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MANAGERIAL SENTIMENT AND PROJECT SELECTION

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ABSTRACT

Often times, managers use the net present value (NPV) criterion for project selection and accept the projects that have positive NPVs. In this paper, we study the effect of managerial sentiment on the NPV calculations and hence on the project selection process. By postulating that the selection of a particular value of beta (the systematic risk) of the firm from among various available values of beta is a function of managerial sentiment, we show that manager with high favorable sentiment (low favorable sentiment) for a project may end up accepting (rejecting) riskier (less risky) projects. In either case the shareholders' wealth will not be maximized because either the managers choose riskier projects which should have been rejected or reject profitable projects that should have been accepted. Therefore, it is obvious that the manager's sentiment defined by the choice of beta must be considered in the project selection process. We suggest that by using average of the available beta values to compute the opportunity cost of capital, businesses may substantially reduce these losses.

Keywords: Net Present Value, Project Selection, Managerial Sentiment

I. Introduction

In corporate finance the accepted norm for project selection is the NPV criterion where the cash flow of the project is discounted at the risk adjusted opportunity cost of capital. It is a well known fact that NPV is the theoretically preferred method of capital budgeting and long term resource allocation as it overcomes the disadvantages associated with payback and IRR approaches[1]. Furthermore, Mukherjee (1988), based on the analysis of the capital budgeting manuals of large U.S firms, reports the choice of discounted cash flow approach as the prominent criterion used by managers in project selection. Use of NPV criterion entails selection of projects with positive NPV. Brealey and Myers (2005) state that the "NPV depends only on the project's cash flows and the opportunity cost of capital", and in the words of Ehrhardt and Brigham (2006) "… NPV method which relies on the discounted cash flow technique, we find the PV of each cash flow, including all inflows and outflows discounted at the project's cost of capital". In this paper, we study the effect of managerial sentiment on the project NPVs and hence on the project selection. We find that manager with high sentiments (who is highly optimistic about the project thus assigning a lower risk to the project) ends up accepting projects which a manager with low sentiments (who is pessimistic about the project thus selecting the higher risk value) usually rejects.

According to Shleifer (2000) behavioral finance which is gaining acceptance by both practitioners and academicians in recent years, is based on two arguments, limited arbitrage

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and investor sentiment (the theory that how investors form their beliefs and valuations). For the first argument Shleifer asserts that from the behavioral finance perspective the real-world arbitrage is risky and hence limited; as the broad categories of securities like stocks and bonds do not have substitutable portfolios, arbitrage does not help to pin down their price levels as a whole hence if they are mispriced there is no riskless hedge for the arbitrageur. In support of the second argument there is a growing acceptance in the field of finance that cognitive biases may influence asset prices. Neal and Wheatley (1998) examine the power of three measures of investor sentiments to predict returns namely, the level of discount on closed-end funds, and ratio of odd-lot sales to purchases, and net mutual fund redemptions. They find that fund discounts and net redemptions do predict the size premium as well as the difference between the small and large firm returns. Fisher and Statman (2003) find that increases in the consumer confidence in the economy are accompanied by statistically significant increases in the bullishness of the individual investors about the stock market. So far, most of the research that has appeared in the literature on behavioral finance, deals primarily with investments. In these studies emphasis has been mostly placed on the affect of investor sentiment on financial asset pricing. Studies by De Bondt and Thaler (1985), Bernard (1989), Jegadeesh and Titman (1993), Chan, Jegadeesh and Lakonishok (1996), and Lawrence, McCabe and Prakash (2007) suggest investors' sentiments do affect stock prices. Though the effect of investor sentiment on the asset pricing has received some attention during the last decade, limited much work has been done in studying the effect of sentiments in corporate finance. In corporate finance we can study the effect of investor sentiments and managerial sentiments differently on the project selection process. Mork Shleifer and Vishny (1990) suggest that investor sentiment can exert pressure on managers to avoid under priced long term projects. They argue that manager myopia facilitates this pressure as hiring and firing is usually linked to the performance of stocks. Stein (1988) and Shleifer and Vishny (1990), use formal models to show that market inefficiencies can lead to suboptimal business investments. Baker Stein and Wurgler (2001) find that stock prices have stronger impact on the investment of firms that need external equity to finance their investments. Polk and Sapienza (2002) present a model of firm's investment decision where investment decisions are affected by the market misevaluation of the company. They argue that investment decisions serve as a signal of firm's value and can be used to manipulate stock prices to stakeholders advantage. If investor's beliefs about the quality of the firm's project are biased, inefficient investments can be predicted with ex-ante variables. Though the effect of investor sentiment has received some attention in firm's investments the capital budgeting literature (Mukherjee (1988), Woods & Randall (1989), Chaney (1989), Trahan & Gitman (1995), Bruner, Eades, Harris and Higgins (1998) and Graham & Campbell (2001) provides no evidence of the use of managerial sentiment in project selection. In this paper, we argue that as the investor sentiment affects asset pricing and capital budgeting, the managerial sentiment may influence the project selection process as well.

