DETERMINANTS OF CAPITAL STRUCTURE OF UKRAINIAN CORPORATIONS

by

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Abstract

Determinants of Capital Structure of Ukrainian Corporations

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The research aims at determining the key factors of Ukrainian corporations' capital structure building as well as testing of classic capital structure theories. Testing has shown that short- and long-term financing decisions have different determining factors. Specifically, profitability and tangibility ratios are negatively correlated with fraction of external financing in short run. On the other hand, long-term leverage is a positive function of corporation's size. Short run financing horizon is dominated by pecking order theory, in which cash flows and depreciation are a major source of financing. Long run financing exhibits tendency to trade-off theory, in which corporations are trying to maintain target leverage ratio.

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Chapter 1

Introduction

In making decisions on which sources to use for investment financing, corporate financiers in transition countries cannot boast having a wide choice of financing instruments. This list may include bank loans, issues of shares, bonds and possibly few other instruments. The decision on in which degree one or another source of financing should be used is often referred to as a classical problem of cost of capital (or weighted average cost of capital – WACC) minimization. Nevertheless, WACC cannot fully explain changes in capital structure. For example, major stakeholders may be interested in such financing that preserves the existing ownership structure (control motive). This consideration is not accounted for in WACC. Businesses in transition countries may not even have an alternative to choose from while seeking for financing of their activity. The reason frequently lies in a poorly developed financial market and illiquid (poorly collaterized) assets possessed by the businesses.

The recourse to different financial devices is determined by particular economic, technical, and institutional factors. From technical point of view, a bank loan can be flexible enough in terms of repayment conditions, but costly at the same time. Common shares for a public company allow obtaining cheap capital but at the expense of erosion of control by current shareholders, and so on. Company specific factors, like size, reputation, growth potential, etc. are also to influence capital structure decisions. It can be concluded therefore that only a clear business strategy would help to evaluate all pros and contras of a certain capital structure choice. The role of the researcher here is to see how market agents with similar firm specific characteristics architect their financing mix.

While not a verdict, such an investigation provides a decision maker with useful background on which the decision is to be made.

In 1958 Modigliani and Miller published their famous 'The Cost of Capital, Corporation Finance and Theory of Investment'. In their article MM put forward the 'capital structure irrelevance' argument stating that in frictionless markets, with no taxes or transaction costs, capital structure is irrelevant – does not affect market value of firm. Some academicians received the work as being controversial (Rose, 1959; Durand, 1959). The critics basically stated that in real world the main assumptions never hold true and hence 'capital structure irrelevance' is nothing but a fiction. However, as brisk answers of the authors proved, they made it explicit that the underlying assumptions are not likely to hold in real world situations. Moreover, they stated that in a 'non-perfect' world there are factors influencing capital structure decisions by firms and the paper itself is 'the beginning of the attack on the cost of capital concept and related problems'. It is that period from which the whole strand of literature on capital structure factors began to emerge.

The empirical papers on the topic usually test for such company specific factors as growth opportunities, size, tax rate, profitability, and others when trying to explain the dynamics of capital structure (e.g. Banerjee *et. al.*, 2000; Nivorozhkin, 2000; Gaud *et. al.*, 2003 to call just a few authors). Another group of factors tested for are macroeconomic, like inflation, stock market value/GDP, real GDP growth rate (Desai, 2003; Booth *et. al.*, 2001).

Capital structure determinants and dynamics were investigated using different panel data specifications in many economies (see, for instance, Gaud *et. al.* (2003), Philippe *et. al.* (2003), and others). These explorations as well as my paper enable to test for validity of some of the theories of capital structure. Current analysis focuses specifically on testing the relevance of agency cost/trade-off framework[1] and pecking order theory[2]. These concepts will be detailed later in the paper. The results obtained contribute to the resolution of theoretical disputes using a dataset of Ukrainian joint-stock companies. Despite a big number of empirical studies, devoted to capital structure choices in developed, developing and transition countries, Ukrainian companies' capital structure has not been investigated. Hence, using the results of previous researches, the study allows to get a close look at financing patterns and determinants of Ukrainian businesses capital structures. This is important in view that Ukrainian corporations are trying to increase their competitiveness both domestically and internationally. Increasing competition (particularly in food processing, banking services, IT sector, etc.) forces Ukrainian businesses to compare the key characteristics of their rivals with those of their own, with capital architecture being one of such characteristics. Thus, using regression coefficients obtained, it is possible to calculate the expected leverage value for a typical company on particular market.

The rest of the paper proceeds as follows: part 2 elaborates on capital structure theories, classifies basic methodological approaches used in previous research, and gives some empirical evidence concerning the main findings in the capital structure researches; part 3 describes recent trends of

[1] It is also called "target debt level model". This theory originates from Miller (1977)

[2] Myers and Majluf (1984)

investment financing by firms in Ukraine; part 4 presents the methodology for current study including variables and econometric specifications used; part 5 characterizes dataset used for testing and estimation. 6th part discusses the results obtained and is followed by the main conclusions of the paper.

C h a p t e r 2

Literature Review

2.1 Capital Structure Theories

Perhaps, of the most comprehensive reviews on capital structure theories is that composed by Harris and Raviv (1991). We can broadly distinguish between tax- and non-tax driven capital structure theories. HR concentrate on the latter. Not going deeply in details concerning all models analyzed in the work, it is sufficient to outline a general classification used by the authors. HR distinguish the following classes of capital structure models:

- Models based on agency costs;
- Models using asymmetric information (essentially pecking order theory framework);
- Interactions of capital structure with behavior in the product or input market or with characteristics of products or inputs;
- Models based on corporate control considerations.

The most popular of the tax-driven capital structure theories is a trade-off supposition, which is to be elaborated on below.

In corporate finance courses trade-off and pecking order theories are studied most widely. The reason seems to be in their high intuitive appeal and proliferation.

2.1.1 Trade-off Theory

There are two types of the trade-off theory: static and dynamic.

Static trade-off theory assumes fixed external environment. Here we view a firm's optimal debt ratio on the grounds of a trade-off between the costs and benefits of borrowing while holding the firm's assets and investment plans constant. In this case the firm is balancing the benefit of debt induced tax shield (due to deductibility of interest payments for taxation purposes) against the costs of financial distress, which basically refers to a risk on non-payment. The firm is supposed to change equity for debt or debt for equity until the value of the firm is maximized. This is the gist of the trade-off.

Dynamic trade-off framework allows for variability in outside factors, like product demand, factors prices, etc. Changes in external and internal environment of the firm necessitate changes in optimal debt ratio. Here adjustment costs come to the fore. In the absence of the adjustment costs the firm is able to immediately fine-tune its debt size to the market conditions. Adjustment costs stipulate lags in coming to optimal debt ratio[3]. One of the examples of such costs is the commission charged by the underwriter of stocks and bonds. Furthermore, the firm compares the benefits of the optimal debt ratio with the costs of adjusting to it. Debt ratio changes only when potential benefits of having optimal debt outweigh adjustment costs of moving to it. Accounting for adjustment costs helps in explaining the fact that many firms may stray from optimal debt ratios for long periods of time. As Myers (1984) notices in his "The Capital Structure Puzzle": "testing financing pattern using cross-section methodology should point out the reason for differences in debt ratios: whether the firms have different target debt ratios or their debts diverge from the optimum". Moreover, the higher the

[3] Debt ratio can be defined in different ways, which is not essential in the given context

adjustment costs are, the more important they become, crowding out in a way possibilities for adjustment.

