Birla Institute of Technology, Mesra

Department of Electronics & Communication Engineering

MC300R1 Summer Training

PROJECT – FINANCIAL VALUTION MODEL FOR DEBIT CARDS

Work Report

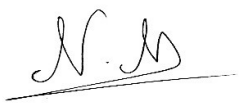
Naman Navneet

B.TECH/10087/19

ECE A

1. Self Declaration

This is to certify that the work presented in the report entitled "Valuation Model for Debit Cards" in fulfillment of the requirement for the award of credits of Summer Internship/Training subject of Birla Institute of Technology, Mesra is an authentic work carried out by me during the Summer of 2022. To the best of my knowledge, the content of this project does not form a basis for the award of any previous Degree to anyone else. Whenever I have used materials (data, theoretical analysis, and text) from other sources, I have given due credit to them by citing them and giving their details in the references.



Naman Navneet

BTECH/10087/19

2. Certificate of Approval

The foregoing project entitled Financial Valuation Model for Debit Card Product at Axis Bank Ltd carried out by Naman Navneet (BTECH/10087/19) is hereby approved as a creditable report of Summer Training and has been presented in satisfactory manner to warrant its acceptance as prerequisite to the credits for which it has been submitted. It is understood that by this approval, the undersigned do not necessarily endorse any conclusion drawn or opinion expressed therein, but approve the project for the purpose for which it is submitted.

Date: 25/07/2022

(External Examiner) (Internal Examiner)

3. Table of Contents

4. Acknowledgement

I, Naman Navneet, would like to extend my sincere gratitude to Axis Bank for providing me with an opportunity to work on real life problems

A special thanks to my mentor, Akshay Nandanwar, for always giving me the opportunity to explore my potential, and my manager Ritesh Devani for mentoring me in my journey. I thank all the teachers and non-teaching staff in the Department of Electronics and Communication Engineering, BIT Mesra, for influencing my journey as an engineering Undergraduate, for the better.

Finally, I take this opportunity to extend our earnest gratitude and respect to my parents, my colleagues and batchmates for their direct or indirect support during the period of my internship project work.

I thank Birla Institute of Technology Mesra, for these 3 years of my life. I have grown a lot here, and I made a lot of memories here. I wouldn't have received so many opportunities and achievements in the last 3 years had it not been for the efforts put in by everyone at BIT Mesra and the environment that I received here.

Naman Navneet

BTECH/10087/19

Dated 25/07/2022

5. About the Company

Axis Bank is the third largest private sector bank in India. The Bank offers the entire spectrum of financial services to customer segments covering Large and Mid-Corporates, MSME, Agriculture and Retail Businesses

Business Intelligence Unit (BIU)

The Business Intelligence Unit is a high-profile team with a mandate to drive data-based decisions within the bank. Reporting into Head Banking Operations and Transformation, this department works with all businesses of the bank including retail, small business and corporate to drive analytics. In terms of functions, the department has teams focused on all aspects of analytics for the bank including risk analytics, financial crime analytics, business and marketing analytics, building predictive scores, data engineering and business reporting.

The Business Intelligence Unit (BIU) provides analytical services to various functions of the Bank. BIU focuses on Artificial Intelligence (Al) & Machine Learning (ML) along with traditional analytics in enabling decision making for different businesses across Retail and Wholesale Banks. BIU team monetizes data assets of the Bank for risk management, growth, and operational optimization.

6. Introduction:

In this financially modern world, there is one need which is common among all of us, that is, Money. We all need money for our survival in this society. It is either available in the form of cash or payment directly from our bank account. So how to access this money from our bank account? One of the most prominent answers is obviously, DEBIT CARDS**. Debit Card makes your payments much more convenient and secure through an electric payment facility directly from our bank account.** Debit Cards can be used for purchases online or at shops by directly debiting our bank account. Debit card can also be used to withdraw cash from an ATM.

7. Aim of the project:

The aim of this project is creating Valuation Model of Debit Cards. It involves analyzing historical data from the last few years, understanding terms and norms used in it, cleaning and refining this data, forming useful extract and getting insights from it. Then we need to predict and analyze the same for the upcoming years using discounted cash flows and vintage curves. NPV and PNL are also calculated for further analysis and decision making.

8. Project Plan:

Week number	Dates	Plan
Week 1	6th to 10th June	1. Introduction to SAS and SQL 2. Understanding Valuation Model
Week 2	11th to 17th June	1. Requesting Data from respective teams 2. Static Assumptions Analysis
Week 3	20th to 24th June	1. Cleaning and refining data 2. Developing Vintage Curves
Week 4	4th to 8th July	1. Revenue Calculation 2. Plotting Graphs
Week 5	11th to 15th July	1. Finalization of cost sources 2. Summary
Week 6	17th to 21st July	1. Getting Insights 2. Preparing Presentation

9. THEORY:

1. What is SAS?
2. What is SQL?
3. What do we understand by Valuation Model?
    a. Introduction
    b. Takeaways
    c. The Two Main Categories of Valuation Methods
    d. Valuation Methods
    e. Discounted Cash Flow Valuation
    f. Limitations of Valuation
4. How Valuation Models are so useful in today's world?
    a. Importance of Valuation.
    b. How Earnings Affect Valuation?
5. Basic Terminologies used in Financial Sector:
    a. Time Value of Money
    b. Formula for TVM
    c. Discounted Cash Flow
    d. Terminal Value
    e. ROA
    f. ROE
    g. NPV
    h. IRR
6. What are Debit Cards?
7. How Data Science can be used in financial sector?

9.1. What is SAS?

SAS is an American multinational developer of analytics software based in Cary, North Carolina. SAS develops and markets a suite of analytics software (also called SAS), which helps access, manage, analyze and report on data to aid in decision-making. The company is the world's largest privately held software business and its software is used by most of the Fortune 500.

SAS Institute started as a project at North Carolina State University to create a statistical analysis system (hence the proper name, Statistical Analysis System) that was originally used primarily by agricultural departments at universities in the late 1960s. It became an independent, private business led by current CEO James Goodnight and three other project leaders from the university in 1976. SAS grew from $10 million in revenues in 1980 to $1.1 billion by 2000. In 1998 a larger proportion of these revenues were spent on research and development than at most other software companies in 1997 these were more than double the industry average.

As of 2012, SAS is the largest privately owned software company in the world. It develops, supports and markets a suite of analytics software also called SAS (statistical analysis system), which captures, stores, modifies, analyzes and presents data. The SAS system and SAS programming language are used by most of the Fortune 500. The SAS software includes a Base SAS component that performs analytical functions and more than 200 other modules that add graphics, spreadsheets or other features. SAS Institute also sells the JMP suite of statistical analysis software, which consists of JMP, JMP Pro, JMP Clinical and JMP Genomics.

Some of the uses for SAS' software include analyzing financial transactions for indications of fraud, optimizing prices for retailers, or evaluating the results of clinical trials. As of 2012, SAS is the largest market-share holder in the advanced analytics segment with a 36.2 percent share and the fifth largest for business intelligence software with a 6.9 percent share. SAS typically sells its software with an emphasis on subscription models that include support and updates, as opposed to software licenses.

9.2. What is SQL?

SQL (Structured Query Language) is a domain-specific language used in programming and designed for managing data held in a relational database management system (RDBMS), or for stream processing in a relational data stream management system (RDSMS). It is particularly useful in handling structured data, i.e. data incorporating relations among entities and variables.

