95
Rm-Rf (in %)	4.91
ßl	0.63
ßu	0.52
Rf_D (in %)	3.95
EBIT (in €)	180,464,000.00

Source: Stada Arzneimittel Plc., Annual Report of Stada Arzneimittel Plc., 2006, pp. 93–94; Damodaran Online: Home Page for Aswath Damodaran, 2012; Government Bonds yields, List by Country, 2012; Investor relations, 2012.

Table 26: Cost of equity for Stada Arzneimittel in 2006 for different levels of leverage

D/(D+E) (in %)	t_{ef} (in %)	ßl	Rf (in %)	Rm-Rf (in %)	Re (in %)
0.00	36.30	0.52	3.95	4.91	6.52
10.00	36.30	0.56	3.95	4.91	6.71
20.00	36.30	0.61	3.95	4.91	6.93
30.00	36.30	0.67	3.95	4.91	7.23
40.00	36.30	0.75	3.95	4.91	7.62
50.00	36.30	0.86	3.95	4.91	8.16
60.00	36.30	1.03	3.95	4.91	8.98
70.00	36.30	1.30	3.95	4.91	10.35
80.00	36.30	1.86	3.95	4.91	13.09
90.00	36.30	3.53	3.95	4.91	21.29

Table 27: Cost of debt for Stada Arzneimittel in 2006 for different levels of leverage

D/(D+E) (in %)	Debt value (in €)	EBIT (in €)	Interest (in €)	Profit before taxes (in €)	Tef (in €)	Profit after taxes (in €)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	180,464,000	0	180,464,000	65,508,432	114,955,568		AAA	4.30	36.30	2.74
10.00	332,627,858	180,464,000	14,296,345	166,167,655	60,318,859	105,848,796	12.62	AAA	4.30	36.30	2.74
20.00	665,255,716	180,464,000	30,921,086	149,542,914	54,284,078	95,258,836	5.84	A+	4.65	36.30	2.96
30.00	997,883,574	180,464,000	49,375,279	131,088,721	47,585,206	83,503,515	3.65	A-	4.95	36.30	3.15
40.00	1,330,511,432	180,464,000	79,138,820	101,325,180	36,781,040	64,544,140	2.28	BB+	5.95	36.30	3.79
50.00	1,663,139,290	180,464,000	198,711,882	-18,247,882	0	-18,247,882	0.91	CCC	11.95	36.30	7.61
60.00	1,995,767,148	180,464,000	318,284,945	-137,820,945	0	-137,820,945	0.57	C	15.95	36.30	10.16
70.00	2,328,395,006	180,464,000	371,332,436	-190,868,436	0	-190,868,436	0.49	C	15.95	36.30	10.16
80.00	2,661,022,864	180,464,000	424,379,926	-243,915,926	0	-243,915,926	0.43	C	15.95	36.30	10.16
90.00	2,993,650,722	180,464,000	477,427,417	-296,963,417	0	-296,963,417	0.38	C	15.95	36.30	10.16

Appendix 10: Optimal capital structure calculation for Stada Arzneimittel Plc. in 2011

Table 28: Data used in optimal capital structure calculation for Stada Arneimittel in 2011

E (in €)	1,135,102,430.00
D (in €)	1,266,366,000.00
V (in €)	2,401,468,430.00
D/V (in %)	52.73
t_{ef} (in %)	67.81
Rf (in %)	1.83
Rm-Rf (in %)	6.00
ßl	0.92
ßu	0.68
Rf_D (in %)	1.83
EBIT (in €)	120,064,000.00

Source: Stada Arzneimittel Plc., Annual Report of Stada Arzneimittel Plc., 2011, pp. 128, 130; Damodaran Online: Home Page for Aswath Damodaran, 2012; Markets Data – Stock market, equities, currencies and commodities performance – FT.com, 2012; Investor relations, 2012.

