Financial Data Analysis

Power BI | DAX | Analysis

-By Shivani Nagar

Agenda

Credit card Usage and financial metrics analysis

We are making use of the Power BI's very rich data analysis feature that is DAX.

DATASRT LINK.

1. Introduction and Objective
2. Data Overview
3. Key Analysis Conducted
4. Problem & Solution
4. Conclusion
4. Connect and Discuss

Introduction and Objective : :

- In this analysis, we will explore credit card usage patterns and essential financial metrics to gain a comprehensive understanding of customer behavior, credit utilization, and delinquency risk within a banking institution.
- Using Power BI with DAX functions, we will calculated key metrics that provide a dynamic view of customer interactions and financial health. These calculations inform actionable KPIs, which help in assessing customer engagement and identifying high-risk segments.
- Our insights will drive targeted strategies to enhance customer retention and strengthen overall financial performance, positioning the bank for sustainable growth and risk mitigation.

Data Overview :

This analysis combines Credit Card and Customer datasets to examine clients' credit behavior, demographics, and risk factors.

1. **Credit Card Dataset:**
   - **Key Info:** Includes details like Credit_Limit, Total_Revolving_Bal, Total_Trans_Amt, and Avg_Utilization_Ratio.
   - **Focus:** Tracks spending habits, credit utilization, and risk indicators (e.g., Delinquent_Acc).
   -
2. **Customer Dataset:**
   - **Key Info:** Demographic and financial attributes such as Income, Education_Level, and Cust_Satisfaction_Score.
   - **Focus:** Provides insights into customer profiles and satisfaction.

KEY ANALYSIS CONDUCTED :

- **Financial Metrics:** Running totals, moving averages, and growth rates for transactions.
- **Risk Indicators:** Delinquency rates, credit risk scores, and high-risk client flags.
- **Behavioral Insights**: Retention, churn indicators, and transaction patterns.
- **Correlations:** Examined income vs. credit limit and loan approvals vs. credit limits.

Power BI | DAX | Analysis

Running Total of Credit Card Transactions

```
running_total =

CALCULATE(SUM(credit_card[Total_Trans_Amt]), FILTER(all(credit_card),
credit_card[Week_Start_Date] <= max(credit_card[Week_Start_Date])))
```

Power BI | DAX | Analysis

Calculate the 4-week moving average of the creditLimit for each client.

```
moving_average =

var window_4_weeks = DATESINPERIOD('calendar'[Date],MAX('calendar'[Date]),-28,DAY)

var sales = CALCULATE(SUM(credit_card[Credit_Limit]),window_4_weeks)

var distinct_week = CALCULATE(DISTINCTCOUNT('calendar'[weeknum]),window_4_weeks)

return DIVIDE(sales,distinct_week)
```

Power BI | DAX | Analysis

Calculate the mom% growth and wow% growth on transaction amount.

```
mom%growth =

var previous_month = CALCULATE(SUM(credit_card[Total_Trans_Amt]),DATEADD('calendar'[Date],-1,MONTH))

return DIVIDE(SUM(credit_card[Total_Trans_Amt])-previous_month,previous_month,0)
```

```
wow%growth =

var previous_week = CALCULATE(SUM(credit_card[Total_Trans_Amt]),DATEADD('calendar'[Date],-7,DAY))

return DIVIDE(SUM(credit_card[Total_Trans_Amt])-previous_week,previous_week,0)
```

Power BI | DAX | Analysis

Calculate Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount.

```
ac_trans_amt = DIVIDE(
    SUM(credit_card[Customer_Acq_Cost]),
    SUM(credit_card[Total_Trans_Amt]))
```

Power BI | DAX | Analysis

Calculate the yearly average of avg_utilization_ratio for all clients.

```
avg_utilization_ratio =
    AVERAGE(credit_card[Avg_Utilization_Ratio])/
    DISTINCTCOUNT(credit_card[current_year])
```

Calculate the percentage of Interest_Earned compared to Total_Revolving_Bal for each client.

```
interest_by_revolving_bal = DIVIDE(
    SUM(credit_card[Interest_Earned]),
    SUM(credit_card[Total_Revolving_Bal]),0)
```

Power BI | DAX | Analysis

Calculate Top 5 Clients by Total Transaction Amount.

```
top_5_clients_by_transaction_amt =

TOPN(5,
SUMMARIZE(credit_card,credit_card[Client_Num],"total_amount",SUM(credit_card[Total_Trans_Amt])),
[total_amount],DESC)
```