SQL offers two main advantages over older read–write APIs such as ISAM or VSAM. Firstly, it introduced the concept of accessing many records with one single command. Secondly, it eliminates the need to specify how to reach a record, e.g. with or without an index.

Originally based upon relational algebra and tuple relational calculus, SQL consists of many types of statements, which may be informally classed as sublanguages, commonly: a data query language (DQL), [a] a data definition language (DDL), [b] a data control language (DCL), and a data manipulation language (DML). [c] The scope of SQL includes data query, data manipulation (insert, update and delete), data definition (schema creation and modification), and data access control. Although SQL is essentially a declarative language (4GL), it also includes procedural elements.

SQL was one of the first commercial languages to use Edgar F. Codd's relational model. The model was described in his influential 1970 paper, "A Relational Model of Data for Large Shared Data Banks". Despite not entirely adhering to the relational model as described by Codd, it became the most widely used database language.

SQL became a standard of the American National Standards Institute (ANSI) in 1986 and of the International Organization for Standardization (ISO) in 1987. Since then, the standard has been revised to include a larger set of features. Despite the existence of standards, most SQL code requires at least some changes before being ported to different database systems.

9.3. What do we mean by Valuation Model?

a. Introduction:

Valuation is the analytical process of determining the current (or projected) worth of an asset or a company. There are many techniques used for doing a valuation. An analyst placing a value on a company looks at the business's management, the composition of its capital structure, the prospect of future earnings, and the market value of its assets, among other metrics.

Fundamental analysis is often employed in valuation, although several other methods may be employed such as the capital asset pricing model (CAPM) or the dividend discount model (DDM).

b. KEY TAKEAWAYS

- Valuation is a quantitative process of determining the fair value of an asset or a firm.
- In general, a company can be valued on its own on an absolute basis, or else on a relative basis compared to other similar companies or assets.
- There are several methods and techniques for arriving at a valuation—each of which may produce a different value.
- Valuations can be quickly impacted by corporate earnings or economic events that force analysts to retool their valuation models.

c. The Two Main Categories of Valuation Methods:

Absolute valuation **models** attempt to find the intrinsic or "true" value of an investment based only on fundamentals. Looking at fundamentals simply means you would only focus on such things as dividends, cash flow, and the growth rate for a single company, and not worry about any other companies. Valuation models that fall into this category include the dividend discount model, discounted cash flow model, residual income model, and asset-based model.

Relative valuation **models,** in contrast, operate by comparing the company in question to other similar companies. These methods involve calculating multiples and ratios, such as the price-to-earnings multiple, and comparing them to the multiples of similar companies.

d. Valuation Methods:

There are various ways to do a valuation. The discounted cash flow analysis mentioned above is one method, which calculates the value of a business or asset based on its earnings potential. Other methods include looking at past and similar transactions of company or asset purchases, or comparing a company with similar businesses and their valuations.

The comparable company analysis is a method that looks at similar companies, in size and industry, and how they trade to determine a fair value for a company or asset. The past transaction method looks at past transactions of similar companies to determine an appropriate value. There's also the asset-based valuation method, which adds up all the company's asset values, assuming they were sold at fair market value, to get the intrinsic value.

Sometimes doing all of these and then weighing each is appropriate to calculate intrinsic value. Meanwhile, some methods are more appropriate for certain industries and not others. For example, you wouldn't use an asset-based valuation approach to valuing a consulting company that has few assets; instead, an earnings-based approach like the DCF would be more appropriate.

e. Discounted Cash Flow Valuation

Analysts also place a value on an asset or investment using the cash inflows and outflows generated by the asset, called a discounted cash flow (DCF) analysis. These cash flows are discounted into a current value using a discount rate, which is an assumption about interest rates or a minimum rate of return assumed by the investor.

If a company is buying a piece of machinery, the firm analyses the cash outflow for the purchase and the additional cash inflows generated by the new asset. All the cash flows are discounted to a present value, and the business determines the net present value (NPV). If the NPV is a positive number, the company should make the investment and buy the asset.

f. Limitations of Valuation

When deciding which valuation method to use to value a stock for the first time, it's easy to become overwhelmed by the number of valuation techniques available to investors. There are valuation methods that are fairly straightforward while others are more involved and complicated.

Unfortunately, there's no one method that's best suited for every situation. Each stock is different, and each industry or sector has unique characteristics that may require multiple valuation methods. At the same time, different valuation methods will produce different values for the same underlying asset or company which may lead analysts to employ the technique that provides the most favourable output.

9.4. How Valuation Models are so useful in today's world?

a. Importance of Valuation:

A valuation can be useful when trying to determine the fair value of a security, which is determined by what a buyer is willing to pay a seller, assuming both parties enter the transaction willingly. When a security trades on an exchange, buyers and sellers determine the market value of a stock or bond.

The concept of intrinsic value, however, refers to the perceived value of a security based on future earnings or some other company attribute unrelated to the market price of a security. That's where valuation comes into play. Analysts do a valuation to determine whether a company or asset is overvalued or undervalued by the market.

b. How Earnings Affect Valuation?

The earnings per share (EPS) formula is stated as earnings available to common shareholders divided by the number of common stock shares outstanding. EPS is an indicator of company profit because the more earnings a company can generate per share, the more valuable each share is to investors.

Analysts also use the price-to-earnings (P/E) ratio for stock valuation, which is calculated as market price per share divided by EPS. The P/E ratio calculates how expensive a stock price is relative to the earnings produced per share.

For example, if the P/E ratio of a stock is 20 times earnings, an analyst compares that P/E ratio with other companies in the same industry and with the ratio for the broader market. In equity analysis, using ratios like the P/E to value a company is called a multiples-based, or multiples approach, valuation. Other multiples, such as EV/EBITDA, are compared with similar companies and historical multiples to calculate intrinsic value.

9.5. Some basic Terminologies:

1. **Time Value of Money:** The time value of money (TVM) is the concept that a sum of money is worth more now than the same sum will be at a future date due to its earnings potential in the interim.
2. **Formula for Time Value of Money:**

   Depending on the exact situation, the formula for the time value of money may change slightly. For example, in the case of annuity or perpetuity payments, the generalized formula has additional or fewer factors. But in general, the most fundamental TVM formula takes into account the following variables:

   - FV = Future value of money
   - PV = Present value of money
   - i = interest rate
   - n = number of compounding periods per year
   - t = number of years

   Based on these variables, the formula for TVM is: $FV = PV \times [1 + (i / n)]^{(n \times t)}$

3. **Discounted Cash Flow:** Discounted cash flow (DCF) is a valuation method used to estimate the value of an investment based on its expected future cash flows. DCF analysis attempts to figure out the value of an investment today, based on projections of how much money it will generate in the future.
4. **Terminal Value:** Terminal value (TV) is the value of an asset, business, or project beyond the forecasted period when future cash flows can be estimated. Terminal value assumes a business will grow at a set growth rate forever after the forecast period. Terminal value often comprises a large percentage of the total assessed value.
5. **ROA:** The term return on assets (ROA) refers to a financial ratio that indicates how profitable a company is in relation to its total assets.
6. **ROE:** Return on equity (ROE) is the measure of a company's net income divided by its shareholders' equity.
7. **NPV:** Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over a period of time. NPV is used in capital budgeting and investment planning to analyze the profitability of a projected investment or project. NPV is the result of calculations used to find today’s value of a future stream of payments.
8. **IRR:** The internal rate of return (IRR) is a metric used in financial analysis to estimate the profitability of potential investments. IRR is a discount rate that makes the net present value (NPV) of all cash flows equal to zero in a discounted cash flow analysis.

