Capital structure choice: the influence of confidence in France

by

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Abstract

The over-confidence bias in relation to investment decisions is well documented in psychology and behavioural finance literature. The less known is that over-confidence bias also relates to financing decisions. Managers that are over-confident of their firm's future are likely to prefer debt to equity financing. This may lead to increased probability of bankruptcy and higher costs of capital. In this paper, we consider the significance of manager confidence on capital structure for a sample of French firms. We decompose a publicly available measure of industry sentiment into two components: a component common with investor confidence and a component unique to manager confidence. We find that investor confidence is negatively related to leverage and that the unique component of manager confidence is positively related to leverage. This supports the manager confidence bias of their preference for debt. In the sample of French firms, the investor confidence component dominates manager confidence, resulting in an overall negative effect of industry sentiment with leverage. This may be due to higher levels of blockholder control and/or a weaker business environment in France relative to other countries.

EFMA classification: 120, 140, 720, 110

Keywords: Behavioural Issues, Capital Structure, Behavioural Finance, Confidence, Leverage

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Comments from Tom Smith (Australian National University), seminar participants at University of Amsterdam Business School, Technological University of Munich and ESSCA-France are gratefully acknowledged.

1. Introduction

Many corporate finance models rely on rigorous assumptions such as rationality in decision making. However, behavioural finance uses models in which decisions are influenced by psychological and/or cognitive biases. This is an area of research that has developed from the work of Kahneman and Tversky (1979) and prospect theory. It provides insight into the influence of psychology on the behaviour of managers and investors and the subsequent effects on markets of their financial decision making (see Nofsinger, 2005).

When managers make financing decisions, a choice between debt and equity must be made. The psychological biases in managers regarding financing decisions do not necessarily result in decisions that are consistent with the expected preferences of investors. One case where psychological bias causes managers to prefer debt over equity is when they are confident of the firm's future (Hackbarth, 2004). This may result in increased risk of bankruptcy and higher costs of capital.

Identifying the determinants of capital structure can help managers make more informed decisions. Academically, it is of interest to understand what determines capital structure given the considerable research since Modigliani and Miller (1958).[1] However, there is no one universal theory of capital structure and it is only recently that manager confidence has been considered an important variable in capital structure choice.

In this paper, we consider the impact of manager confidence as a determinant of capital structure in a sample of French firms. The sample of French firms is selected because it has been documented that France is different from other countries in terms of shareholder control, legal environments and social attitudes (Bloch and Kremp, 2002; Lamoreaux and Rosenthal, 2004; Sraer and Thesmar, 2006; Roger, 2006). If managers are controlled by shareholders, then their psychological bias may not be as influential in their decision making.

[1] Modigliani and Miller (1958) is regarded as the seminal research on the theory of capital structure.

Furthermore, if the legal environment is not supportive of a business environment, manager's psychological bias may also be affected.[2] In addition, very little has been documented on the capital structure of French firms. France provides a rich source of research.

We find that traditional determinants of capital structure are significant for French firms, as they are for firms in many other countries. We find that manager confidence,[3] as proxied by industry sentiment indices (described later), is highly negatively significant in explaining French firm financing decisions. This does not support the hypothesis that managers are acting according to their expected psychological bias- a preference for debt when they are confident. Our initial results are the opposite of what has been found in the US market, where a positive relation between leverage and manager confidence has been documented (Oliver, 2006; Malmendier, Tate and Yan, 2005; Malmendier and Tate, 2005a, 2005b). However, we decompose our measure of industry sentiment into a common consumer confidence component and a unique manager confidence component and find that the manager component does have the expected positive relation with leverage. The dominance of the common investor confidence component of industry sentiment may be due to the uniqueness of the French capital market, particularly the high levels of blockholder control in French firms. This may induce a stronger preference for issuing equity by managers. In other words, the manager bias for preferring debt is dampened by an investor bias preferring equity. Our results are robust to a range of alternative methods and measures of confidence.

[2] In a recent series of articles, La Porta, Lopez-de-Silanes, Shleifer, and Vishny have argued that countries whose legal systems are based on civil law (especially of French origin) have systematically weaker environments for business than those whose legal systems are based on Anglo-American common law (Lamoreaux and Rosenthal, 2004).

[3] Malmendier and Tate (2005a) state that there is a strong precedent in the psychology literature for using 'confidence' to describe biases in self-assessment and 'optimism' for biases in beliefs about exogenous events. Sentiment is also a term often used to described confidence or optimism. For the purpose of this paper, we use the words sentiment, confidence and optimism interchangeably. However, we see terms as a continuum of beliefs about the future and the ability or perceived ability to control outcomes. At one end of the continuum managers have beliefs about issues where they have strong control over the outcome, through issues where they have perceived control, to issues that are more abstract, where they have little perceived or actual control. For example, managers have beliefs about unique aspects of their firm which they directly control; they have beliefs about the future of the industry in which their firm operates, where they may believe they have some control; and they may have beliefs about the future of the economy, where they have little control.