Traditionally, in the computation of the NPV, the free cash flows of the firm are discounted using the firms required rate of return[2]. Despite empirical and theoretical arguments against it, the Capital Asset Pricing Model (CAPM) is the most popular method for computing the cost of equity capital for firm's investment projects (Graham and Harvey (2001) and Jagannathan and Meier (2002)). The CAPM is a function of the risk-free rate, market risk premium and the beta of the firm[3]. Different financial services report different values of beta of the firm during the same time period. Beta of any stock is computed using its covariance with the market and the variance of market. For different choices of the proxy of market (S&P 500 or NYSE Index), the time period used for computing beta (2 years or 5years) and depending on the frequency of data used (weekly or monthly), different sources will compute different beta for a firm. As all

betas thus computed and available from different sources are valid any of them can be used by practitioners. Obviously, then manager's choice of beta will affect the cost of capital and hence the NPV of the project thereby affecting the decision in selecting projects. To emphasize our point, we compute the NPV of a hypothetical project for each of the 30 Dow Jones (DJ) index firms to test the effect of managerial sentiment on the project selection process. For the expected return calculations, a manager can either compute the beta of firm by regressing the firm's returns over the return of a large market index or select the value of beta from any of the financial services firms which provide the value of beta such as Valueline, Reuters, S&P Netvantage and Yahoo Finance[4]. The generally accepted model to compute the beta of the firm is the Sharpe's market model (1963) which stipulates a linear return generating process, also known as the market model. In expost form this can be written as:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_i \qquad (1)$$

where R_{it}, and R_{mt} , respectively, are the rates of return of the asset *i* and market m during the time period *t* and ε_{it} is the stochastic error term.

There is usually a large inconsistency in the beta values reported by the various financial services firms and the firm beta that a manager computes using the Sharpe's market model. The differences in some cases are as large as 75 percent (see table 1A). Since the beta values for firms fall in a wide range depending on the source from where the beta is obtained, a manager who is highly sentimental about the project (optimistic) might perceive the project less risky and choose a low beta value thus resulting in low required rate of return hence a large NPV. In case of the manager who has low sentiment for the project (pessimistic), she may perceive the project more risky and hence choose a high value of beta and obtain higher required rate of return resulting in a lower NPV. Thus the selection of beta based on the manager's sentiment will affect the NPV of the project and hence the project selection decision.

In order to analyze the impact of managerial sentiment on the project selection process, we use a hypothetical project that requires $400,000 initial investment and generates an annual cash flow of $80,000 each year for ten years. For each of the 30 Dow Jones companies we compute the beta of each firm using the market model (equation 1 above). As is the industry norm in the computation of beta, we regress the past sixty monthly returns of the firm on the past contemporaneous sixty monthly rates of return of S&P500 index. We also obtain the beta values from Valueline, Reuters, S&P Netvantage and Yahoo Finance. We then compute the net present values of the project for each firm using the high beta, low beta and the average of all beta values. We find that the high sentiment manager who may choose the lowest beta value obtains a positive NPV for 28 out of the 30 Dow Jones index firms whereas the low sentiment manager who may consider the project risky and choose the high beta value ends up rejecting the project for 18 of the 30 Dow Jones index firms. As a way forward we propose that in computation of NPV, managers should use an average of the beta values from the computed beta and the beta reported by different financial sources. Using an average beta a low sentiment manager ends up accepting 27 percent of projects which would otherwise be rejected and a high sentiment manager rejects 27 percent of the projects which would otherwise be accepted.

Fama and French (1997) suggest using industry betas for all firms in an industry as there is lot of noise in estimated betas for individual firms. Bernardo, Chowdhry and Goyal (2007) refine this suggestion by computing three betas for each industry: the mean unlevered beta of all firms with low market-to-book ratios, the mean unlevered beta of all firms in the industry (the industry cost of capital), and the mean unlevered beta of firms with high market-to-book

ratios. They argue that projects with low, medium and high growth opportunities can be assigned these three betas, respectively. In this paper we show the effect of human sentiments in choosing beta and hence on the project selection process. Even if a manager chooses an industry beta, given different sources of beta to choose from she will select the beta according to her sentiments (low beta if she is optimistic and high beta if she is pessimistic about the project) which will effect the project selection. Though Bernardo, Chowdhry and Goyal (2007) refine the beta computation adding the growth opportunities in the project, these growth opportunities are decided by the manager who may choose higher or lower growth opportunity based on her sentiments towards the project. Manager sentiment affects the project selection and hence the profits of firm and hence rather than leaving the choice of beta on the managers, firms should adopt a more objective and standardized way to compute beta.

The organization of the paper is as follows. In section II we describe the NPV model incorporating managerial sentiments. Section III has information on the data and the hypothetical project to compute the NPV. In Section IV we provide the results of our investigation. We end our study by providing some concluding remarks in section V.

II. NPV Model with Managerial Sentiment

As mentioned earlier, Mukherjee (1988), based on the examination of the capital budgeting manuals of large U.S firms, reports the choice of discounted cash flow approach as the prominent criterion of the project selection. NPV is computed by discounting the projected cash flows by the firm's cost of capital. The cost of capital for an all equity firm (as we have assumed here) is the expected required rate of return computed using the security market line (SML) of CAPM. It is obvious that in computing the cost of capital the choice of beta value is a function of the manager's sentiment which will in turn influence the NPV of projects. Manager's sentiment here is considered as his or her belief about the future performance of the project. The manager may take feedback from the overall macroeconomic conditions of the firm, the advice of experts and project analysts. But, eventually the belief is his/her own, which is subjective and will vary from person to person, depending not only on the risk averseness of the manager but on their stake in the firm[5], educational background, their ages, gender and culture.

A manager who is hopeful about the strong future performance of the project will perceive it to be less risky than a manager who believes that the project is a sure failure; hence the high sentiment manager will require less rate of return than the latter. Furthermore, the NPV of the project is determined by discounting the future free cash flows by the firm's required rate of return. The net present value of a project can thus be written as

$$NPV = \sum_{t=1}^{n} \frac{FCF_t}{(1+E(k))^t} - I_0 \qquad (2)$$

where $FCF_{t,}$, I_0 and $E(k)$ are respectively the free cash flow at time t, initial investment and the firm's expected required rate of return and n is the useful life of the project.

