

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 ANALYSIS

Write DAX formulas for the following:

1. Running Total of Credit Card Transactions
2. Calculate the 4-week moving average of the creditLimit for each client.
3. Calculate the mom% growth and wow% growth on transaction amount.
4. Calculate Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount.
5. Calculate the yearly average of avg_utilization_ratio for all clients.
6. Calculate the percentage of Interest_Earned compared to Total_Revolving_Bal for each client.
7. Calculate Top 5 Clients by Total Transaction Amount.
8. Identify clients whose Avg_Utilization_Ratio exceeds 80%.
9. Customer Churn Indicator: Create a KPI that flags clients who have not made any transactions (Total_Trans_Amt = 0) in the last 6 months.
10. Delinquency Rate: Calculate the percentage of clients with Delinquent_Acc > 0.

11. Credit Risk Score: Create a score for each client based on their Avg_Utilization_Ratio, Delinquent_Acc, and Total_Revolving_Bal.
12. Income vs Credit Limit Correlation: Show the correlation between Income and Credit_Limit for all clients.
13. Average Customer Satisfaction Score by Credit Card Category: Calculate the average Cust_Satisfaction_Score by Card_Category.
14. 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.
15. 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.

1. Running Total of Credit Card Transactions

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

Week_Start_Date	Total Transaction Amount	Running Total
01 January 2023	\$8,35,767	\$8,35,767
08 January 2023	\$8,44,739	\$16,80,506
15 January 2023	\$9,23,367	\$26,03,873
22 January 2023	\$8,69,235	\$34,73,108
29 January 2023	\$8,49,078	\$43,22,186
05 February 2023	\$8,98,867	\$52,21,053
12 February 2023	\$8,90,756	\$61,11,809
19 February 2023	\$8,68,091	\$69,79,900
26 February 2023	\$8,81,861	\$78,61,761
05 March 2023	\$7,93,080	\$86,54,841
12 March 2023	\$9,15,725	\$95,70,566
19 March 2023	\$8,90,081	\$1,04,60,647
26 March 2023	\$7,89,941	\$1,12,50,588
02 April 2023	\$8,09,413	\$1,20,60,001
09 April 2023	\$8,50,979	\$1,29,10,980
16 April 2023	\$8,67,373	\$1,37,78,353
23 April 2023	\$7,84,927	\$1,45,63,280
30 April 2023	\$8,62,036	\$1,54,25,316
07 May 2023	\$8,34,443	\$1,62,59,759
Total	\$4,55,33,021	\$4,55,33,021

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

```

1 Moving_average_4_weeks =
2
3 VAR weeks4 = DATESINPERIOD('Calendar'[Date],MAX('Calendar'[Date]),-28,DAY)
4
5 VAR total_amount = CALCULATE([Total Transaction Amount],weeks4)
6
7 VAR num_of_weeks = CALCULATE(DISTINCTCOUNT('Calendar'[Week_num]),weeks4)
8
9 RETURN DIVIDE(total_amount,num_of_weeks,0)

```

Week_num	Total Transaction Amount	Moving_average_4_weeks
1	\$8,35,767	\$8,35,767.00
2	\$8,44,739	\$8,40,253.00
3	\$9,23,367	\$8,67,957.67
4	\$8,69,235	\$8,68,277.00
5	\$8,49,078	\$8,71,604.75
6	\$8,98,867	\$8,85,136.75
7	\$8,90,756	\$8,76,984.00
8	\$8,68,091	\$8,76,698.00
9	\$8,81,861	\$8,84,893.75
10	\$7,93,080	\$8,58,447.00
11	\$9,15,725	\$8,64,689.25
12	\$8,90,081	\$8,70,186.75
13	\$7,89,941	\$8,47,206.75
14	\$8,09,413	\$8,51,290.00
15	\$8,50,979	\$8,35,103.50
Total	\$4,55,33,021	\$6,89,950.20

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

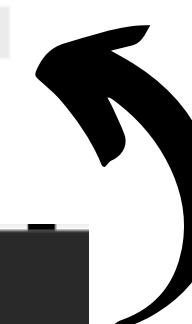
```

1 mom%growth =
2
3 VAR prev_month = CALCULATE([Total Transaction Amount],DATEADD('Calendar'[Date],-1,MONTH))
4
5 return DIVIDE([Total Transaction Amount]-prev_month,prev_month,0)