Power BI | DAX | Analysis

Identify clients whose Avg_Utilization_Ratio exceeds 80%.

```
avg_uti_exceedes_80% = IF([avg_utilization_ratio] > 0.8 , True,FALSE)
```

Power BI | DAX | Analysis

Customer Churn Indicator: Create a KPI that flags clients who have not made any transactions (Total_Trans_Amt = 0) in the last 6 months.

```
no_trans_in_last_6_months =

var months_6 = CALCULATE(SUM(credit_card[Total_Trans_Amt]),
                         DATESINPERIOD('calendar'[Date],MAX('calendar'[Date]),-6,MONTH))

return IF(ISBLANK(months_6),True,False)
```

Power BI | DAX | Analysis

Delinquency Rate: Calculate the percentage of clients with Delinquent_Acc > 0.

```
delinquency_rate =

var delinquent_accounts = CALCULATE(COUNTROWS(credit_card),credit_card[Delinquent_Acc] > 0)

var total_accounts = COUNTROWS(credit_card)

return DIVIDE(delinquent_accounts,total_accounts,0)
```

Power BI | DAX | Analysis

Credit Risk Score: Create a score for each client based on their Avg_Utilization_Ratio, Delinquent_Acc, and Total_Revolving_Bal.

Normalising the column Total_revolving balance to values between 0-1 --->

```
normalize_revolving_blance =

var min_value = MIN(credit_card[Total_Revolving_Bal])

var max_value = MAX(credit_card[Total_Revolving_Bal])

return DIVIDE(credit_card[Total_Revolving_Bal]-min_value,max_value-min_value,0)
```

Giving weightages to each of the columns :
Avg_Utilization_ratio = 50% --->

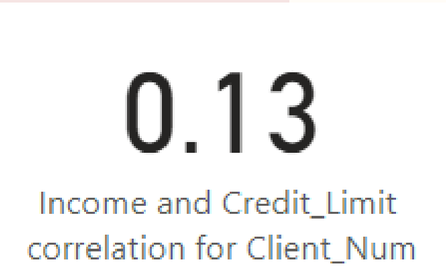
```
credit_risk_score =

0.5 * credit_card[Avg_Utilization_Ratio] +
0.3 * credit_card[Delinquent_Acc] +
0.2 * credit_card[normalize_revolving_blance]
```

Income vs Credit Limit Correlation: Show the correlation between Income and Credit_Limit for all clients.

In the Home Tab in Report view :

Go to Quick measures -> Under Calculation -> In mathematical operations (Correlation coefficient) ->
In category : Client_Num
On X-Axis : Summation of Income
On Y axis : Summation of credit_card



Average Customer Satisfaction Score by Credit Card Category: Calculate the average Cust_Satisfaction_Score by Card_Category.

```
average_score_by_card_category =

SUMMARIZE(credit_card,credit_card[Card_Category],
"Avg score",ROUND(AVERAGE('customer data'[Cust_Satisfaction_Score]),2))
```

Power BI | DAX | Analysis

Loan Approval vs Credit Limit: Analyze how Credit_Limit affects Personal_loan approval by calculating the average credit limit for clients with and without loans.

```
personal_loan_yes = CALCULATE(AVERAGE(credit_card[Credit_Limit]),'customer data'[Personal_loan] = "yes")
```

```
personal_loan_no = CALCULATE(AVERAGE(credit_card[Credit_Limit]),'customer data'[Personal_loan] = "no")
```

Power BI | DAX | Analysis

High Risk Clients Flag: Create a flag for clients whose Total_Revolving_Bal exceeds 90% of their Credit_Limit and who have a high Avg_Utilization_Ratio.

```
flag_exceeds_90%_of_credit_limit =

var credit_limit_90 = credit_card[Credit_Limit] * 0.9

return if(credit_card[Total_Revolving_Bal] > credit_limit_90
&& credit_card[Avg_Utilization_Ratio] > 0.5,True,False)
```

Power BI | DAX | Analysis

CONCLUSION :

- The analysis provided deep insights into customer spending, identifying patterns and usage trends that inform better financial management and credit policies.
- Key metrics, calculated with DAX in Power BI, highlighted significant factors such as high-risk segments, credit utilization rates, and delinquency risk.
- Actionable insights emerged to support strategies for reducing credit defaults, optimizing credit offerings, and improving customer retention.
- These findings enable the bank to enhance customer satisfaction and loyalty, while aligning with goals for sustainable growth and risk management.

Let’s Connect !!

power BI | DAX | Data Analysis

Linkedin Profile

Github

Gmail : shivaninagar2nd@gmail.com