

# **Behavioural Corporate Finance: Existing Research and Future Directions.**

**Author: Richard Fairchild,**

**Institution: School of Management, University of Bath, UK.**

**Date: September 3<sup>rd</sup> 2007.**

## **Abstract.**

Behavioural corporate finance (BCF) examines the effects of managerial and investor psychological biases on a firm's corporate finance decisions (such as investment appraisal and capital structure). In contrast to the well-developed research in behavioural finance (which examines the effects of investors' biases on the behaviour of the financial markets), the emerging research in BCF is relatively young. In this paper, we review the existing research to date in BCF, and suggest areas for future development.

## **1. Introduction**

Traditionally, financial economists have based their work on the standard assumption that agents are fully rational, self-interested, maximisers of expected utility (the homo economicus view). However, researchers are increasingly recognising that the psychological biases of investors and managers may affect decision-making and outcomes in financial markets and in corporations. As a result, a new body of research, behavioural finance, has emerged as a challenge to the traditional paradigm. The initial work in behavioural finance arose as a reaction to empirically observed financial market anomalies that were inconsistent with the standard view. Ricciardi and Simon (2000) note that behavioural finance is an integrated approach that combines traditional finance, psychology and sociology in an attempt to explain these anomalies.

Hence, much of the analysis in behavioural finance (BF) has focused on the effect of investor biases on the behaviour of the financial markets, taking managerial rationality as given. For instance, the papers in this special issue consider various aspects of investor psychology on stock market phenomena. For example, Basili et al develop the cumulative prospect theory approach of Barberis et al (2001) in order to consider the effect of multiple reference points on investor behaviour. Gounopoulos et al analyse the price performance of Initial Public Offerings on the Cyprus Stock Exchange in order to consider behavioural aspects of the underpricing phenomenon. Hodgkinson et al consider behavioural aspects of Bull-Bear cycles. Finally, Cox et al consider the effect of trust in investors' portfolio decisions and choice of provider of financial services.

A relatively new approach considers behavioural corporate finance (BCF), which analyses the effects of psychological biases on corporate finance decisions (such as investment appraisal, capital structure, and dividend policy). In their review paper, Baker et al (2004) identify two approaches within the field of BCF; a) the irrational

investors approach, taking managerial rationality as given, and b) the irrational managers approach, taking the rationality of investors as given.

In this paper, we review the emerging and growing body of work in behavioural corporate finance. The rest of the paper is organised as follows. We first briefly review research in behavioural financial markets as a basis for our subsequent discussion. Then we turn to the focus of our analysis; behavioural corporate finance. Within this field, we first briefly discuss the irrational investors approach, and then we turn to the main focus of our analysis; the irrational managers approach.

## 1.1 Behavioural finance.

The foundations for the traditional analysis of financial markets were laid by Markowitz 1952 (portfolio theory), Sharp 1963, 1964, and Lintner 1965 (Capital Asset Pricing Model), and Fama 1970 (efficient market hypothesis). According to the standard approach, the market value of a stock should generally be aligned with its fundamental value, and financial markets should react quickly to new information. An implication is that prices follow a random walk (under the assumption that ‘news’ arrives randomly and is incorporated immediately into the share price). Another implication is that no investor can consistently earn an ‘abnormal’ return in excess of that consistent with risk (the risk-return relationship embodied in the CAPM).

Empirically observed financial market anomalies, inconsistent with the standard view, prompted the development of Behavioural Finance. In table 1, we present some of these financial market anomalies, and the psychological biases proposed by researchers as possible causes.

Table 1: Financial Market Anomalies and Possible Investor Bias.

<b>Financial Market Anomalies</b>	<b>Possible Investor Bias</b>
Market Over-reaction	<b>Overconfidence</b>
Market Under-reaction	Conservatism/anchoring/availability bias/confirmation bias/representativeness/belief perseverance
Excessive volatility	<b>Overconfidence</b>
Momentum	<b>Overconfidence</b> /availability bias/confirmation bias/herding.
Post-earnings announcement Drift	<b>Overconfidence</b> /availability bias/confirmation bias/herding.
Panics and Crashes	<b>Overconfidence</b> /availability bias/confirmation bias/herding
Holding losers too long/selling winners too quickly	Disposition Effect/prospect theory.

In the table, we highlight overconfidence, since this is one of the major findings of the research into behavioural finance.

Since our review paper focuses on behavioural corporate finance, we do not discuss these financial market anomalies, or investor biases. For excellent in-depth reviews of behavioural finance, we refer the reader to Shleifer (2000), Daniel et al (2001), and Barberis and Thaler (2002).

## **2. Behavioural Corporate Finance.**

An emerging body of research, behavioural corporate finance (BCF), focuses on the effect of psychological biases on corporate financing decisions (such as investment appraisal, capital structure, and dividend policy). In their review paper, Baker et al (2004) identify two approaches within the field of BCF; a) the irrational investors approach, taking managerial rationality as given, and b) the irrational managers approach, taking investor rationality as given.

In section 2.1, we briefly review the irrational investors approach. Then we turn to the main focus of our analysis in section 2.2, where we review the irrational managers approach.