```



Month	Total Transaction Amount	mom%growth	Week_num	Total Transaction Amount	wow%growth
January	\$43,22,186	▲ 0%	1	\$8,35,767	0.00%
February	\$35,39,575	◆ -18%	2	\$8,44,739	1.07%
March	\$33,88,827	▲ -4%	3	\$9,23,367	9.31%
April	\$41,74,728	● 23%	4	\$8,69,235	-5.86%
May	\$34,26,913	◆ -18%	5	\$8,49,078	-2.32%
June	\$35,33,660	▲ 3%	6	\$8,98,867	5.86%
July	\$45,46,958	● 29%	7	\$8,90,756	-0.90%
August	\$34,49,868	◆ -24%	8	\$8,68,091	-2.54%
September	\$34,52,874	▲ 0%	9	\$8,81,861	1.59%
October	\$40,50,909	● 17%	10	\$7,93,080	-10.07%
November	\$34,05,420	◆ -16%	11	\$9,15,725	15.46%
December	\$42,41,103	● 25%	12	\$8,90,081	-2.80%
Total	\$4,55,33,021	10%	Total	\$4,55,33,021	2.27%



```

1 wow%growth =
2
3 VAR prev_week = CALCULATE([Total Transaction Amount],DATEADD('Calendar'[Date],-7,DAY))
4
5 return DIVIDE([Total Transaction Amount]-prev_week,prev_week,0)

```

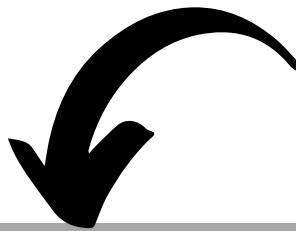


4. Calculate Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount.

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

2.18%

ratio_cac_transaction_amount



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.



5. Calculate the yearly average of avg_utilization_ratio for all clients.

```
avg_utilization_ratio = AVERAGE('credit  
card'[Avg_Utilization_Ratio])
```

10.89%
ratio_cac_transaction_amount

0.74
avg_utilization_ratio

Client_Num
708083283
708082083
708083283
708084558
708085458
708086958
708095133
708098133

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.



6. Calculate the 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]))
```

2.43%

0.24

ratio_cac_transaction_a...

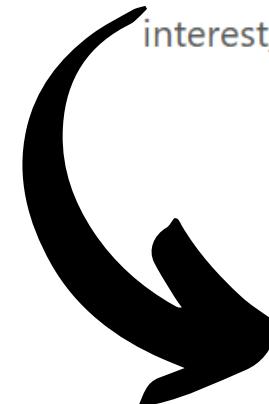
avg_utilization_ratio

Client_Num

708086958 ▾

134.16%

interest_earned_by_revol_balance



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.

7. Calculate 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)
```



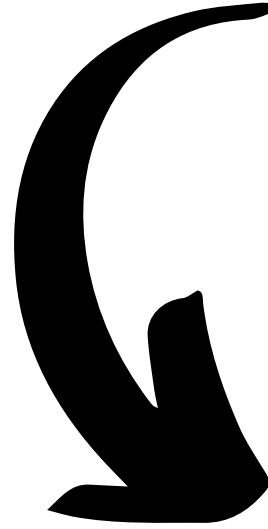
Client_Num	total amount
718140783	18484
941614504	18504
919695363	19739
956622169	19597
920819113	79463

