

Individual Assignment 1

Due 6:30PM, 29 Aug

1. You have been offered a unique investment opportunity. If you invest \$10,000 today, you will receive \$1,500 one year from now, \$1,000 two years from now, and \$10,000 ten years from now.
 - a. What is the NPV of the opportunity if the interest rate is 2% EAR? Should you take the opportunity?
 - b. What is the NPV of the opportunity if the interest rate is 6% APR with semi-annually compounding? Should you take it now?
2. You are thinking of purchasing a house. The house costs \$350,000. You have \$50,000 in cash that you can use as a down payment on the house, but you need to borrow the rest of the purchase price. The bank is offering a 30-year mortgage that requires annual payments and has an interest rate of 5% per year. What will your annual payment be if you sign up for this mortgage? If the interest rate goes up to 7% per year, what will your annual payment be?
3. You would like to buy the house and take the mortgage described in Problem 2, with the interest rate of 7% per year. You can afford to pay only \$22,500 per year. The bank agrees to allow you to pay this amount each year, yet still borrow \$300,000. At the end of the mortgage (in 30 years), you must make a balloon payment; that is, you must repay the remaining balance on the mortgage. How much will this balloon payment be?
4. You own a coal mine and are considering selling it to a company to open it. However, this company only knows how to mine but not how to make sure the site be cleaned and maintained at environmental standards. So, it will be your responsibility if you decide to sell. The company offer you an immediate payment of \$20 million to buy the mine. The cleaning and maintenance are expected to cost \$2 million per year in perpetuity. What does the IRR rule say about whether you should accept this opportunity? If the interest rate is 8%, what does the NPV rule say? Which rule will you follow if they deviate?
5. You are considering buying a gaming console with a price tag of \$1,000. You do not have enough cash for it, but there is an interest-free BNPL option for you. With this BNPL option, the payment is made in five equal installments, with the first \$200 being made at the time of the purchase. The other four installments will be equally spread in a year, i.e., the second one three months later, etc. Meanwhile, the risk-free interest rate is 5% EAR. What is your minimal evaluation for the gaming console such that you should take the BNPL option and buy it?