9.6. DEBIT CARDS:

A debit card is a payment card that deducts money directly from a consumer's checking account when it is used. Also called "check cards" or "bank cards," they can be used to buy goods or services; or to get cash from an automated teller machine or a merchant who'll let you add an extra amount onto a purchase.

Key Takeaways:

1. Debit cards eliminate the need to carry cash or physical checks to make purchases, and they can also be used at ATMs to withdraw cash.
2. Debit cards usually have daily purchase limits, meaning it may not be possible to make an especially large purchase with a debit card.
3. Debit card purchases can usually be made with or without a personal identification number (PIN).
4. You may be charged an ATM transaction fee if you use your debit card to withdraw cash from an ATM that's not affiliated with the bank that issued your card.
5. Some debit cards offer reward programs, similar to credit card reward programs, such as 1% back on all purchases.

How a Debit Card Works

A debit card is usually a rectangular piece of plastic, resembling any charge card. It is linked to the user's checking account at a bank or credit union. The amount of money that can be spent with it is tied to the account size (the amount of funds in the account).

In a sense, debit cards work as a cross between ATM cards and credit cards. You can use them to get cash from a bank's automated teller machine, as with the former; or you can make purchases with them, like the latter. In fact, many financial institutions are replacing their plain vanilla, single-purpose ATM cards with debit cards that are issued by major card-payment processors such as Visa or Mastercard. Such debit cards come automatically with your checking account.

Whether being used to obtain cash or to buy something, the debit card functions in the same way: It draws the funds immediately from the affiliated account. So, your spending is limited to what's available in your checking account, and the exact amount of money you have to spend will fluctuate from day to day, along with your account balance.

Debit cards usually have daily purchase limits as well, meaning you can't spend more than a certain amount with them in one 24-hour period.

Debit card purchases can be made with or without a PIN. If the card has a major payment processor's logo, it often can be run without one, just as a credit card would be.

9.7. Data Science in Finance:

Finance is one of the most critical sectors in the world. Finance management used to require a lot of effort and time, but not anymore. Using Data Science, now one can quickly analyze finance and make a better decision to manage finance.

Now Data Science is being used in the Finance Industry for the same reason. Data Science is a field that is used for many finance areas such as algorithmic trading, fraud detection, customer management, risk analytics and many more. Read more about Data Science applications.

Some area where Data Science can be really useful in Financial Sector are:

1. Risk Analytics:
2. Real-Time Analytics:
3. Consumer Analytics:
4. Customer Data Management
5. Personalized Services
6. Financial Fraud Detection
7. Algorithmic Trading

10. DATASETS:

1. Monthly Historical Data Table: We have received some latest months (last 5 years) data table from the product analytics team and improved it using SAS Enterprise Guide 7.1. This table contains parameters like Account Open Date, Customer ID, Account ID, Segment, Product, Card Number, Bin Number, pos txn, pos amt, online txn, online amt, init_txn, init_amt etc.
   Products (Debit Cards) we are using:
   a) Priority Platinum
   b) Online rewards
   c) Rewards+
   d) Secure+
   e) Business Classic Chip
   f) Business Platinum
2. Assumptions Table: This table consists of static assumptions required for the Valuation model of Debit Cards. Latest static assumptions like Acquisition cost, Network cost, Annual Fee, etc. Please update the 'Assumption Debit card' sheet.
3. Movie deals table
4. Airport Lounge Costs
5. Issuance Costs

11. APPROACH:

A. Data Processing:

i. Collecting Datasets Historical Transactions Data and Assumptions Sheet
ii. Cleaning and Refining Data. Modified some columns.
iii. Creating Vintage Curves for Online amount,
iv. POS Spend etc. and finally merging them all
v. Dimensional Mapping - Creating all possible combination for each parameter.
vi. Saving all data in final sheet. This complete process of Data Processing knowledge of SAS and SQL to get our raw data have some meaningful insights.

B. Data Analysis:

i. In this step we are going to analyze the extracted data from SAS in Excel Sheet. We have our Data Sheet ready. In input sheet we will choose from option of cards in which we want to do analysis. In this input sheet we will also go through Cost Inputs, Key Values, Lifetime Values, Spend Drivers and Vintage Curves of each Debit Cards separately. This is either derived from Calculator sheet or Assumptions Sheet.
ii. Assumptions sheet consists of Cost of Acquisition, Service Cost, Network Cost, Joining Fee of each card. Movie deals and Airport Lounge Cost used in Calculator sheet will also be extracted from here.
iii. Original Card sheet consists of live counts of each card yearly, quarterly, and specifically for our months data for calculation purpose.
iv. Next step will be filling FY22 spends and incomes in PNL sheet and calculating overall Cost of Acquisition and Service cost for each Opex. This will ultimately help us in finding Total CoA, COS and Other Service Expense.
v. In Calculator we use different formula on different SAS extracted data and Assumptions to formulate final input for each combination of Parameters of Cards, that is, ultimately to be filled in Input Sheet.

C. Getting Insights

Final step of our project includes summarizing our project via two sheets - Summary for Q3FY22 and Summary Q4FY22.

Each of the Summary will consist of:

1. Card Variables, Cost Inputs and Key rates for each card Variant

2. Net Present Value, Return On Assests and Open Accounts for each variant.

3. Net present Value, Terminal Value, Final NPV of each variant.

4. Card Variables, Cost Inputs and Key rates for a specific card chose on Input Sheet.

5. Net Present Value, Present Values and Open Accounts for specific card chose on Input sheet.

Card wise estimated NPV and ROA is plotted for both summary sheets. Another plot which can also be useful is NPV Profitability Waterfall for each card variants separately. We have also plotted Yearly Revenue and Profit for FY 16-22 and Monthly Revenue Analysis for Fy22.

12. Step-wise Procedure:

12.1. BASICS:

- ✓ Firstly, I have gone through the basic fundamentals of SAS and SQL through these courses on Coursera:
  1. Getting started with SAS Programming.
  2. SQL using SAS.
  3. Doing more with SAS Programming.

- ✓ Then, my manager Ritesh Sir explained to us the concept of Valuation Modelling, how it is related to Data Science, what will be our aim, agenda and learning objective. I have learned some new terms like:
  1. Discounted Cash Flows
  2. Net Present Value
  3. Time Value of Money
  4. Terminal Value
  5. Vintage Curves etc.

- ✓ I was assigned project on Valuation Model for product Debit Cards. So, I have to go through the terms and regulations related to Debits Cards. I also learned about some of Debit Cards like:
  1. Burgundy Debit Card
  2. Prime Debit Card
  3. Prestige Debit Card
  4. Liberty Debit Card

- ✓ To get along well with the project, my mentor Akshay shared a previous similar model and PNL sheet to understand what we are going to need from different BIU teams to build this project. I have gone through that model, understood how different formulas are used and how the overall model is going to be modulated.