Assuming an all-equity firm, the required rate of return can be calculated using the following equation given by Sharpe (1964)[6],

$$E(k_i) = k_f + E(k_m - k_f)\beta_i \qquad (3)$$

where k_i, k_f and k_m are respectively, the expected rates of return of the asset *i,* risk-free

rate and expected rate of return of the market. The above model is a single period model and long term projects by definition have long lives divided into several periods (usually of one calendar year). Therefore, if we are going to use the SML (expression 3 above) to compute the expected required rate of return, the SML must remain valid in each of the sub-periods. Since the life of the project is invariably measured in calendar year terms for ease in computation of cash flows and accounting & tax requirements, a long holding period subdivided into many calendar years to synchronize with the year end estimated cash flow may seem at odd with the theoretical underpinnings of the CAPM (of which SML is a part) which is based on the assumption that investors have single period investment horizon. However, as Rubenstein (1973)[7] points out that if the cash flows are intertemporally independent between subperiods and, within each subperiod (usually a calendar year in practice) they are (cash flows) normally distributed, the CAPM can be used to estimate the expected rate of return[8]. Since we assume the life of our example project to be 10 years, we take the risk free rate, k_f, as the yield of 10 year T-bond. We compute the expected market risk premium $E(k_m - k_f)$ by taking the difference between the historical realized returns on market index (S&P500 here) and T-bonds[9]. Taking beta of the firm from various sources and plugging it in equation (2) we compute the expected rate of return for the project.

If there are different values of beta available to choose from the high sentiment manager will consider a beta which is low ($\hat{a}^{HS}$) and would compute a lower rate of return than the low sentiment manager who will choose the higher beta ($\hat{a}^{LS}$) and hence compute a higher rate of return. For high sentiment manager the SML can be rewritten to incorporate the manager's sentiment as

$$E(k_i^{HS}) = k_f + E(k_m - k_f)\beta_i^{HS} \qquad (5)$$

Similarly, for the low sentiment manager (pessimistic) who will consider a beta which is high ($\hat{a}^{LS}$) and would require a higher rate of return, the SML would be

$$E(k_i^{LS}) = k_f + E(k_m - k_f)\beta_i^{LS} \qquad (6)$$

We test how managerial sentiment affects the project selection by using both the high sentiment and the low sentiment beta values on a hypothetical project for each of the 30 firms that constitute the Dow Jones Industrial Average. We collect beta value for the 30 Dow Jones firms from different financial sources and note that the reported betas are quite different from each other. We also compute the beta by using the market model (equation1).

We then compute an average beta which is the average of our computed beta and all the four reported betas to find out if the average betas lead to a different project selection decision. The average beta is computed as follows

$$\beta^{avg} = \frac{\sum_{i=1}^{n} \beta^i}{n} \qquad (7)$$

where *i* represents the beta from the ith source .

III. Data

We collect beta values (as of November 20, 2006) for each of the thirty companies that

constitute the DJIA index from the four published sources, namely, Valueline, Reuters, S&P Netvantage and Yahoo Finance. The value of beta reported by the Valueline, S&P Netvantage, Yahoo and Reuters are different for each firm due to the method in calculating the beta. Valueline computes the beta using the regression analysis of the relationship between the weekly price changes of the stock and the weekly price changes of NYSE Index (DJIA) over a five year period. For stocks with shorter trading history, a minimum of two years is used in the computation[10]. The beta reported by Yahoo Finance is calculated using regression analysis of the relationship between the stock's monthly return to that of S&P 500 Index over a period of three to five years[11]. S&P Netadvantage calculates the stock's beta using regression analysis of end-of-month returns for sixty months that includes dividends and the S&P 500 Index as a proxy for the market[12]. Reuters does not publicly disclose the method of computation of beta. Therefore, the differences in the reported value of beta for a firm are due to the following factors.

1. The Selection Bias: This arises due to the difference in index used for the market. Yahoo Finance uses S&P 500 as the market index, whereas Valueline uses NYSE index.
2. The Data Intervaling Bias: This arises due to the difference in the frequency of the used data. Yahoo uses monthly returns whereas Valueline uses weekly returns.
3. Investment Horizon Bias: This arises due to the time period used in the calculating the returns for the stocks/market in the regression analysis. Valueline uses past five years return data, whereas Yahoo uses return data for three years.

Wagner and Quay (1974), report that beta depends on the estimation methods. Statman (1981) compares the beta estimates of Valueline and Merrill Lynch's Market Sensitivity Report. He reports that the differences are considerable for both sources on account of their estimation technique and these differences do not diminish even when comparing the betas of portfolios instead let alone beta of betas of individual securities.

We compute beta for all the thirty firms of DJIA using past 60 month returns of the firm as the dependent variable and regressing it over the market return (S&P 500 here). The computed beta and the beta values collected from various financial news sources are in Table 1.(Refer to Annexure 1- Table 1)

From Table 1 it is evident that there exists a wide range of beta values for any given firm. For example, for Intel, the computed beta is 2.23 which is the highest and Valueline reports a beta of 1.20, which is the least. In order to compute the required rate of return for each firm, we use S&P 500 index annual return between November 2005 and November 2006 as a proxy for market return. For the risk free rate we use the yield on the 10 year U.S. Treasury bond rate as of November 20, 2006. We then calculate the required rates of return for both high beta and low beta values for the 30 DJ firms and present the results in Table 2. It is clear from our computations as reported in Table 2 that for each firm there exists a vast range of required rate of returns, for example, Johnson & Johnson has a high sentiment return of 5.87 percent and low sentiment return of 10.18 percent with a difference of 4.31 percent, quite a significant difference by any standard. These differences are large for all the firms; the average difference in the required rate of return is 4.67% and the average difference in beta value is 0.54. .(Refer to Annexure 2- Table 2)