Overall, trade-off theory utters that an increase in the firm's leverage increases its market value due to debt induced tax shield effect. Let us briefly describe the effect of debt-induced tax shield.

We consider two hypothetical cases of income calculation for firms A and B. A and B are completely identical firms with the only difference that A is financed fully with debt and B is entirely equity-financed. Current corporate income tax is 30%. Both companies have just obtained revenue of $100. A pays 5% of interest to its bondholders whereas B pays 5% of its revenue to the shareholders. Interest payment for A is tax deductible. Assume that production expenses are 50% of total revenues. The table below presents income calculation procedure.

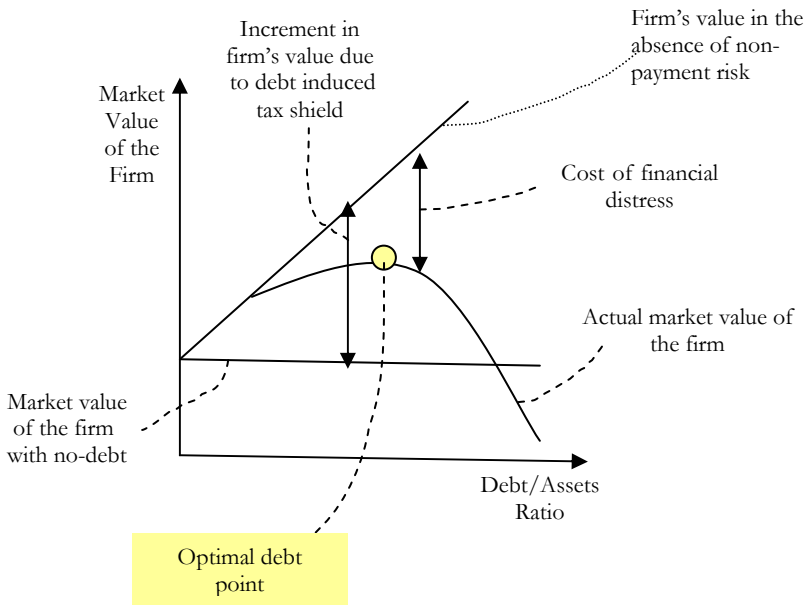
Figure 1. Income calculation for firms with two extreme capital structure patterns

Company	A	B
	100% debt	100% equity
Initial revenue	$100	$100
Production expenses	$50	$50
Payment to bondholders	$5	-
Pre tax earnings	$45	$50
Tax payment	=$45*0.3	=$50*0.3
After tax earnings	$31.5	$35
Dividends	-	$5
Residual earnings	$31.5	$30

As can be seen, A earns more. Hence, having identical technologies and all other parameters but capital structures, debt-financed corporation gets higher free cash flows due to tax deductibility of interest payments. As a result, discounted value of cash flow streams from A exceeds that of B. Therefore market value of firm A exceeds B. This effect can be explained in detail as follows. Suppose we are to obtain funds at the expense of equity capital. Then the amount of dividends, which we want to be equal to the amount of the interest paid, will be taxed before payment. In case of bonds, we can repay the same quantity of cash spending smaller amount of money due to debt induced tax shield. Hence, in our case the difference is: payment to capital owners multiplied by income tax rate: $5*0.3=1.5. This is exactly the debt induced tax shield advantage we have obtained above. Still, this is not the end of the story. In the real world, firms' capital structure is a mix of both debt and equity. Hence, depending upon the share of debt vs. share of equity, the example above will bring different residual earnings ranging from $30 to $31.5. Moreover, the costs of financial distress for a firm increase along with the share of debt in the capital structure. In other words, the more debt the firm has accumulated the more likely that it will have difficulties repaying it or will even default on its debt. Hence, these costs, which effectively represent a non-payment risk, will tend to decrease firm's value. Finally we see two effects: debt induced tax shield effect and cost of financial distress, working in opposite directions. That is while the former increases market value of the firm and the latter decreases it. It is this trade off which serves as a major concern for many firms in making decisions on how much debt to take on. This idea for a static trade off case is depicted on Figure 1 below. The horizontal axis denotes a major debt ratio, which is a ratio of total debt to total assets; the vertical axis indicates market value of the firm. The horizontal line, which is parallel to the Debt/Assets axis and lies above it, denotes the value of the firm without any debt.

The upsloping straight line reflects an increment in market value of the firm due to debt induced tax shield effect. The 'Actual market value of the firm' line results from subtraction of default risk costs from 'riskless debt' upsloping straight line. It is the highest point on 'Actual market value of the firm' line that shows the existence of a point of maximum firm's value. Calculation of Debt/Assets ratio corresponding to this point is the main focus in the application of static trade-off framework.

Figure 2. Static trade-off theory of capital structure (Ross *et. al.*, 2000)



2.1.2 Pecking Order Theory

Suppose a firm has profitable investment opportunities. In order to realize these opportunities it needs funds. The firm can obtain the necessary funds in different ways. One of them is to use

financial instruments available on the market. The firm may try to issue new stock at a fair value. The fair value here corresponds to the expected value of company's stock after successful completion of the investment project. Unfortunately here is a problem stemming from information asymmetry. It is insiders in first place who can evaluate the true earnings potential of the project. Information asymmetry quite often makes investors underestimate potential returns from the projects proposed. Therefore, in order to make equity offering successful, it would have to be underpriced. In this case new investors would buy stock at the price below its real value. As a result they effectively obtain rights for future earnings in the amount that exceeds their investment. The losers in this situation are incumbent shareholders. They sacrifice a fraction of their stock value in favor of new equity buyers. This problem makes current shareholders unwilling to embark upon issuing stock as a way of getting finance. Yet information asymmetry problem can be avoided if the firm finances the project using an instrument that faces less or no asymmetric information problem and undervaluation stemming from it. For instance, internal funds[4] and riskless debt cause no undervaluation. The reason is that the former belongs to the firm (insiders) itself, while the latter promises a fixed rate of return regardless of the investment project results. Consequently, the corporation will prefer these two for financing purposes. Since there is no completely riskless debt (at least in case of corporations), bonds and loans do create some information asymmetry. Still this asymmetry is significantly smaller than in the case of equity issue. Myers (1984) refers to this hierarchical sequence of preferences in financing as "pecking order" theory of financing. In other words, capital structure will be driven by firms' desire to finance new investments first internally, then using low-risk debt, and finally with equity only as a last resort. In fact it is not only information

[4] primarily cash flow, which is sum of depreciation and net income

asymmetry but also a corresponding risk that sets ground for the price of financing. Though not explicitly stated, pecking order theory incorporates the risk attributed to different financial instruments. This risk along with information asymmetry is reflected in the price of funds obtained from different sources.

Below follow some implications of the "pecking order" theory of Myers:

(1) upon announcement of an equity issue, the market value of the firm's existing shares will fall – anticipation of value takeover by new shareholders;

(2) financing using internal funds or riskless debt (or a security which value is independent of the information asymmetry) will not convey information and will not result in any stock price reaction;

(3) new projects will tend to be financed mainly from internal sources or the proceeds from low-risk debt issues;

(4) as Korajszyk *et. al.* (1990) state, "… the underinvestment problem is least severe after information releases such as annual reports and earnings announcements". It implies that equity issues will tend to occur right after these events since information asymmetry at those moments is least;

(5) the companies with smaller share of tangible assets tend to be more subject to information asymmetries. It is because intangible assets are more difficult to price. Therefore 'intangible firms' will face underinvestment problem more often. Hence, *ceteris paribus*, these firms will tend to accumulate more debt over time.