12.2. DATA PROCESSING:

- ✓ Data preprocessing is an important task before using the dataset for any operations. This is because there can be rows or columns in data tables which are of no use or which may mislead our model and in turn mislead our approach. So, we need to replace or delete those rows and columns in data to make our tables more refined and useful. There can be different types of preprocessing steps to be followed based on the data. We will use SAS Enterprise Guide to process our data using both SAS and SQL knowledge. Some basic steps of Data Processing are
  1. Collecting Datasets Historical Transactions Data and Assumptions Sheet.
  2. Cleaning and Refining Data. Modified some columns.
  3. Creating Vintage Curves for Online amount, POS Spend etc. and finally merging them all.
  4. Dimensional Mapping-Creating all possible combinations for each parameter.
  5. Saving all data in final sheet. This complete process of Data Processing knowledge of SAS and SQL to get our raw data has some meaningful insights.

Alternate Method (Tried)

Using SAS to save only those columns which we need for our model and saved them in different tables Merged different months table into one program Now we tried to predict the spendings of the upcoming few months using time series forecasting in Excel. Here we are using historical data points to predict seasonality dependent forecasting for the upcoming few months. Then we tried to plot a similar plot for upcoming months by merging a with previous months plot and forecasted plot. I took the weighted average ratio of provided that successive months and multiplied this average to each of the previous opening month-year in order to get similar graph as that of previous opening month yar. We got the new vintage curve but when we matched them with previous model data, we found that spends were not increasing as it is supposed to. The growth was very small and slow. This might have occurred as we didn't have sufficient data to plot the curves and hence, we neglected this vintage curve and pilled previous model curves into our model.

12.3. DATA ANALYSIS:

As the first method doesn't work as it is supposed to be, we are going to directly use vintage curves from previous months data and use it for our analysis.

- ✓ In this step we are going to analyze the extracted data from SAS in Excel Sheet. We have our Data Sheet ready. In the input sheet we will choose from the option of cards in which we want to do analysis. In this input sheet we will also go through Cost inputs, Key Values, Lifetime Values, Spend Drivers and Vintage Curves of each Debit Cards separately. This is either derived from Calculator sheet or Assumptions Sheet.
- ✓ The assumption sheet consists of Cost of Acquisition, Service Cost, Network Cost. Joining Fee of each card. Movie deals and Airport Lounge Cost used in Calculator sheet will also be extracted from here.
- ✓ Original Card sheet consists of live counts of each card yearly, quarterly, and specifically for our months data for calculation purpose.
- ✓ Next step will be filling FY22 spends and incomes in PNL sheet and calculating overall Cost of Acquisition and Service cost for each Opex. This will ultimately help us in finding Total COA, CoS and Other Service Expense.
- ✓ In Calculator we use different formula on different SAS extracted data and Assumptions to formulate final input for each combination of Parameters of Cards, that is, ultimately to be filled in Input Sheet.

12.4. Summarizing Data:

The final step of our project includes summarizing our project via two sheets.

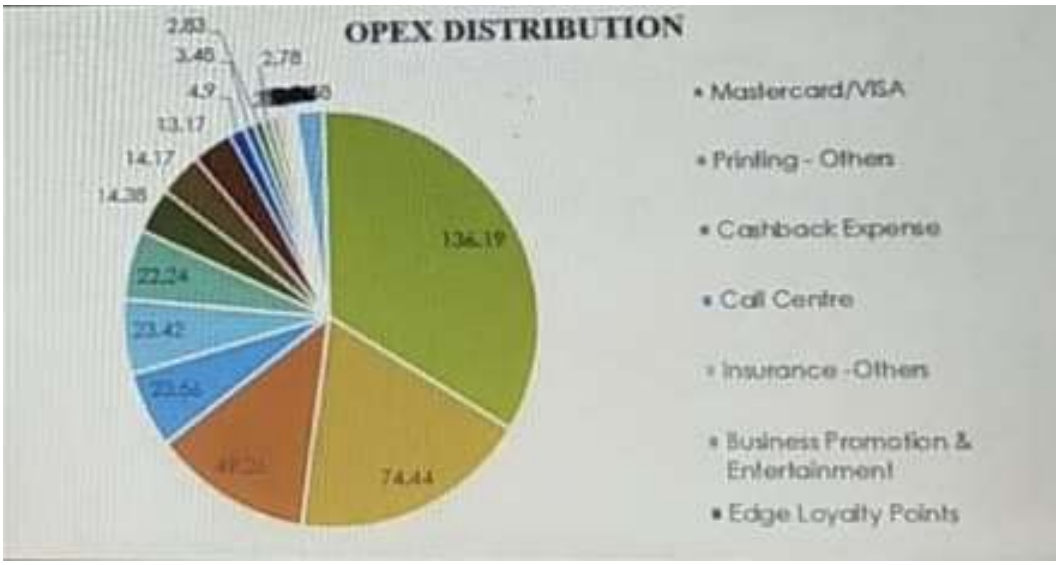
1. Summary for Q3FY22 and Summary Q4FY22. Each of the Summary will consist:

    a) Card Variables, Cost Inputs and Key rates for each card Variant.
    b) Net Present Value, Return on Assets and Open Accounts for each variant.
    c) Net present Value, Terminal Value, Final NPV of each variant.
    d) Card Variables, Cost Inputs and Key rates for a specific card are chosen on the Input Sheet.
    e) Net Present Value, Present Values and Open Accounts for specific card chose on Input sheet.

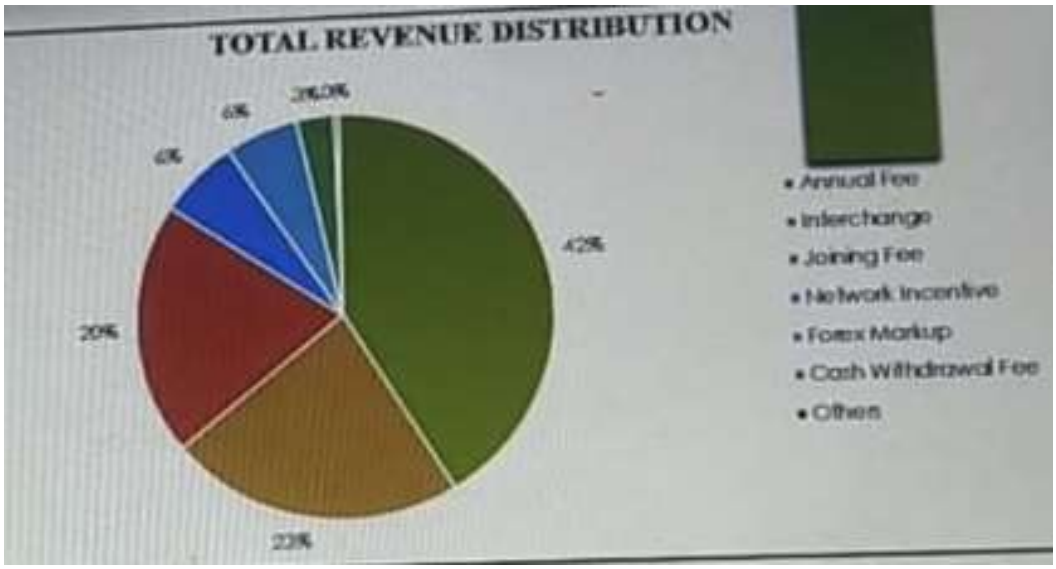
2. Card wise estimated NPV and ROA are plotted for both summary sheets.
3. Another plot which can also be useful is NPV Profitability Waterfall for each card variant separately.
4. We have also plotted Yearly Revenue and Profit for FY16-22 and Monthly Revenue Analysis for Fy22.
5. A comparison between Q3 and Q4 is plotted for each of the cards.
6. NPV Distribution is plotted using stacked column bar chart.
7. NPV and ROA are plotted for both quarters using combined bar and line chart.
8. Yearly and monthly revenue and profits are plotted on linear graphs.
9. Sources of Income and Opex distribution are presented through pie-charts.
10. NPV Waterfall Profitability is plotted.