8. Identify clients whose Avg_Utilization_Ratio exceeds 80%.

Structure		Formatting		Properties		Sort		Groups		Relationships		Calculations	
	X ✓	1	check_exceeds_80 = IF([avg_utilization_ratio] > 0.80,TRUE,FALSE)										
Current_Year	Credit_Limit	Total_Revolving_Bal	Total_Trans_Amt	Total_Trans_Vol	Avg_Utilization_Ratio	Use_Chip	Exp_Type	Interest_Earned	Delinquent_Acc	check_exceeds_80			
2023	2435	2432	1460	32	0.999	Chip	Travel	292	0	True			
2023	1863	1853	2462	40	0.995	Swipe	Bills	664.74	0	True			
2023	2472	2457	1392	33	0.994	Swipe	Bills	375.84	0	True			
2023	1812	1798	2921	44	0.992	Swipe	Bills	175.26	0	True			
2023	1442	1428	1134	26	0.99	Swipe	Fuel	158.76	0	True			
2023	2452	2423	4204	63	0.988	Swipe	Grocery	378.36	0	True			
2023	1857	1833	829	17	0.987	Swipe	Travel	207.25	0	True			
2023	2330	2294	2107	40	0.985	Chip	Entertainment	189.63	0	True			
2023	2419	2380	4099	73	0.984	Swipe	Fuel	696.83	0	True			
2023	2329	2290	4609	76	0.983	Swipe	Bills	829.62	1	True			
2023	2420	2379	4348	86	0.983	Chip	Grocery	739.16	0	True			
2023	1606	1578	2418	44	0.983	Chip	Entertainment	507.78	0	True			
2023	2523	2481	4683	76	0.983	Chip	Bills	889.77	0	True			
2023	1843	1802	5199	73	0.978	Swipe	Grocery	1247.76	0	True			
2023	2575	2517	1874	40	0.977	Swipe	Fuel	299.84	0	True			
2023	2469	2410	1027	20	0.976	Swipe	Bills	133.51	0	True			
2023	2578	2517	1830	64	0.976	Swipe	Entertainment	292.8	0	True			

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

```
1 churn =
2
3 VAR balance = CALCULATE([Total Transaction Amount],
4 DATESINPERIOD('Calendar'[Date],MAX('Calendar'[Date]),-6,MONTH))
5
6 RETURN IF(ISBLANK(balance),"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 (Total_Trans_Amt = 0) in the last 6 months, indicating 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.



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

```
1 Delinquency Rate =  
2  
3 VAR greater_zero = CALCULATE(COUNTROWS('credit card'),  
4 'credit card'[Delinquent_Acc] >0)  
5  
5 var total_rows = COUNTROWS('credit card')  
6  
6 RETURN DIVIDE([ greater_zero, total_rows,0])
```

6%

Delinquency Rate

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.



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

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

```
1 normalized_revolving_balance =  
2  
3 DIVIDE('credit card'[Total_Revolving_Bal] - MIN('credit card'[Total_Revolving_Bal]),  
4  
5 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.

```
1 Credit_risk_score =  
2  
3 [avg_utilization_ratio] * 0.5 +  
4 'credit card'[normalized_revolving_balance] * 0.3  
5 'credit card'[Delinquent_Acc] * 0.2
```

12. Income vs Credit Limit Correlation

In this analysis, we utilized Quick Measures to calculate the correlation between different metrics.

Category: Client_Num
Measure X: Income
Measure Y: Credit_Limit

This setup allows us to evaluate the relationship between Income and Credit_Limit for each client.

The screenshot shows the 'Quick measure' interface in Power BI. The 'Calculations' tab is selected, showing a dropdown menu for 'Correlation coefficient'. Below it, a description explains that it calculates the correlation coefficient between two values over a category, originally suggested by Daniil Maslyuk. The 'Category' field contains 'Client_Num'. The 'Measure X' field contains 'Income'. The 'Measure Y' field contains 'Credit_Limit'. A green 'Add' button is visible at the bottom right of the measure area. To the right, a 'Data' pane lists various data items, including 'Activation_30_Days', 'Annual_Fees', 'Avg_Utilization_Ratio', 'Card_Category', 'Client_Num', 'Credit_Limit', 'credit_risk_score', 'credit_risk_value', 'current_year', 'Customer_Acq_Cost', 'Delinquent_Acc', 'Exp Type', 'High_Utilization_Clients', 'Income and Credit_Limit corr...', 'Interest_Earned', 'no_trans_in_last_6_months', and 'normalized_revolving_balance'. A green cloud graphic is partially visible on the right side of the screen.

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

```
X ✓
1 avg_satisfaction_score =
2 SUMMARIZE('credit card','credit card'[Card_Category],
3
4 "avg_satisfaction_score", AVERAGE(customer[Cust_Satisfaction_Score]))
```

Card_Category	avg_satisfaction_score
Blue	3.19927536231884
Silver	3.22187981510015
Gold	3.04663212435233
Platinum	2.71641791044776



14. Loan Approval vs Credit Limit

```
1 loan_approval =  
2 CALCULATE(AVERAGE('credit card'[Credit_Limit]),  
3 customer[Personal_loan] = "Yes")
```

```
1 loan_approval_no =  
2 CALCULATE(AVERAGE('credit card'[Credit_Limit]),  
3 customer[Personal_loan] = "No")
```





THANK YOU



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