Table 29: Cost of equity for Stada Arzneimittel in 2011 for different levels of leverage

D/(D+E) (in %)	**t_{ef} (in %)**	**ßl**	**Rf (in %)**	**Rm-Rf (in %)**	**Re (in %)**
0.00	67.81	0.68	1.83	6.00	5.90
10.00	67.81	0.70	1.83	6.00	6.04
20.00	67.81	0.73	1.83	6.00	6.22
30.00	67.81	0.77	1.83	6.00	6.46
40.00	67.81	0.82	1.83	6.00	6.77
50.00	67.81	0.90	1.83	6.00	7.20
60.00	67.81	1.00	1.83	6.00	7.86
70.00	67.81	1.19	1.83	6.00	8.95
80.00	67.81	1.55	1.83	6.00	11.13
90.00	67.81	2.64	1.83	6.00	17.67

Table 30: Cost of debt for Stada Arzneimittel in 2011 for different levels of leverage

D/(D+E) (in %)	Debt value (in €)	EBIT (in €)	Interest (in €)	Profit before taxes (in €)	Tef (in €)	Profit after taxes (in €)	ICR	Rating	r_D (in %)	t_{ef} (in %)	$r_D(1-t_{ef})$ (in %)
0.00	0	120,064,000	0	120,064,000	81,415,398	38,648,602		AAA	10.31	67.81	3.32
10.00	240,146,843	120,064,000	31,119,108	88,944,892	60,313,531	28,631,361	3.86	A-	11.31	67.81	3.64
20.00	480,293,686	120,064,000	90,303,194	29,760,806	20,180,803	9,580,003	1.33	B-	16.41	67.81	5.28
30.00	720,440,529	120,064,000	158,154,405	-38,090,405	0	-38,090,405	0.76	CC	19.16	67.81	6.17
40.00	960,587,372	120,064,000	221,878,414	-101,814,414	0	-101,814,414	0.54	C	20.16	67.81	6.49
50.00	1,200,734,215	120,064,000	277,348,018	-157,284,018	0	-157,284,018	0.43	C	20.16	67.81	6.49
60.00	1,440,881,058	120,064,000	332,817,621	-212,753,621	0	-212,753,621	0.36	C	20.16	67.81	6.49
70.00	1,681,027,901	120,064,000	388,287,225	-268,223,225	0	-268,223,225	0.31	C	20.16	67.81	6.49
80.00	1,921,174,744	120,064,000	443,756,828	-323,692,828	0	-323,692,828	0.27	C	20.16	67.81	6.49
90.00	2,161,321,587	120,064,000	499,226,432	-379,162,432	0	-379,162,432	0.24	C	20.16	67.81	6.49

Appendix 11: Ratings, Interest Coverage Ratios and Default Spread in 2006

Table 31: Ratings, Interest Coverage Ratios and Default Spread in 2006 for large manufacturing firms

If interest coverage ratio is			
>	≤ to	Rating is	Spread is (in %)
-100,000	0.199999	D	20.00
0.2	0.649999	C	12.00
0.65	0.799999	CC	10.00
0.8	1.249999	CCC	8.00
1.25	1.499999	B-	6.00
1.5	1.749999	B-	4.00
1.75	1.999999	B+	3.25
2	2.2499999	BB	2.50
2.25	2.49999	BB+	2.00
2.5	2.999999	BBB	1.50
3	4.249999	A-	1.00
4.25	5.499999	A-	0.85
5.5	6.499999	A+	0.70
6.5	8.499999	AA	0.50
8.50	100,000	AAA	0.35

Source: Damodaran Online: Home Page for Aswath Damodaran, 2012

Appendix 12: Ratings, Interest Coverage Ratios and Default Spread in 2011

Table 32: Ratings, Interest Coverage Ratios and Default Spread in 2011 for large manufacturing firms

If interest coverage ratio is			
>	≤ *to*	Rating is	Spread is (in %)
-100,000	0.199999	D	12.00
0.2	0.649999	C	10.50
0.65	0.799999	CC	9.50
0.8	1.249999	CCC	8.75
1.25	1.499999	B-	6.75
1.5	1.749999	B-	6.00
1.75	1.999999	B+	5.50
2	2.2499999	BB	4.75
2.25	2.49999	BB+	3.75
2.5	2.999999	BBB	2.50
3	4.249999	A-	1.65
4.25	5.499999	A-	1.40
5.5	6.499999	A+	1.30
6.5	8.499999	AA	1.15
8.5	100,000	AAA	0.65

Source: Damodaran Online: Home Page for Aswath Damodaran, 2012