



# FINANCIAL ANALYSIS PROJECT

BY APPLYING DAX FUNCTIONS

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# INTRODUCTION

**This report provides a comprehensive analysis of credit card usage and customer financial behavior, utilizing Power BI and DAX functions to derive actionable insights. By calculating running totals, moving averages, growth rates, and key performance indicators, we assess credit utilization, delinquency risks, and customer engagement.**

**The analysis includes metrics such as transaction trends, customer acquisition costs, utilization ratios, and churn indicators. It identifies high-risk clients, evaluates satisfaction by card category, and explores the correlation between income and credit limits. These insights equip the institution to improve customer retention, optimize financial performance, and mitigate risks effectively.**





# FINANCIAL METRICS



- **Running Total of Credit Card Transactions**
- **4-Week Moving Average of Credit Limits**
- **Month-over-Month (MoM) and Week-over-Week (WoW) Growth in Transaction Amount**
- **Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount**
- **Yearly Average of Avg\_Utilization\_Ratio for All Clients**
- **Percentage of Interest\_Earned Compared to Total\_Revolving\_Bal for Each Client**
- **Income vs Credit Limit Correlation**
- **Average Customer Satisfaction Score by Credit Card Category**
- **Loan Approval vs Credit Limit: Average Credit Limit for Clients With and Without Loans**





## Running Total of Credit Card Transactions



```
Running Total =  
CALCULATE([Total Transaction Amount],  
    FILTER(  
        ALL('Credit Card'),  
        'Credit Card'[Week_Start_Date] <= MAX('Credit Card'[Week_Start_Date])  
    )  
)
```

The **running total of credit card transactions** indicates the cumulative sum of all transactions over a specified period. It helps to track the progressive total of transaction amounts, providing insights into trends and patterns in customer spending behavior.





## 4-Week Moving Average of Credit Limits

```
Moving_average_4_weeks =  
  
VAR weeks4 = DATESINPERIOD('calendar'[Date],MAX('calendar'[Date]),-28,DAY)  
  
VAR total_amount = CALCULATE([Total Transaction Amount],weeks4)  
  
VAR num_of_weeks = CALCULATE(DISTINCTCOUNT('calendar'[week_num]), weeks4)  
  
RETURN DIVIDE(total_amount,num_of_weeks,0)
```

**Calculating the 4-week moving average of the credit limit for each client provides a smoothed view of credit limit trends over time, reducing the impact of short-term fluctuations. It focuses on understanding how the average credit limit for a client changes in rolling periods of four weeks.**





## MOM% Growth

```
mom%growth =  
  
VAR prev_month = CALCULATE(  
    [Total Transaction Amount],  
    DATEADD('calendar'[Date], -1, MONTH)  
)  
  
return  
DIVIDE(  
    [Total Transaction Amount] - prev_month,  
    prev_month, 0  
)
```

## WOW% Growth

```
wow%growth =  
  
var prev_week = CALCULATE(  
    [Total Transaction Amount],  
    DATEADD('calendar'[Date], -7, DAY)  
)  
  
return  
DIVIDE(  
    [Total Transaction Amount] - prev_week,  
    prev_week, 0  
)
```



**The Month-over-Month (MoM) % Growth and Week-over-Week (WoW) % Growth on transaction amounts are metrics that measure the percentage change in credit card transaction volumes between consecutive months or weeks. These indicators provide insights into short-term and medium-term spending trends.**







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



```
ratio_cac_transaction_amount = DIVIDE(  
    SUM(  
        'Credit Card'[Customer_Acq_Cost]), [Total Transaction Amount], 0  
    )
```

**Calculating Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount** indicates the efficiency of marketing and acquisition efforts by measuring how much acquisition cost contributes to each dollar of revenue. A lower ratio suggests cost-effective customer acquisition and high profitability potential, while a higher ratio highlights inefficiencies needing optimization.





## Yearly Average of Avg\_Utilization\_Ratio for All Clients



```
avg_utilization_ratio = AVERAGE(  
    'Credit Card'[Avg_Utilization_Ratio]  
)
```

Calculating the **yearly average of the average utilization ratio for all clients** provides a high-level view of how effectively customers are using their available credit throughout the year. By understanding the yearly average of the `avg_utilization_ratio`, the bank can assess the financial health of its clients, manage credit risk effectively, and design customer-centric products.