2.2 Comparing the Two Theories

What is the principal difference between the two theories? Trade-off approach searches for an optimal debt-equity ratio. Pecking order approach calls for maximum utilization of the cheapest instrument available. In pecking order 'world' these cheap instruments are (in order of preference) internal funds, debt and equity. The two theories approach capital structure question from different points. Trade-off theory tries to maximize market value of the company. Pecking order principle pursues minimization of the cost of capital using the least 'asymmetric' funds. Here meant the sources of financing, which are obtained from the most informed or relatively insured (in case of bonds) parties. The natural question arising here is whether the point of maximum market capitalization converges with the point of minimum costs of funds?

Let us consider some hypothetical example. Suppose ABC company has inexhaustible investment opportunities in which it can earn the return high enough to cover financing costs. The chief financial officer (CFO) of ABC faces strategic dilemma: which principle of financing to choose? The alternatives, in our case, boils down to the two: trade-off or pecking order code.

Trade-off principle of financing. Let us assume the CFO chooses trade-off principle of financing. In this case s/he would always try to have certain financing structure in which the ratio of debt to equity is kept constant to maximize market value of the firm. We shall emphasize that with expansion of business, the proportion of external to internal funds is not supposed to change!

Pecking order principle of financing. Now the CFO chooses hierarchical sequence of financing. Here s/he would use funds in pecking order as has been described earlier. In this case, as company uses up all internal funds (which cost is about a risk-free rate), it switches to debt financing and

corporation's cost of capital increases. Later on at the point where debt financing cost reach the cost of equity financing (because at some point financial distress costs become prohibitively high) the company has to switch to equity financing (remember: it has inexhaustible investment opportunities and so needs infinite funds). When it happens, market price per share would tend to decline due to stock value dilution. Dilution implies the loss in existing shareholder's value.

Following trade-off approach, we maximize total market capitalization of the company without regard to the market price of stock units (shares). Adhering to pecking order, we, in principle, maximize market value of a stock unit (up to the equity issue point). This is the essence. The value of a stock unit is maximized in pecking order approach because equity issues here are disfavored due to their adverse impact on the wealth of existing shareholders. The pecking order theory calls to maximize the value of the existing stock units. This is unambiguously a boon for shareholders. On the other hand, trade-off principle intends to maximize total value of the company. This maximization is of uncertain use for the incumbent shareholders since it is not clear what the price of a stock unit is going to be due to possible dilution of share price (though in most cases it declines). Nevertheless, this maximization is usually of use to managers since their power should increase.

Some remarks are in order here. The two theories may just reflect different time horizons. The short run fits well the pecking order principle. This is so because in the short run financial resources are constrained. Internal finance is finite and as it becomes fully used, the company resorts to debt issue. Still, the cost of debt increases along with leverage ratio. After some point the cost of debt would

increase above the cost of equity issue. At this point company turns to equity financing. Equity financing, though being costly, theoretically is not limited.

In the long run, however, trade-off theory seems to be more logical. It is so because long run horizon does not impose financial constraints on the company. As a result, it can find an optimum mix of financing which would maximize market value.

It is trade-off and pecking order theories that this research focuses attention on. However, there are factors, which do not directly point out on the effect of any theory, but are essential in capital structure formation. As results will be presented later, we will see that the two theories indeed manifest themselves more or less distinctly depending upon the time nature of debt (short- or long-term).

We have now approached to presentation of generalized classification of the models commonly used in capital structure investigations.

2.3 Classification of Econometric Models Used in Capital Structure Investigations

Among the models, which use panel data methodology in empirical research on the subject, we can broadly distinguish static and dynamic ones. Static models embrace multiple linear regressions, fixed, and random effects specifications. In turn, dynamic models incorporate simple dynamic models and the models with dynamic adjustment. Let us briefly outline general characteristics of these models.

The simplest scheme is based on the assumption of linear association between leverage and the set of explanatory variables. This approach is used in Devic *et. al.* (2001), who explore capital structure determinants of Polish and Hungarian enterprises. The *multiple linear regression model* (or *simple pooling*

in the context of panel framework) used in the research can be represented by the following equation:

$$Y_i = \alpha + \sum_{k=1}^{4} \beta_{ik} X_k + \varepsilon_i, \quad (1)$$

in which Y_i denotes leverage, X_k (k=1,…,4) presents independent variables, β_{ik} presents regression coefficients, and ε_i is the error term. Independent variables represent tangibility, size, profitability and growth opportunities. All explanatory variables were expressed as two-year averages. The peculiarity of this methodology is that the averages were calculated in the two years preceding the year in which leverage was calculated. The authors justify it on the ground that firms do not instantly react to the changes in the explanatory variables. Being simple, the model does not allow investigating dynamic effects in capital structure patterns.

Next in order of complexity come *fixed* and *random effects specifications*. These models have been widely used (Booth *et. al.*, 2001; Gaud *et. al.*, 2003; and others). It is worth noticing that fixed effects regression results are usually presented together with simple pooling in this capital structure researches (Desai, 2003). In doing so, the authors want to test whether the assumption of homogeneity among firms holds. Fixed effects, though consuming degrees of freedom, allow seeing pure effect (cleaned of the firms time invariant features) of the explanatory variables on firm's capital structure. Presenting both models, the researchers can demonstrate how valid is the assumption of random distribution of individual firms' characteristics in the sample.

Another set of models are dynamic ones. *Dynamic models* using panel data methodology, like the ones used in Gaud *et. al.* (2003) and Banerjee *et. al.* (2000), allow for adjustment costs. Adjustment costs look quite reasonable if we think of the costs incurred by firms when changing their capital

structure. Instances of the adjustment costs are underwriters' fees, costs of legal provisions during debt/equity issues. Moreover, the assumption of zero adjustment costs appears to be too strong since it implies that every firm adjusts its leverage within maximum one time period. Thus, per period change in the observed leverage ratio would exactly equal the one necessary for optimal adjustment:

$$L_{it} - L_{it-1} = L^{*}_{it} - L_{it-1} \tag{2}$$

where L_{it} is the observed leverage of the firm i at time t, L^{*}_{it} optimal leverage value of the firm i at time t.

In this case all firms should have optimal capital structure. Unfortunately, this is not very likely to be observed in reality. The dynamic model framework introduces speed of adjustment coefficient, which fixes this deficiency, allowing for adjustment lags in the model. It is generally represented as follows:

$$L_{it} - L_{it-1} = \delta(L^{*}_{it} - L_{it-1}) \tag{3}$$

where δ is the adjustment coefficient.

Final dynamic model specification is as follows (Banerjee *et. al.* 2000):

$$L_{it} = (1-\delta)L_{it-1} + \delta L^{*}_{it} \tag{4}$$

The dynamic adjustment representation in expression (5) below differs from dynamic model in that it allows the speed of adjustment to vary across firms and time, which appears to be reasonable. Indeed, we can hardly assume that all firms change their capital structures with exactly the same speed. Besides, time changes firms' structures, which also affects their speed of adjustment. Analytically, dynamic adjustment model is as follows (Banerjee *et. al.*, 2001):

$$L_{it} = (1 - \delta_{it}) L_{it-1} + \delta_{it} L_{it}^{*} \tag{5}$$

Banerjee *et. al.* (2001) define optimal leverage ratio in the way it is defined in trade-off theory (see part 2.1.1 on trade-off theory). Namely, optimal leverage ratio is determined as the one, which equates major benefits of incurring debt, like debt induced tax shield, and the costs corresponding to it, like financial distress. For optimal leverage ratio, the following relationship is assumed (Banerjee *et. al.*, 2001):

$$L_{it}^{*} = \alpha_0 + \sum_j \alpha_j Y_{jit} + \sum_s \alpha_s D_s + \sum_t \alpha_t D_t \tag{6}$$

where Y_{jit} is a set of explanatory variables with j denoting the ordinal number of the explanatory variable, i and t expressing unit and time period numbers respectively, D_s and D_t denoting industrial sector and time dummy variables accordingly.