The rest of this paper proceeds as follows. Section 2 summarizes the literature on the capital structure determinants. Section 3 describes the research design, including variable definitions. Section 4 describes the data. The results are presented in section 5. Section 6 presents some robustness checks. Finally, section 7 concludes the paper.

2. Capital structure determinants

Since the work of Modigliani and Miller (1958) on the irrelevance of capital structure to firm value, theoretical and empirical analyses have been developed to discuss the determinants of corporate financing decisions in practice. This research has generally followed traditional finance theory and comprises the trade-off theory, the pecking-order theory and more recently the market timing theory. However, there is no universal theory of capital structure and no reason to expect one (Frank and Goyal, 2004).

The trade-off theory argues that a firm's optimal capital structure results from a trade-off between tax advantages of debt and bankruptcy costs of debts (Miller, 1977).[4] According to the pecking-order theory, formalized by Myers and Majluf (1984) and Myers (1984), there is a hierarchy in manager financing choices. External financing transaction costs, especially those associated with adverse selection, result in managers having a preference for internal financing, then new debt and finally new equity financing. Concerning the market timing theory, managers will issue equity when the firm's market value relative to book value is high and they will issue debt when the debt market conditions are perceived relatively more favourable (see Myers, 1984; Graham and Harvey, 2001; Hovakimian, Opler and Titman, 2001).

[4] The trade-off theory has two forms: static and dynamic forms. The static view suggests that the firm must always have the optimal debt/equity mix. Under the dynamic view firms that consider fixed costs of adjustment allow the actual leverage ratio to deviate from the target ratio until it becomes too extreme.

Intensive empirical research has been conducted to test the predictions of these theories (see for example Rajan and Zingales, 1995; Shyam-Sunder and Myers, 1999; Fama and French, 2002; Frank and Goyal, 2003, 2004). The theories are supported in the empirical research to varying degrees. In relation to research on capital structure determinants in France a recent paper provides a review of the literature (Ziane, 2004). Ziane (2004) documents a limited amount of research on capital structure determinants of French firms.

A nascent literature recognises that the bias of confidence is a significant determinant of mangers investment and financing decisions. Psychological studies document that confidence causes people to underestimate risks, to be more certain about predictions and to exaggerate their ability to control events (see Gilovich, Griffin and Kahneman (2002) for an overview of this area).

Heaton (2002) argues that confident managers overestimate the futures cash flows and so the Net Present Value (NPV) of new investment projects. Doing so leads them to invest in negative NPV.

Hackbarth (2004) develops a theoretical model to study the implications of managerial confidence for financing decisions. The model shows that optimistic and overconfident managers tend to choose higher debt levels and to issue new debt more often compared to otherwise identical less confident managers. Recently, Malmendier, Tate and Yan (2005) test these predictions. They find that managerial confidence leads to a preference for internal financing over external finance and, conditional on accessing the capital market, debt over equity. The main argument for the manager bias toward debt financing is that confident managers underestimate the probability of financial distress, and therefore take on higher levels of debt than optimal. This may lead to higher probability of bankruptcy and higher costs of capital. Therefore, in support of this confidence bias we expect a positive relation between manager confidence and leverage.

We test for the effect of the manager confidence bias in the French capital market by considering manager confidence as a determinant of capital structure, while controlling for common determinants of capital structure established in the current literature.

3. Empirical Method

In the next sub-sections, we present the model and we define the variables considered relevant to study the capital structure choice of French firms.

3.1 The model

Traditionally, financing decisions of managers are generally regarded as the outcome of a wide range of determinants related to market, industry and firm characteristics. We aim to verify if the corporate structure of a sample of French firms can be explained by the traditional determinants as well as testing the psychological theory that predicts that manager confidence is positively related to levels of debt or leverage.

Following Baker and Wurgler (2002) amongst others, we use a model that relates leverage –the proxy of the firm capital structure choice- to a range of independent variables related to market, industry and firm specifications. We consider management confidence as an extra variable in this model.

Frank and Goyal (2004) use a sample of US firms over 1950-2000 and evaluate the importance of 36 factors on leverage. They argue that "a set of seven factors account for more than 32% of the variation in leverage, while the remaining 29 factors only add 4%". The seven factors are: median industry leverage (***INDYMEDLEV***), market to book ratio (***MB***), dividend payment (***DIVDUM***), collateral (***COLLTRL***), profit (***PRF***), the firm size (***SIZE***) and inflation expectations. Similar variables have been documented as determinants of capital structure in many studies around the world. Rajan and Zingales (1995) find tangibility of assets, market-to-book, size and profitability as significant determinants of capital structure in

their sample of French firms. We include in our model all these variables as controls except the expected inflation rate due to the lack of this data for the French case. Moreover, Frank and Goyal (2004) argue that excluding this factor does not alter results significantly.

