

INVESTOR-MANAGER HETEROGENEOUS BELIEFS AND CORPORATE FINANCING DECISION

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Abstract: This paper considers a firm that may issue common stock or debt to undertake an investment opportunity when the investors and the manager have different estimates of the expected return from the investment. Firstly, an equilibrium model is developed to reveal the impact of investor-manager heterogeneous beliefs on corporate financing decision, and the model concludes that the greater the investors' belief relative to the manager, the more likely the firm is to choose to issue equity rather than debt. Secondly, using a sample of debt and seasoned equity issues from Chinese listed firms we empirically analyze the conclusion above. We find empirical results support for the conclusion.

1 INTRODUCTION

Modigliani and Miller (1958) posited that in an ideal world the value of a firm depends only on its profitability, not on the debt-equity mix, so that the choice between debt and equity is irrelevant. This issue initiated a flood of work analyzing this choice in a world of imperfect and incomplete capital markets. Jensen and Meckling (1976) has concentrated on agency costs as a determinant of corporate financing choice, and argued that the firm should issue debt in order to avoid the incentive dilution. Ross (1977) argued that the firm will not issue 100% with debt because of high bankruptcy costs, and the optimal amount of debt-equity finance occurs when the costs associated with incentive dilution are equal to the costs associated with increased risk. Myers and Majluf (1984) analyzed the financing decision by firms according to the "pecking order" hypothesis because of issues relating to control and disclosure. A key assumption of the above modern corporate financing decision is homothetic expectation. The investor and manager are assumed to have identical estimates of the expected return from the investment.

However, Miller (1977) argued that it is implausible to assume identical estimate although the future is very uncertain and that men may differ in their forecasts what Miller called divergence of opinion or heterogeneous belief.

After Miller (1977), the heterogeneous belief is

explored by many scholars. Kreps (1990) argues that heterogeneous priors are a more general specification than homogeneous priors. Kurz (1994) provides the foundations for heterogeneous but rational priors. Harris and Raviv (1993) use differences of opinion to explain empirical regularities about the relation between stock price and volume. Kandel and Pearson (1995) make the case that their evidence of trading volume around public information announcements can be best understood within a framework in which agents interpret the same information differently. Barberis and Thaler (2002) note that a key ingredient of behavioral models that provide explanations for asset pricing anomalies is disagreement among market participants. Garmaise (2001) examines the implications of heterogeneous beliefs for security design. Coval and Thakor (2005) show that heterogeneous priors can give rise to financial intermediation.

But the heterogeneous belief is considered less in corporate financing decision. Allen and Gale (1999) examine how heterogeneous priors affect new firm financing. Boot, Gopalan and Thakor (2006) use heterogeneous priors to develop a theory of "managerial autonomy" that characterizes the allocation of control rights among financiers and its capital structure implications. Dittmar and Thakor (2007) predicts that managers use equity to finance projects when they believe that investors' views about project payoffs are likely to be aligned with theirs.

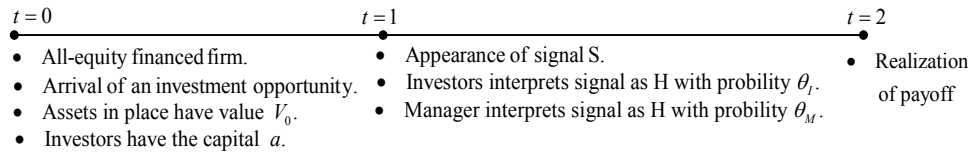


Figure 1: Sequence of events.

This paper develops a model and presents a new prediction to reveal the impact of investor-manager heterogeneous beliefs on corporate financing decision, and tests the prediction using the data in Chinese financial market. The rest of the paper is organized as follow: Section 2 develops the model and puts forwards a testable hypothesis. Section 3 describes sample selection procedure, and Section 4 discusses the empirical result. Section 5 concludes.

2 MODEL AND PREDICTION

2.1 Events and Time Line of Corporate Financing decision

A model is developed briefly and the prediction is presented in this section. There are three points in time. The investors and the manager are risk-neutral, the financial market is perfectly competitive, and the risk-less rate and the debt rate are all zero. All investors are assumed to have identical estimate of the expected return from the investment. But the manager and the investors have different estimate. There are no transaction cost, asymmetry information and tax.

At $t = 0$, the firm is all-equity financed and has an expected value of V_0 . A new investment opportunity arrives with the required investment amount of a . The payoff of the investment is a random amount of $Z \in \{H, L\}$, where $L < 0 < H$ and H means high payoff and L means low payoff. The investors have the capital value of a .

At $t = 1$, A public signal S about the investment arrives. The manager will interpret the signal as H payoff with probability θ_M and the investors with θ_I . The manager decides to issue equity, debt or desert the investment. If equity is chosen then a fraction λ ($0 < \lambda < 1$) of the firm will be sold, so the initial shareholders will have a claim to a fraction $1 - \lambda$ of the terminal payoff. If debt is chosen then repayment will have to be made at

$t = 2$. If the manager deserts the investment then the initial shareholders and the investors have zero payoff.