## Percentage of Interest\_Earned Compared to Total\_Revolving\_Bal for Each Client

```
interest_earned_by_revol_balance = DIVIDE(  
    SUM('Credit Card'[Interest_Earned]),  
    SUM('Credit Card'[Total_Revolving_Bal]),  
    0  
)
```

Calculating the **percentage of Interest\_Earned compared to Total\_Revolving\_Bal** for each client provides insights into how much interest income the bank is generating relative to the client's outstanding revolving credit balance. By analyzing this percentage, the bank can balance profitability with responsible lending, ensuring that customers are not overburdened while maximizing revenue from interest-earning accounts.





## Income vs Credit Limit Correlation



Quick measure

Copilot can help

Get measure suggestions in DAX query view. [Try it now](#)

Select a calculation to create a measure.

Correlation coefficient

Calculate the correlation coefficient between two values over a category. Originally suggested by Daniil Maslyuk in the quick measures gallery. [Learn more](#)

Category ⓘ

Client\_Num

Measure X ⓘ

Sum of Income

Measure Y ⓘ

Sum of Credit\_Limit

Add

Visualizations

Data

Search

avg\_satisfaction\_Score

calendar

Credit Card

Activation\_30\_Days

Annual\_Fees

Avg\_Utilization\_Ratio

Card\_Category

churn\_status

Client\_Num

clients\_Avg\_Utilization

Credit\_Limit

credit\_risk\_score

current\_year

Customer\_Acq\_Cost

Delinquent\_Acc

Exp Type

flag\_clients

Income and Credit\_Lim

Interest\_Earned

normalized\_revol\_bal

Qtr

Total\_Revolving\_Bal

Total\_Trans\_Amt

To find the correlation between income vs credit\_limit, we can use the quick measure tool where

**Category : Client\_Num**

**Measure X : Income**

**Measure Y :Credit\_Limit**

The correlation between income and credit limit for all clients indicates the relationship between a customer's income level and the amount of credit the bank extends to them.





## Average Customer Satisfaction Score by Credit Card Category



```
avg_satisfaction_Score =  
SUMMARIZE(  
    'Credit Card',  
    'Credit Card'[Card_Category],  
    "avg_satisfaction_score",  
    AVERAGE(Customers[Cust_Satisfaction_Score])  
)
```

By calculating the **average customer satisfaction score by card category**, the bank can gain a clear understanding of which offerings are resonating well with customers and where improvements or adjustments may be needed to enhance the customer experience.





## Loan Approval vs Credit Limit: Average Credit Limit for Clients With and Without Loans



```
loan_approval_yes =  
CALCULATE(  
    AVERAGE('Credit Card'[Credit_Limit]),  
    Customers[Personal_loan] = "Yes"  
)
```

```
loan_approval_no =  
CALCULATE(  
    AVERAGE('Credit Card'[Credit_Limit]),  
    Customers[Personal_loan] = "No"  
)
```

**Analyzing how Credit Limit affects Personal Loan approval by calculating the average credit limit for clients with and without loans provides insights into the relationship between a client's available credit and their likelihood of being approved for a personal loan. By comparing the average credit limits of clients who have been approved for a loan versus those who have not, the bank can better understand how credit capacity influences loan approval decisions.**





# KEY PERFORMANCE INDICATORS (KPI's)



- **Top 5 Clients by Total Transaction Amount**
- **Identify Clients Whose Avg\_Utilization\_Ratio Exceeds 80%**
- **High-Risk Clients Flag:  $\text{Total\_Revolving\_Bal} > 90\%$  of Credit\_Limit and High Avg\_Utilization\_Ratio**
- **Customer Churn Indicator: No Transactions ( $\text{Total\_Trans\_Amt} = 0$ ) in Last 6 Months**
- **Delinquency Rate: Percentage of Clients with  $\text{Delinquent\_Acc} > 0$**
- **Credit Risk Score: Based on Avg\_Utilization\_Ratio, Delinquent\_Acc, and Total\_Revolving\_Bal**







## Top 5 Clients by Total Transaction Amount

```
top_5_clients =  
TOPN(  
    5,  
    SUMMARIZE(  
        'Credit Card',  
        'Credit Card'[Client_Num],  
        "total amount",  
        [Total Transaction Amount]  
    ),  
    [total amount],  
    DESC  
)
```

**Top 5 Clients by Total Transaction Amount** indicates the customers who are contributing the most to the bank's revenue in terms of their credit card transactions. This metric identifies the top five clients based on the total amount of transactions they have made during a given period.