### **2.1 The Irrational Investors Approach.**

One branch of BCF considers the effects of the combination of managerial rationality and investor irrationality on corporate finance decisions. This approach focuses on managerial decisions in the face of differences between fundamental values and market values due to investor biases.

According to Baker et al (2004), the manager balances three conflicting goals in this approach; maximisation of fundamental value, maximisation of current market value, and exploitation of current mispricing in order to transfer wealth to existing, long-run investors. Scholars have examined these objectives using two main types of models; a) catering models, and b) timing models.

For example, Baker and Wurgler (2004) develop a catering model of dividends. In their analysis, irrational investors categorise firms into dividend-paying and non-paying. These investors pay a premium (above fundamental value) for dividend-payers. Managers can use free cashflow to pay dividends or re-invest in the future long-term growth of the business. Hence, managers face a trade-off between short-term catering (paying dividends to maximise current market price, but destroying long-term growth) and re-investing in growth (that is, not catering with dividends, but maximising long-term fundamental value).

Market timing models focus on the manager's exploitation of stock mispricing in order to transfer wealth to existing long-run investors. For example, according to Graham and Harvey's (2001) survey (quoted in Baker et al 2004), two-thirds of CFOs of public corporations believe that market mis-pricing is an important factor in their decision to issue stock. Isagawa (2002) develops a share repurchase timing model, in which managers exploit stock undervaluation, caused by investor biases, in order to buy back cheap shares, thus transferring wealth from tendering share holders to non-tendering share holders.

### **2.2 The Irrational Managers Approach.**

We now turn to the main focus of our analysis. We review the emerging research into the combined effects of managerial irrationality and investor rationality on corporate financing decisions. Researchers are increasingly recognising that the psychological biases that beset investors may also be widespread amongst corporate managers.

As in standard finance, we may consider two main areas in BCF; capital budgeting (the investment decision), and capital structure (the financing decision). In standard finance, the focus is on the effects of agency problems (managerial self-interest) and informational asymmetries on investment and financing decisions. In BCF, the focus is on the effects of managerial psychological biases on these decisions (although some BCF models, such as Fairchild 2005b, and Hackbarth 2002, attempt to combine managerial psychological biases with agency and informational asymmetry problems. See section 2.2.2 for a review).

Shefrin (2007) identifies 3 categories of psychological phenomenon; biases, heuristics, and framing effects. As outlined by Shefrin (2007), a bias is a predisposition towards error. A heuristic is a mental shortcut or rule of thumb which facilitates decision-making. Framing refers to the way in which “a person’s decisions are influenced by the manner in which the setting for the decision is described.” The following list (reproduced from Shefrin 2007) places some psychological phenomena into these 3 categories.

1. Biases:
  - a) **Excessive Optimism.**
  - b) **Overconfidence.**
  - c) Confirmation Bias.
  - d) Illusion of Control.
2. Heuristics:
  - a) Representativeness.
  - b) Availability.
  - c) Anchoring.
  - d) Affect.
3. Framing Effects.
  - a) Loss Aversion.
  - b) Aversion to a Sure Loss.
  - c) Prospect Theory.

As Shefrin (1999) notes, if the corporate manager intentionally makes bad (value-reducing) decisions due to agency problems, this can be addressed through incentive contracts. However, if the manager unintentionally makes bad decisions (psychological error, for instance overconfidence) while believing that he is doing the right thing, then this is much more difficult to correct. Shefrin suggests that now management education becomes important.

It is interesting to note that Shefrin (2007) emphasises the negative, value-reducing, aspects of managerial biases, such as overconfidence, and, hence, the need to correct such biases. In contrast, some researchers (eg Fairchild 2005, Hackbarth 2002) argue that overconfidence may, in fact, have a positive, value-adding, effect. See section 2.2.2 for a review.

In spite of the potentially infinite list of managerial biases, much of the existing research focuses on managerial overconfidence. Increasingly, researchers are recognising that the bias of overconfidence may play a significant role in managers' financing and investment decisions (for example; Kahnemann and Lovallo 1993, Shefrin 1999, Goel and Thakor 2000, Malmendier and Tate 2001, Heaton 2002, Gervais, Heaton and Odean 2003, Hackbarth 2004). Heaton (2002) cites the psychological research (eg, Weinstein 1980, March and Shapira 1987) that supports the view that people are over-optimistic or overconfident. This research demonstrates that agents tend to be more optimistic about outcomes a) that they believe that they can control, and b) to which they are highly committed. Both findings support the view that managers may be overconfident about the success of their ventures. Researchers have considered the desirability of managerial overconfidence in capital budgeting and capital structure decisions. The research thus far provides mixed results.

In section 2.2.1, we review the major research into managerial overconfidence and capital budgeting decisions. In section 2.2.2, we review the major research into managerial overconfidence and capital structure decisions.