The speed of adjustment coefficient, which is allowed to change for different firms and time periods, is assumed to be defined as follows:

$$\delta_{it} = \beta_0 + \sum_k \beta_k Z_{kit} + \sum_s \beta_s D_s + \sum_t \beta_t D_t \tag{7}$$

where Z_{kit} denotes a set of explanatory variables, with subscripts k, I, and t standing for the ordinal number of explanatory variable, unit number and time period correspondingly .

Dynamic capital structure research can also use multivariate cointegration methodology (Graflund, 2000), though this type of investigation is most suitable for a single firm only if its leverage data is available for many years.

Chapter 3

Trends in Corporation's Investment Financing in Ukraine

According to the poll conducted by Ukrainian Institute for Economic Research and Policy Consulting, the sources of investment for Ukrainian enterprises in 2002 were as follows:

- 94.6% - after tax cash flow,
- 3.7% - bank loans,
- 1.2% - share issues,
- 0.5% - state funds

Though the bulk of investment in Ukraine is being financed from companies' after tax cash flow, the relative weight of external sources is steadily increasing. It is especially vividly seen when looking at the corporate bond market dynamics in Ukraine. The share of bond financing in the total investment made by Ukrainian companies increased from 0.37% in 2002 to 3.64% in the first half of 2003[5]. Among the reasons, which have contributed to this are: (1) changes in the law "On taxation of profit of enterprises" that made the revenues from bond issues untaxable and the interest paid on bonds is now tax deductible as it is throughout the world; (2) since Ukrainian government recently favored borrowing on international markets, state bonds do not crowd out corporate bonds[6]. Still another reason for rapid dynamics of the bond market (which exceeds the dynamics of "real"[7] share

[5] own calculations of Ukrsotsbank, Укрсоцбанк специальный обзор, Рынок корпоративных облигаций: аналитика для эмитента, 21 July, 2003.

[6] For instance in 2003 Ukraine issued eurobonds with 8% coupon rate

[7] Issues of shares by non-"to-be-privatised" companies

issues) is the rule rather than exception that controlling stakes of the biggest and most attractive enterprises in Ukraine belong directly or via intermediaries to a single shareholder. Minority shareholders' rights are often being violated[8]. It makes investors trying to acquire largely controlling stakes so as to secure their property rights. In this environment the major shareholders want to retain the status quo in the ownership structure. Though currently the absolute volumes of share issues greatly exceed those of bonds[9], almost all of these issues are made either by start-ups or by the state enterprises in the process of corporatisation[10]. At the same time, the existing non-financial corporations, which want to expand their business, do not use share issues widely to finance their investment projects and expansion of business. This situation logically forces the owners to choose between after tax cash flow, bank lending, and bond issue to finance business activity growth. The first source, which is after tax cash flow, is the most convenient one. It has the best features of the equity issue, like an unlimited term of the funds usage and low cost (which is opportunity cost only), while it has no equity issue "negatives", like erosion of control rights. Still the cash flow source is not always sufficient. Despite complete domination of internal financing in Ukraine, it cannot be explained by high profits and big depreciation deductions solely. A part of the reason is (as was just mentioned) in poor investors rights' protection, which applies to cases of portfolio investments and bank loans. Hence, poor protection discourages potential portfolio investors. Another possible source of financing to mention is through so-called internal capital market within financial-industrial

[8] See, for instance, Инвестгазета, 16 December 2003, page 15, article entitled "Не слилось"

[9] according to Ukrainian Securities and Stock Market State Commission, in 2002 equity issues amounted to UAH12,796 (circa $2,41bn) versus bond issues of UAH4,275 (circa $0,806bn)

[10] the term here means legal transformation of statutory fund into a number of shares, which in case of state enterprises is usually made prior to privatisation; SSMSC, 2002 report on securities market development

groups. In this case financing is obtained from an associated company in the holding or from a legal entity, which owns the company.

C h a p t e r 4

Methodology

4.1 Models and Variables Used in the Current Study

It becomes typical for such type of a research to present the results of several models, which employ differing estimation techniques, like simple pooling along with fixed and random effects. In addition, the authors traditionally try to check capital structure determinants for different leverage measures[11]. This research presents the three models conventionally used for capital structure investigations: pooled OLS, random and fixed effects.

The dataset available allows for estimation of capital structure determinants in independently pooled regression framework. Independently pooled regression has the following specification:

$$Y_{it} = \beta_0 + \sum_{j=1}^{4} \beta_j X_{jit} + \sum_{t=1}^{2} \alpha_t D_t + u_{it} \qquad (8)$$

where Y_{it} is a leverage of company *i* at time period *t*, β_j is a coefficient of the respective company specific variable X_{itj}, which stands for SIZE, EFFECTIVE TAX RATE, TANGIBILITY and PROFITABILITY for company *i* at time period *t*, and α_t with D_t are respectively time dummy coefficient and dummy variable itself for years 2001 and 2002; u_{it} is a stochastic residual that varies over time period and company.

[11] specifically, this paper surveys determinants for short- and long-term leverage

The model's drawback is that this framework does not allow controlling for unobservable company specific characteristics, which can be static over time. However, we can solve this problem using panel data methodology, which allows accounting for the time-invariant individual characteristics of companies. The specification in this case is the following:

$$Y_{it} = \beta_0 + \sum \beta_j X_{itj} + \sum \alpha_t D_t + a_i + u_{it} \qquad (9)$$

In (9) we extend the previous model by allowing for company specific variable a_i.

It should also be mentioned that weak time invariant company-specific characteristics would make the results in (8) and (9). On the other hand, strong presence of fixed effects makes estimated coefficients in (8) and (9) differ significantly.

4.2 Variables

Booth *et. al.* (2001) came to the conclusion that capital structure determinants are similar between developed and developing countries. Although, Ukraine is a transition country, it is not too strict to hypothesize that this conclusion would hold for it also. Such reasoning dictates that we shall check for the significance of traditionally used capital structure determinants[12].

4.2.1 Leverage Measures

The dependent variables used in this study are short- and long-term leverage. Leverage measures are generally called to indicate either the degree of variability in income as a function of fixed costs and

operating cash flow (in case of operating leverage) or the share of external finance in the company's capital structure (in case of financial leverage). Current study focuses on the behavior of financial leverage indicators. As financial leverage is a debt/total assets ratio[13], its calculation requires getting information from company's balance sheet, more exactly from its liabilities part. As a broad distinction for debt types by maturity, we can think of debt as being either short- (less than one year) or long-term (more than one year). Consequently, it is possible to derive long-term debt/total assets and short-term debt/total assets ratios. For the purposes of the current study, short-term debt is represented by all short-term liabilities (accounts payable, short-term interest-bearing debt, accrued liabilities)[14]. Long-term debt was calculated as a total sum of all long-term liabilities[15]. It includes long-term bank loans, deferred tax liabilities and other long-term financial liabilities.

