**MSCFE 600 FINANCIAL DATA**

Introduction

In this task, the financing team requires data and analytics support to develop a model that will guide their lending decisions and improve their responses to customer inquiries. The attached notebook focuses on analyzing two lending scenarios, including unsecured fixed-rate loans, such as credit cards for individuals, and secured floating-rate loans, such as home or automobile loans. The unsecured loans involve higher risk due to the lack of collateral, therefore this needs a careful assessment of delinquency rates and interest adjustments. On the other hand, the secured loans, backed by assets, require continuous monitoring of market rates and asset values to manage risks.

Step 1: Collateral Related Risks

As mentioned above, the team wants to analyze various lending scenarios to help them determine appropriate rates and assess risks associated with different types of loans. The two scenarios include unsecured fixed-rate loans, such as credit cards, and secured floating-rate loans, like home or automobile financing. Below is an outline of the financing and collateral risks for the two scenarios:

| Scenario | Financing Challenges | Collateral Challenges |
| --- | --- | --- |
| Money at a fixed rate for an unsecured purchase | Higher risk of defaulting because of lack of collateral.  Fixed rate reduces ability to adjust to market conditions.  Borrower credit deterioration increases loss exposure. | No collateral increases the risk of full loss in the event of default.  Difficulty in recouping losses if the borrower fails to repay. |
| Money at a floating rate for a secured purchase | Exposure to interest rate volatility can increase repayment burden.  Collateral depreciation impacts loan security.  Higher delinquency rates if market rates rise significantly. | Collateral may decrease in value during market downturns.  Risk of collateral damage reduces asset value.  Costs associated with repossessing and selling collateral in case of default. |

Step 2. Statistical Related Challenges

In the evaluation of statistical-related challenges for lending scenarios, the team must consider volatility and correlation risks. Volatility related issues include fluctuations in market prices, interest rates, and borrower income and significantly affect loan repayment and collateral value. Correlation issues focus on how certain factors, such as interest rates and market conditions, influence borrower defaults and lending risks.

| Scenario | Volatility Challenges | Correlation Challenges |
| --- | --- | --- |
| Money at a fixed rate for an unsecured purchase | High volatility in the borrower’s income can lead to increased default risk.  Unstable economic conditions affecting ability to repay.  Consumer credit risk volatility due to fluctuating employment rates and personal financial health. | Strong correlation between unemployment rates and loan defaults.  Correlation between economic downturns and higher default rates on unsecured loans. |
| Money at a floating rate for a secured purchase | Volatility in housing market prices affecting collateral value.  Interest rate fluctuations impacting monthly payments and borrower affordability.  Economic instability leading to unpredictable changes in asset values. | High correlation between interest rate hikes and increased default rates.  Correlation between housing market downturns and increased default risk. |

Step 3. Identifying Data

Scenario 1: Money at a fixed rate for an unsecured purchase (credit card)

* Data Type: Consumer Credit Data, Economic Data, Credit Ratings, Factor Data.
* Data Processing: Delinquency rates, raw credit usage data, consumer spending levels, credit scores.
* Data Frequency: Monthly or Quarterly.
* Data Class: Fixed Income, Credit.
* Data Source: Federal Reserve Economic Data (FRED), Audited Financial Statements, Consumer Credit Agencies.
* Data Variety: Actual data on delinquencies, adjusted data for economic conditions, observed spending data.

Scenario 2: Money at a floating rate for a secured purchase (e.g., home or automobile)

* Data Type: Asset Data, Real Estate Data, Economic Indicators, Mortgage Rates, Credit Data.
* Data Processing: Mortgage rates (average and historical), house price indices, delinquency rates on mortgages, interest rate data.
* Data Frequency: Weekly for mortgage rates, Quarterly for house price indices and delinquencies.
* Data Class: Real Estate, Fixed Income, Credit.
* Data Source: FRED, Mortgage Lenders, Real Estate Databases, Brokers, and Dealers.
* Data Variety: Adjusted vs. unadjusted housing price data, observed vs. modeled mortgage rate data, historical data on defaults.

Step 6. Describe how the data can help to meet the challenge

The selected datasets are helpful in understanding the risks and improving the outcomes. For Scenario 1, where a loan is issued at a fixed rate for non-collateral purchases such as credit cards, it is possible to determine, despite consumer’s credit delinquency trends, when borrowers are likely to be saddled with debt and unable to make payments. With this information, lenders are well aware of the default risks, especially the risks that come with too much debt. In Scenario 2, dealing with floating rate loans for secured purchases such as homes, other key indicators like mortgage rates, housing price index, and even mortgage delinquency ratio become critical in looking at the collateral worth and the capacity of the borrower to repay.