### 2.2.1 Managerial Overconfidence and Capital Budgeting.

Several researchers have investigated the effects of managerial overconfidence on capital budgeting and investment appraisal. Malmendier and Tate (MT 2002) consider the relationship between managerial overconfidence, internal funds, and corporate investment. They argue that overconfident managers overestimate the quality of their projects and also perceive external finance as excessively costly (since they believe that outside financiers underestimate the value of the firm). Therefore, MT hypothesise that there is a positive relationship between corporate investment and internal funds. In order to test this hypothesis, MT classify CEOs as overconfident if they continually fail to exercise options that are highly in-the-money, or repeatedly buy stock of their own company. They find that investment is significantly more responsive to cashflow if the CEO is overconfident.

Gervais et al (GHO 2003) employ a real-options framework in order to consider the combined effects of managerial risk-aversion and overconfidence on the decision to invest immediately in a project, or delay investment. Risk-aversion may induce a manager to delay investment sub-optimally, reducing shareholder value. One means of addressing this agency problem is through the use of executive stock options. However, GHO point out that managerial overconfidence provides an alternative solution to the agency problem, as overconfidence offsets risk-aversion, such that overconfident managers hesitate less before making their investment decisions. Indeed, in this case, the use of stock options in an attempt to induce the correct managerial decision may actually hurt shareholders as it encourages overconfident managers to take too many risks.

Kahnemann and Lovallo (1993) argue that managerial optimism may lead to managers making “bold forecasts” regarding prospective projects, while at times making timid choices due to risk aversion. In Goel and Thakor’s (2000) tournament model of managerial promotion to executive positions, managers become overconfident in order to increase their chances of success. This is beneficial for shareholder wealth, since it offsets some of the manager’s risk aversion.

Heaton (2002) argues that overconfidence leads to managers overestimating the net present value of new investment projects. Therefore, they will invest in negative NPV projects that they mistakenly believe to be positive NPV. Hence, overconfidence is value-reducing. Similarly, Malmendier and Tate (2004) argue that overconfidence may result in corporate investment distortions. Overconfident managers view external funds as unduly costly. Therefore, they overinvest when they have abundant internal funds, and they underinvest when they require external financing.

Zacharakis and Shepherd (2001) consider the investment appraisal process of venture capitalists<sup>1</sup>. They argue that, due to time and resource constraints, VCs may be overconfident in their ability to evaluate business plans. In particular, they may overestimate the bad signals that they receive, and this may lead to excessive rejection of potentially good projects.

Statman and Tyebjee (ST 1985) examine the effect of managerial overconfidence on the forecasts of revenue and costs in the net present value calculation. They argue that overconfidence results in the manager overestimating the expected revenues, and underestimating the expected costs, for a potential project. Hence, the NPV is inflated by overconfidence, resulting in managers taking too many bad projects.

Motivated by ST’s analysis, Pruitt and Gitman (1987) conduct a mail survey of US managers in order to analyse various aspects of managerial bias in capital budgeting forecasts. They support ST’s finding that capital budgeting forecasts are optimistically biased by people with work experience.

Coleman (2007) employs survey techniques to analyse the effects of behavioural biases on finance executives risk propensity and decision-making. Particularly, he finds the following 5 effects to be important; a) decision-makers’ characteristics and perceptions, b) reference levels, c) mental accounting and the assumption of mean-reversion, d) the longshot bias or overconfidence, and e) the desire for immediate gratification.

Hribar and Yang (HY 2006) employ a press-based measure of CEO overconfidence, first developed by Malmendier and Tate (2005) to demonstrate that overconfident CEOs are more likely to miss their own forecast of earnings. Further, HY find that overconfident CEOs are more likely to issue point forecasts rather than range forecasts, and that range forecasts are narrower for overconfident CEOs.

### 2.2.2 Overconfidence and Capital Structure.

Since the seminal work of Modigliani and Miller (1958), much research effort has been directed at understanding firms’ capital structure and investment decisions and the corresponding effects on firm value. Until recently, the standard approach was to assume rationality of managers and investors. For example, a large body of research exists examining the role of security signalling in the face of informational asymmetries in a rational framework (eg Leland and Pyle 1977, Ross 1977, Myers and Majluf 1984)<sup>2</sup>. Another strand of research examines the use of capital structure to mitigate agency problems (Jensen and Meckling 1976, Grossman and Hart 1982,

Jensen 1986, Dewatripont and Tirole 1991, Fairchild 2003a)<sup>3</sup>. This approach assumes a principal-agent problem based on selfish managerial rationality.

Recently, researchers are beginning to consider the effect of managerial overconfidence on capital structure decisions.

Heaton (2002) analysed the effect of overconfidence on financing decisions in the absence of asymmetric information or moral hazard problems. Since the manager is overconfident, he believes that the market undervalues his equity. Therefore, the Myers-Majluf mispricing problem exists. That is, the manager may pass up a positive NPV project, in which case, free cashflow is beneficial. However, due to managerial overconfidence, the manager may take negative NPV projects that he mistakenly believes to be positive NPV. Now free cashflow is harmful (as in Jensen 1986). Hence, Heaton argues that, given managerial overconfidence, an optimal level of free cashflow exists that eliminates both the Myers-Majluf and Jensen problem.

