**DOTS: Week 3: *TVM & WACC Homework***

***DUE 11:59PM EDT ON FRIDAY (10/23)***

***Name & NetID:***

***Project Manager:***

***PART 1***

1. **Is a dollar worth more today or 100 years from now? WHY?**
2. **Equation for Future Value**
3. **How much money would I have in 15 years if I have $2,000 today, assuming 7% growth after inflation?**
4. **A) How much money would I have in 10 years if $2,500 is deposited today and my account earns 4% interest, compounded annually?**

**B) Quarterly?**

1. **A) If I deposit $10 in an account that pays 5% interest, compounded annually, how much would I have in 10 years?**

**B) 50 years?**

1. **TRUE or FALSE: Debt is cheaper than equity. Explain your reasoning.**
2. **What does WACC stand for? What is the definition of WACC?**
3. **Draw the WACC graph.**
4. **Write out the equation for WACC. Label what each component is.**

**10.Write out the equation for CAPM. Label what each component is.**

**11.A) A company has $80 of equity and $30 of debt through a single bond offering. This bond pays an interest rate of 8%. Assume a cost of equity of 10%, and a corporate tax rate of 20%. What is the WACC?**

**B) The company is growing at a rate of 2% and generates $100 at time 1. What is the PV at time 0 (AKA: now)?**

***PART 2***

**TIME VALUE OF MONEY**

1. **If you were to place $25,000 in the bank at 2.4% interest, how much would you have in the bank after one year if the interest were compounded monthly?**

Ans: Website 2

1. **If a 1922 gold certificate is currently worth $84,000 and it increases at a rate of 17½%, how much will it be worth next year?**

Ans: Website 2

More Info -- Bond Math:

When you buy a bond (aka a company takes out a loan from you), there are two portions to that transaction. First they will pay you back the money you gave them (aka face value). Then they will also pay back the return you deserve based on the time value of money (aka coupon payment). However, the expectations of that return change after the bond has been issued. If people expect a greater return because the company is more risky, the price of the bond will decrease, and vise versa. Therefore, there is also a “yield” associated with the bond, and the price on the secondary market changes. A company will be unaffected by change in “yield” but people will be willing to buy or sell their bond if it becomes more valuable.

**CALCULATING WACC**

1. **Calculate the WACC for a company with $10B in equity, $2B in debt with an average interest rate of 4%, a beta of 1.2, a risk free rate of 0.5%, and a market risk premium of 5%.**

Ans: Website 1

**WORKING WITH BETA**

1. **The beta of the risk free asset is…** (remember beta means how much the return changes in comparison to the market, aka volatility, while risk free assets have no risk)

**a) negative**

**b) 0**

**C) positive**

Ans: Website 1

1. **If a stock’s beta is 0.5, its expected return should be:**

**a) more than the risk-free rate**

**b) equal to the risk-free rate**

**c) less than the risk-free rate, but positive**

**d) zero**

**e) negative**

Ans: Website 1

**Website 1:** <http://users.iems.northwestern.edu/~armbruster/2011fiems326/Final%20Practice.pdf>

**Website 2:** <https://campus.purdueglobal.edu/DocumentStore/Docs11/pdf/MC/MM255_Unit6_SampleProblems.pdf>