At $t = 2$ the payoff from the investment is realized and the initial shareholders and the investors get their own payoff.

2.2 The Predicted and Real Payoff of the Manager and the Investors

If equity is issued then the manager predict that the initial shareholder's equity value is $V_M^E = (1 - \lambda)(V_0 + a + \theta_M \cdot H + (1 - \theta_M) \cdot L)$ and the investors predict that their equity value is $V_I^E = \lambda(V_0 + a + \theta_I \cdot H + (1 - \theta_I) \cdot L)$. If debt is issued then the manager predict that the initial shareholder's equity value is $V_M^D = V_0 + \theta_M \cdot H + (1 - \theta_M) \cdot L$ and the investors predict that their debt value is a . If the manager deserts the investment then the initial shareholder's equity value is V_0 and the investors' capital value is a . The above results can be listed in Table 1, where $E_M \equiv \theta_M \cdot H + (1 - \theta_M) \cdot L$, $E_I \equiv \theta_I \cdot H + (1 - \theta_I) \cdot L$ for simplicity.

Table 1: Predicted value of shareholder and investors.

Issue tape	shareholder	investors
Desert	V_0	a
Equity	$(1 - \lambda)(V_0 + a + E_M)$	$\lambda(V_0 + a + E_I)$
Debt	$V_0 + E_M$	a

2.3 Corporate Financing Decision under Heterogeneous Beliefs

When the following conditions are met the manager will issue equity.

$$\begin{cases} (1 - \lambda)(V_0 + a + E_M) > V_0 + E_M & (1) \\ (1 - \lambda)(V_0 + a + E_M) > V_0 & (2) \\ \lambda(V_0 + a + E_I) > a & (3) \end{cases}$$

That is

$$\theta_I > \theta_M > -\frac{L}{H-L} \tag{4}$$

Or

$$\begin{aligned} \theta_I &> \frac{V_0 a}{(H-L)^2 \theta_M + (H-L)(a+L)} - \frac{V_0}{H-L} - \frac{L}{H-L} \\ &> -\frac{L}{H-L} > \theta_M, \end{aligned} \tag{5}$$

When the following conditions are met the manager will issue debt.

$$V_0 + \theta_M \cdot H + (1 - \theta_M) \cdot L > V_0, \text{ and}$$

$$\begin{cases} (1 - \lambda)(V_0 + a + E_M) > V_0 + E_M \\ \lambda(V_0 + a + E_I) > a \end{cases}$$

have no solution. That is

$$\theta_M > -\frac{L}{H-L}, \theta_M > \theta_I. \tag{6}$$

When the following conditions are met the manager will desert the investment.

$$V_0 + \theta_M \cdot H + (1 - \theta_M) \cdot L < V_0, \text{ and}$$

$$\begin{cases} (1 - \lambda)(V_0 + a + E_M) > V_0 \\ \lambda(V_0 + a + E_I) > a \end{cases}$$

have no solution. That is $\theta_M < -\frac{L}{H-L}$,

$$\theta_I < \frac{V_0 a}{(H-L)^2 \theta_M + (H-L)(a+L)} - \frac{V_0}{H-L} - \frac{L}{H-L} \tag{7}$$

The above results can be expressed as Figure 2, Where district ① means equity issue, district ② means debt issue and district ③ means the manager will desert investment.

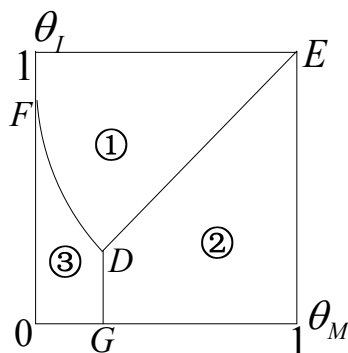


Figure 2: Corporate financing decisions.

2.4 Testable Prediction

From the conditions (4)(5), we know that only the investor’s predicted value is high enough can the manager choose to issue equity. The condition (6) shows that when the manager’s predicted value is high enough the firm will issue debt. The condition (7) shows that when the manager’s and the investor’s predicted values are all low the firm will desert the investment. So we have the following prediction:

Prediction: The higher the difference between the investor’s and the manager’s predicted value, the more likely a firm tends to issue equity.

3 EMPIRICAL METHOD

3.1 Sample Selection and Source of Data Description of Variable

We use a sample of firms that issue seasoned equity or nonconvertible debt from Chinese A-share firms listed in Shanghai and Shenzhen Stock Exchanges between 2005 and 2010. This is because of the absence of analysis earnings forecasts data and few firms issue debt before 2005. All security issuance data are from the Wind database. If a firm has multiple issuances in a calendar year, we use only the first issuance. We further delete the issues by the following firms: (1) firms by ST, PT; (2) firms that asset-liability ratio beyond 100%; (3) financial firms. (4) firms with Chinese B-share, Honking-share. This produces a sample of 443 seasoned equity issuers and 431 nonconvertible debt issuers.