Hackbarth (2004) employs a real options framework, combined with an earnings-based capital structure model, in order to analyse the relationship between managerial overconfidence, investment and debt. Specifically, he focuses on the conflict between shareholders and bondholders, embodied in Myers' (1977) underinvestment problem. Debt induces an inefficient delay in investment, but mild overconfidence mitigates this problem. Hackbarth further demonstrates that an increase in risk-shifting opportunities exacerbates underinvestment, and that leverage is inversely related to the value of investment opportunities.

Hackbarth (2002) models the effect of managerial overconfidence in a trade-off model of capital structure. First, he considers the case where the manager attempts to maximise firm value, trading-off the tax shield benefit of debt and the bankruptcy cost of debt. Second, he considers the case where an agency conflict exists between the manager and investors over managerial diversion of discretionary resources. In both cases, Hackbarth finds a positive relationship between overconfidence and debt.

Fairchild (2005b) develops the work of Heaton (2002) and Hackbarth (2004) by presenting two models of managerial overconfidence and capital structure. His first model considers the combined effects of managerial overconfidence and asymmetric information. His second model considers the combined effects of managerial overconfidence and moral hazard.

His asymmetric information model consists of two firms, one of which is run by a high-ability manager, while the other is run by a low ability manager. Each firm approaches the capital market to raise investment funds  $I > 0$ , which are required to start the firm's only project. After investing in the project, it either succeeds, achieving income  $R > I$ , or it fails, achieving zero income. For the high ability manager, the probability of success is  $p \in (0,1]$ , while for the low ability manager, the probability of success is  $q < p$ . Fairchild models overconfidence as follows. Each manager is overconfident in his ability. The high-ability (low-ability) manager believes that his success probability is  $\hat{p}(\hat{q})$ , where  $\hat{p} > p$ , and  $\hat{q} > q$ .

In the absence of any signals, the firms are observationally equivalent to the market, and the market values the firm at the average of the two firms. That is, the market value of each firm in the absence of signals is  $V = \frac{(p+q)R}{2}$ .

Each manager simultaneously decides whether to raise the required investment funds  $I$  by issuing either debt (borrowing  $I$  at interest rate  $r$ ) or equity (issuing a proportion  $1-\alpha \in [0,1]$  to outside equity holders, while retaining a proportion  $\alpha$  for

himself). If the manager issues debt, and the project succeeds, the manager is able to pay the debt holders (since  $R > I$ ). If the manager issues debt, and the project fails (achieving zero income), the manager is unable to pay the debt holders, in which case the manager faces financial distress costs  $b$ . If the manager issues equity, the equity holders share in the achieved project income. In the case of failure, there are no financial distress costs.

Under the assumption that the capital market is competitive, debtholders and equity holders invest at zero NPV. That is, in the case of debt,  $\bar{P} \cdot I(1+r) = I$ , while in the case of equity,  $(1-\alpha)\bar{P}R = I$ , where  $\bar{P}$  represents the investors' expectation of project success, given the signals provided by the managers' choice of financing method. All of the positive NPV goes to the manager.

Since Fairchild considers a signalling model, he employs a Bayesian updating approach, where the market updates its beliefs upon observing the managers' financing choices. The author specifies the following beliefs. If the managers both choose the same instrument (either both choose debt or both choose equity), the market is unable to update its beliefs, and continues to assign an equal probability to each firm being run by a good or bad manager. If one manager chooses debt, and one manager chooses equity, the market believes that it is the high-ability manager who issued debt, and the low-ability manager who issued equity.

In the separating equilibrium, the high-ability manager issues debt, while the low ability manager issues equity. In deciding whether to issue debt, each manager trades-off the signal of ability provided to the market against the expected financial distress costs of debt.

Fairchild (2005b) demonstrates that increasing managerial overconfidence increases the incidence of debt issuance. Indeed, in the case where

$$(1-q)b > (1-\hat{q})b > \frac{\hat{q}(p-q)}{q(p+q)}I > (1-p)b > (1-\hat{p})b > \frac{p-q}{p+q}I,$$

the low-ability manager (whether rational,  $\hat{q} = q$ , or overconfident,  $\hat{q} > q$ ), issues equity in equilibrium. A rational high-ability manager issues equity, while an overconfident manager issues debt in equilibrium.

Furthermore, in this asymmetric information case, Fairchild demonstrates that managerial overconfidence is unambiguously welfare-reducing, since it increases the use of debt (to signal ability), which merely shifts value from the bad firm to the good firm (through the signalling effect) while resulting in an increase in expected financial distress costs.

Whereas Fairchild's (2005b) first model (managerial overconfidence and asymmetric information) unambiguously demonstrates the negative (welfare-reducing) effects of overconfidence, his second model (managerial overconfidence) introduces an ambiguous relationship between managerial overconfidence and firm value. In this model, the agency problem exists due to the manager's incentives to shirk. The manager uses debt as a commitment to high effort, and hence high firm value.