4.2.2 Explanatory Variables

- **SIZE** – calculated as natural logarithm of sales – should take on a negative sign according to pecking order theory. In this case bigger companies are supposed to have bigger cash flows[16] and hence satisfy bigger fraction of financing needs from this cash flow. On the other hand, smaller companies should not be able to use as much fraction of internal finance due to relatively small values of cash flows[17]. If the sign is positive, the validity of pecking

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[13] Another commonly used measure of financial leverage is debt/equity ratio

[14] In the balance sheet of Ukrainian corporations it can be found in the total sum of section III of the right-hand side

[15] section II of liabilities side of balance sheet

[16] in both absolute and percentage terms

[17] again in percentage terms

order hypotheses is under question. In this case we expect bigger company to have more debt in its capital structure, which is consistent with trade-off theory. It is expected that a large company would have easier access to debt market, hence positive sign. Still there are no conclusive results in the literature: some researches find a positive relationship (Rajan and Zingales, 1995; Frank and Goyal, 2002; Booth et al., 2001) while the same study of Rajan and Zingales (1995) finds a negative relationship for Germany. Another factor here is that proportion of bankruptcy costs decreases as SIZE increases, assuming bankruptcy costs are constant. If it is the case, lenders will more readily provide funds for big companies – one more argument for positive sign and trade off theory effect. Another, dynamic aspect of this variable is a growth effect. It is caused by increase in sales and works as follows: increasing sales require increase in trade credit funds for customers (accounts receivable), while increasing production does not allow for freeing any financial resources. Hence, necessity of external financing emerges and leverage tends to increase. This reasoning supports expectations of positive sign;

- **PROFITABILITY** – return on total assets – the sign will prove dominance of pecking order (negative sign) or trade-off theory (positive sign). Booth *et. al.* (2001) find the sign of this variable to be consistently negative for a set of 10 developing countries. Apart from the conventional argument that negative sign here reflects difficulties of borrowing against intangible growth potential, the authors note that the importance of profitability increases in case the local financial market is poorly developed. This can be explained among other things by *ceteris paribus* higher information asymmetry. It must be noted that due to existing tax climate profits are often underreported. The reason for this is in dangers for enterprises

to show high profitability levels. Highly profitable enterprises, as a rule, attract special attention of tax administration and other state agencies. As a result, a lot of enterprises prefer underreporting profits. Lower registered profits do not cause big problems for enterprises though. It is in part because classic public companies with their transparency levels and the necessity of showing very good performance are not yet in very high demand among the investors;

- **TANGIBILITY** – total assets minus current assets divided by total assets – this variable's definition follows Rajan and Zingales, 1995, and Booth *et. al.*, 2001. It is interesting to mention here the results of Booth *et. al.* (2001) investigation on capital structure determinants in developing countries. The authors find generally negative correlation between the total debt ratio and tangibility. However, running an additional regression with long-term debt ratio as a dependent variable suggested the existence of positive association between long-term debt and tangibility of assets. The authors then conclude that a company with more tangible assets tends to use more long-term debt, but the overall debt ratio goes down as tangible assets' size increases: "... the more tangible the asset mix, the higher the long-term debt ratio, but the smaller the total-debt ratio". From this follows that substitution between long- and short-term debts is smaller than one. Nivorozhkin (2002) obtained similar conclusion for Hungarian companies. It does not seem valid to conclude on the effect of trade-off/pecking order theory depending on the sign on this variable. Rather, it helps in accounting for a significant factor influencing the willingness of external creditors to provide financing. The reason for it is that tangible assets, being more liquid than intangible, can be used as a collateral for loans;

- **EFFECTIVE TAX RATE** – is estimated from before and after-tax income (definition is from Booth *et. al.*, 2001). Although corporate income tax rate, as it is legally defined, may not vary widely[18] in the sample of national companies, effective tax rate, defined as:

$$effective\_tax\_rate = 1 - \frac{after - tax\_income}{pre - tax\_income} \quad (8)$$

does vary significantly due to carryovers[19] and other operating and financial choices. The worldwide observation is that increased corporate tax rates cause increasing debt usage (Gallinger, 2003). This observation is in accordance with trade-off theory – the expected sign of this variable is thus positive. The problem with this variable is akin to the problem with profitability in that it is widely manipulated in Ukraine.

Company specific ***dummies*****:**

- **INDUSTRY** – supposedly, average industry leverage is influenced by the specificity of business activity. For instance, long production cycle and seasonality should require borrowing more to cover needs in funds for operations. No expected sign – it depends upon the industry;

[18] general corporate income tax rate in Ukraine is 30%

[19] carryover is a possibility for a company to carry losses from its current operations so that it decreases taxable base in future or past

- **LOCATION –** as descriptive statistics shows, there are differences in the degree to which companies levered depending upon their geographic location. Every company in the sample is assigned location dummy to account for 27 administrative regions of Ukraine.

Chapter 5

Dataset Description

The data used in the research are taken from electronic database of State Commission on Securities and Stock Market of Ukraine, which is available on the Internet site www.istock.com.ua. 11 455 companies out of 14 000 contained in the database have all the necessary information per at least one year of operation. Still fewer of them have these data for the whole period under investigation, which is 2000-2002. Consequently, before using panel data methodology one has to check whether the observations are missed randomly in this unbalanced dataset. Overall, the total number of observations in the sample is 19 369. It means that, on average, there is 1.5 observations per company per period analyzed.

The major problem of the data is twofold. Firstly, almost all companies in the sample are unlisted; hence the quality of their financial statements is supposedly not high enough to make fully substantiated conclusions. Secondly, as business practitioners in Ukraine often say, financial statements are widely manipulated. It is especially relevant to such items in statements as taxes and net income. While interpreting the results, one has to bear in mind that they are derivatives from the information conveyed by financial statements, rather than by true business activity. After all, the results are as valid as strong is the link between mandatory financial reporting and real business operations. The table in Figure 5 presents descriptive statistics for the sample. Data are represented for the sample overall and the selected dataset industries and variables included.

Figure 3. Descriptive statistics of sample variables in industry framework (selected industries)

Total number of observations 19368, years 2000-2002	number of entries	LT leverage	Overall leverage	EFTR	Profitability	Sales	Log Sales	Tangibility
Overall means		0.04	0.33	0.10	-0.02	43094	6.85	0.69
power generation	151	0.06	0.55	0.09	0.01	253337	9.64	0.52
fuel industry	358	0.04	0.43	-0.06	-0.01	182880	9.22	0.60
metallurgy	327	0.04	0.35	0.09	-0.03	195082	9.03	0.68
chemical industry	369	0.05	0.33	0.13	0.01	38385	8.02	0.70
machine building	3669	0.03	0.25	0.07	-0.01	19589	6.84	0.75
building materials	1203	0.03	0.34	0.11	0.01	11734	6.96	0.70
light industry	500	0.05	0.36	0.02	0.01	9810	6.49	0.72
food industry	2693	0.04	0.41	0.13	0.01	18035	7.56	0.63
agriculture	2800	0.04	0.26	0.04	0.00	8800	6.30	0.75
transport	4177	0.03	0.30	0.07	-0.06	27421	6.70	0.71
communications	172	0.05	0.34	0.20	0.03	47614	7.09	0.67
construction	2978	0.02	0.33	0.08	-0.01	28030	6.80	0.66
trade	7883	0.04	0.33	0.09	-0.03	30121	7.11	0.69
information-computer services	103	0.02	0.39	0.08	0.02	5545	5.73	0.61
communal housing	352	0.12	0.43	0.34	0.02	280625	6.68	0.68

As can be seen, from "Overall means" row, long-term and overall leverage figures are 0.04 and 0.33 respectively. It does not compare favorably with other countries. For instance, if ranked by total debt ratio, Ukraine has the lowest leverage among the countries reported by Demiurguc-Kunt/Maksimovic (1999) (see Table 1 in appendix).