To ascertain the significance of these determinants for leverage we use a pooled cross-sectional time-series model as follows:[5]

$$\begin{aligned} \boldsymbol{LEVERAGE}_{it} = {} & \alpha_0 + \alpha_1 \boldsymbol{CONF}_{i,t-1} + \alpha_2 \boldsymbol{INDYMEDLEV}_{i,t-1} + \alpha_3 \boldsymbol{MB}_{i,t-1} \\ & + \alpha_4 \boldsymbol{DIVDUM}_{i,t-1} + \alpha_5 \boldsymbol{COLLTRL}_{i,t-1} + \alpha_6 \boldsymbol{PRF}_{i,t-1} + \alpha_7 \boldsymbol{SIZE}_{i,t-1} + \varepsilon_{it} \end{aligned} \quad (1)$$

All the independent variables are lagged one year. This allows the information regarding the determinants of capital structure to be available to managers in the year prior to the observed level of leverage.

LEVERAGE is the total amount of debt to market value of assets of firm *i* at a time *t*, defined as:

$$\boldsymbol{LEVERAGE}_{it} = \frac{\boldsymbol{Long\ term\ debt}_{i,t} + \boldsymbol{Short\ term\ debt}_{i,t}}{\boldsymbol{Market\ value\ of\ assets}_{i,t}}$$

Market value of assets is obtained as the sum of the market value of equity, long term debt, short term debt, preferred-liquidation value, deferred taxes and investment tax credit. Rajan and Zingales (1995) and Frank and Goyal (2004) discuss various definitions of leverage and argue that the most appropriate measure is the total debt to market value of assets.

3.2 The independent variables

The independent variables used in equation (1) are manager confidence, industry median leverage, market-to-book ratio, dividend dummy, firm collateral assets, firm profitability and firm size. We explain in this sub-section why they are considered determinants of capital structure and how they are measured.

[5] The technique corrects for both cross-sectional heteroskedasticity and contemporaneous correlation.

Manager confidence (*CONF*)

As mentioned previously, there is a growing body of evidence supporting confidence as a determinant of capital structure. We expect that leverage and confidence will be positively related. The more confident the manager is, the less likely they will expect the firm to go into bankruptcy and the greater they will use debt finance.

The biggest challenge for the analyses of confidence is to construct a plausible measure of confidence. Biased beliefs naturally defy direct and precise measurement (Malmendier and Tate 2005a). Malmendier and Tate (2005a and 2005b) adopt two methods to proxy manager confidence. The first is a 'revealed beliefs' argument by inferring manager beliefs about the future performance of the company from their personal portfolio transactions. The second approach captures how outsiders perceive the managers. They classify managers as overconfident based on their portrayal in the press. Such data for these two proxies is not readily available in the French market.

We proxy manager confidence by the results of sentiment surveys of industry representatives in four industry classifications (industrial, services, retail and construction). The surveys are conducted by the Economic and Financial Affairs Department of the European Commission. The European Commission distributes surveys to managers of a sample of firms in each of the four industry sectors each month. The surveys are sent to managers of a sample of firms and the managers are legally required to complete them. The results of all surveys and the process of collection and sample selection are publicly available from the European Commission website (http://ec.europe.eu). The surveys elicit responses on manager sentiment about firm production, inventory levels and sales for the next period. They represent the combination of manager sentiment about the firm, industry and the economy as a whole. We take the December figure as the relevant measure of manager confidence for that

year.[6] If managers are acting according to the psychological theory of manager bias then we expect the coefficient on the ***CONF*** variable to be positive. In other words, when managers are confident a significant positive relation with leverage is expected. We describe later how we isolate a more specific measure of manager confidence from this index.

Industry median leverage (*INDYMEDLEV*)

MacKay and Phillips (2005) show that industry factors are important to firm financial structures. Frank and Goyal (2004) find that the median industry leverage is a significant determinant of leverage. "It is either the top factor or the second factor when explaining leverage". These results suggest that firms in the same industry can have a similar optimal capital structure since they are exposed to the same constraints (investment, technology, etc). Therefore, we expect a positive correlation between the median industry leverage and firm leverage. The median industry leverage (***INDYMEDLEV***) is defined as the median of total debt divided by the total market value of assets for all firms in each industry each year.

Market-to-book (*MB*)

The market-to-book ratio has been used by previous research to measure growth opportunities (Adam and Goyal (2002) present a summary of this literature). When market equity prices are high relative to book prices, the market is signaling higher expected growth. Previous empirical studies in the capital structure literature document a negative relation between the market-to-book ratio and leverage ratio. This negative sign is predicted by most capital structure theories. Indeed, firms with high market-to-book ratio have higher costs of financial distress (Rajan and Zingales, 1995) and consequently are expected to have lower debt. This interpretation is consistent with the trade-off theory. Under the pecking-order

[6] We consider the significance of other ways to select the index in the section on robustness checks later in the paper.

theory, profitable firms have much retained earnings and therefore a smaller need for external finance and thus debt. According to the market timing hypothesis, if the market-to-book ratio is high, then issuing equity seems more attractive than issuing debt.

