

Chapter 2

Theory of Capital Structure and Literature Review

2.1 The MM Theory

Ever since Modigliani and Miller (MM, 1963) published their paper indicating that capital structure is irrelevant, the optimal balance between debt and equity has been a major and interesting issue in academic studies. Basically, the MM theory states that if the capital structure decision has no effect on the total cash flows that a firm can distribute to its debt and equity holders, the decision also will have no effect on the total value of the firm's debt and equity.

The prerequisite of the MM theory is the absence of taxes and other market frictions such as transaction costs and bankruptcy costs. Of course in reality, the frictionless markets do not exist as the survey finding of Beattie, Goodacre, and Thomson (2006) shows that managers of firms do not believe the market to be efficient. In the following, we consider the static tradeoff theory and the pecking order theory, two competing models of financing decisions that are often discussed in finance literatures.

2.2 The Static Tradeoff Theory

Firms must create value by good use of the asset side of their balance sheets. Since interest payments are tax deductible, firms can actually create value on the liability side. Departure from all-equity financing is the advantage that debt is a less expensive form of financing than equity.

The key insight is that interest payments are tax deductible because the firm can benefit from tax deduction of debt and probably avoid falling into financial distress.

Therefore, a firm's managers would be pleased with the decision to take on a large amount of debt if the firm did very well in a competitive market. On the other hand, managers of a being highly leveraged firm would regret to have high debt ratio when the firm's business was disappointing because they are unable to benefit from the tax deduction of debt and have to face with a potential huge amount of financial distress costs of debt.

The trade-off theory states that firms have optimal debt equity ratios, which they determine by trading off the benefits of debt with the costs. The tax deductibility of interest payments induces firms to use debt financing up to the margin where the present value of interest tax shield is just offset by the value loss due to agency costs of debt and the possibility of financial distress (Myers 1993). Simply speaking, in the tradeoff theory borrowing could generate tax shield and too much debt can make costly trouble.

In practice, the optimized capital structure is hardly to remain unchanged as time goes on. At any given point in time, a firm may deviate from its long-term optimal or target debt ratio as the theory suggests. If the deviation occurs, managers then try to set it back to the optimal level as a result of a dynamic process depending on the cost of debt, growth opportunity in markets, introduction of new technology, and other factors.

2.3 The Theory of Pecking Order

The pecking order theory of capital structure reasons as follows:

1. Firms prefer to finance investments with internal sources, i.e. retaining earnings, rather than external financing sources.
2. Because of their preference to use retaining earnings for future investment,

firms adapt their dividends policies to reflect their future investment needs

3. If firms do require external financing, they will issue the safest security first – i.e., they will choose debt before equity financing.
4. Retained earnings may be more or less than a firm's investment needs. If external financing is required, firms will work down the pecking order of securities, from safe to risky debt. They begin with straight debt such as bank loans, next issue convertible bonds, and finally issue equity as a last resort.

There is no long-term optimal or well-defined target debt ratio in the pecking order theory. Debt ratio is a function of time when an imbalance occurs because of its dividend policy, fluctuation in cash flows and future investment requirements, due to external competitive business environments.

This theory gives an explanation for the negative correlation between profitability and leverage. Highly profitable firms with good investment opportunities tend to do debt financing in the capital market when retained earnings are less than its investment needs. Hence, debt ratio increases. When investment opportunities are limited, highly profitable firms' retained earnings are more than its investment needs. Given the dividend policy, the excess retained earnings may be used to pay off debts resulting in a lower debt ratio. Less profitable firms or firms in a loss end up borrowing more for new investment and drive the debt ratio up.

Equity is considered as an expensive form of financing. For firms having financial difficulties to invest in new projects, they are reluctant to issue equity. Since these firms are less likely to be able to borrow from banks or other financial institutions, the reluctance of issuing equity appears to be the greatest when these firms need the equity funds the most.

In the pecking order theory, there is no well-defined optimal target debt ratio. The capital structure is a result of the combination of investment decision, financing decision, dividend policy, and market competition.

2.4 Literature review

Through an extensive study of manufacturing corporations in the U.S. and Japan for capital structure, Kester (1986) finds that return on assets is the most significant explanatory variable for actual debt ratios. Other studies (Baskin, 1989, Titman and Wessels, 1988) that provide evidence against the tradeoff theory and in support of the pecking order theory are the significant negative correlation between profitability and debt. As explained in Section 2.3, the more profitable firms borrow less, and the less profitable firms borrow more.

