

IMPACT OF ANCHORING BIAS ON CORPORATE PROFITS AND SHAREHOLDERS WEALTH

Ibrahim Emre Karaa

Celal Bayar University, School of Applied Sciences

ABSTRACT

Behavioral Corporate Finance studies mainly concerned with irrationality in sense of overconfidence and optimism especially about the firms which are already take place in stock exchange. In this paper, I examined impacts of the fixed opinion or a common belief of the statement “I never borrow money” which should be considered as a judgemental bias under the concept of anchoring in relatively small firms. By using artificial dataset, I explicitly show the impact of this bias in borrowing that effect profitability of the company, shareholders wealth and costly time loses.

Keywords: Behavioral Corporate Finance; Corporate Decision making; Irrationality

JEL classification: G31

INTRODUCTION

Behavioral Finance (BF) is an emerging discipline that depicts a number of approaches to make contributions to finance in sense of rationality. In particular, BF moves on the psychology and cognitive science literatures to examine why and how individual decision-making often deviates from rational choices and expectations in systematic ways. As Akgüç(1988) argued, risks like sharp declines of asset prices heavily depends on psychological affects even no economical cause for that.

Capital budgeting, capital structures are subject to decision making and potentially astray from rationality by managers'/owners' behavioural biases. Anchoring to a certain time interval, like the high inflationary times in Turkey/or similar inflationism suffering countries, and having the information of bankrupts occurred in decades ago, is the main hesitate of managers in lending. Manager's fear can be viewed by their tendencies of debt financing: “no borrowing” policy as a part of past extrapolation.

Several differences are well-known between large firms and small firms that the difference is something more than size, as Storey (1994) pointed out which require specific models for decision making including capital issues. Relatively small firms, who are not involved in stock exchange, and traditionally not issuing initial bonds, generally prefer bank loans.

Decisions of investing in productive and effective projects are; replacement projects, expansion projects, new product and services regulatory, safety and environmental projects.

Capital structure questions arise after taking decision of any project for management. There are neither fixed rules on what represents an ideal capitalization nor one drop solution about examining relationship between capital structures' forms likewise degree of debt vs. equity. A suitable capitalization has to depend on the nature of business, prevailing economic and financial conditions and beliefs of management. Unification of ownership and management exists, as a result, lack of sophistication prevails and still most of managers are not aware of risks and costs of equity. Successful capital structure and budgeting demands sophisticated information processing. However, unlikely managers' belief or opinions on loans violate rationality.

In this early draft, I investigated how that bias affects firms, profits, and shareholders wealth eventually, even though uniqueness is a problem and all the solutions are tailored for the special case. Main finding and contribution of the research is comparison of companies under assumptions of manager's preferences on debt, and show that varying behaviours cause different decisions on capital budgeting and so structure which has direct effects on profits and wealth.

The plan of the paper is as follows: in Section I, I briefly review the main theories on SME financing. In Section II, I discuss the four cases of attitude towards debt financing and separately anchoring bias and cost of equity/debt issues. Section III describes the methodology and, purpose the hypothesis by explanation. Finally, I present results, conclusions and discussions in Section IV.

I. Capital Structure

Modern capital structure theory first developed by Modigliani-Miller (1958) in their distinguished work: "The Cost Of Capital, Corporation Finance and the Theory Of Investment". Their first proposition is that the value of a company is independent of its capital structure. And, second proposition states that the cost of equity for a leveraged firm is equal to the cost of equity for an unleveraged firm, plus an added premium for financial risk. That is, as leverage increases, while the burden of individual risks is shifted between different investor classes, total risk is conserved and hence no extra value created.

Modigliani-Miller (MM) theory influenced the early development of the trade-off theory and the pecking order theory, however, this two theories did not re-examine the assumptions of MM theory. Moreover, as Fama and French(1998) pointed out, irrelevance proposition is quite hard to test. Regressing value on debt cannot be a solution to structural testing because there so many factors exist of effecting such as profits, collateral and growth opportunities.

When corporate income tax was added to the original MM theory, benefits of debt arise. But, if the objective function is linear, 100% debt becomes logical which early after, an avoidance from the situation appeared for offsetting cost of debt.