To compute the NPV for all 30 DJ firms, we use the above mentioned rate of returns and a hypothetical project that requires an initial investment of $400,000 and generates an annual free cash flow of $80,000 for 10 years. In order to ascertain whether same project would result in an "accept" or "reject" decision by managers who have different sentiments we compute

the required rates of returns based on high managerial sentiment (low beta) and low managerial sentiment (high beta). Table 3 shows that 18 of the 30 firms (60 percent) have negative NPV when the low sentiment manager uses a higher required rate of return to discount the cash flow by choosing the high beta. On the other hand 28 of the 30 firms (93.33 percent) have positive NPV when the high sentiment manager uses a lower required rate of return to discount the cash flows by choosing the low beta. .(Refer to Annexure 3 Table 3)

IV. Results and Discussion

From Tables 1A and 1B, it is evident that financial sources report a wide range of beta for each firm and there is no pattern in these reported beta values. Valueline reports the highest beta for 10 firms, which are, 3M, American Express, Boeing, GE, GM, Johnson & Johnson, Pfizer, United Technologies, WalMart and Walt Disney. Valueline reports lowest beta for 6 firms namely, Alcoa, Caterpillar, HP, Honeywell, IBM and McDonalds. S&P Netvantage report highest beta for Alcoa, HP and Home Depot and lowest beta for Coca-Cola. Yahoo reports the lowest beta for 12 firms out of 30; AT&T, Boeing, Citigroup, GE, Intel, Johnson & Johnson, JP Morgan, Microsoft, Home Depot, Verizon, WalMart and Walt Disney. Yahoo reports highest beta for 7 firms namely, AIG, Caterpillar, DuPont, Exxon, Merck, Coca-Cola and Proctor & Gamble. Reuters report highest beta for six firms which are Altria, AT&T, IBM, JP Morgan, McDonalds and Verizon. Furthermore, Reuters reports lowest beta for 3M, GM and United Technologies. We find that the computed beta is the highest for Citigroup, Honeywell, Intel and Microsoft and lowest for Alcoa, Altria, AIG, DuPont, Exxon, Merck, Pfizer and Proctor & Gamble. Furthermore, our computations reveal that computed beta values are different from each of the reported betas. The managers might choose to compute the beta on their own or use the reported beta value. Irrespective of which source is used to select beta the difference in values might lead to incorrect project selection decision.

In Table 2, we select the high sentiment beta (β^{HS}) and low sentiment beta (β^{LS}) values to correspond to respectively, high and low managerial sentiments. Using these beta values we obtain the required rate of returns, k^{HS} and k^{LS}, from equations 5 and 6. In order to compute the NPV of the hypothetical project, we use the calculated rates of return and report the high and low sentiment NPVs in Table 3. From this table, it is evident that when a high sentiment manager chooses a low value of beta it leads to a lower required rate of return resulting in 93 percent of firms having positive NPVs leading to an accept decision. In this case only exceptions are Alcoa and HP Similarly, when a low sentiment manager chooses a high value of beta she gets negative NPV in 60 percent of the firms. Hence, we can conclude that choosing the extremes of the beta values leads to unusually high accept or unusually high reject decisions of capital projects.(Refer to Annexure 4- Table 4)

As a way forward, we suggest that managers should use an average value of beta by taking the average of the computed beta and other reported beta values from Valueline, Yahoo, Reuters and S&P Netvantage. We calculate the average beta (β^{avg}) value for each of the 30 DJ firms and using this average beta we compute the required rate of return. .(Refer to Annexure 5- Table 5)

In Table 5, we compare the NPV values obtained using the average beta value, high sentiment beta value and the low sentiment beta value. We find that 27 percent of the projects (for American Express, Caterpillar, General Motors, Honeywell, Intel, IBM, JP Morgan, and Home Depot) that were previously accepted by manager with high sentiments are rejected when we use the average beta. Also, 27 percent of the projects (for AIG, AT&T, Citigroup, DuPont, Exxon, McDonalds, Verizon, and Walt Disney) that were previously rejected by low sentiment manager are now accepted when we use the average beta.

Most finance books (Ehrhardt & Ehrhardt (2006), Brealey & Myers (2005), and Reilly & Brown (2003)) emphasize on using a computed beta value. We find that computed beta value is highest for some firms and might be picked by a low sentiment manager. The computed beta values are lowest for some other firms and may be used if the managers in those firms have high sentiments for their projects. In either case, the company looses; by either accepting the projects which are not so profitable or by rejecting the projects which might be profitable. We recommend that when calculating the NPV of a project managers should use an average beta value to compute the required rate of return instead of calculating beta value or choosing beta value from any financial source else they may skew the project's accept/reject decision.

V. Conclusion

In this paper, we hypothesize that as the investor sentiment affects asset pricing, the managerial sentiment may influence the project selection process. Project selection requires computation of the net present value which is the sum of discounted future cash flows and SML is generally used to calculate the expected rate of return for the project. Given choice of beta a manager who is optimistic about the firm's project will perceive the project to be less risky and consider a beta which is low computing a lower rate of return than the low sentiment (pessimistic) manager who will choose the higher beta and hence compute a higher rate of return. The manager's choice of beta affects the required rate of return and hence the NPV of the project thereby affecting the decision in selecting projects. We use the 30 Dow Jones index firms to test our conjecture of whether managerial sentiment defined by the choice of beta influences the project's accept or reject decision. By computing the beta values and from the information reported by different financial firms like Valueline, S&P, Reuters and Yahoo finance, we find that each of the Dow Jones index firms have wide range of beta values and based on manager's sentiment and risk preference, a high sentiment manager who is optimistic about the prospects of a project might consider using a low beta value while a low sentiment manager who is pessimistic about the prospects of project may consider using high beta value. By applying the required rate of return on a hypothetical project we compute the NPV for all 30 Dow Jones index firms. As expected, the high sentiment manager who may choose the low beta obtains a positive NPV for 28 out of the 30 Dow Jones index firms whereas the low sentiment manager who may consider the project risky and choose the high beta ends up rejecting the project for 18 of the 30 Dow Jones index firms.

