
Homework Assignment I

(To be collected prior to the distribution of the midterm examination paper)

1. The FGM Corporation has 800M shares of its common stock outstanding, which is priced at \$12 per share. The stock beta is estimated at 1.5. In addition, the Corporation's 8%, \$40B par, 15-year, B-rated semiannual coupon paying bonds are priced at a discount of 10% from its par. In addition, The FGM Corporation also finances its operation with 100M shares of its preferred stock, which pays annual DPS of \$4 and is currently priced at \$50 per share. Currently, the yield on short term Treasury securities is 2%, and the market risk premium is 9.5%. Assume that the tax rate is 34%.

- (i) **Compute** the weighted average cost of capital (WACC) of The FGM Corporation.
- (ii) Say, the flotation costs for issuing new debt, preferred stock, and common stock capital are, respectively, 3%, 8%, and 15%. Without the adjustment for flotation costs, the NPV of The FGM Corporation's \$120M project is estimated to be \$8M. **Compute** the weighted average flotation cost, **and** the NPV of this project after taking into account of the flotation costs.

Note: This problem is based on the review topics, and is similar to the problem (#24 of Chapter 13) that we worked through in details in our 1/7/ lecture. Since this problem is intended to give you the second chance to review the related topics that you learned in FIN 531 or its equivalent, the answers are not provided.

2. XYZ, Inc. plans to expand its manufacturing facilities and start producing a new type of artificial stone for outdoor patios. XYZ has a debt-to-equity ratio of 0.4 and a pre-tax cost of debt of 8%. ABC, the sole firm producing this product now, has a pre-tax cost of debt of 7.5%, a debt-to-value ratio of 0.2, and an equity beta of 1.4. Both firms have a 35% tax rate. The risk-free rate of return is 4.5% and the market rate of return is 12%.

- (i) **Compute** ABC's cost of equity capital. **<0.150>**
- (ii) **Compute** the unlevered cost of capital for a firm producing artificial stones. **<0.1395>**
- (iii) **Compute** XYZ's cost of equity capital. **<0.155>**
- (iv) **Compute** XYZ's weighted average cost of capital. **<0.1256>**

3. Frypan Inc. forecasts sales of \$550,000 per year in the foreseeable future for a manufacturing project. Costs for this project are expected to be \$420,000 per year. The initial investment is estimated to be \$500,000. The firm has a corporate tax rate of 35%. The cost of unlevered equity for the firm is 13%. The cost of (perpetual) debt for Frypan Inc. is currently 10%. The target capital structure for Frypan Inc. is 30% (perpetual) debt and 70% common equity.

- (i) Use the FTE approach to **compute** the NPV of this project. **<\$226,257>**
(Hint: Use the levered firm's valuation (with taxes) equation to determine the dollar amount of debt! If you still don't know/remember the calculation, then use an assumed amount of \$160,000 in your calculation!)
- (ii) Use the WACC approach to **compute** the NPV of this project. **<\$226,258>**

4. Worldwide Trousers, Inc. is considering a \$5 million expansion of their existing business. The initial investment will be depreciated straight-line over 5 years to zero salvage value. Consider the depreciation tax shield to be as risky as the project. The project will generate pretax earnings of \$1,400,000 per year, and will not change the risk level of the firm. The firm can obtain a 5-year \$2,000,000 subsidized loan at 8% to partially finance the project, and there is a 2% flotation cost associated with this subsidized loan. The estimated bankruptcy cost of this loan is \$200,000. If the project were financed with all equity, the cost of capital would be 17%. The corporate tax rate is 34%, and the risk-free rate is 4%. The market is pricing loans of comparable risk at 12%. **Compute** the adjusted present value (APV) of this 5-year project! **<APV= -\$692,468>**
<Ref: NPV(U)=\$-956,026; Loan=\$2,040,816; PV(interest tax shield)=\$494,369; PV(NET flotation costs)=\$30,811;>
5. An all-equity firm and a levered firm, which are otherwise identical, both have an expected perpetual annual EBIT of \$250,000. The unlevered firm's cost of capital is 12%. The levered firm has \$1.25M of debt in its capital structure. The cost of debt is 8% and the tax rate is 34%.
- Compute the value of the unlevered firm, the value of the levered firm, and the value of equity of the levered firm, respectively.** **<\$1.3M; \$1.8M; \$550K>**
 - Assume that the marginal personal tax rates for debt and equity income are 40% and 20%, respectively. **Compute the gain from leverage** in this situation. **<\$150K>**
 - Assume that there are **NO** corporate and personal taxes. Suppose that the unlevered firm and the levered firm are selling at, respectively, \$2M and \$2.2M. **Show numerically** how you would execute an arbitrage strategy, with the help of "homemade leverage", to reap the arbitrage opportunity *without changing your risk and cash flow positions*. Make sure you show that your positions, both before and after the transaction, have the same cash flow (or income), assuming that you initially own the equity of the firm that is overvalued. **<Ref: Arbitrage profit = \$200K; Cash flow = 150K>**
- Note: By nature, this is a conceptual question with an emphasis on the topics of "capital structure arbitrage" and "homemade leverage/unleverage". Hence, you are required to show that your arbitrage portfolio satisfies the two conditions for a successful capital structure arbitrage!!!**

NOTE: This homework assignment is composed of a **SAMPLE** of past examination problems that are pertaining to the midterm examination. Since this is just a sample, the actual midterm examination may include other numerical problems (such as those from Chapters 15, 17, 19, and other topics covered in Chapters 16 & 18) that are not included in this homework assignment such as those similar to the **suggested end of chapter problems** posted. As such, while you will find this homework assignment a valuable tool for your preparation for the midterm examination, it is by not mean inclusive of all topics that are covered by the midterm examination!

The answers to the problems are given for your reference. Due to the degree of similarity between these homework problems and the actual examination problems, detailed solutions will **NOT** be posted. Please note that numerical illustrations similar to these homework, and hence examination, problems can be found in the lecture materials for the respective chapters/topics!