**Clients Whose Avg\_Utilization\_Ratio Exceeds 80%**

```
clients_Avg_Utilization_Ratio_exceeds_80% =  
if(  
    [avg_utilization_ratio] > 0.80, TRUE, FALSE  
)
```



**Top 5 Clients by Total Transaction Amount** indicates the customers who are contributing the most to the bank's revenue in terms of their credit card transactions. This metric identifies the top five clients based on the total amount of transactions they have made during a given period.





## High-Risk Clients Flag



```
flag_clients =  
IF(  
    'Credit Card'[normalized_revol_balance] > 0.9 && [avg_utilization_ratio] > 0.8,  
    "Flagged", "Not Flagged")
```

**Creating a High-Risk Clients Flag for clients whose Total Revolving Balance exceeds 90% of their Credit Limit and who have a high Avg\_Utilization Ratio indicates a group of customers who are heavily reliant on their available credit and may be at significant financial risk.**

**The High-Risk Clients Flag helps the bank identify customers who are in a potentially precarious financial position due to excessive credit utilization and high revolving balances. By flagging these clients, the bank can take steps to mitigate the risk of defaults, offer targeted support, and design strategies to reduce the impact of high credit usage on both the client and the bank's portfolio.**





## Customer Churn Indicator

```
churn_status =  
  
var last_6_months =  
    CALCULATE(  
        [Total Transaction Amount],  
        DATESINPERIOD('calendar'[Date],MAX('calendar'[Date]),-6,MONTH)  
    )  
  
return  
    IF(ISBLANK(last_6_months),"Churned","Not-Churned")
```



The **Customer Churn Indicator** is a key metric for identifying clients who are no longer engaging with the bank's credit card offerings.

The **above DAX query** flags clients with no transactions ( $\text{Total\_Trans\_Amt} = 0$ ) in the last 6 months, indicates customers who have become inactive in terms of their credit card usage. A total transaction amount of zero over a six-month period suggests that these customers are no longer engaging with the bank's credit card products.





## Delinquency Rate



```
percentage_with_delinquent_acc =  
  
VAR greater_zero = CALCULATE(COUNTROWS('Credit Card'), 'Credit Card'[Delinquent_Acc] > 0)  
  
VAR total_rows = COUNTROWS('Credit Card')  
  
RETURN DIVIDE(greater_zero, total_rows, 0)
```

The **Delinquency Rate**, defined as the percentage of clients with **Delinquent\_Acc > 0**, indicates the proportion of clients whose accounts are past due or have unpaid balances. Specifically, this metric identifies clients who have one or more accounts marked as delinquent, meaning they have missed at least one payment or are behind on their scheduled payments.





## Credit Risk Score



**Step 1: Normalize the revolving balance as it is in thousands in the data**

```
normalized_revol_balance =  
DIVIDE(  
    'Credit Card'[Total_Revolving_Bal]-MIN('Credit Card'[Total_Revolving_Bal]),  
    MAX('Credit Card'[Total_Revolving_Bal]) - MIN('Credit Card'[Total_Revolving_Bal]),  
    0  
)
```

**Step 2: Weight the average utilization ratio, delinquent accounts, and normalized revolving balance.**

```
credit_risk_score =  
  
[avg_utilization_ratio] * 0.5 +  
'Credit Card'[normalized_revol_balance] * 0.3 +  
'Credit Card'[Delinquent_Acc] * 0.2
```