The choice of extreme beta values influences the project selection decision; an incorrect beta choice might lead the firm's manager taking up very risky projects that might lead to loss or rejecting a profitable project. As a way forward, we propose that managers should use average beta using all the reported values of beta and the beta value computed using the market model. Our results indicate that 27 percent of the projects which were previously rejected where the managers with low sentiment choose a high beta are accepted when we use an average beta. Also, the average beta leads to rejecting 27 percent of projects that were previously accepted where high sentiment managers chose the low beta value. We recommend that in capital budgeting textbooks, the authors should emphasize the use of average beta instead of using the computed beta or the beta from any particular source in calculating the required rate of return used in NPV computation.

References

1. Baker, M., J. Stein, and J. Wurgler, 2001, "When does the market matter? Stock prices and the investment of equity-dependent firms", *Harvard University, mimeo*
2. Bernard, V., 1989, "Stock Price Reactions to Earnings Announcements", in R. Thaler (ed.),

Advances in Behavioral Finance, New York: Russell Sage Foundation,
3. Bernardo, A.E., B. Chowdhry and A Goyal, 2007, "Growth options, beta, and the cost of capital", *Financial Management*
4. Brealey, R A., Stewart C Myers., 2005, *"Principles of Corporate Finance"*, 7th ed., McGraw-Hill Companies
5. Bruner, Robert F., Kenneth M. Eades, Robert S. Harris and Robert C. Higgins, 1998, "Best practices in estimating the cost of capital: Survey and synthesis", *Financial Management 27*, pp.13-28
6. Chan, L., N. Jegadeesh, and J. Lakonishok., 1996, "Momentum Strategies", *Journal of Finance,* 51, pp.1681-1713
7. Chaney, Paul, 1989, "Moral Hazard and Capital Budgeting", *Journal of Financial Research,* Summer pp.113-128
8. De Bondt, W.F.M., and Thaler R.H., 1985, "Does the stock market overreact", *Journal of Finance,* 40, pp. 793-808
9. Ehrhardt, Michael C., Ehrhardt F. Brigham., 2006, "*Corporate Finance: A Focused Approach"*, 2nd ed, South-Western College Pub
10. Fama, E.F. and K.R. French, 1997, "Industry costs of equity", *Journal of Financial Economics* 43, 153-193
11. Fisher, Kenneth L., M. Statman, 2003, "Consumer Confidence and Stock Returns"*, The Journal of Portfolio Management,* pp. 115-127
12. Graham, J. R. and C. R. Harvey, 2001, "The theory and practice of corporate finance: evidence from the field", *Journal of Financial Economics* 60, 187-243
13. Jagannathan, R. and I. Meier, 2002, "Do we need CAPM for capital budgeting?" *Financial Management* 31, 55-77
14. Jagdeesh N. and Titman S., 1993, "Returns to Buying Winners and Selling Losers: Implications for Stock market Efficiency", *Journal of Finance*, 48, pp. 65-91
15. Lawrence, Edward R., G. McCabe, Arun J. Prakash, 2007, "Answering Financial Anomalies: Sentiment based Stock Pricing", *Journal of Behavioral Finance,* Vol. 8, No. 3
16. Morck, R., A. Shleifer and R. Vushny, 1990, "The stock market and investment: is the market a sideshow?", Brookings papers on Economic Activity 157-215
17. Mukherjee, Tarun K., 1988, "The Capital Budgeting Process of Large U.S. Firms: An Analysis of Budgeting Manuals", *Managerial Finance,* Number 2/3, pp28-35
18. Neal, R., Simon M. Wheatley, 1998, "Do Measures of Investor Sentiments Predict Returns", *The Journal of Financial and Quantitative Analysis"*, pp. 523-547
19. Polk, C. and P. Sapienza, 2004, "The real effects of investor sentiments"*, NBER working paper* no. 10563
20. Prakash, Arun J., Gordon V Karels and Ray Fernandez, 1987, *"Financial, Commercial and Mortgage Mathematics and their Applications*", Praeger Publishers
21. Reilly, Frank K., Keith C. Brown, 2003, *"Investment Analysis and Portfolio Management",* 7th ed., pp 254
22. Rubinstein, M., 1973, "A Mean-Variance Synthesis of Corporate Financial Theory", *The Journal of Finance*, Vol. 28, No. 1, pp. 167-181
23. Sharpe, W. F., 1963, "A simplified model for portfolio analysis", *Management Science*, Vol 9 (January), pp 277-293
24. Sharpe, W. F., 1964, "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk"*, Journal of Finance,* September, pp 435-442
25. Shleifer, A. and R. Vishny, 1990, "Equilibrium short horizons of investors and firms", *American Economic Review Papers and Proceedings* 80, 148-153
26. Shleifer, Andrei, 2000, *"Inefficient Markets: An Introduction to Behavioral Finance"*, Oxford University Press
27. Stein, Jeremy, 1988, "Takeover threats and managerial myopia", *Journal of Political Economy* 96, 61-80
28. Trahan, Emery A. and Lawrence J. Gitman, 1995 "Bridging the theory-practice gap in corporate

finance: A survey of Chief Financial Officers" *Quarterly Review of Economics and Finance,* pp73-87

29. Woods, John C. and Maury R. Randall, 1989, "The Net Present Value of Future Investment Opportunities: Its Impact on Shareholder Wealth and Implications for Capital Budgeting Theory", *Financial Management,* 18, 2, pp 85-92

ANNEXURES

Annexure-1-Table IA

In the following table we report the beta values from different financial sources for the 30 firms that constitute the Dow Jones index as of November 16, 2006. In the column on computed beta we regress the past 60 month returns of the firm on the monthly returns of the S&P 500 index.