3.2 Description of Variable

(1) Dependent Variable (*TAPE*)

We use the discrete dependent variable *TAPE* to describe manager’s issuance decision and assume that *TAPE* equals 1 for an equity issuance and equals 0 for a debt issuance.

(2) Independent Variable (*IMHB*)

Following Lin, Hu and Chen(2005), Yu, Xia and Zou(2006), we use the difference between the analysts earnings forecasts and the announced earnings by the firm at the fiscal year of the issue to proxy the degree of heterogeneous beliefs between the manager and investors.

(3) Control Variable

The other independent variables are described in

table 2. All control variables are measured at the end of the year prior to the issue.

Table 2: This caption has one line so it is centered.

Variable name	Variable definition
<i>LnTA</i>	log of total asserts
<i>ExTS</i>	exchange-traded shares to total shares
<i>RNA</i>	return to net assets
<i>InTS</i>	institutional shares to total shares
<i>TaTA</i>	tangible assets to total asserts
<i>DAMI</i>	debt to assets minus the median

3.3 Methodology

We use Probit regression to test the theoretical prediction due to the dummy independent variable. The regression can be expressed as the following equation (8), where individual firms are index *i* and year *t*, and *F*(·) is the cumulative distribution function of a standard normal variable. All the data are disposed using the soft of eviews6.0 and excel2003.

$$P_r(TAPE_{i,t} = 1) = F \left(\begin{matrix} \beta_1 \cdot IMHB_{i,t} + \beta_2 \cdot LnTA_{i,t-1} + \beta_3 \cdot ExTS_{i,t-1} + \beta_4 \cdot RNA_{i,t-1} \\ + \beta_5 \cdot InTS_{i,t-1} + \beta_6 \cdot TaTA_{i,t-1} + \beta_7 \cdot DAMI_{i,t-1} + C \end{matrix} \right) \quad (8)$$

Table 3: Probit regressions of the heterogeneous beliefs' impact on corporate financing decision.

	eq01	eq02	eq03	eq04	eq05	eq06
<i>C</i>	5.648*** (7.252)	5.698*** (6.547)	5.787*** (6.448)	5.294*** (5.759)	5.648*** (5.239)	5.661*** (5.651)
<i>IMHB</i>	2.220*** (2.633)	2.205** (2.542)	2.171** (2.475)	2.327*** (2.599)	2.328*** (2.592)	2.328*** (2.589)
<i>LnTA</i>	-0.440*** (-7.313)	-0.473*** (-7.270)	-0.498*** (-7.374)	-0.459*** (-6.605)	-0.477*** (-6.360)	-0.486*** (-6.453)
<i>ExTS</i>		0.815** (2.343)	1.003*** (2.720)	1.198*** (3.131)	1.148*** (2.937)	1.128*** (2.897)
<i>RNA</i>			1.139* (1.647)	1.747** (2.099)	1.707** (2.041)	1.666** (1.993)
<i>InTS</i>				-0.633* (-1.933)	-0.620* (-1.887)	-0.594* (-1.794)
<i>TaTA</i>					-0.291 (-0.638)	
<i>DAMI</i>						0.467 (0.953)
<i>McF R²</i>	0.120	0.143	0.155	0.158	0.159	0.160
<i>LR</i>	71.6***	84.3***	89.9***	90.7***	91.1***	91.6***
<i>Obs.</i>	430	425	419	413	413	413

Note: *, **, *** indicate significance at 10%, 5%, 1%, respectively.

4 EMPIRICAL RESULT

Table 3 presents a series of Probit regression results employing independent variables, such as heterogeneous beliefs between the manager and investors, log of total asserts, ratio of exchange-traded shares to total shares, ratio of return to net assets, ratio of institutional shares to total shares, ratio of tangible assets to total asserts and the ratio of debt to assets minus the median in its industry, which may have impact on financing decision in prior literature.

In terms of coefficient and significance of variable, the coefficient of key variable *IMHB* is positive and significant at 1% or 5% level in all equations, which indicate that the higher the heterogeneity of beliefs between the investors and the manager, the more likely a firm is to issue equity. The result empirically supports our prediction and is consistent with Dittmar and Thakor(2007) empirical result in American financial market. Additionally, conclusions about control variables are consistent with prior studies. We also

observe that $McFR^2$ is increasing in the number of variables, reaching its peak of 0.160, which supports that every control variable has incremental explanatory power over corporate financing decision.

5 CONCLUSIONS

We present a model to investigate the relation between corporate financing decision and the heterogeneity of beliefs between the investors and the manager. The model generates a new prediction and we test it. Firstly, different values of the initial shareholder and investors under the issues of equity, debt and no financing are analyzed. Secondly, the conditions on the issue of equity, debt and no financing are confirmed respectively. Thirdly, the prediction is presented based on the above two conclusions. In the end, we empirically analyze the impact of heterogeneity beliefs on security issuance decision using a sample of issues from Chinese financial market, and we find that heterogeneity beliefs have explanatory power to security issuance decision.

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