The details of the model are as follows. At date 0, the manager issues debt or equity to raise investment funds  $I > 0$  in order to invest in the firm's only one-period project. Having received the funds and invested in the project, the manager exerts effort  $e$ . He faces a cost of effort  $c(e) = \beta e^2$ . The project either succeeds or fails at date 1, providing income  $R > 0$  or zero respectively.



The manager's effort level affects the project's success probability. The true success probability is  $P = \lambda e$ . The overconfident manager's perceived success probability is  $\hat{P} = (\lambda + \gamma)e$ . The parameter  $\gamma$  represents the managerial overconfidence parameter. The true value is  $\gamma = 0$  (this is recognised by a rational, well-calibrated manager). The overconfident manager believes that  $\gamma > 0$  (that is, he overestimates his ability to generate value).

The overconfident manager's perceived expected payoff from issuing debt is

$$\hat{M}_D = \hat{P}(R - D + b) - b - \beta e^2 + PD - I,$$

The overconfident manager's perceived expected payoff from issuing equity is

$$\hat{M}_E = \alpha \hat{P}R - \beta e^2 + (1 - \alpha)PR - I.$$

Substituting for  $\hat{P}$ , and solving  $\frac{\partial \hat{M}_D}{\partial e} = 0$ , and  $\frac{\partial \hat{M}_E}{\partial e} = 0$ , we obtain the manager's optimal effort level under the debt and equity contracts respectively;

$$e_E^* = \frac{(\lambda + \gamma)(R - D)}{2\beta}, e_D^* = \frac{(\lambda + \gamma)(R - D + b)}{2\beta}.$$

Fairchild notes two important features of these optimal effort levels; a) for a given level of overconfidence  $\gamma$ , effort is higher under the debt contract than under the equity contract (this higher effort is 'forced' by the expected financial distress costs). b.) Under either contract, managerial effort is increasing in overconfidence  $\gamma$ .

The author then proceeds to incorporate these optimal effort levels into the manager's payoffs and firm values under the debt and equity contracts. He demonstrates that increasing overconfidence can lead to a switch from equity to debt, as the manager overestimates his ability, and underestimates expected financial distress costs. Furthermore, the effect of overconfidence on firm value is ambiguous. As noted above, overconfidence drives higher managerial effort, which has a positive effect on firm value. However, it also increases the use of debt (as a commitment to higher effort), and hence increases expected financial distress costs. The overall effect of managerial overconfidence on firm value depends on the trade-off between these two effects (higher managerial effort and higher expected financial distress). Interestingly, Fairchild demonstrates that, in certain cases, medium overconfidence may be value-reducing (as the manager switches from equity to debt, but does not exert particularly high effort), while high overconfidence may be value-increasing, as the manager switches to debt, and exerts very high effort.

Despite the difficulties of finding observable measures of managerial overconfidence, there have been some recent attempts at empirical analysis of the relationship between managerial overconfidence and capital structure. Malmendier and Tate (2005b, 2005c) proxy managerial overconfidence using managers' stock option exercise decisions. The same authors (2005a, 2005c) analyse press statements to develop an

index of managerial overconfidence. Oliver (2005) uses the University of Michigan Consumer Sentiment Index as a measure of overconfidence. Barros and Silveira (2007) employ an entrepreneur/non-entrepreneur classification as a proxy for overconfidence. All of these studies find a positive relationship between overconfidence and debt.

### 2.2.3 Managerial Overconfidence and Firm Value.

The literature surveyed in sections 2.2.1 and 2.2.2 suggests that the relationship between managerial overconfidence and firm value is ambiguous. In terms of investment appraisal, some researchers have suggested that an overconfident manager may invest in too many negative NPV projects, and take too many value-reducing risks. Other scholars have considered the role of managerial overconfidence in offsetting managerial risk-aversion.

In terms of capital structure, the theoretical and empirical evidence suggests that managerial overconfidence leads to higher debt levels, but the relationship with firm value is ambiguous, since overconfidence results in higher managerial effort.

Indeed, in Shefrin's (1999) survey of behavioural corporate finance, he states that overconfidence may induce a manager to adopt an excessively heavy, sub-optimal, debt-laden capital structure. He cites the example of the firm PSINet. Similarly, in his case study of BT, Fairchild (2003b) argues that the company took debt in excess of the optimal level, and were slow to reduce debt. Was this a result of managerial overconfidence?

## 2.3 Combination of Managerial Biases.

Thus far, we have reviewed the literature on the effects of one particular bias, managerial overconfidence, on capital budgeting and capital structure decisions. We now turn to the literature that considers a combination of biases. We note that such literature has exclusively focused on investment appraisal.

Coleman (2007) considers financial executives' risk propensity, and considers the effect of decision maker's characteristics and perceptions, reference levels, mental accounting and the assumption of mean reversion, the longshot bias (overconfidence), and the desire for immediate gratification.

Ashta (2006) considers the effect of several biases on the calculation process (and particularly the forecast of expected cashflows) in investment appraisal.