In order to understand the dynamics of capital structure, and the offsetting, two main theories developed: Trade off Theory and Pecking order Theory.

Trade-off Theory

Kraus and Litzenberger(1973) developed *Trade off Theory* that rely on the idea that a firm chooses how much debt finance and how much equity finance to use by balancing the costs and benefits. They provide a classic statement of the theory that optimal leverage reflects a trade-off between the tax benefits of debt and the deadweight costs of bankruptcy.

The trade off theory predicts a target optimal structure, and this balance requires an equilibrium which has some effects named by Copeland et al (2004) like: industry-wide influences, agency problems, bankruptcy costs and taxes. According to Myers (1984), a firm that follows the trade-off theory sets a target debt-to-value ratio and then gradually moves towards the target. The target is determined by balancing debt tax shields against costs of bankruptcy. This critic responded with the arguments; possibility of observing targets, complexity of tax codes and the nature of costs, transaction costs, by researchers (Graham, 2003; Frank and Goyal, 2007). Despite critics, theory has many empirical evidences.

Taxes, bankruptcy costs, transactions costs, adverse selection, and agency conflicts have all been advocated as major explanations for the corporate use of debt financing but not the behavioural dimensions for instance anchoring bias mainly.

Pecking order Theory

Myers and Majluf (1984) developed the *Pecking order Theory* represents that firms prioritize their sources of financing from internal financing to equity according to the principle of least effort. The pecking order differentiates from the trade off in its conclusion of a hierarchy in the financing choices. Hence, internal funds are used first, and when that is depleted, debt is issued, and when it is not sensible to issue any more debt, equity is issued. Instead of existence of an optimal structure, advantages discussed by flexibility, transaction costs, and information asymmetries. First, managers are precautionous to use the funds; secondly, external funding creates costs which is not valid for internal funding; last, managers know better than anyone about the firm and they do not want to share the information about their returns, profits and opportunities.

Berger and Udell (1998) contributed by the “financial growth cycle”, that explains the growth of firm in terms of changes in financial needs and options which of the firm information becomes opaque eventually. Especially for the first two years of a firm, usage of trade credits arise. Long afterwards short term and later long-term funds become available. If firm grows steadily, may gain access to capital markets. Thus, this progress can be seen as verifying of pecking-order theory.

Debt Financing

Fazzari et al. (1988a, 1988b) by concentrating on debt instead of equity finance, emphasis that for most firms debt is more important source of incremental funding than outside equity. A number of studies(Friedman (1982), Srinivasan (1986), and Fazzari et al. (1988a, 1988b) indicate that share issues typically account for less than 5% of total new external finance. In a loose sense, if debt is the primary marginal source of external funds, then the potential is great for credit restrictions to affect corporate decisions.

Using a sample of over 15,000 yield observations, Bharath(2004) finds that the Bond-Bank spread is negative for high credit quality firms and positive for low credit quality firms. Bharath explains his findings as consistent with the view that for high quality firms, the benefits of bank monitoring are outweighed by the costs of bank assistance. This causes the spread to be negative; indicating that bank debt offers few benefits for high quality firms. For low quality firms, the opposite is true, causing the spread to be positive. The magnitude of the potential agency costs mitigated by banks is more important for poor quality firms, justifying the decision to borrow from banks.

Whited(1992) also presents evidence supporting the theory that problems of asymmetric information in debt markets affect financially unhealthy firms' ability to obtain outside finance and, consequently, their allocation of real investment expenditure over time. Another possible explanation (Chittenden et al, 1996) is that issuing external equity may be costly for SME, because of the relatively fixed costs of initial public offerings, the small firm effect on the cost of equity, and the potential loss of control by the original owner-managers. Also, managers may use short term trade credits and personal loans.