Titman and Wessels (1988) presented a study of the attributes of capital structure that may affect the firm's debt-equity choice. These attributes are denoted asset structure, non-debt tax shields, growth, uniqueness, industry classification, size, earnings volatility, and profitability. The variables discussed were analyzed over 1974 through 1982 from a total sample of 469 firms. They find that firms with unique or specialized products have relatively low debt ratios. They also find that smaller firms tend to use significantly more short-term debt than larger firms and that some support for the proposition, i.e., pecking order, that profitable firms have relatively less debt relative to the market value of their equity. However, there is no evidence to support theoretical work that predicts that debt ratios are related to a firm's expected growth, non-debt tax shields, and earning volatility.

Liu (1999) used data from 1992 to 1997 for companies listed on two Chinese National Stock Exchanges. He finds that debt ratio is positively related to firm size,

proportion of tangible assets and growth rate of assets, and is negatively related to profitability. Overall, viewing China as a developing country, his results suggest that factors affecting debt ratio for firms under study in China are similar to those in developed countries.

Yang, Liao, and Huang (楊淑媛,廖四郎,黃瑞靜,2000), by using a complicated mathematical EBIT-based optimal dynamic capital structure model, analyzed the optimal dynamic capital structures of traditional and high-tech industries in Taiwan. The simulation results indicate that the leverage ratio of traditional industry is higher than that of high-tech industry, while the relation between firm size and leverage ratios appears to be U-shaped, rather than a positive linear relationship. Their results seem to support the tradeoff theory. For instance, after the Asian financial crisis, the debt ratios of the food, textile, plastics, and steel industries in Taiwan tend to shift to their simulated optimal debt ratio. Their simulation results are roughly in consistence with the conclusion of Long and Malitz (1985), and Kester (1986).

Graham and Harvey (2001) surveyed 392 CFOs in the U.S. about the cost of capital, capital budgeting, and capital structure. They find that executives weigh significantly on practical, informal rules when choosing capital structure. The most important factors affecting debt policy are financial flexibility and a good credit rating. In sum, the importance of financial flexibility and equity undervaluation to security issuance decisions is generally consistent with the pecking-order model of financing hierarchy. They also ask directly whether firms have an optimal or target debt ratio and find moderate support that firms follow the tradeoff theory and target their debt ratio. Nineteen percent of the firms do not have a target debt ratio or target range. Another 37% have a flexible target, and 34% have a somewhat tight target or range. The

remaining 10% have a strict target debt ratio. However, achieving that target is not of prime importance. In terms of firm size, a majority of large firms have a tight or somewhat tight target debt ratio, in contrast to only one-third of small firms. These overall numbers provide mixed support for the notion that companies trade off costs and benefits to derive an optimal debt ratio. In their study of rebalancing of capital structure, Leary and Roberts (2006) show that their results are also consistent with the survey evidence of Graham and Harvey in support of the tradeoff theory.

Fama and French (2002), in their study of testing tradeoff and pecking order predictions about dividends and debt, collected annual samples that cover the 1959 to 1999 period and on average include more than 3000 firms. They find that, as predicted by the tradeoff model, leverage is mean-reverting. It appears for firms to take a long time to return their debt ratios to its long-run mean. Their results of debt ratios adjusting slowly toward long-run mean, or target, is roughly consistent with survey results of Graham and Harvey (2001). Leary and Roberts (2006) also find that mean-reversion in leverage that the rate at which leverage reverts to its target is often characterized as slow. Fama and French also confirm that more profitable firms are less levered, a result consistent with the pecking order theory but contradicting the static tradeoff theory.

Based on an informal analysis of twenty papers across several countries, Thomson (2003) identifies a number of major features of firms that seem to have influenced the debt ratios across a wide range of environments and through time. He finds that debt ratio is positively related to size, earnings variability, and asset tangibility, but is negatively related to profitability, investment opportunity set and industry.

Beattie, Goodacre, and Thomson (2006), in their reports on a comprehensive survey of corporate financing decision-making in UK listed companies, find that certain

arguments are strongly refuted. Perhaps surprisingly respondents do not agree that interest tax shields are formally balanced with bankruptcy costs, one of the fundamental features of the trade-off theory. Overall, about half of the firms seek to maintain a target debt level, consistent with trade-off theory, but 60% claim to follow a financing hierarchy, consistent with pecking order theory. These two theories are not viewed by respondents as either mutually exclusive or exhaustive.

