MScFE 600 FINANCIAL DATA

Group Work Project # 1

See grading rubric here.

Scenario

You have 3 different mortgages to compare:

1. A 30-year fixed rate at 4%. The loan will amortize over 30 years.
2. A 20-year fixed rate at 2.5%. The loan will amortize over 20 years.
3. A 7-1 Adjustable Rate Mortgage (ARM) that varies according to rates. Use the following set of simulated rates (from April 2 1971 to June 9 2022). The loan will amortize over 30 years. A 7-1 ARM means that the interest rate applied is fixed for the first 7 years and then it adjusts once yearly at the beginning of that year). Part of the task consists in how to adjust the rate. There is no absolute right or wrong way to do it, **but explain how you decide to do it**!).

   Note that the amortization will change when the interest rate changes, so you will have to determine the new payment each year. Suppose after the 7-year fixed rate, you calculate an interest payment of 1500 per month (which would apply for 12 months). Further suppose that in the first month, $1000 of that $1500 applies to interest, and $500 to principal. In the following month, perhaps $1020 applies to principal and $480 applies to interest. During that 12 month period, you will show how the $1500 is split between interest and principal paydown. After making that payment for 1 year, the interest rate would change – at which you would be 1 year closer to the balance being paid.

   In the 30-year mortgage, you will calculate 1 payment that applies for the entire 30 years. In the 7-1 ARM, you will calculate a payment 23 times: once at the beginning, once at the end of year 7, once at the end of year 8, …, and once at the end of year 29. After the 7-year period, the payment is updated once a year.

Tasks

Step 1: Individually, each team member will:

4. Select one of the mortgages
5. Show the cash flows, amortization, and total interest paid
6. Provide an ideal customer for each loan-type. Recall that customers vary in income level, risk tolerance, etc.

Step 2: Choose a period of 30 years (any period within the range of dates provided. Typically students choose the latest years, but some students choose a period in the middle. Any choice is fine, but be sure to state clearly the period under consideration). In groups, build an amortization schedule in Google Sheets, showing the month number, fixed payment amount, principal paydown, interest applied, and new principal balance.

Step 3: Individually, students work on the same mortgages selected in step 1 to do the following:

1. The 30-year mortgage should have 361 rows: first row is time = 0, then 1 row per month until month 360 = 30 years. The unpaid principal balance, or UPB, column should be $1,000,000 million at the beginning, and 0 at the end. Be sure to add the total interest paid.
2. The 20-year mortgage should have the same columns, but only 20*12 + 1 = 241 rows.
3. The 7-1 ARM should have 361 rows (same as 30-year mortgage), but the interest rate will (potentially) change every 12 months.

Step 4: In groups, compare the results and brainstorm the features and benefits of each single mortgage product. Then, build a marketing piece*, meant to attract a specific customer with a certain income level, risk tolerance, etc.

> *A **marketing piece** will address the features and benefits of a specific type of mortgage. For example, an interest-only loan is more affordable. Marketing can focus on any of the following criteria: 1) price 2) quality 3) innovation. There may be other criteria, but these are the main ones*.

In groups of 2 members, in addition to doing all the individual work on the selected mortgage, students will complete all the steps for the third mortgage together.

Submission requirements and format

One team member submits on behalf of the entire group the following:

1. The first page of the Report Template in PDF format completed with the required information
2. **1 zipped folder including:**
    a. 1 Excel spreadsheet* with 1 tab per mortgage for the amortization schedule
    b. A 3-page PPT presentation** in PDF format for the marketing piece

** **Use Google Sheets to collaborate**. Once completed, click File → Download → Microsoft Excel (.xlsx) to obtain the copy for your submission*

** **Use Google Slides to collaborate**. Once completed, click File → Download → PDF Document (.pdf) to obtain the copy for your submission*

*The PDF file with your report must be uploaded **separately** from the zipped folder that includes any other types of files. This allows Turnitin to generate a similarity report.*

Rubric

Your instructor will evaluate your group submission for GPW1 using the following rubric:

Quantitative Analysis (open-ended questions) 40 Points	Technical and Non-technical Reports 30 Points	Writing and Formatting 20 Points
The group is able to apply results, formulas, and their knowledge of theory to real-life finance scenarios by doing the following: ● Providing all the necessary information to support their arguments. ● Presenting arguments that reflect group discussion and research. ● Using authoritative references to support a position and provide updated information ● Concluding with practical takeaways for more insightful financial decision-making	Technical Reports contain 3 parts: 1) summary of key results; 2) interpretation of results; and 3) the recommended course of action that can reasonably follow from those results and interpretations. **Note**: Technical reports will include the technicalities of models, such as names, methods of estimation, parameter values, etc. and exclude generalities about the work done. It should NOT include the names of Python code that was used.	A submission that looks professional should include: ● The axes labels and scales in graphs. ● No significant grammar errors or typos. ● Organized, clear structure, and easy to read document. ● Proper citations and bibliography using MLA format.
	Non-technical Reports contain 3 parts: 1) clear explanation of results; 2) the recommended course of action that follows; and 3) the identification of factors that impact each portfolio. **Note**: AVOID all references to model names, algorithms, unnecessary details, and focus on the investment decision.	