II. Four cases of attitude towards debt financing

Corporate finance aims to explain the financial contracts and the real investment behaviour that appears from the interaction of managers and investors. Thus, a complete explanation of financing and investment patterns requires an understanding of the beliefs and preferences of these two sets of agents; rational and irrational. The majority of research in corporate finance assumes a broad rationality. Agents are supposed to develop unbiased forecasts about future events and use these to make decisions that best serve their own interests(Baker et al, 2005). Traditional approach emphasizes all agents and markets are rational and pursue utility maximization. Behavioral approach emphasizes, agents could be irrational and markets itself contains irrationality (see. Barberis and Thaler, 2003; Shleifer,2000) as well as rationality. For instance, managers might not be following the rational laws of markets for their interest in terms of utility maximization.

In this research I am interested in the biases in people's beliefs and preferences. Regarding how people form beliefs, some outstanding characteristics are overconfidence, anchoring, and optimism(Karaa, 2010). On the subject of preferences, I explained anchoring bias of managers whose preference is never borrowing caused by anchored rates. These behavioural costs are internal to the firm, and are caused by managers' cognitive imperfections and emotional influences (Shefrin, 1999).

Behavioural finance theories have not concern with small firms. Still, it deserves attention for its widespread and large in numbers especially in emerging economies. Special models are required in the field, because shareholders and managers are generally the same and generally their shares do not trade.

Anchoring bias reveals when people make estimates by starting from an initial value that is adjusted to yield the final answer as a part of past extrapolation bias. The initial value, or starting point, may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient. That is, different

starting points yield different estimates, which are biased toward the initial values (Kahneman and Tversky, 1982). For instance, when confidence interval probabilities are asked to investors, in replies, too narrow predictions had been seen and interpreted as anchoring effect in Stephan and Keil (2000). Moreover, if an anchoring bias exists, it is expected that the financial analysts react slowly when prices in picks. Maybe just because of this, some shares are mispricing moreover, anchoring bias induces overconfidence (Stephan, 1999).

III. Methodology and Brief Description of Hypothesis

Data Description

Even though study is more hypothetic and relies on artificial data, I used to approximate hypothesis to real world. Firstly, I obtained IMKB-100 index and Textile industry index from IMKB. I used, indexes between 2001- 2010, the last ten years including the years crisis existed which could reduced the returns meanwhile. I evaluated different states via using Net Present Value (NPV).

I used Stata 9 and Excel 2007 for calculations.

Statement: “When a project decision arise; if a manager has a fixed idea on borrowing caused by a judgemental bias like assuming a certain rate on debt or a rate of return, it affect decisions and preferences which are not profitable”

Assumptions

Assume there a textile small firm exists which of shares not trading arise a 4 year project with no tax. All mean cash flows are known to managers.

States:

Four states explained below in order to understand the difference that behavioural attitude affected.

State 1: Managers decide on project funding by equity only. (Firm has enough equity)

State 2: Managers decide on project funding by both equity and debt. (Capital structure is, 50% Equity, 50 % Debt)

State 3: Managers decide on project funding by equity only. (Firm has not enough equity)

State 4: Managers expected return on project is anchored to a percentage like 12%.

Managers’ behavioural bias of anchoring reveals in State 1 and State 2 and if there is no anchoring; State 3, it is shown how anchoring effects under borrowing and non-borrowing conditions. State 4, is an examination of anchoring bias briefly.

Cost of Equity and Beta estimation:

Beta is the predictor of systemic risks and relatively easy if firms are in stock markets but estimating betas in non-trading stock firms, it is quite hard to predict betas. These firms' betas could be estimated in a different way than stock firms like accounting betas, and/or fundamental betas to make comparisons with similar firms (Kırlı, 2004). I predicted sector beta in order to make comparison different than suggestions (Beaver, Kettler and Scholes, 1970; Damadoran, 2002) and to highlight the cost of equity used by firm. The hypothetical nature of the study required to suggest this suggestion. I used CAPM model for estimation.

$$K_E = R_F + \beta_E(R_M - R_F)$$

where,

K_E = firm's cost of equity(required rate of return), R_f = Risk free rate, R_M = Return on all market, R_F = Return on Textile sector.

For calculating the returns, I used average of monthly cumulative returns for both IMKB-100 and Textile sector indexes.