The way in which "number of entries" is calculated in Figure 5 means also requires some explanation. The initial database contains information on all industries in which companies operate. It means that one and the same company can be registered in different industries. That is why there is no statistics for number of companies in a particular industry, but instead number of companies, which are registered to operate in particular industry.

Profitability mean may look strange in view that Ukraine had sound economic recovery over the analyzed period. However, this figure might only prove that Ukrainian enterprises use 'creative' accounting to hide profits. For instance, one of the most profitable industries, which is metallurgy, shows –3% mean profitability.

Figures 6 and Figure 7 with leverage rankings of regions and industries help in making comparison of industry and region average leverage levels with that of particular company. As could be expected, Kyiv, Ukrainian capital, heads regional ranking. Also, we can observe that the upper part of the rating is composed basically of Eastern Ukrainian regions, while Western part of Ukraine shows

below-average leverage levels. This, in part, reflects regional disparities in the level of economic development and industrialization.[20]

Figure 4. Ranking of regions by leverage value

Overall ranking	Region	LT leverage	Overall leverage	Overall ranking	Region	LT leverage	Overall leverage
1	Kyiv	0.073	0.39	15	Kyivska	0.038	0.27
2	Dnipropetrovska	0.043	0.41	16	Khmelnitska	0.025	0.34
3	Zaporizka	0.047	0.37	17	Crimea	0.036	0.28
4	Donetska	0.037	0.42	18	Lvivska	0.031	0.31
5	Mykolayivska	0.040	0.35	19	Vinnitska	0.031	0.32
6	Kharkivska	0.038	0.35	20	Ternopilska	0.018	0.34
7	Kirovohradska	0.037	0.33	21	Cherkaska	0.029	0.30
8	Luhanska	0.031	0.36	22	Odeska	0.030	0.27
9	Khersonska	0.036	0.34	23	Chernihivska	0.019	0.29
10	Chernivetska	0.043	0.29	24	Rivnenska	0.016	0.29
11	Ivano-Frankivska	0.032	0.33	25	Sevastopol	0.022	0.25
12	Poltavska	0.035	0.32	26	Zakarpatska	0.024	0.23
13	Volynska	0.032	0.33	27	Zhytomirska	0.020	0.27
14	Sumska	0.026	0.35		Mean	0.04	0.35

Next table presents leverage ranking by industries. As can be seen, communal housing and power generation industries head the rating. The explanation to this is that these two industries have the most stable cash flows, which allow them obtaining external financing comparatively easier than it is for other industries. Since the bulk of external financing is of short-term nature, high cash flow from operations is an important indicator of current liquidity of a corporation and hence, the risk related with non-payment of principal and interest is minimal.

[20] General rank was calculated as follows: short-term and long-term leverage ranks were added together and these sums were ranked again

Figure 5. Ranking of (selected) industries by leverage value

Rank	Industry	LT leverage	Overall leverage	Score
1	communal housing	**0.12**	**0.43**	**4**
2	power generation	**0.06**	**0.55**	**5**
5	food industry	**0.04**	**0.41**	**15**
6	light industry	**0.05**	**0.36**	**16**
7	communications	**0.05**	**0.34**	**16**
8	fuel industry	**0.04**	**0.43**	**19**
9	metallurgy	**0.04**	**0.35**	**21**
10	chemical industry	**0.05**	**0.33**	**24**
12	trade	**0.04**	**0.33**	**28**
15	information-computer services	**0.02**	**0.39**	**32**
16	building materials	**0.03**	**0.34**	**33**
21	construction	**0.02**	**0.33**	**38**
22	agriculture	**0.04**	**0.26**	**39**
23	transport	**0.03**	**0.30**	**39**
25	machine building	**0.03**	**0.25**	**44**

One important characteristic of the data set must also be mentioned. It concerns the structure of short- and long-term debt. Since most empirical works on the capital structure determinants are based on listed companies' data, such companies presumably have bigger share of external financing on their balance sheets. Still external funds per se are too broad a category to deal with. In case of short- and long-term debt it may comprise not only bank loans and bond issues, but also accounts payable, notes

across regions/industries.

payable, other financial and nonfinancial liabilities. When exploring the structure of short- and long-term debt in a part of sample companies (for year 2002), it was found that 52% of short-term debt consists of accounts and notes payable while 80% of long-term debt consists of the liabilities which are not bank loans (for instance, deferred tax liabilities, nonbank financial liabilities, etc). It is not unreasonable to assume that the rest of the dataset has similar debt structure. The data available do not allow calculating for the share of bond issues in the debt structure though. Hence, regressions' results are trying to explain how exactly these mixes of liabilities change in total values depending upon the changes in explanatory variables. This peculiarity needs to be born in mind when explaining regressions results.

Chapter 6

Results and their interpretation

6.1 Excluded regressors

Unlike traditional empirical works on capital structure, which use a wide range of explanatory variables, current research does not include some of the traditionally used regressors. One reason for it lies in unavailability of data on some parameters. This, in particular, concerns GROWTH variable, which is a market-value-to-book-value ratio. Since overwhelming majority of the sample companies are not publicly traded (more than 99%), the information on their market value is absent. Some other variables are absent in regressions for either technical or econometric reasons. Namely, OPERATING RISK and INCOME VARIABILITY (variance of income) measures are barely reliable if calculated. The reason lies in the very small time range covered by the available data (3 years) and unbalanced character of the dataset. Still, the attempt to use INCOME VARIABILITY regressor was made. The statistics obtained indicated that it is both statistically insignificant and has a negligibly small coefficient. At the same time, exclusion of this variable from the set of explanatory regressors increases sample size very significantly (from 2000 to 19000 companies). Hence, INCOME VARIABILITY was dropped from the following investigation. NON-DEBT TAX SHIELD regressor was excluded on exactly the same grounds. Trial regressions with NON-DEBT TAX SHIELD provided both negligibly small and statistically insignificant value coefficient, while its exclusion did not change regression statistics any significantly and increased the dataset size a lot.

6.2 Consistency check

Since the dataset represents an unbalanced panel, it was necessary to check whether the data demonstrate consistency with its balanced sub-samples and what is the likelihood of selection bias in the sample. For this end balanced subset was created and tested. The results were compared with full dataset coefficients. This test suggested by Verbeek (2000). Comparison of the coefficients obtained (essentially, their signs and statistical significance) have shown no significant differences and implies consistency of data and absence of selection bias.

6.3 Specification of regressions

The sets of short- and long-term leverage regressions are run separately and include pooled OLS, random and fixed effects models. Every regression includes four company specific variables (Effective Tax Rate, Profitability, Size, and Tangibility), two time dummies, and 26 industry dummies, which are not presented in the table. In the very right column of every table you can see the difference between fixed and random effects coefficients and the corresponding results of Hausman test. Hausman test statistics suggests that there is a strong presence of fixed effects in the sample both for short- and long-term regressions. However, taking into account the fact that there is on average 1.8 observations per firm, it becomes clear that the difference between fixed- and random effects regressions should be significant due to the different number of observations accounted for in every case. In particular, all companies having only one observation in the sample are simply ignored by fixed effects methodology. As a result, a lot of cross sectional variation, which is in single observations, is not used at all due to the nature of fixed effects model. Therefore, both types of models are presented as well as pooled OLS, as it would provide more objective picture on the subject of investigation.