Given these arguments, we expect a negative relation between leverage and the market-to-book ratio. The market-to-book ratio (***MB***) is defined as the market value of assets divided by book value of assets. The market value of assets equals the book value of assets minus the book value of common stock plus market value of equity.

Dividend dummy (*DIVDUM*)

Predictions about how paying dividend affects leverage are unclear (for more details see Fama and French, 2002). The pecking order model permits interpretation in two contradictory ways. In one way, dividend paying firms may have high earnings relative to investment opportunities and consequently they can maintain less leverage- a negative relation between dividend paying firms and leverage. This prediction is confirmed by Fama and French (2002). In the other way, as interpreted by Shyam-Sunder and Myers (1999) and reported by Frank and Goyal (2004), the decision to pay dividend increases firms financing needs, all else equal. If firms are constrained to retain debt financing, the implication of paying dividend is to increase leverage- a positive relation between dividend paying firms and leverage.

Under the trade-off theory, predictions of the relation between leverage and payout decisions can be driven from considering either bankruptcy costs or agency costs of free cash flow. Indeed, firms paying dividend have normally more cash flows in comparison to investment opportunities and so they do not have to increase leverage and deadweight costs of debt. In the agency models of Jensen and Meckling (1976) and Easterbrook (1984), the managers do not necessarily act in the interest of shareholders and can waste the free cash

flow. Dividends and debt, by forcing managers to pay out free cash flow, can control the free cash flow problem. Since they are presented as substitutes for controlling the agency problem, we can predict that relation between dividends and leverage will be negative. The empirical study of Frank and Goyal (2004) show that dividend paying firms have lower leverage. The dividend variable (***DIVDUM***) is measured by a dividend paying dichotomous variable which takes a value of unity if the firm paid dividends in the corresponding year and zero otherwise.

Collateral assets (*COLLTRL*)

The asymmetric information theory explains that moral hazard and adverse selection problems can appear when banks or creditors have limited information on investment project returns. Collateral may be considered as a signal of the solvency capacity of the firm and it can diminish the moral hazard problem. Therefore, tangible assets are likely to have an impact on the borrowing decisions of firms. Empirical studies (for example Rajan and Zingales, 1995 and Frank and Goyal, 2004) show that the relation between collateral and leverage is significant and positive. Our proxy for the collateral value of the firm (***COLLTRL***) is the sum of inventory plus property, plant and equipment divided by total assets. We predict a positive relation between the level of collateral and leverage.

Firm profitability (*PRF*)

From a pecking-order perspective, for firms with large expected investments, it is likely that financing would be from internal sources and low risk debt (Myers, 1984). Indeed, to manage the risk of foregoing future investments because of a lack of financing resources, profitable firms will choose to have less current leverage. Frank and Goyal (2004) show that in the US, more profitable firms have less debt, supporting the pecking order theory. We measure firm profitability (***PRF***) as the operating income before depreciation to total assets.

We expect a negative relation between leverage and profitability, supporting the pecking-order theory of capital structure.

Firm size (*SIZE*)

The effect of firm size on leverage is ambiguous. Rajan and Zingales (1995) find that financial leverage increases with size. They justify this finding by the fact that size is an inverse proxy for the probability of bankruptcy. Bigger firms can diversify more easily and so the probability of being in financial difficulty is lower. Under the trade-off theory, such companies can increase the percentage of debt. In this case, a positive relationship between size and leverage is to be expected. On the other hand, size may proxy for the information available to outsiders. Under the pecking order theory, less information asymmetry implies preference for equity relative to debt, thus applying a negative correlation between size and leverage. Given those arguments, it is difficult to expect a clear sign of the relation between firm size and leverage. Our proxy for firm size (***SIZE***) is the natural logarithm of total assets.

4. Data

The sample consists of all French firms listed on the Compustat database with at least three years of data over the years 1995-2004. Financial companies (SIC 6000–6999) are excluded because they are subjected to legal regulations regarding capital structure. This approach 1,670 firm/year observations.[7] All the accounting and financial statement data are

[7] Fifteen observations had market-to-book values in excess of 7 with one being over 225. When these were removed the MB variable became significant. The significance of the other variables remained the same both in sign and size. As these observations only influenced the MB variable they were excluded as outliers. There are 303 different firms in the sample.

Ten observations had leverage values over 1. This implies these firms are bankrupt. These observations were initially removed, but no significant differences in the regression results were obtained, so results are reported with them included.

sourced from Compustat Global. Stock return data are sourced from Datastream. The confidence indices are sourced from the European Commission.

Table 1 presents summary statistics of the relevant variables. The average leverage of firms (***LEVERAGE***) in the sample is approximately 45%. This value represents an average in both time series and cross section.