Statman and Caldwell (SC 1987) examine the effect of managerial biases on the reluctance to terminate poorly performing projects. According to the net present value approach, sunk costs should be ignored, and the project should be terminated when the expected present value of cashflows from termination exceed the expected present value of cashflows from continuation of the project. SC outline the managerial entrapment problem as follows; "managers tend to become entrapped into losing projects and throw good money after bad as they attempt to rescue them."

The authors consider the reluctance to abandon in a conceptual behavioural finance framework including a) prospect theory, b) framing and mental accounting, c) regret aversion, and d) self-control.

SC consider the following example. A risk-averse manager is involved in a project in which he has already lost \$2,000. He now faces a choice between terminating the project to make a sure gain of \$1,000, or continuing the project, in order to obtain the risky prospect of an equal chance of making \$2,000 or zero. What should he do?

According to economic accounting (which prescribes ignoring the sunk loss), the risk-averse manager should terminate the project (since safe termination and risky continuation have the same expected values). However, if the manager creates a mental account in which he includes the sunk loss (the framing problem), he now faces the choice between terminating the project to make a loss of -\$1,000, or continuing the project, with the prospect of an equal chance of making -\$2,000 or zero.

Therefore, by including the sunk loss, the manager's choices shift into the 'negative domain'. According to Kahnemann and Tversky's (1979) prospect theory, people are risk-averse in the 'positive domain', but become risk-seeking in the negative domain. That is, when faced with a choice between a sure loss and a gamble, they are likely to choose the gamble. Therefore, combining mental framing (where the manager includes the sunk loss) with prospect theory, the manager would choose to continue the project, rather than abandoning it. This framework provides the intuitive notion that the manager "chases" the sunk loss by throwing more resources into the project in an attempt to recover the situation.

Statman and Caldwell (1987) also consider the effect of regret aversion. Bell (1982) and Loomes and Sugden (1982) first developed regret theory. The idea is that a manager suffers more than just the loss of a bad outcome from a risky project; he also suffers negative utility from the feeling of regret at not taking an alternative course of action (for example, he may feel that he should have taken a safer project). Furthermore, regret theory makes a distinction between 'paper' losses and 'realised' losses. The manager does not experience the pain of regret until he makes the decision to abandon the project. This will strengthen his entrapment in continuing the losing project. Regret theory can be used to justify the evidence that entrapment into losing projects is stronger when managers have been involved in the initial decision to take the project (since regret may be stronger for such managers).

Motivated by Statman and Caldwell's (1987) conceptual analysis of the project abandonment decision, Klauss (2005) provides the first attempt at developing a formal theoretic framework of the combined effects of managerial overconfidence and regret on the entire investment appraisal process (initial information gathering, investment appraisal decision, project performance, and the continuation/abandonment decision). He demonstrates that in certain cases, these biases may offset each other, while in other cases, they reinforce each other.

### **3. Directions for Future Research.**

Much of the existing research in behavioral finance focuses on the psychological biases affecting investors in the financial markets. Thaler (1999) calls for an increased level of research in the area of behavioral corporate finance (that is, an increased understanding of the effects of managerial psychological biases). Since then, major

steps have been taken in modelling the effect of one particular bias, managerial overconfidence, on investment and financing decisions.

In contrast to the research into behavioral finance, the research into behavioral corporate finance is still relatively young. The rigorous theoretical developments have focussed on managerial overconfidence. However, we believe that the existing models of investor irrationality (eg Barberis et al 1998 and Daniel et al 1998) could be developed and applied to managerial irrationality. Indeed, an examination of Statman and Caldwell's (1987) survey of the biases facing managers in investment appraisal decisions (eg framing combined with prospect theory, regret aversion, loss aversion) reveals that managers exhibit much of the same biases that face investors. Hence, it should be relatively straight-forward to extend models of investor irrationality regarding share trading and pricing to models of managerial irrationality regarding investment appraisal and capital structure decisions.

Furthermore, it is possible that the managerial biases in investment appraisal decisions, as identified by Statman and Caldwell, could be extended to financing decisions. For example, Statman and Caldwell discuss a manager's refusal to abandon a loss-making project, due to various biases, such as framing, loss aversion, and regret aversion. We could conceivably apply this to capital structure, where a manager might experience a refusal to abandon a high value-reducing debt level, especially if he had been involved in the initial decision to take on high debt. Furthermore, Hirschleifer (1993) discusses some behavioral biases that could be applied to debt decisions, such as reputation effects and short-termism.

Capital structure models that combine several managerial biases will provide much richer policy implications than examining, say, overconfidence in isolation. What is the effect of combining biases on a manager's value-increasing or value-reducing activities? Indeed, Besharov (2002) develops a model that combines 3 biases (overconfidence, regret aversion and hyperbolic discounting). Overconfidence and regret aversion result in higher effort levels, while hyperbolic discounting results in lower effort levels. Therefore, these biases offset each other. It would be interesting to apply Besharov's (2002) model to corporate finance decision-making.

Klauss (2005) provides theoretical and empirical analysis of the combined effects of managerial overconfidence and regret on the decisions made at the various stages of the investment appraisal process (initial information gathering stage, the project appraisal stage, and the continuation/abandonment stage).