COMPANIES	Yahoo	ValueLine	Reuters	S&P Netvantage	Computed Beta
3M Co	0.82	0.85	0.57	0.61	0.70
Alcoa Inc	1.74	1.40	1.84	1.91	1.70
Altria Group Inc	0.72	0.80	0.84	0.77	0.52
American Express	1.01	1.35	1.27	1.28	1.29
American International Group Inc	1.43	1.20	1.17	1.14	0.89
AT&T Inc.	0.62	1.10	1.54	1.44	0.95
Boeing Co.	0.72	1.10	0.73	0.73	1.02
Caterpillar Inc.	1.87	1.20	1.34	1.33	1.26
Citigroup, Inc.	0.43	1.30	1.28	1.25	1.32
E.I. Du Pont de Nemours	1.33	1.00	1.01	1.03	0.98
Exxon Mobil Corp	1.27	0.90	0.76	0.66	0.61
General Electric Company	0.65	1.20	0.82	0.82	0.86
General Motors Corporation	1.88	1.40	1.13	1.24	1.18
Hewlett-Packard Co.	1.53	1.40	1.76	1.91	1.76
Honeywell Intl Inc	1.23	1.20	1.45	1.45	1.59
Intel Corporation	1.66	1.20	2.03	2.20	2.23
International Business Machines	1.65	1.00	1.73	1.69	1.58
Johnson & Johnson	0.15	0.65	0.31	0.30	0.30
JP Morgan & Chase & Co	0.69	1.40	1.77	1.73	1.66
McDonald's Corporation	1.12	1.10	1.36	1.30	1.11
Merck & Co., Inc.	1.11	0.85	0.78	0.76	0.58
Microsoft Corporation	0.79	1.00	0.99	1.02	1.16
Pfizer Inc	0.79	0.85	0.62	0.61	0.52
The Coca-Cola Company	0.76	0.60	0.49	0.44	0.49
The Home Depot, Inc.	1.01	1.10	1.40	1.51	1.44
The Procter & Gamble Company	0.88	0.60	0.20	0.23	0.19
United Technologies Corporation	0.90	1.15	0.66	0.71	0.94
Verizon Communications	0.79	0.95	1.39	1.26	1.04
Wal-Mart Stores, Inc.	0.46	0.80	0.57	0.62	0.63
Walt Disney Company	0.93	1.35	1.08	1.09	1.17

Annexure-1: Table IB

In the following table we summarize the results of table 1A and for each source of beta we report the total number of firms with highest and lowest beta values for the 30 Dow Jones index firms.

	High Sentiment (low beta) $ß^{LS}$	Low Sentiment (high beta) $ß^{HS}$	% of $ß^{LS}$ firms	% of $ß^{HS}$ firms
Yahoo	7	12	23.3%	40.0%
ValueLine	10	6	33.3%	20.0%
Reuters	6	3	20.0%	10.0%
S&P Netvantage	3	1	10.0%	3.3%
Computed Beta	4	8	13.3%	26.7%

Annexure-2: Table 2

For the 30 firms that constitute the Dow Jones index we select the low beta and the high beta by picking the minimum and maximum values of the beta reported in Table 1A. The difference between the beta value for high sentiment manager (lowest value) and the beta value for low sentiment manager (highest value) is in column seven and the difference between the ROR for high sentiment manager and the ROR for low sentiment manager is in column eight. On average there is a difference of 0.54 in the high and low beta values and a difference of 4.67% in the high and low rate of returns.