The average value of industry sentiment (***CONF***) over the sample period for each industry is: -1.4 for industrial companies, 2.5 for service firms, -15 for retail firms and -12 for construction firms. The indices showed considerable variation from -53 to 30, which occurred in the construction industry with a possible maximum and minimum of each index is being + or – 100. We would expect average confidence levels over a sufficiently long period to be close to zero indicating that managers are on average neither over- or under- confident. Simple t-tests of differences from zero indicated only the average retail index was significantly different from zero.

The average industry median leverage (***INDYMEDLEV***) is 50% across the sample. The minimum of 8% and maximum of 85% indicates a wide range of annual industry median leverage ratios.

The average market-to-book ratio (***MB***) is 0.72. This implies that French firms are in general value firms over the sample period, trading at a discount to their book value.

The average proportion of collateral assets to total assets (***COLLTRL***) is 33%.

The average profitability of French firms (***PRF***) in the sample over the period is 11% per annum.

The average firm size (***SIZE***), measured as total assets is 584 million euro (exp(6.37)).

Table 2 reports correlations between variables and tests of significance. As shown in Table 2 the industry median leverage variable (***INDYMEDLEV***) and the size variable (**SIZE**)

are significantly correlated with most of the other variables. The confidence variable is significantly correlated with market-to-book and collateral. Analyses regarding multicollinearity are discussed under the section on robustness checks.

5. Industry sentiment and leverage

Table 3 presents the results of the estimation of equation (1). The pooled time-series cross-sectional regression has an adjusted R^2 of 40%.[8] The results identify all the independent variables as significantly related to firm leverage, except the dividend variable. We find strong evidence that industry sentiment (***CONF***) is significantly but negatively related to leverage. Firstly, this implies that industry sentiment is an important variable in explaining firm leverage after controlling for major traditional capital structure determinants. Secondly, the sign on this variable is negative implying that when industry sentiment increases leverage decreases. This is not consistent with other studies on manager confidence, neither on a theoretical level (Hackbarth 2004) or on an empirical level (Malmendier and Tate 2005). We posit later an explanation for this result.

The results for the control variables are similar to that reported using US data (Frank and Goyal, 2004; Hovakimian 2006; amongst others).

The coefficient estimate for the median industry leverage (***INDYMEDLEV***) has an expected positive sign and is highly significant. This result supports the hypothesis that firms in the same industry follow the same optimal capital structure.

[8] The method used for the estimation is the Seemingly Unrelated Regression method in Eviews Pooled Regression. It estimates a feasible GLS specification correcting for both cross-section heteroskedasticity and contemporaneous correlation. A common intercept was also selected. The result is robust to different specifications and estimation methods. Also, univariate regressions were conducted on each variable and the results are similar to those reported in the multivariate analyses in both sign and significance of the coefficients.

For the market-to-book variable (***MB***), the coefficient is negative and significant indicating that when market values are higher than book values, leverage is lower. This result supports the trade-off, market-timing and pecking order theories of capital structure.

The coefficient for dividend dummy (***DIVDUM***) is negative, as predicted, but not significant. This result provides little support for the hypothesis that paying dividend is a solution for the free cash flow problem and a substitute for leverage.

In accordance with our prediction, the collateral variable (***COLLTRL***) is positively and significantly correlated with leverage supporting the theory of signalling. The French firms with higher tangibility of assets have relatively lower information asymmetries and suffer less from moral hazard and adverse selection problems.

The results also show that profitable French firms use less debt with the variable for firm profitability (***PRF***) being negative and significant. In the pecking order world, this finding can be interpreted by the fact that these firms prefer not to use debt in order to have a higher borrowing power to finance future investments.

Firm size (***SIZE***) is positively and significantly related to leverage. This is consistent with the trade-off theory of capital structure.

In summary, the results are significant, particularly for the manager confidence coefficient. However, as mentioned earlier this is negative and not what was expected. A negative relation means that managers are not acting as manager psychological bias would predict.

5.1 The decomposition of industry sentiment

The measure of industry sentiment comprises at least three main components. The first one is the component associated with manager confidence or sentiment in the market as a whole. The second one is the component associated with manager confidence in the industry

in which the firm operates and the third one is the component associated with manager confidence of the firm in which he or she manages. We expect the manager psychological bias to be most evident in the third component, less evident in the second and least evident in the first. The reason for this is that if we could identify the component of manager confidence that is solely related to the firm then we would expect this measure to allow the strongest test of the psychological bias, as a direct link between manager confidence about the firm and leverage could be identified. Individuals are the most optimistic about outcomes in which they believe are under their control (Langer, 1975). Managers are more likely to be confident about specific firm issues where they are likely to have the strongest control. As mentioned previously, obtaining this measure of manager confidence is extremely difficult if not impossible. The next best measure of manager confidence is a measure associated with manager confidence from managers in the industry in which the firm operates. However, this measure will still comprise all three components of manager confidence. For example, a question requiring a response from a manager on expected future sales will incorporate the managers' sentiment about the economy, the industry and the firm. We propose a method which separates the industry sentiment measure into two components. The first component is associated with manager confidence in the market as a whole and the second component is manager confidence associated with the industry and the firm which they manage. We cannot isolate the second component into industry and firm specific components of manager confidence. However, research on herding behaviour in capital markets suggests that manager confidence may be more pervasive than solely at individual firm levels (Hirshleifer and Teoh 2003). To separate the economy and the industry and firm components of manager confidence, we consider the impact of a broad measure of market confidence.