6.4 Short-term leverage regressions

As the Figure 8 shows, EFTR variable (which stands for effective tax rate), is not statistically significant in two out of three regressions. It also changes sign across specifications. It may mean that companies do not make use of debt induced tax shield in short-term financing decisions. In practice, short-term financing channel does not usually employ bond instruments, but bank short-term loans are often used here for keeping liquidity and satisfying short-term needs in working capital. Statistically significant and negative coefficient in OLS regression may represent one more proxy for profitability, when debt induced tax shield is not used, hence a negative sign. Possible reason for some coefficients of EFTR to be insignificant is in alternative ways to hide/shield profits. Another thing to mention is that average profitability level in the sample is –2%. Therefore, according to financial statements data, there is generally no profit to shield for companies. Negative profit figure may not represent the actual state of affairs in business units, but still companies calculate taxes using reported profit figures, which appear basically negative. This result also means that one of the main elements of trade-off theory, which is debt induced tax shield, is not employed here.

PROFITABILITY variable is both statistically significant and has a negative sign. It means that higher corporate incomes decrease needs in external financing. While being intuitively appealing, this result suggests that short-run financing decisions are guided by pecking order theory considerations. In other words, information asymmetry makes firms look for funds from their cash flows on the first place, and only then do they resort to external financing as bank loans, etc. It is interesting that despite the fact that most companies in one way or another hide their profits, the level of this hiddenness is generally proportional to their profits so that relative profit figures are still informative

for comparison purposes. More profitable firms should have better access to external financing (or firms seeking external financing have a greater incentive to show that they are profitable).

Figure 6. ST leverage regressions

ST Leverage (SD=0.32)	Pooled OLS	Random Effects	Fixed Effects	Difference FE - RE
Effective Tax Rate	-0.2757	-0.1442	0.0181	0.1623
	0.0340	0.2440	0.8930	
Profitability	-0.1075	-0.1222	-0.2297	-0.1074
	0.0150	0.0050	0.0000	
Size (Log of Sales)	-0.2733	-0.0915	0.2767	0.3681
	0.0000	0.1020	0.0090	
Tangibility	-91.673	-77.235	-37.461	39.7740
	0.0000	0.0000	0.0000	
Dummy2001	-5.734	-5.1529	-3.2106	1.9423
	0.0000	0.0000	0.0000	
Dummy2002	-0.234	0.2612	1.0444	0.7832
	0.5160	0.3960	0.0010	
Industry dummies (26 industries)	not shown	not shown	not shown	not shown
R-squared	0.6614	-	-	
Adj R-squared	0.6607	-	-	
R-sq: within	-	0.2229	0.2328	Hausman test stat
between	-	0.7438	0.676	$\chi^2 = 5.292$
overall	-	0.6595	0.6051	
# of observations	16933	16933	16933	$Prob > \chi^2 = 0.00$
# of groups	-	9166	9166	
obs per group (average)	-	1.8	1.8	

So a positive sign on profit might reflect this rather than pecking order theory. However, Ukrainian enterprises having their distinct mix of bank and nonbank financing sources (of which a big part is comprised of accounts payable, notes payable, nonbank financial liabilities) probably need not profits disclosures on as large a scale as conventional traded companies. The reason is that such 'external financing' is most likely available to them without uncovering their real conditions. The reason for willingness to provide such funds (basically in the form of payables) may lie in good knowledge of business partners by each other.

SIZE variable, which is represented by natural logarithm of sales, is statistically significant, but changes its sign depending upon specification. Dominance of negative sign can be interpreted in favor of pecking order theory. Nevertheless, because LOGSALES has a negative sign for ST leverage in two regressions out of three ran, this result is not strictly reliable.

TANGIBILITY variable is negative across all specifications and statistically significant in all of them. On the first glance, it may seem strange, but there are purely practical considerations in this result. Short-term financing usually needs to be collaterized with liquid assets. As tangibility is a ratio of fixed assets to total assets, it becomes clear that the higher this coefficient is, the smaller the share of current assets (which are effectively liquid assets). Another point to mention about TANGIBILITY is that it has the biggest coefficient by absolute value. It may mean that in conditions of transition country financing is strongly influenced by tangible assets, which are relatively easy to value. There is another factor, contributing to a negative value of tangibility variable. Accounts receivable being an element of liquid assets, correlated negatively with tangibility and positively with accounts payable. Correlation coefficient between accounts payable and accounts receivable is close to 0.6. This introduces slight negative relationship between leverage and tangibility variable. Nevertheless, such association is going to be eroded because it is not direct but via tangibility. Also accounts receivable take only a fraction in short-term leverage (no more than 30%).

TIME DUMMY variables account for changes in macroeconomic environment. It can be inferred that 2001 to 2002 period brought about a bullish trend in this figure.

All R^2 coefficients in short-term leverage regressions are significantly bigger than those in long-term leverage regressions (presented next). One of the reasons for this lies in much higher variation of the

dependent variable in case of short-term leverage. In fact, standard deviation of ST leverage is 0.32 while that of LT leverage is 0.14.

6.5 Long-term leverage regressions

The set of regressions describing factors of long-term leverage has the same specifications but different dependent variable, which is now a long-term leverage. As was the case in the previous table, Hausman test suggests a strong presence of fixed effects.

Figure 7. LT leverage regressions

LT Leverage (SD=0.14)	Pooled OLS	Random Effects	Fixed Effects	Difference FE - RE
Effective Tax Rate	-0.0643	-0.0712	-0.0735	-0.0023
	0.476	0.213	0.232	
Profitability	0.0051	0.0013	-0.0056	-0.0069
	0.868	0.953	0.825	
Size (Log of Sales)	0.0719	0.0927	0.1044	0.0117
	0.033	0.004	0.030	
Tangibility	-1.8643	1.3558	3.6564	2.3006
	0.000	0.000	0.000	
Dummy2001	0.1743	0.4327	0.5675	0.1349
	0.425	0.000	0.000	
Dummy2002	1.2394	1.0085	0.9081	-0.1005
	0.000	0.000	0.000	
Industry dummies (26 industries)	not shown	not shown	not shown	not shown
R-squared	0.0131	-	-	
Adj R-squared	0.0113	-	-	
R-sq: within	-	0.0140	0.0229	Hausman test stat
between	-	0.0067	0.0014	$\chi^2 =$ 177
overall	-	0.0067	0.0005	
# of observations	16933	16933	16933	$Prob > \chi^2 =$ 0.00
# of groups	-	9166	9166	
obs per group (average)	-	1.8	1.8	

EFTR variable is insignificant as in the regression before. It can be explained by a small share of bank loans in the LT leverage figure (about 20%). It follows then that debt induced tax shield usage

in LT financing is insignificant. Another argument also applies that corporations find alternative ways to shield their profits (like amortization and depreciation, some semi legal ways etc.).

PROFITABILITY variable is both statistically insignificant and changes sign depending upon specification. Therefore it is considered as playing no role in LT financing decisions. PROFITABILITY coefficients do not evidence the effect of pecking order theory. The support of trade-off theory is despite the dominance of positive signs negligibly weak due to statistical insignificance of the coefficients. The explanation for the obtained results is that in case of transition economy long-term horizon for earnings forecast is too uncertain to be relied upon. Hence, current profits are not necessarily a good indicator of future profitability. It means that lenders pay much more attention to "more material" figures, like a share of tangible assets on company's balance sheet. Indeed TANGIBILITY coefficient is positive in two out of three regressions and statistically significant in all of them. It means that long-term external financing is weakly positively related with tangibility figure. This result is also proved by reality: the lenders of long-term funds usually pay attention on tangible collateral which is less volatile in absolute size over time than other indicators (like PROFITABILITY, SALES).