COMPANIES	High Sentiment (low beta)	Low Sentiment (high beta)	High Sentiment (low RoR)	Low Sentiment (high RoR)	High sentiment Beta-Low Sentiment Beta	High Sewntiment ROR-Low Sentiment ROR
	$ß^{HS}$	$ß^{LS}$	k^{HS}	k^{LS}	$ß^{HS} - ß^{LS}$	$k^{HS} - k^{LS}$
3M Co	0.57	0.85	9.49%	11.90%	-0.28	-2.41%
Alcoa Inc	1.40	1.91	16.63%	20.99%	-0.51	-4.36%
Altria Group Inc	0.52	0.84	9.06%	11.81%	-0.32	-2.76%
American Express	1.01	1.35	13.28%	16.20%	-0.34	-2.93%
American International Group Inc	0.89	1.43	12.24%	16.89%	-0.54	-4.65%
AT&T Inc.	0.62	1.54	9.92%	17.84%	-0.92	-7.92%
Boeing Co.	0.72	1.10	10.78%	14.05%	-0.38	-3.27%
Caterpillar Inc.	1.20	1.87	14.91%	20.68%	-0.67	-5.77%
Citigroup, Inc.	0.43	1.32	8.28%	15.95%	-0.89	-7.66%
E.I. Du Pont de Nemours	0.98	1.33	13.02%	16.03%	-0.35	-3.01%
Exxon Mobil Corp	0.61	1.27	9.83%	15.51%	-0.66	-5.68%
General Electric Company	0.65	1.20	10.18%	14.91%	-0.55	-4.74%
General Motors Corporation	1.13	1.88	14.31%	20.77%	-0.75	-6.46%
Hewlett-Packard Co.	1.40	1.91	16.63%	21.06%	-0.51	-4.43%
Honeywell Intl Inc	1.20	1.59	14.91%	18.27%	-0.39	-3.36%
Intel Corporation	1.20	2.23	14.91%	23.78%	-1.03	-8.87%
International Business Machines	1.00	1.73	13.19%	19.48%	-0.73	-6.29%
Johnson & Johnson	0.15	0.65	5.87%	10.18%	-0.50	-4.31%
JP Morgan & Chase & Co	0.69	1.77	10.52%	19.82%	-1.08	-9.30%
McDonald's Corporation	1.10	1.36	14.05%	16.29%	-0.26	-2.24%
Merck & Co., Inc.	0.58	1.11	9.57%	14.14%	-0.53	-4.56%
Microsoft Corporation	0.79	1.16	11.38%	14.57%	-0.37	-3.19%
Pfizer Inc	0.52	0.85	9.06%	11.90%	-0.33	-2.84%
The Coca-Cola Company	0.44	0.76	8.33%	11.12%	-0.32	-2.79%
The Home Depot, Inc.	1.01	1.51	13.28%	17.60%	-0.50	-4.32%
The Procter & Gamble Company	0.19	0.88	6.22%	12.16%	-0.69	-5.94%
United Technologies Corporation	0.66	1.15	10.26%	14.48%	-0.49	-4.22%
Verizon Communications	0.79	1.39	11.38%	16.55%	-0.60	-5.17%
Wal-Mart Stores, Inc.	0.46	0.80	8.54%	11.47%	-0.34	-2.93%
Walt Disney Company	0.93	1.35	12.59%	16.20%	-0.42	-3.62%

Annexure-3Table 3

In the following table we report the high sentiment return (lowest ROR) and the low sentiment return (highest ROR) from Table 2 for each of the 30 Dow Jones index firm. We compute the NPV based on a hypothetical example of a project which has $400,000 as initial investment and $80,000 annual cashflows for ten years discounted at the appropriate discount rate (k^{LS} or k^{HS}) for each firm. We find that managers with high sentiment accept the project in 28 out of 30 firms whereas managers with low sentiments reject the same project in 18 out of 30 firms. The negative NPV's are highlighted.

COMPANIES	High Sentiment Return k^{HS}	Low Sentiment Return L^{HS}	High Sentiment NPV	Low Sentiment NPV
3M Co	9.49%	11.90%	$93,684.14	$48,170.54
Alcoa Inc	16.63%	20.99%	($19,116.06)	($62,469.23)
Altria Group Inc	9.06%	11.81%	$102,810.73	$49,645.90
American Express	13.28%	16.20%	$25,911.22	($13,986.90)
American International Group Inc	12.24%	16.89%	$42,371.19	($22,111.89)
AT&T Inc.	9.92%	17.84%	$84,879.03	($32,596.37)
Boeing Co.	10.78%	14.05%	$68,183.03	$14,432.16
Caterpillar Inc.	14.91%	20.68%	$2,481.75	($59,832.21)
Citigroup, Inc.	8.28%	15.95%	$120,091.56	($10,825.48)
E.I. Du Pont de Nemours	13.02%	16.03%	$29,898.68	($11,886.40)
Exxon Mobil Corp	9.83%	15.51%	$86,614.95	($5,412.02)
General Electric Company	10.18%	14.91%	$79,744.97	$2,481.75
General Motors Corporation	14.31%	20.77%	$10,760.86	($60,568.91)
Hewlett-Packard Co.	16.63%	21.06%	($19,116.06)	($63,045.26)
Honeywell Intl Inc	14.91%	18.27%	$2,481.75	($37,113.93)
Intel Corporation	14.91%	23.78%	$2,481.75	($83,559.80)
International Business Machines	13.19%	19.48%	$27,231.20	($48,995.77)
Johnson & Johnson	5.87%	10.18%	$181,737.56	$79,744.97
JP Morgan & Chase & Co	10.52%	19.82%	$73,067.90	($52,194.04)
McDonald's Corporation	14.05%	16.29%	$14,432.16	($15,026.58)
Merck & Co., Inc.	9.57%	14.14%	$91,897.81	$13,200.00
Microsoft Corporation	11.38%	14.57%	$57,179.91	$7,164.17
Pfizer Inc	9.06%	11.90%	$102,810.73	$48,170.54
The Coca-Cola Company	8.33%	11.12%	$119,022.64	$61,829.08
The Home Depot, Inc.	13.28%	17.60%	$25,911.22	($29,990.79)
The Procter & Gamble Company	6.22%	12.16%	$172,131.22	$43,805.87
United Technologies Corporation	10.26%	14.48%	$78,057.85	$8,354.88
Verizon Communications	11.38%	16.55%	$57,179.91	($18,103.98)
Wal-Mart Stores, Inc.	8.54%	11.47%	$114,205.76	$55,651.87
Walt Disney Company	12.59%	16.20%	$36,731.42	($13,986.90)

Annexure-4-Table 4

In this table we report the values of average beta based on the four beta values obtained from published sources and the computed beta as reported for each firm in Table 1A. We compute the rate of return using the average beta values and then compute the NPV value of the project for all 30 Dow Jones firms. Using average beta managers accept the project in 20 out of 30 Dow Jones index firms. Negative NPVs have been highlighted.