The European Commission survey 3,300 French individuals regarding a range of issue on their sentiment and the survey results are used to construct an index of consumer

sentiment. This measure of sentiment represents a broad market view about the future. Qui and Welch (2004) document that similar measures of consumer sentiment provide a good estimate of investor confidence. Therefore, we posit that this measure of consumer sentiment is a reasonably proxy for investor confidence. We obtained the results of this survey over the period from 1995-2004 and selected the December value of the index for each year. Correlation between industry sentiment and investor confidence is 0.68. As expected, when we replace the measure of industry sentiment with the measure of investor confidence and re-estimate equation (1), similar results are found. That is, investor confidence is also significantly negatively related to leverage.

The impact of manager confidence is analyzed by constructing a two-stage model. The first model separates industry sentiment into two components: a common component and a unique component. The common component is the amount of manager confidence associated with a broad view of the market. The unique component is the amount of manager confidence that relates to the industry and firm in which the manager operates. We argue that managers' views of the market as a whole, the common component, are going to be reasonably proxied by levels of investor confidence in the market. The influence of the common component is represented by α_1 in equation (2). The residuals in equation (2) represent the unique component of manager confidence that is not explained by investor confidence. This is shown as follows:

$$CONF_{i,t} = \alpha_0 + \alpha_1 CONF_{i,t}^{INV} + CONF_{i,t}^{Unique} \qquad (2)$$

where $\boldsymbol{CONF_{i,t}}$ = industry sentiment for firm *i* at time *t*, which is the same as in equation (1).

$\boldsymbol{CONF_{i,t}^{INV}}$ = investor confidence for firm *i* at time *t*.

$\boldsymbol{CONF_{i,t}^{Unique}}$ = unique component of manager confidence for firm *i* at time *t*.

The second stage is to respecify equation (1) as follows:

$$LEVERAGE_{it} = \alpha_0 + \alpha_1 CONF^{INV}_{i,t-1} + \alpha_2 CONF^{Unique}_{i,t-1} + \alpha_3 INDYMEDLEV_{i,t-1} + \alpha_4 MB_{i,t-1} + \alpha_5 DIVDUM_{i,t-1} + \alpha_6 COLLTRL_{i,t-1} + \alpha_7 PRF_{i,t-1} + \alpha_8 SIZE_{i,t-1} + \varepsilon_{it} \quad (3)$$

The coefficient α_2 measures the impact of the unique components manager confidence, after controlling for the impact of the broader view of the market, represented by investor confidence. If manager confidence does have a positive effect on leverage as predicted by the manager bias then α_2 will be positive and significant. The results of equation (3) are shown in Table 4.

Table 4 shows that the unique component of manager confidence (***CONF*** ^{Unique}) enters equation (3) with a positive sign and is significant at the 5% level.[9] We therefore conclude that the component of manager confidence, which is not explained by a broader view of the market, has a significant positive impact on leverage as predicted. The impact of the managers views of the market as a whole dominates the relation, resulting in an overall negative relation with leverage. This domination may be due to the higher levels of blockholder control of firms in France, or the weaker business environment. These factors are likely to dampen the unique component of manager confidence, particularly the component relating specifically to manager confidence about the firm they have control over. Also, when investors are confident they are more likely to prefer equity. An example is the issuance of equity by rational managers when firms are overvalued due to investor confidence (Baker and Wurgler 2000, 2002). In France, the industry sentiment measure generally represents the views of managers who are likely to be blockholders. When French managers are confident about the firm (and the future generally) they are more likely to prefer equity investment rather than debt, as they are also blockholders in the firm. This broader confidence view dominates the industry

[9] Based on maximum historical annual changes in the consumer sentiment and industry sentiment indices over the sample period, the economic significance on leverage is approximately 25 million and 5 million Euros, respectively.

sentiment measure. We have isolated this out and shown that manager confidence is indeed positively related to leverage as psychology predicts.

6. Robustness checks

Table 2 shows significant correlations, particularly between the industry median leverage variable (***INDYMEDLEV***) and the size variable (***SIZE***) with most of the other variables. To assess the robustness of our results we re-estimate equations (1) and (3) omitting first the industry median leverage variable and then the size variable. When ***INDYMEDLEV*** is omitted from the regression, the results are similar to those reported in Tables 3 and 4. Specifically, in Table 4 the investor confidence variable ($\boldsymbol{CONF^{INV}}$) remains negative and significant and the unique component of manager confidence ($\boldsymbol{CONF^{Unique}}$) remains positive and significant. Also, removing firm size (***SIZE***) from the regression does not cause significant changes in the results.