Net Present Value

Net present is one of the techniques whereby the discounting of cash flows is done which serves as a good measure of profitability. NPV is the sum of all incremental cash flows if a project is undertaken. The discount rate used is the firms cost of capital adjusted for risk of the project. For a normal project where there is initial cash outflow and then it's followed by a series of after tax cash inflows. The NPV, in such cases will be present value of the expected cash inflows minus the initial cost of the project. This can be represented in formula as:

$$-CF_0 + CF_1 / (1+k) + CF_2 / (1+k)^2 + CF_3 / (1+k)^3 + \dots + CF_n / (1+k)^n$$

Here, CF_0 is the initial cash outflow or the cost of the project.

CF_n is the after cash inflow in time interval t ,

k is the required rate of return or the cost of capital adjusted for the risk of the project that the firm has undertaken.

In financial theory, if there is a choice between two mutually exclusive alternatives, the one yielding the higher NPV should be selected. A project having positive NPV will increase shareholders value and will be profitable, if R_t is a positive value, the project is in the status of discounted cash inflow in the time of t , whilst projects with negative NPV won't be profitable and will decrease shareholders value. So these projects should be rejected.

IV. Results, Conclusions and Discussion

First, I predicted textile sector beta, in order to compute the firm's required rate of return as CAPM suggests in model; I regressed textile cumulative returns on IMKB-100 returns.

Beta	0.899014
CRrtn_Tum (Average)	27.16%
CRrtn_Tekstil (Average)	15.58%
(R_m-R_F)	11.58%
Risk Free	
β (R_m-R_F)	0.104105821
Cost of Equity (K_F)	17.41%

Suppose to undertake a project £3000, and two states 1, 2 are explicitly provides same investment and outcomes. Anchoring bias, loss aversion is appears at that moment. And managers who believe that borrowing produces losses-even the borrowing is suitable, economically and rationally most profitable-, they tend not to borrow.

State 1: Enough equity for the new project

100% of project funded by equity than costs($k_{equity}, k_{interest}$) that;

$$3000 \times 0.1741 = \underline{\underline{£522}} \quad (k_{equity})$$

State 2: 50% Equity, 50% Debt

$$1500 \times 0.1741 = \underline{\underline{£261,15}} \quad (k_{equity})$$

$$1500 \times 0.10 = \underline{\underline{£150}} \quad (k_{debt})$$

$$\text{Total sum} = \underline{\underline{£411.15}}$$

As shown above, cost of equity is higher than cost of debt (interest).

State 3:

Suppose two conditions K, L are explicitly provides same investment and outcomes. I anticipated, if the full amount of investment paid, inflow amounts would be higher in inception. I used NPV (Net Present Value) method to estimate.

K: Firm does not have enough equity to invest, so total amount paid in years time.(Firm_{resist})

L: Indebted firm (firm_{accelerated}), investment made at start.

Date	Cash Flows	
	Firm _{resist}	Firm _{accelerated}
02/01/2011	-1000	-3000
31/12/2011	300	1500
02/01/2012	-1000	1500

31/12/2012	900	
02/01/2013	-1000	1200
31/12/2013	1200	
02/01/2014	1500	900
02/01/2015	1500	300
	2400	2400

$$NPV(\text{Firm}_{\text{accelerated}}) = \text{£}829.69 > NPV(\text{Firm}_{\text{resist}}) = \text{£}488.67$$

State 4:

Inconsistency between rational and suffering anchoring biased irrational managers may cause anchored managers to form expectations about a firm's future cash flows that are biased in relation to market's rational expectations. The effects on value and the firm's cost of equity are analysed by Stein(1996). The bias is assumed to take simple form;

$$Y^b = \Sigma E(Y)(1+\delta)$$

where Y^b is the biased expected value of a cash flow next date with an unbiased expected value of $E(Y)$, and the bias can be positive or negative.