We identified (following Baker et al 2004) that there are currently two approaches to BCF; a) the irrational investors approach, with managerial rationality, and b) the irrational managers approach, with investor irrationality. We suggest that an exciting area for future BCF research would be to combine these two approaches, such that we consider the combined effects of managerial and investor irrationality on corporate finance decisions.

#### **4. Conclusion.**

We have provided a survey of the existing research in behavioural corporate finance (BCF). We have considered both the irrational investors and irrational managers approach. Within the irrational managers approach, we have focused on the major research into the effects of managerial overconfidence on corporate finance decisions. We suggest several avenues for future research in BCF. Firstly, the effect of managerial overconfidence on capital structure and firm value should be examined

more thoroughly, particularly regarding the ambiguous relationship between overconfidence and firm value<sup>4</sup>.

Secondly, scholars should begin to analyse more formally the effects of other managerial biases. We suggest the relatively mature research into investor biases in behavioural financial markets (BF) could provide a framework for analysing managerial biases in BCF.

Within BCF, research into the effect of managerial biases such as overconfidence, regret, loss aversion, prospect theory and anchoring on investment appraisal is quite well-developed. Probably the most under-researched area is the effect of these biases on capital structure, which has focused almost exclusively on overconfidence. Future researchers could examine such questions as; can prospect theory, loss aversion and regret aversion drive a manager to be reluctant to “abandon” a sub-optimally excessive debt level, leading to an inertia in capital structure? Do framing effects lead to managers anchoring on a target debt level?

A final exciting development would be to consider the combined effects of managerial and investor irrationality on corporate finance decisions.

Our suggestions should present an interesting and challenging agenda for future behavioural corporate finance research.

#### Endnotes:

1. In this survey, we focus on managerial biases in public corporations. Research into behavioural biases and venture capital contracting provides an interesting area of research in its own right. For instance, there has been some work on the effect of fairness and trust in venture capital contracting and performance (see eg, Fairchild 2006), and the effects of entrepreneurial overconfidence on VC contracts and performance (Landier and Thesmar 2003).
2. In Ross's (1977) model, debt provides a signal of managerial ability. Debt carries a bankruptcy threat. A high-ability manager is confident that he can repay the debt holders, while the bad manager is not. Therefore, the good manager is able to separate from the bad manager by issuing debt, while the bad manager issues equity. In Myers and Majluf's (1984) model, equity provides a signal of poor future prospects. In the absence of a signal, investors believe that good or bad news arrives with equal probability. Therefore, they price the firm at an average value. If the manager knows that good news is coming, he will avoid issuing undervalued equity, since this will dilute his equity stake. If he knows that bad news is coming, he will attempt to 'beat the market' by issuing overvalued equity. However, by issuing equity, the manager will signal his knowledge of the bad news to rational investors, and the share price will fall. This is termed the Myers-Majluf mispricing problem. Hence, Myers and Majluf derive a pecking order of finance, in which firms will first use retained earnings to invest in new projects (so that they can avoid the mispricing problem associated with external capital markets). Secondly, they will use debt. Finally, they will use equity as a last resort.
3. In Jensen and Meckling's (1976) model, a self-interested manager could divert company funds for consumption of value-reducing private benefits. Increasing the debt level (and reducing outside equity) aligned the manager with the investors by increasing the manager's personal equity stake in the firm, hence reducing his incentives to take private benefits. Jensen (1986) considered a self-interested manager's incentives to waste free cash flow on empire-building, value-reducing, projects. Increasing debt commits managers to paying out to debt holders, hence reducing the free cash flow problem. Grossman and Hart (1982), Dewatripont and Tirole (1991), and Fairchild (2003a) analysed the disciplining role of debt, as the threat of bankruptcy induces the manager to increase value-adding effort levels.
4. In this review paper, we have identified that existing theoretical and empirical research in BCF suggests that the relationship between managerial overconfidence

and debt is unambiguously positive, while the relationship between overconfidence and firm value is ambiguous (it may be positive or negative). In a recent working paper (Fairchild 2007), the author is the first to present a theoretical argument that even the relationship between managerial overconfidence and debt may be ambiguous.

## References

Ashta, A. (2006), "Behavioral influences on the calculation of expectations in project appraisal." SSRN Working paper database;  
[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=937878](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=937878)

Barros, L., and Silveira, A. (2007), "Overconfidence, managerial optimism and the determinants of capital structure." SSRN Working paper database  
[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=953273](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=953273)

Baker, M., Ruback, R.S., and Wurgler, J. (2004), "Behavioral corporate finance: a survey." [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=602902](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=602902).

Baker, M., and Wurgler, J. (2004), "A catering theory of dividends." *Journal of Finance* 59, 271 – 288.

Barberis, N., Schleifer, A., and Vishny, R. (1998), "A model of investor sentiment." *Journal of Financial Economics* 49, 307-343.

Barberis, N., and Thaler, R. (2002), "A survey of behavioral finance." [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=327880](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=327880).

Bell, D. (1982), "Regret in decision making under uncertainty." *Operations Research*, 30, 961-981.

