Exploratory Note 21

Modigliani and Miller – Trade-Off Theory

**INTRODUCTION**

Precise funding sources aside, does capital structure—a firm’s mix of equity and debt—actually matter? If so, is there an optimal capital structure which will maximize shareholder value? Questions like these have interested both academicians and practitioners for quite a long time: Modigliani and Miller (1958), for instance, set the groundwork for a simple but powerful debt tradeoff theory (which was a major contributing factor to Modigliani’s 1985 and Miller’s 1990 Nobel Prize awards) while Myers and Majluf (1984) present an alternative, asymmetric information-based theory. After a brief introduction to capital structure and the cost of capital, this first exploratory note of the evening presents some of the ideas of Modigliani and Miller.

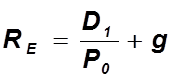
**CAPITAL STRUCTURE (AND COST)**

To understand Modigliani and Miller, we need to think about a few basic questions regarding the capital structure of a firm. First, what exactly is capital structure?

***The Cost of Capital - Equity***

Now, debt and equity differ in terms of cost. Which is cheaper? Why?

The cost of equity is notoriously difficult to calculate; however, the Gordon Growth Model (GGM) and the Capital Asset Pricing Model (CAPM) provide reasonable models. Starting with the GGM:



What do the different variables stand for in the GGM?

What is the primary intuition behind the GGM?

Any major issues with the GGM?

In a prior exploratory note, we discussed the CAPM—though, admittedly, in a different context (we were using it as a baseline model to test the ability of VC fund managers to generate alpha). It can also be utilized to estimate the cost of equity:



What do the different variables stand for in the CAPM?

What is the primary intuition behind the CAPM?

Any major issues with the CAPM?

***The Cost of Capital - Debt***

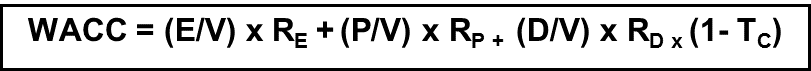
Clearly, the cost of equity is tricky, but things are a lot simpler when it comes to the cost of debt: either the after-tax yield to maturity (YTM) on existing debt is computed or estimates of current rates are utilized.

What is the YTM of a debt instrument?

Why after-tax? What role does taxation play in the conversation?

***The Weighted Average Cost of Capital***

This brings us to the weighted average cost of capital (WACC):



What are the different variables?

**MODIGLIANI AND MILLER – TRADE-OFF THEORY**

If there is an optimal capital structure, it would be logical that it should minimize the cost of capital. In 1958, Franco Modigliani and Merton Miller set the groundwork for a powerful debt tradeoff theory which does just this. Consider the figure on the following page:

[HANDBOOK OF FINANCING GROWTH 4.1]

The intuition behind the model is simple: there is value to the tax shelter offered by every dollar of debt, but debt also increases the likelihood of financial distress and/or bankruptcy. The optimal capital structure, therefore, is to be found when the marginal cost of adding another dollar of debt (due to increased likelihood of financial distress and/or bankruptcy) is greater than the marginal benefit of adding another dollar of debt (per the tax shield). Make sense?

So, if a firm is perceived to be underleveraged, what should be done? Why?

**CONCLUSIONS**

To a significant extent, this exploratory note is insufficient in its coverage of Modigliani and Miller; however, due to time constraints and asymmetry in student backgrounds, the mathematical foundations of the theorem need to be omitted. Even so, the general takeaway for entrepreneurs should be obvious: (the right amount of) debt is a good thing.