δ = difference between $E(R^*)$ and $E(R^b_E)$, where $E(R^*)$ is the unbiased expected return and $E(R^b_E)$ is biased(anchored) expected return. Thus;

$$\delta = E(R^*) - E(R^b_E) = 0.0358 \text{ and,}$$

$$Y^b = 5400.(1.0358) = 5593.32 \text{ if we assume } Y^* = 5400 \text{ as following the example.}$$

Difference between biased and unbiased expected cash flow is;

$$Y^b - Y^* = 193,32$$

In addition to this, if we look for the market value of project where V^b is the biased value;

$$V^b = E(Y)(1+\delta)/(1+R^b_E)$$

where R^b_E is the biased discount rate from CAPM:

$$R^b_E = R_f + [\text{cov}(Y/V_b, R_m)/\text{var}(R_m)][E(R_m) - R_f]$$

The unbiased V^* for the cash flow is

$$V^* = E(Y)/(1+R^*_E)$$

where

$$R^*_E = R_f + [\text{cov}(Y/V^*, R_m)/\text{var}(R_m)][E(R_m) - R_f]$$

In example, the R_E^b is assumed fixed value like 12%, as anchoring biased return, and $E(R_m)=15.58$ as textile market returns, thus;

$$V^b = 5400(1-0.0358)/(1+12) = \underline{4972.088}$$

$$V^* = E(Y)/(1+R_E^*)$$

$$V^* = 5400/(1+0.1741) = \underline{6340.14}$$

$V^b < V^*$ and sign is negative, so anchored managers are underestimated the unbiased expected returns, and, if $V^b > V^*$ and sign is positive, then managers overestimated, or very optimistic about their expected returns. This bias, not only cause a wrong expected value of cash flow, also cause a different distribution of expected pay-offs in time as well.

To sum up, anchoring bias caused never borrowing orientation of managers leave the firm to face to lower cash flows which they can obtain high levels of cash flow in use of debt instead. Further, most biased managers seem they do not estimate the cost of equity. In the scenario(State:1,2,3), regardless of tax advantages and reaching same outcomes, time value of money is the main factor in most investment decisions. Higher pay-off value is higher than lower payoff value and the difference is a loss if time considered technique like in NPV approach.

State 4, represents a biased manager decision under anchored return rate. Continuing the same data set, I explicitly presented how the bias in expectations affects the market value of project in comparisons. Valuation mistakes cost to firm in lending like pay-back and cash flow plans. Anchored manager's, may lead the firm irrationally if the expectations formed in some ways rather than rational market expectations, as being optimistic or pessimistic but not realistic.

Conclusion-Discussion

In this study the main contribution is: I identify anchoring bias in different states in comparison of decision making and propose a new approach that includes some behavioural characteristics of these firms. It is still crucial that if firm really need to know cost of capital to decide how much to invest if it knows the market value of capital goods used in firm however, this discussion is beyond the study.

I classify the managers/owners as unbiased and biased in terms of rational and irrational. Even though the study relies on hypothetic and scenario based, and need of real values and stochastic processes implemented, it is possible to see obvious impacts of anchoring bias especially in debt financing. Manager's who suffer from anchoring bias, or a fixed idea form future expectations and so decisions on investing in new projects, may lead the firm to make mistakes by estimations which depend on expectations. Anchoring bias may diminish/exaggerate expected returns and may form capital structure or capital budgeting. Under a biased perception, simply associated profits and eventually shareholders wealth is affected. Further study should evaluate inflation expectations effect on return expectations and project valuation in respect to anchoring.

References

Akgüç, Ö., 1998, "Finansal Yönetim", Yenilenmiş 7. Baskı, Muhasebe Enstitüsü Yayın No : 65, Avcıol Basım-Yayın, İstanbul

Barberis, N., and Thaler R.H., 2003, "A survey of behavioral finance", in George Constantinides, Milton Harris, Rene Stulz, eds., *Handbook of the Economics of Finance*, (Amsterdam: North-Holland).

Berger, A. N. and G. F. Udell, 1998, "The Economics of Small Business Finance: The Roles of Private Equity and Debt Markets in the Financial Growth Cycle", *Journal of Banking and Finance*, 22, 613-673.

Bharath, S., 2004, "Agency costs, bank specialness and renegotiation", Working Paper, Stephen M. Ross School of Business, University of Michigan

Chittenden, F, G. Hall, and P. Hutchinson, 1996, "Small Firm Growth, Access to Capital Markets and Financial Structure: Review Of Issues and an Empirical Investigation", *Small Business Economics*, 8, 59-67.