In Table 2 a significant correlation is reported between market-to-book (***MB***) and industry sentiment (***CONF***). Correlation analysis with market-to-book (***MB***) and investor confidence ($\boldsymbol{CONF^{INV}}$) and the unique component of management confidence ($\boldsymbol{CONF^{Unique}}$) shows insignificant correlation. However, to confirm the robustness of our result we removed market-to-book (***MB***) variable from the model and re-estimated equation (1) and (3) and the result did not change in any significant way from that reported. Therefore, multicollinearity is not a problem.

To gauge the sensitivity of the choice of the December sentiment index we calculate a series as the average 12 monthly values for the year, rather than selecting the value of the index as of December each year. The results are again similar to those reported in Table 4.

Furthermore, results are replicated using OLS rather than pooled regression with consistent results. Overall, we conclude that the results are a good representation of the

relationships between leverage and the independent variables explaining approximately 40% of the variation in leverage.

7. Summary

The over-confidence bias in relation to investment decisions is well documented in psychology and behavioural finance literature. The less known is that over-confidence bias also relates to financing decisions. Managers that are over-confident of their firm's future are likely to prefer debt to equity financing. This may lead to increased probability of bankruptcy and higher costs of capital. In this paper, we consider the significance of manager confidence on capital structure for a sample of French firms. We decompose a publicly available measure of industry sentiment into two components: a component common with investor confidence and a component unique to manager confidence. We find that investor confidence is negatively related to leverage and that the unique component of manager confidence is positively related to leverage. This supports the manager confidence bias of their preference for debt. In the sample of French firms, the investor confidence component dominates manager confidence, resulting in an overall negative effect of industry sentiment with leverage. This may be due to higher levels of blockholder control and/or a weaker business environment in France relative to other countries.

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Table 1: Explanatory Variables – Summary Statistics

This table provides summary information for the dependent and independent variables used in the analyses. It provides the variable's definition, the source of data for the variable and the key summary statistics.

Variable	Variable description (Source)	N	Mean	Median	Std. Dev.	Min.	Max.
Leverage: ***LEVERAGE***	The sum of current liabilities plus long-term debt divided by the market value of assets. Compustat and Datastream	1670	0.45	0.42	0.30	0	1.15
Industry sentiment: ***CONF***	The value of the industry sentiment for the company in December of each year. This measure has a possible range between -100 and +100. European Commission	Code					
		1	-1.4	1.5	10	-17	11
		2	2.5	3.5	8	-12	14
		3	-15	-16	6	-24	-8
		4	-12	-11.5	27	-53	30
Median industry leverage: ***INDYMEDLEV***	The median of total debt divided by the market value of assets by SIC code and by year. Compustat and Datastream.	1670	0.50	0.58	0.23	0.08	0.85
Market-to–book ratio: ***MB***	The market-to-book ratio is defined as the market value of assets divided by book value of assets. The market value of assets equals the book value of assets minus the book value of equity plus market value of equity. Compustat and Datastream.	1670	0.72	0.47	0.75	0.04	6.78
Collateral: ***COLLTRL***	The sum of inventory plus property, plant and equipment divided by total assets. Compustat and Datastream.	1670	0.33	0.34	0.18	0.00	0.89
Firm profitability: ***PRF***	The operating income before depreciation divided by total assets. Compustat and Datastream.	1670	0.11	0.11	0.10	-0.95	0.59
Firm size: ***SIZE***	Natural logarithm of total assets. Compustat and Datastream.	1670	6.37	6.10	2.27	1.03	13.06

Code: 1= Industrial; 2= Service; 3= Retail; 4= Construction

Table 2: Pearson Correlation Coefficients

This table reports Pearson correlation coefficients for the independent variables used in the analyses and tests of their significance. ***CONF*** is the December value of the France industry sentiment survey results from the European Commission for each industry code. ***INDYMEDLEV*** is the median of total debt divided by the market value of assets by SIC code and by year for each firm. ***MB*** is equal to the market value of assets divided by book value of assets. The market value of assets equals the book value of assets minus the book value of common stock plus market value of equity. ***DIVDUM*** is a dummy variable which takes a value of unity if the firm had paid dividends in the corresponding year and zero otherwise. ***COLLTRL*** is the sum of inventory, property and equipment value divided by total assets. ***PRF*** is the operating income before depreciation divided by total assets. ***SIZE*** is the natural logarithm of total assets.

	CONF	***INDYMEDLEV***	***MB***	***DIVDUM***	***COLLTRL***	***PRF***
INDYMEDLEV	0.061					
MB	-0.095*	-0.480*				
DIVDUM	-0.012	0.121*	0.064*			
COLLTRL	-0.109*	0.391*	-0.264*	0.036		
PRF	0.052	0.155*	-0.016	0.042	0.197*	
SIZE	0.013	0.447*	-0.310*	0.137*	0.171*	0.057*

* significantly different from zero at the 1% level.