Besharov, G. (2002), "Second-best considerations in correcting cognitive biases." [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=381300](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=381300).

Coleman, L. (2007), "Risk and decision making by finance executives: A survey study." *International Journal of Managerial Finance* Vol 3, No 1, 108-124.

Daniel, K., Hirshleifer, D., and Subramanyam, A. (1998), "A theory of overconfidence, self-attribution, and security market under- and over-reaction." *Journal of Business* 53, 1839-1886.

Daniel, K., Hirshleifer, D., and Teoh, S.H. (2001), "Investor psychology and capital markets: evidence and policy implications." [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=278848](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=278848).

DeLong, J. B., Shleifer, A., Summers, L.H., and Waldmann, R.J. (1991), "The survival of noise traders in financial markets." *Journal of Business* 64, 1-19.

Dewatripont, M., and Tirole, J. (1994), "A theory of debt and equity: diversity of securities and manager-shareholder congruence." *Quarterly Journal of Economics* 1027-1053.

Fairchild, R. (2003a), "Conflicts between managers and investors over the optimal financial contract." *International Journal of Business and Economics: Symposium on Principal-agent Models*, 197-212.

Fairchild, R. (2003b), "An investigation of the determinants of BT's debt levels from 1999-2002: what does it tell us about the optimal capital structure?" *International Business and Economics Research Journal*, 75-86.

Fairchild, R. (2005a), "Behavioral finance in a principal-agent model of capital budgeting". *ICFAI Journal of Behavioral Finance* vol II, no 1, 34-44.

Fairchild, R. (2005b), "The effect of managerial overconfidence, asymmetric information, and moral hazard on capital structure decisions." *ICFAI Journal of Behavioral Finance*, vol II, no 4, 46- 68.

Fairchild, R. (2006), "The effects of self-interest and fairness on entrepreneur/venture capitalist financial contracting and performance" [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=875833](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=875833).

Fairchild, R. (2007), "Managerial overconfidence, agency problems, financing decisions and firm performance." Working Paper Series, School of Management, University of Bath, UK.

Gervais, S., Heaton, J.B., and Odean, T. (2003), "Overconfidence, investment policy, and executive stock options." [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=361200](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=361200).

Goel, A.M, and Thakor, A.V. (2000), "Rationality, overconfidence, and leadership." Mimeo, University of California, Berkeley.

Graham, J, and Harvey, C. (2001), "The theory and practice of corporate finance: evidence from the field." *Journal of Financial Economics* 60, 187 – 243.

Grossman, S., and Hart, O. (1982), "Corporate financial structure and managerial incentives," in *The Economics of Uncertainty*, E Lippman and J. McCall eds., Chicago: University of Chicago Press.

Hackbarth, D. (2002), "Managerial optimism, overconfidence, and capital structure decisions." [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=362740](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=362740).

Hackbarth, D. (2004), "Determinants of corporate bo



Modigliani, F, and Miller, M. (1958), "The cost of capital, corporation finance, and the theory of investment." *American Economic Review* 48, 261-297.

Myers, S.C. and Majluf, N.S. (1984), "Corporate financing and investment decisions when firms have information that investors do not have." *Journal of Financial Economics* 13, 187-221.

Oliver, B. (2005), "The impact of management confidence on capital structure". [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=791924](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=791924).

Pruitt, S.W., and Gitman, L.J. (1987), "Capital budgeting forecast biases: evidence from the Fortune 500." *Financial Management*, 46 – 51.

Ross, S.A. (1977), "The determination of financial structure: the incentive signalling approach." *The Bell Journal of Economics* 8, 23-40.

Shefrin, H. (1999), "Behavioral corporate finance." *Journal of Applied Corporate Finance* Volume 14, No 3.

Shefrin, H. (2007), *Behavioral Corporate Finance: Decisions that Create Value*, McGraw-Hill International Edition.

Shleifer, A. (2000), "Inefficient markets: An introduction to behavioral finance." (Oxford UK: Oxford University Press).

Statman, M., and Caldwell, D. (1987), "Applying behavioral finance to capital budgeting: project terminations." *Financial Management* 7-15.

Statman, M., and Tyebjee, T. (1985), "Optimistic capital budgeting forecasts: an experiment." *Financial Management*, 27 – 33.

Stein, J.C. (1996), "Rational capital budgeting in an irrational world." *Journal of Business* 69, 4. 429-455.

Thaler, R. (1999), "The end of behavioral finance." *Financial Analyst Journal* 12-17.

Thaler, R. (2000), "From homo economicus to homo sapiens." *Journal of Economic Perspectives* 14 (1): 133-141.

Tversky, A, and Kahneman, D. (1992), "Advances in prospect theory: cumulative representation of uncertainty." *Journal of Risk and Uncertainty*, 5, 297-323.

Weinstein, N. (1980), "Unrealistic optimism about future life events." *Journal of Personality and Social Psychology* 39, 806-821.

Zacharakis, A, and Shepherd, D. (2001), "The nature of information and overconfidence on venture capitalists' decision making." *Journal of Business Venturing*. 311-332.