13. Plots and Charts:

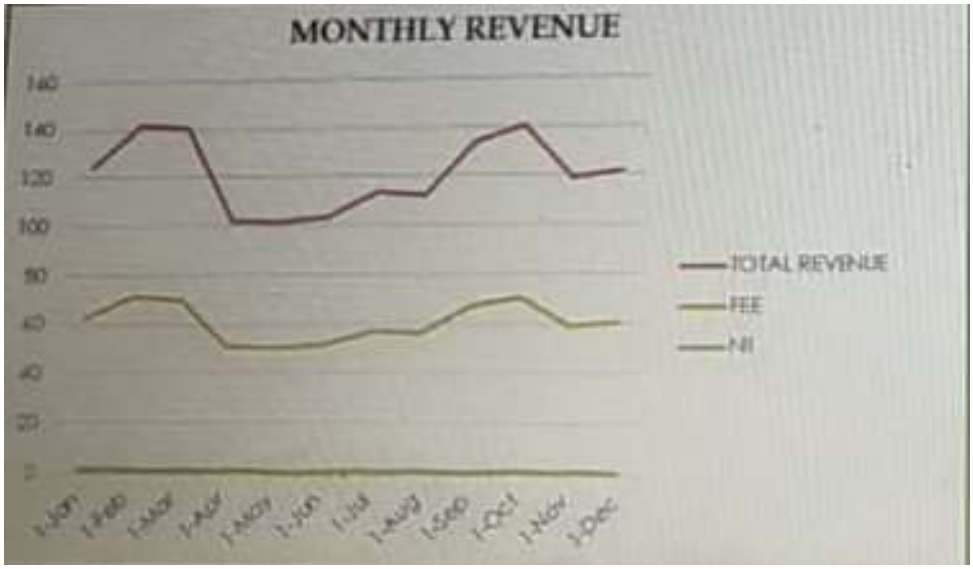
a. Opex Distribution:



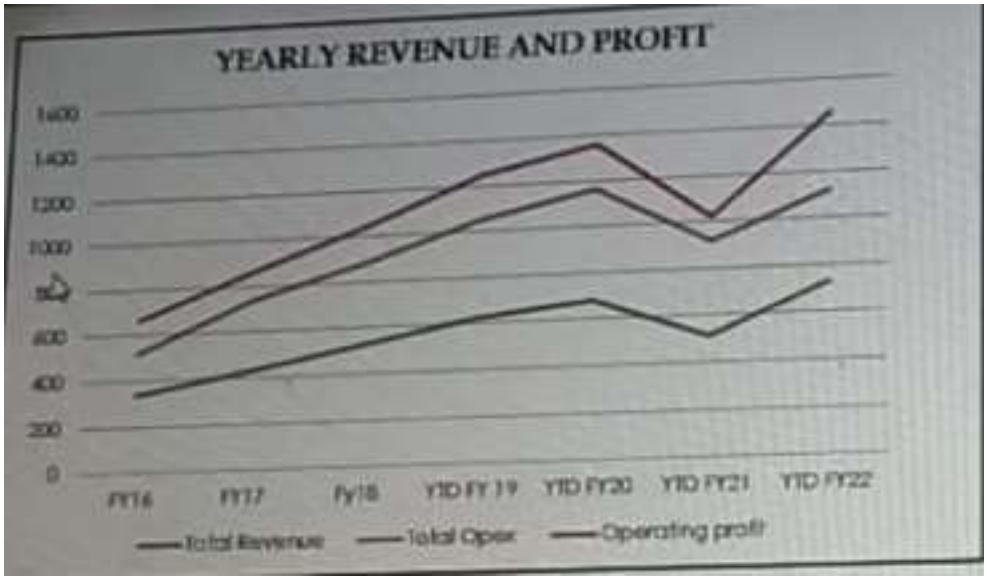
b. Total Revenue Distribution:



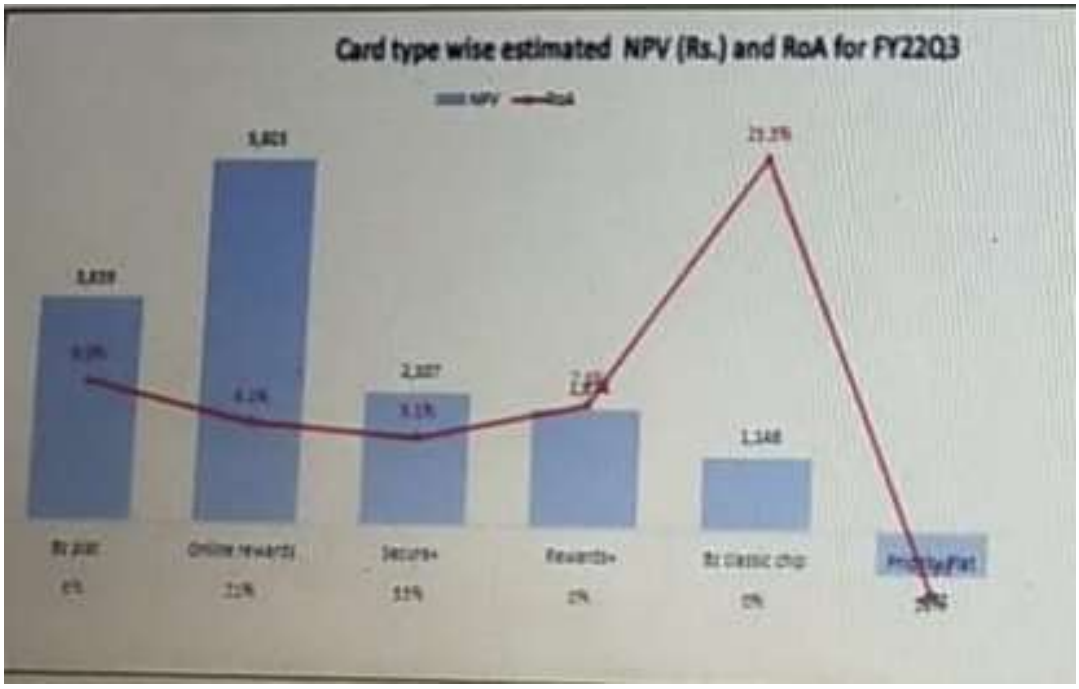
c. Monthly Revenue and Profit



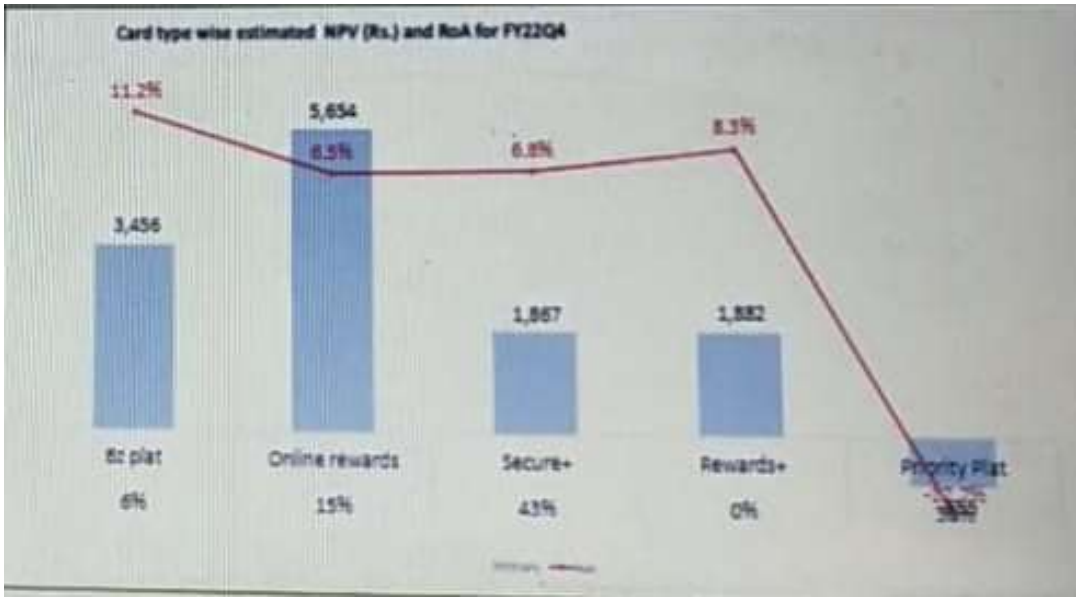
d. Annual Revenue and Profit



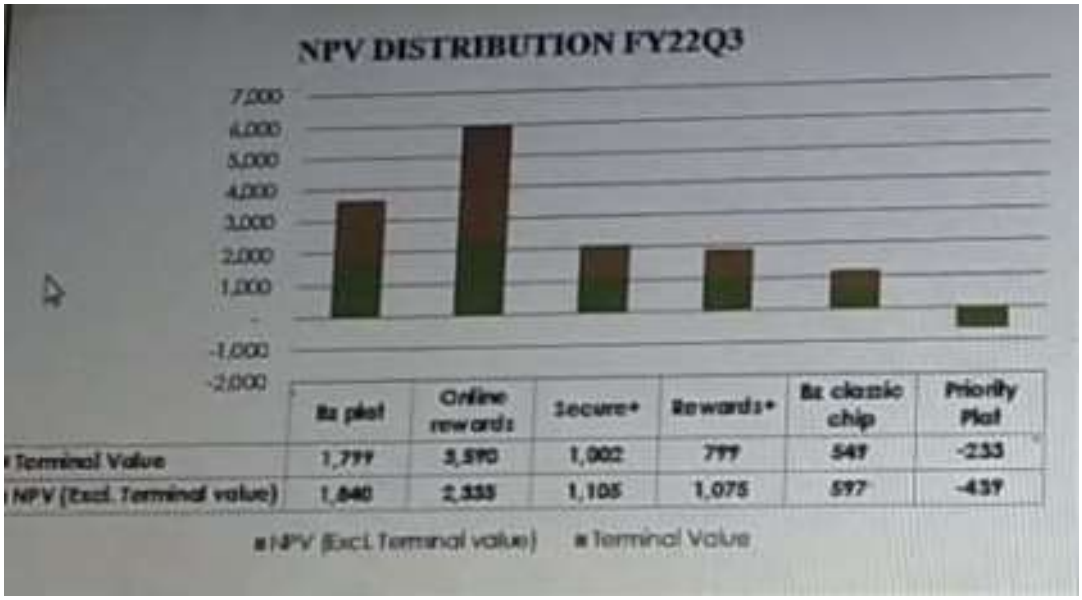
e. Card type wise estimated NPV for FY22Q3



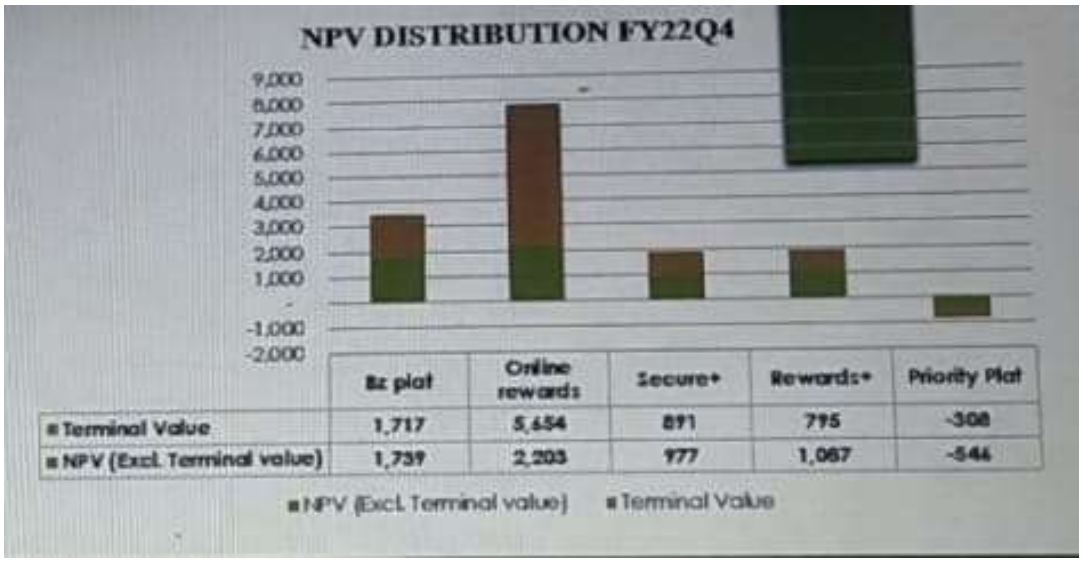
f. Card type wise estimated NPV for FY22Q4