Copeland, T., F.Weston, and K. Shastri, 2004, "Financial Theory and Corporate Policy", Ed Pearson, 4th Edition.

Fama, E., and K.R. French, 1998, Taxes, Financing decisions and firm value, *Journal of Finance* 53, 819-843.

Fazzari, S., R. G. Hubbard, and B.P., 1988a, "Finance constraints and Corporate investment, Brookings Papers on Economic Activity 1", 141-195., 1988b, Investment, financing policy, and tax policy, *American Economic Review*, 78, 200-205.

_____, 1988b, Investment, financing policy, and tax policy, *American Economic Review*, 78, 200-205.

Frank, M.Z and V.K. Goyal, 2007, "Trade-off and Pecking oder Theories of Debt, Handbook of Corporate Finance: Empirical Corporate Finance", ed. Espen Eckbo, Elseiver, 2008

Friedman, B. M., 1982, "Debt and economic activity", in Benjamin M. Friedman, ed.: *The Changing Roles of Debt and Equity in Financing U.S. Capital Formation* (University of Chicago Press, Chicago)

Graham, J.R., 2003, "Taxes and corporate finance: A review", *Review of Financial Studies* 16, 1075-1129.

Kahneman, D., P. Slovic, and A.Tversky, 1982, "Judgment Under Uncertainty: Heuristics and Biases", Cambridge University Press

Karaa, E., 2010, "Yatırımcı Beklentilerinin Oluşumunda Rasyonel ve İrrasyonel Faktörler", Yayınlanmamış Doktora Tezi, Celal Bayar Üniversitesi Sosyal Bilimler Enstitüsü İşletme Anabilim Dalı, Manisa

Kırlı, Mustafa, 2004, "Şirket Değerlemesi ve İndirgenmiş Nakit Akımları Yönteminin Determinist Bir Yaklaşımla Uygulanması", Yayınlanmamış Doktora Tezi, Ankara Üniversitesi Sosyal Bilimler Enstitüsü İşletme Anabilim Dalı, Ankara

Kraus A. and R.H. Litzenberger, "A State-Preference Model of Optimal Financial Leverage", *Journal of Finance*, September 1973, pp. 911-922.

Modigliani, F. and M. Miller, 1958, "The Cost Of Capital, Corporation Finance and the Theory Of Investment", *American Economic Review*, 48 (3), 261-297.

Myers, Stewart C. and Nicolas Majluf, 1984, "Corporate financing and investment decisions when firms have information that investors do not have", NBER Working Paper No. W1396

Shefrin, Hersh, 2000, "Beyond Greed and Fear", Boston, MA: Harvard Business School Press

Shleifer, A., 2000, "Inefficient Markets: An Introduction to Behavioural Finance", Clarendon Lectures in Economics, Oxford University Press, NY

Stein, J.C., 1996, "Rational Capital Budgeting in an Irrational World", *Journal of Business*, 69, 429-55

Stephan E., 1999, "Die Rolle von Urteilshuristiken bei Finanzentscheidungen : Ankereffekte und Kognitive Verfügbarkeit:-The Role of Judgemental Heuristics in Financial Decisions: Anchoring and Availability Effects, in L Fisher, T. Kutsh, and E Stephan (eds.), *Finanzpsychologie*, Munich and Vienna: R. Oldenbourg Verlag, 101-134

Stephan E. and Keil G., 2000, "Decision process in Professional investors: Does expertise moderate judgemental biases?", in E.Hözl(ed) *IAREP/SABE Conference Proceedings: Fairness and Competition*, Vienna, WUv, Universtatsverlag, 416-20

Storey, D., 1994, "Understanding the Small Business Sector", Routledge, London

Vasan, Srini and P.Vijay, 1986, "Credit rationing and corporate investment, Unpublished Ph.D. Dissertation, Harvard University.

Whited, T.M., 1992, "Debt, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data", *The Journal of Finance*, Vol. 47, No. 4 , pp. 1425-1460