COMPANIES	Average Beta (ßavg)	ROR using Average Beta	NPV using Average Beta
3M Co	0.71	10.69%	$69,864.71
Alcoa Inc	1.72	19.37%	($47,956.07)
Altria Group Inc	0.73	10.86%	$66,728.09
American Express	1.24	15.26%	($2,131.04)
American International Group Inc	1.17	14.62%	$6,467.82
AT&T Inc.	1.13	14.30%	$10,877.17
Boeing Co.	0.86	11.98%	$46,816.45
Caterpillar Inc.	1.40	16.63%	($19,071.67)
Citigroup, Inc.	1.12	14.18%	$12,538.13
E.I. Du Pont de Nemours	1.07	13.80%	$18,091.48
Exxon Mobil Corp	0.84	11.81%	$49,711.05
General Electric Company	0.87	12.07%	$45,244.81
General Motors Corporation	1.37	16.34%	($15,682.12)
Hewlett-Packard Co.	1.67	18.98%	($44,275.17)
Honeywell Intl Inc	1.38	16.50%	($17,577.04)
Intel Corporation	1.86	20.62%	($59,349.28)
International Business Machines	1.53	17.75%	($31,617.35)
Johnson & Johnson	0.34	7.52%	$138,315.79
JP Morgan & Chase & Co	1.45	17.06%	($23,992.00)
McDonald's Corporation	1.20	14.90%	$2,705.91
Merck & Co., Inc.	0.82	11.61%	$53,199.12
Microsoft Corporation	0.99	13.13%	$28,229.84
Pfizer Inc	0.68	10.42%	$74,921.70
The Coca-Cola Company	0.56	9.36%	$96,373.27
The Home Depot, Inc.	1.29	15.71%	($7,857.73)
The Procter & Gamble Company	0.42	8.19%	$122,242.04
United Technologies Corporation	0.87	12.08%	$45,012.98
Verizon Communications	1.09	13.92%	$16,283.84
Wal-Mart Stores, Inc.	0.62	9.88%	$85,620.49
Walt Disney Company	1.12	14.26%	$11,418.57

Annexure-5-Table 5

In the following table we compare the NPVs of the high sentiment manager and low sentiment manager with the NPVs computed using average of the available beta values. We find that using average beta values the project is accepted by managers of 20 of the 30 Dow Jones index firms. Projects accepted by high sentiment manager in eight firms are rejected and project rejected by low sentiment manager in eight firms are accepted using the average beta value. Negative NPVs have been highlighted.

COMPANIES	Average Beta ßavg	Avg Beta Return *K* avg	Average Beta NPV	High Sentiment NPV	Low Sentiment NPV
3M Co	0.71	10.69%	$69,864.71	$93,684.14	$48,170.54
Alcoa Inc	1.72	19.37%	-$47,956.07	-$19,116.06	-$62,469.23
Altria Group Inc	0.73	10.86%	$66,728.09	$102,810.73	$49,645.90
American Express	1.24	15.26%	-$2,131.04	$25,911.22	-$13,986.90
American International Group Inc	1.17	14.62%	$6,467.82	$42,371.19	-$22,111.89
AT&T Inc.	1.13	14.30%	$10,877.17	$84,879.03	-$32,596.37
Boeing Co.	0.86	11.98%	$46,816.45	$68,183.03	$14,432.16
Caterpillar Inc.	1.40	16.63%	-$19,071.67	$2,481.75	-$59,832.21
Citigroup, Inc.	1.12	14.18%	$12,538.13	$120,091.56	-$10,825.48
E.I. Du Pont de Nemours	1.07	13.80%	$18,091.48	$29,898.68	-$11,886.40
Exxon Mobil Corp	0.84	11.81%	$49,711.05	$86,614.95	-$5,412.02
General Electric Company	0.87	12.07%	$45,244.81	$79,744.97	$2,481.75
General Motors Corporation	1.37	16.34%	-$15,682.12	$10,760.86	-$60,568.91
Hewlett-Packard Co.	1.67	18.98%	-$44,275.17	-$19,116.06	-$63,045.26
Honeywell Intl Inc	1.38	16.50%	-$17,577.04	$2,481.75	-$37,113.93
Intel Corporation	1.86	20.62%	-$59,349.28	$2,481.75	-$83,559.80
International Business Machines	1.53	17.75%	-$31,617.35	$27,231.20	-$48,995.77
Johnson & Johnson	0.34	7.52%	$138,315.79	$181,737.56	$79,744.97
JP Morgan & Chase & Co	1.45	17.06%	-$23,992.00	$73,067.90	-$52,194.04
McDonald's Corporation	1.20	14.90%	$2,705.91	$14,432.16	-$15,026.58
Merck & Co., Inc.	0.82	11.61%	$53,199.12	$91,897.81	$13,200.00
Microsoft Corporation	0.99	13.13%	$28,229.84	$57,179.91	$7,164.17
Pfizer Inc	0.68	10.42%	$74,921.70	$102,810.73	$48,170.54
The Coca-Cola Company	0.56	9.36%	$96,373.27	$119,022.64	$61,829.08
The Home Depot, Inc.	1.29	15.71%	-$7,857.73	$25,911.22	-$29,990.79
The Procter & Gamble Company	0.42	8.19%	$122,242.04	$172,131.22	$43,805.87
United Technologies Corporation	0.87	12.08%	$45,012.98	$78,057.85	$8,354.88
Verizon Communications	1.09	13.92%	$16,283.84	$57,179.91	-$18,103.98
Wal-Mart Stores, Inc.	0.62	9.88%	$85,620.49	$114,205.76	$55,651.87
Walt Disney Company	1.12	14.26%	$11,418.57	$36,731.42	-$13,986.90