Table 3: Capital structure determinants

This table reports the results of the pooled cross-sectional time-series regression analysis (panel analysis) on a sample of 1,670 French firm years from 1995 to 2004:

$$\boldsymbol{LEVERAGE_{it}} = \alpha_0 + \alpha_1 \boldsymbol{CONF_{i,t-1}} + \alpha_2 \boldsymbol{INDYMEDLEV_{i,t-1}} + \alpha_3 \boldsymbol{MB_{i,t-1}} + \alpha_4 \boldsymbol{DIVDUM_{i,t-1}} + \alpha_5 \boldsymbol{COLLTRL_{i,t-1}} + \alpha_6 \boldsymbol{PRF_{i,t-1}} + \alpha_7 \boldsymbol{SIZE_{i,t-1}} + \varepsilon_{it}$$

The dependant variable, ***LEVERAGE***, is defined as the total debt divided by the market value of assets. ***CONF*** is the December value of the France industry sentiment survey results from the European Commission for each industry code. ***INDYMEDLEV*** is the median of total debt divided by the market value of assets by SIC code and by year for each firm. ***MB*** is equal to the market value of assets divided by book value of assets. The market value of assets equals the book value of assets minus the book value of common stock plus market value of equity. ***DIVDUM*** is a dummy variable which takes a value of one if the firms had paid dividend on the corresponding year and zero otherwise. ***COLLTRL*** is the sum of inventory, property and equipment value divided by total assets. ***PROFIT*** is the operating income before depreciation divided by total assets. ***SIZE*** is the natural logarithm of total assets.

The estimation method used is Seemingly Unrelated Regression in Eviews with a common intercept. This method estimates a feasible GLS specification correcting for both cross-section heteroskedasticity and contemporaneous correlation.

Variable	Coefficient	t-Statistic	Prob.
CONF	-0.0019	-3.4232	0.0006
INDYMEDLEV	0.3928	13.29134	0.0000
MB	-0.0222	-4.1328	0.0000
DIVDUM	-0.0366	-1.5843	0.1133
COLLTRL	0.4067	12.3213	0.0000
PRF	-0.5486	-9.8299	0.0000
SIZE	0.0244	8.8262	0.0000
C	0.0260	1.2574	0.2088
Adjusted R-squared	0.39		

Table 4: The impact of management confidence

This table reports the results of the pooled cross-sectional time-series regression analysis (panel analysis) on a sample of 1,670 French firm years from 1995 to 2004:

$$LEVERAGE_{it} = \alpha_0 + \alpha_1 CONF_{i,t-1}^{INV} + \alpha_2 CONF_{i,t-1}^{Unique} + \alpha_3 INDYMEDLEV_{i,t-1} + \alpha_4 MB_{i,t-1} + \alpha_5 DIVDUM_{i,t-1} + \alpha_6 COLLTRL_{l,t-1} + \alpha_7 PRF_{i,t-1} + \alpha_8 SIZE_{i,t-1} + \varepsilon_{it}$$

The dependant variable, ***LEVERAGE***, is defined as the total debt divided by the market value of assets. The $CONF^{INV}$ is the December value of the consumer sentiment survey results from the European Commission. $CONF^{Unique}$ is estimated from the following regression:

$$CONF_{i,t} = \alpha_0 + \alpha_1 CONF_{i,t}^{CONS} + CONF_{i,t}^{Unique}$$

where ***CONF*** is the December value of the French industry sentiment survey results from the European Commission for each industry code. ***INDYMEDLEV*** is the median of total debt divided by the market value of assets by SIC code and by year for each firm. ***MB*** is equal to the market value of assets divided by book value of assets. The market value of assets equals the book value of assets minus the book value of common stock plus market value of equity. ***DIVDUM*** is a dummy variable which takes a value of unity if the firm had paid dividend in the corresponding year and zero otherwise. ***COLLTRL*** is the sum of inventory, property and equipment value divided by total assets. ***PROFIT*** is the operating income before depreciation divided by total assets. ***SIZE*** is the natural logarithm of total assets.

The method used is Seemingly Unrelated Regression in Eviews with a common intercept. This method estimates a feasible GLS specification correcting for both cross-section heteroskedasticity and contemporaneous correlation.

Variable	Coefficient	t-Statistic	Prob.
$CONF^{INV}$	-0.0049	-8.3518	0.0000
$CONF^{Unique}$	**0.0016**	**2.2462**	**0.0248**
INDYMEDLEV	0.3965	13.7477	0.0000
MB	-0.0200	-3.8402	0.0001
DIVDUM	-0.0393	-1.7094	0.0876
COLLTRL	0.4269	13.0547	0.0000
PRF	-0.5512	-10.0161	0.0000
SIZE	0.0254	9.2890	0.0000
C	-0.0512	-2.2937	0.0219
Adjusted R-squared	0.39		