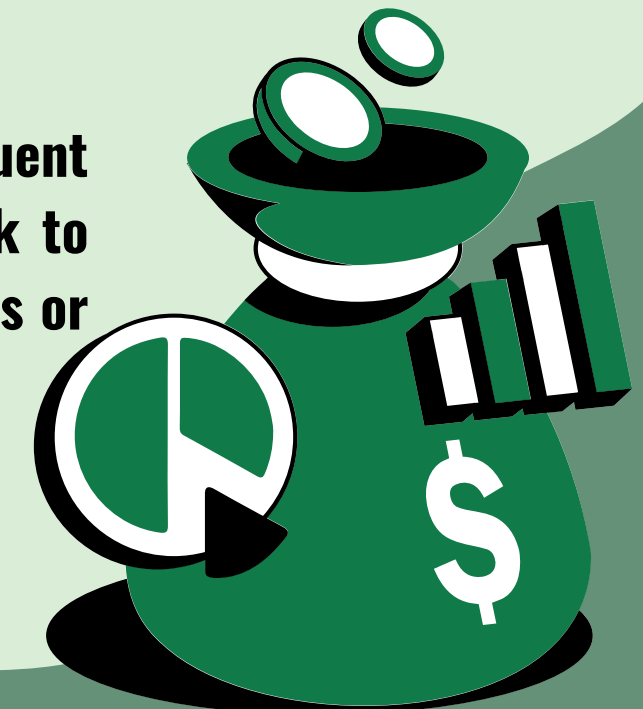
## Credit Risk Score Assessment



The **Credit Risk Score**, based on **Avg\_Utilization\_Ratio**, **Delinquent\_Acc**, and **Total\_Revolving\_Bal**, is a comprehensive metric used to assess a client's financial stability and creditworthiness. It combines three key indicators of risk:

1. **Avg\_Utilization\_Ratio** reflects how much of the client's available credit is being used. Higher utilization indicates reliance on credit and potential financial strain.
2. **Delinquent\_Acc** indicates whether the client has missed payments or is behind on obligations, signaling a higher risk of default.
3. **Total\_Revolving\_Bal** measures the total outstanding credit, with larger balances suggesting higher debt levels.

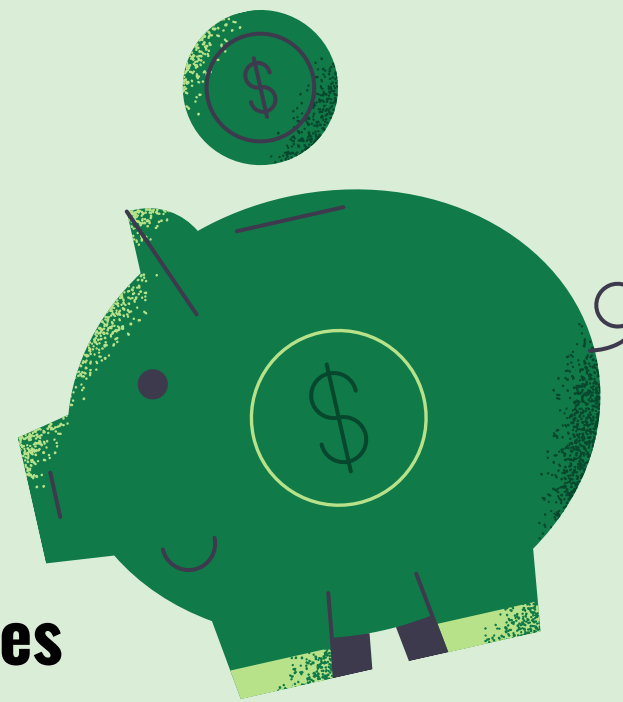
This score helps identify clients at risk of defaulting on their payments. Clients with high utilization, delinquent accounts, and large revolving balances are considered high risk. The Credit Risk Score enables the bank to segment clients, prioritize collections, and implement targeted interventions, such as adjusting credit limits or offering financial assistance, to minimize potential losses and manage credit portfolio risk effectively.








# CONCLUSION



**In conclusion, the analysis of key financial metrics and performance indicators provides critical insights into credit card usage, customer behavior, and financial risks. By evaluating metrics like running totals, moving averages, and growth rates, we gain a clear understanding of transaction trends and client activity. KPIs such as customer churn, delinquency rates, and credit risk scores allow for effective segmentation and risk management.**

**Analyzing factors like customer acquisition costs, loan approval, and the relationship between income and credit limits helps refine credit strategies. These insights enable the bank to optimize its offerings, mitigate risks, and improve customer retention, driving long-term profitability and growth.**



The background of the entire image is a light green color, overlaid with a pattern of numerous green coins. The coins are depicted in a stylized, hand-drawn manner with dark green outlines and lighter green fills. They are scattered across the frame in various orientations, some showing the obverse and others the reverse, creating a sense of abundance and value.

# **THANK YOU!**

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