SIZE variable is positive and statistically significant in all LT regressions. Assuming bankruptcy costs to be constant in absolute value, they decline as a percentage cost in company's size. It means that cost of financial distress (inability to meet financial obligations) decreases with increase in company's size. As a result, trade-off theory suggests increase in leverage for a bigger company (which is observed in the regression). Hence, positive sign of size variable indicates effect of trade-off theory in the long run. It means that bigger companies tend to take on bigger fraction of long-term external financing.

Time dummy variables demonstrate gradual increase in LT leverage in the sample in 2001 to 2002 period.

We can think of firms as making choice between short- and long-term financing. The results of the two sets of regressions are consistent with the story that sizable companies with big share of tangible assets and high profitability levels (which normally implies creditworthiness) can get long-term financing. On the other side, small, tangible-assets poor and unprofitable corporations can only get short-term financing. Having access to both short and long money, the big corporations would most likely choose borrowing primarily long. Hence, profitability coefficients in both sets of regressions can be affected by both the pecking-order hypothesis (more profitable corporations have less need to look outside financing) and creditworthiness. If they were only affected by creditworthiness, then the long-term leverage coefficients would be positive[21]. However, they are statistically insignificant.

[21] I thank professor David Brown for this comment on the regressions' results

Chapter 6

Conclusions

The analysis conducted suggests that short-term financing of Ukrainian corporations exhibits pecking order theory pattern. In other words, short-term investment sources for Ukrainian businesses are based primarily on internal finance, which is represented by cash flows and depreciation. In turn, long-term financing design is subjected to trade-off theory considerations. Here bigger companies take on bigger fraction of external debt, supposedly because percentage value of bankruptcy costs decreases in size.

We have also found out that profitability and tangibility negatively influence the size of short-term external financing. Therefore, more profitable and tangible Ukrainian companies tend to have smaller short-term leverage. On the other hand, company's long-term leverage increases in size and possibly in tangibility. Hence, bigger and more tangible companies are predisposed to be more long-term leveraged.

We found that big, profitable and highly tangible companies being creditworthy and having relatively easy access to both short- and long-term financing tend to choose long-term borrowings. On the other side, small, unprofitable corporations with poor tangible collateral can hope to get primarily short-term external funds. Thus, we conclude that creditworthiness, which in our case derives from certain size, profitability and tangibility levels, affects term structure of corporate leverage.

Contribution of this research in that it has complemented the existing body of literature through putting forward and empirically proving on the sample of Ukrainian companies that pecking order and trade-off theories are not contradictory but rather supplementary to each other. It is manifested in that short-term financing exhibits pecking order pattern while long-term financing tends to target debt ratio. Previous researches did not articulate this distinction between the elements of the debt term structure and the appropriateness of the two theories to it.

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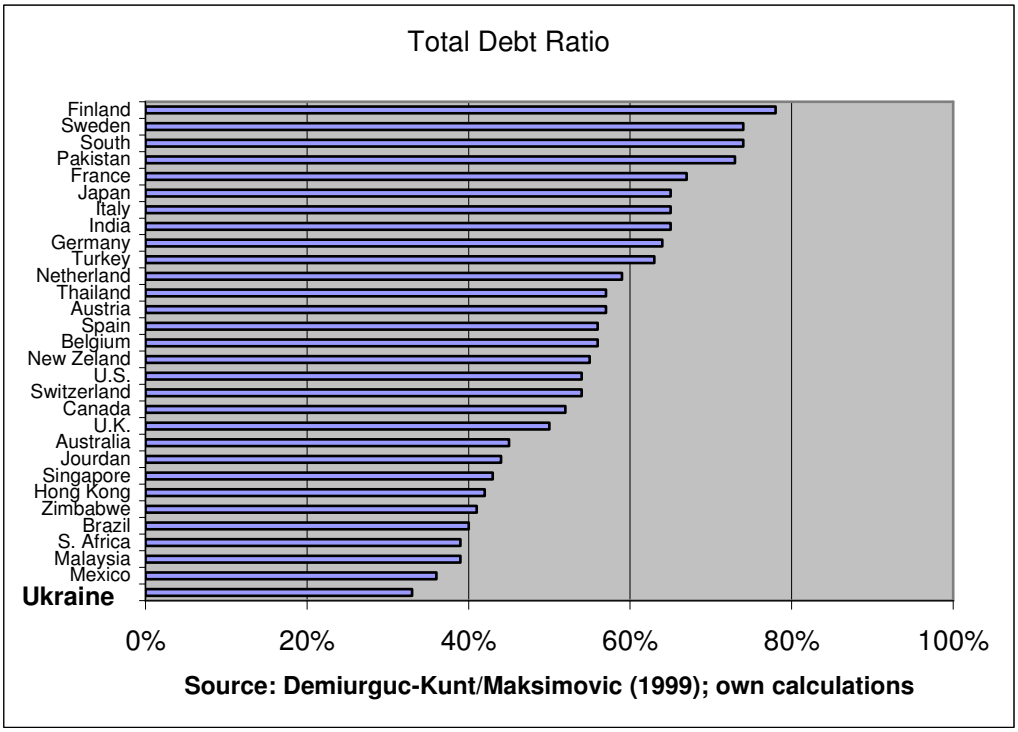
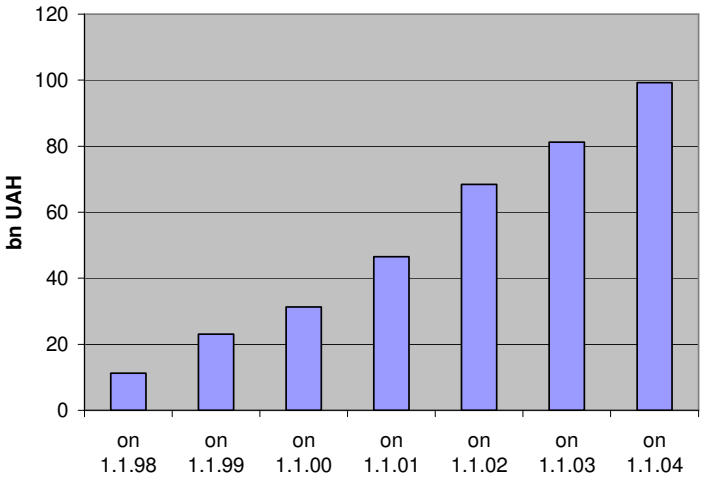
Appendices

Appendix 1 . Total Debt Ratio for selected countries



Appendix 2. Registered Share Issues: Cumulative Volume



Appendix 3. Share issues by market participants, bn UAH

Market Agents	1996	1997	1998	1999	2000	2001	2002
Commercial Banks (CJSC)	0.006	0.17	0.231	0.215	0.333	0.498	0.3435
Commercial Banks (OJSC)	0.049	0.269	0.324	0.639	0.755	0.436	0.8749
Insurance Companies	0.002	0.015	0.1	0.165	0.192	0.385	0.4365
Investment Companies and Funds	0.001	0.018	-0.03	0.01	-0.002	0.003	0.0005
Enterprises (CJSC)	0.068	1.724	6.254	2.516	3.390	6.602	4.445
Enterprises (OJSC)	1.696	7.247	4.960	4.374	10.827	13.999	6.696
Total	1.822	9.443	11.839	7.919	15.495	21.923	12.7957