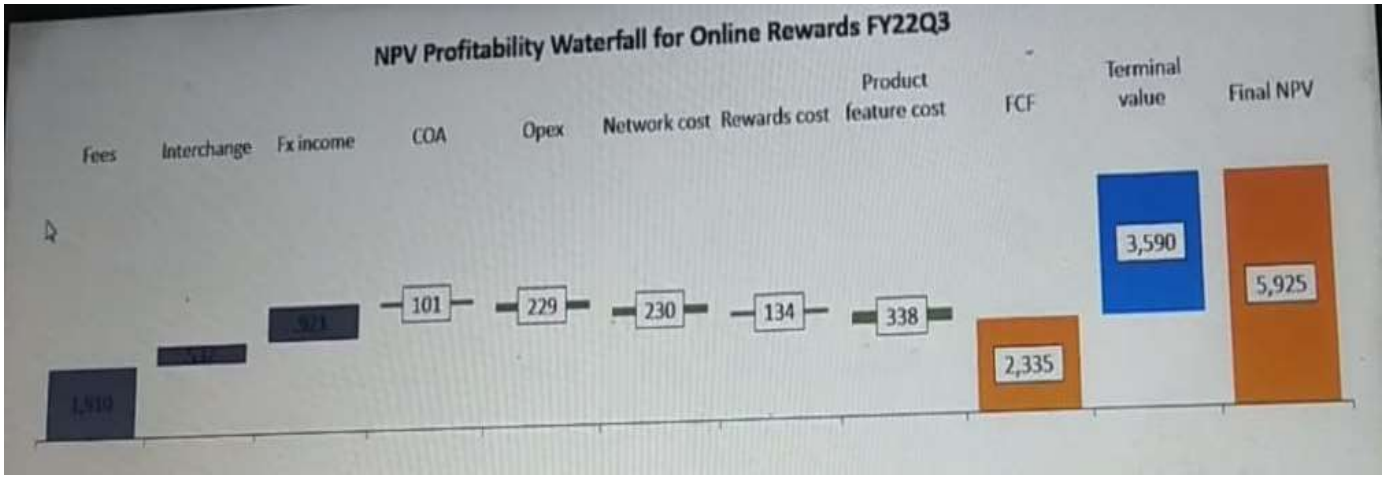
g. NPV Distribution for FY22Q3



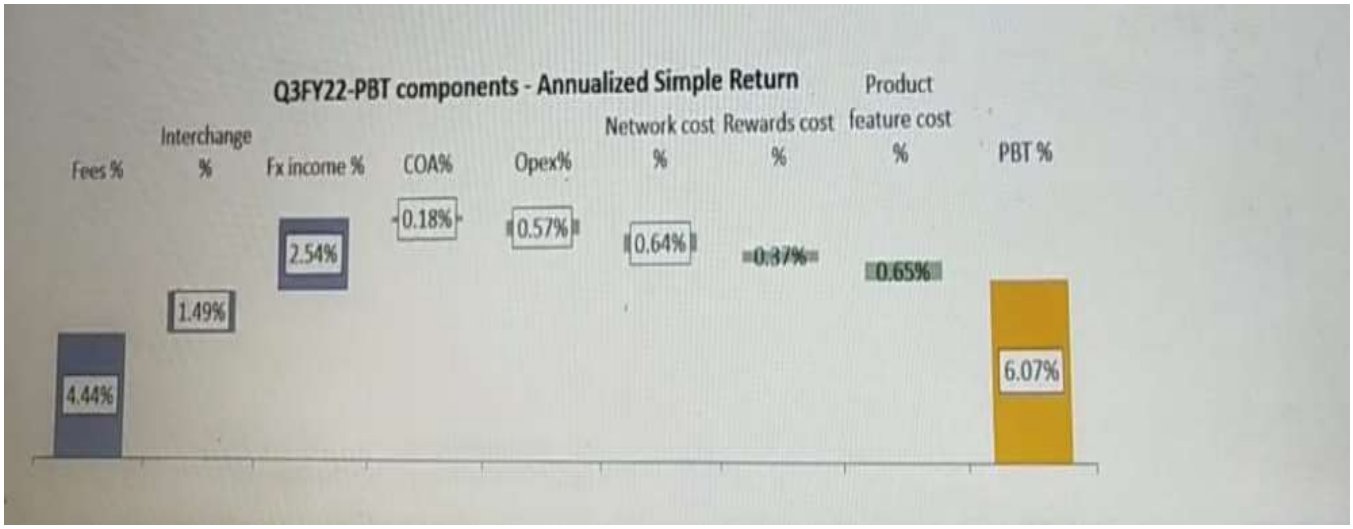
h. NPV Distribution for FY22Q4



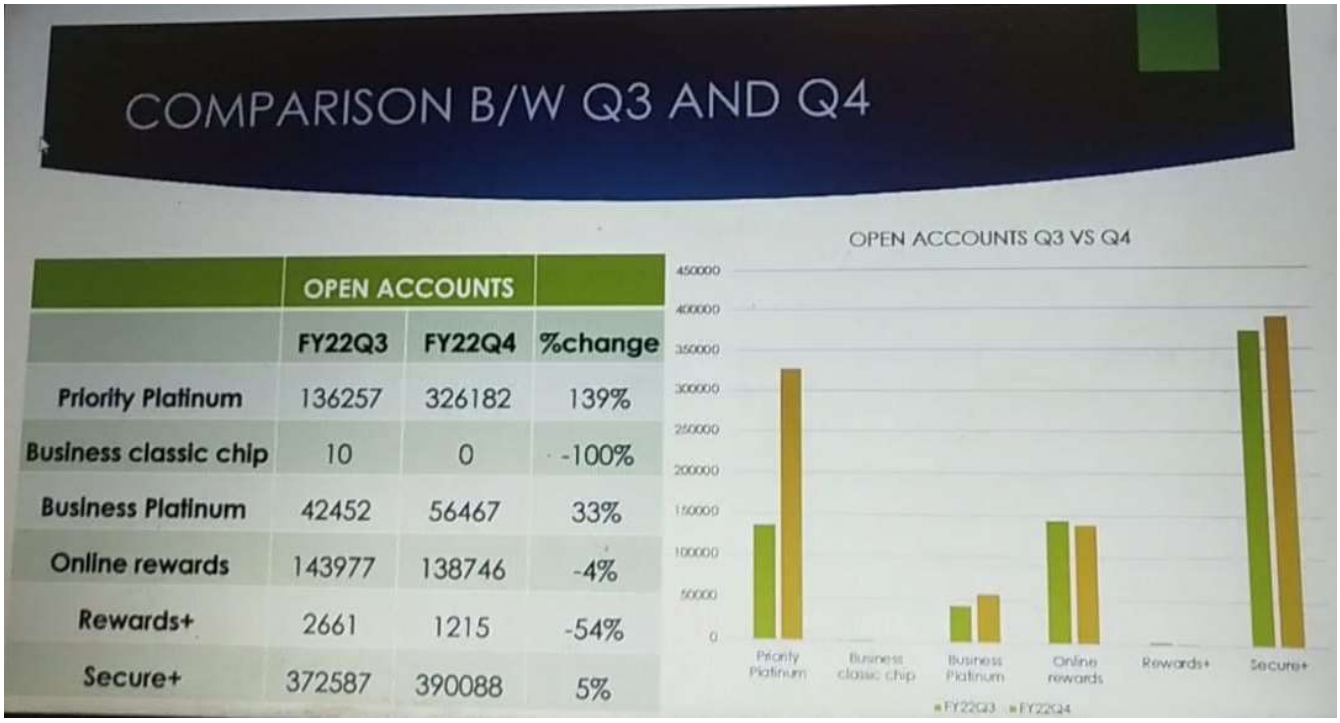
i. NPV Profitability Waterfall



j. Annualized Simple Return

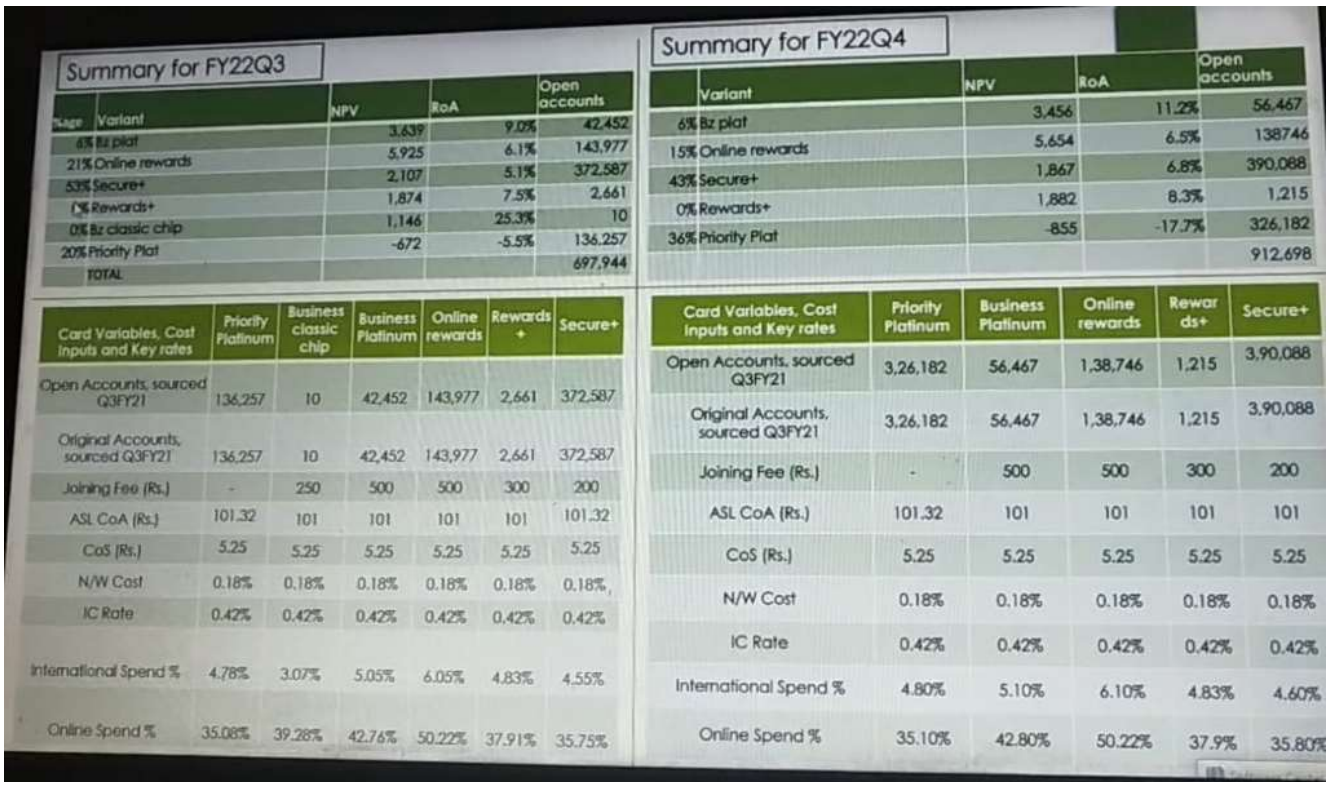


14. FY22Q3 vs FY22Q4



	OPEN ACCOUNTS		
	FY22Q3	FY22Q4	%change
Priority Platinum	136257	326182	139%
Business classic chip	10	0	-100%
Business Platinum	42452	56467	33%
Online rewards	143977	138746	-4%
Rewards+	2661	1215	-54%
Secure+	372587	390088	5%

15. SUMMARY DATA



Summary for FY22Q3

Share	Variant	NPV	RoA	Open accounts
6%	Bz plat	3,639	9.0%	42,452
21%	Online rewards	5,925	6.1%	143,977
53%	Secure+	2,107	5.1%	372,587
1%	Rewards+	1,874	7.5%	2,661
0%	Bz classic chip	1,146	25.3%	10
20%	Priority Plat	-672	-5.5%	136,257
	TOTAL			697,944

Card Variables, Cost inputs and Key rates	Priority Platinum	Business classic chip	Business Platinum	Online rewards	Rewards +	Secure+
Open Accounts, sourced Q3FY21	136,257	10	42,452	143,977	2,661	372,587
Original Accounts, sourced Q3FY21	136,257	10	42,452	143,977	2,661	372,587
Joining Fee (Rs.)	-	250	500	500	300	200
ASL CoA (Rs.)	101.32	101	101	101	101	101.32
CoS (Rs.)	5.25	5.25	5.25	5.25	5.25	5.25
N/W Cost	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%
IC Rate	0.42%	0.42%	0.42%	0.42%	0.42%	0.42%
International Spend %	4.78%	3.07%	5.05%	6.05%	4.83%	4.55%
Online Spend %	35.08%	39.28%	42.76%	50.22%	37.91%	35.75%

Summary for FY22Q4

Share	Variant	NPV	RoA	Open accounts
6%	Bz plat	3,456	11.2%	56,467
15%	Online rewards	5,654	6.5%	138746
43%	Secure+	1,867	6.8%	390,088
0%	Rewards+	1,882	8.3%	1,215
36%	Priority Plat	-855	-17.7%	326,182
				912,698

Card Variables, Cost inputs and Key rates	Priority Platinum	Business Platinum	Online rewards	Rewards+	Secure+
Open Accounts, sourced Q3FY21	3,26,182	56,467	1,38,746	1,215	3,90,088
Original Accounts, sourced Q3FY21	3,26,182	56,467	1,38,746	1,215	3,90,088
Joining Fee (Rs.)	-	500	500	300	200
ASL CoA (Rs.)	101.32	101	101	101	101
CoS (Rs.)	5.25	5.25	5.25	5.25	5.25
N/W Cost	0.18%	0.18%	0.18%	0.18%	0.18%
IC Rate	0.42%	0.42%	0.42%	0.42%	0.42%
International Spend %	4.80%	5.10%	6.10%	4.83%	4.60%
Online Spend %	35.10%	42.80%	50.22%	37.9%	35.80%

16. Getting Insights:

FOR FY22Q3:

- Secure+ cards have the maximum Accounts opened with a majority of 53%.
- Max NPV is achieved by Online rewards card.
- Business Classic Chip has max ROA

FOR FY22Q4:

- Secure+ cards have maximum Accounts opened with a majority of 43%.
- Max NPV is achieved by Online rewards card.
- Business Platinum has max ROA

- Annual Fee and Interchange Fee constitute the majority of the Total Revenue Distribution d. Master Card/ Visa Expense and Printing Expense constitute majority of the Opex.

- Seeing the Yearly Profit and Revenue Plot from Fy16 Fy22 we can analyze that there is drastic decrease in revenues and profits from FY21 to FY22. This may have occurred due to the Covid Pandemic.

17. Conclusion:

Let me conclude my project on Valuation Modelling for product Debit Card.

I. Firstly, I have gained some basic knowledge on SAS, SQL, Valuation Modelling and all other terms and norms which are going to be used in this project.
II. Secondly, we managed to extract some raw data for our project from other responsible BIU teams.
III. Thirdly, we converted this raw data into some meaningful data in order to understand and ease the process of analysis.
IV. Next step was calculating revenue, NPV, Terminal Values etc. Using financial formulas. V. Then we plotted various charts and graphs to enhance our analysis.
V. At last, we added summary of data points and insights we got these data points.

18. Key Learnings:

1. Introduction to Valuations.

2. Understanding Profits and Cash Flows

3. Understanding Financial terms like NPV and Terminal Value

4. Use of Data Science in Financial sector.

5. Working with Financial Analytics domain problems

6. Working with supervised & unsupervised datasets (end to end) including collection and cleaning of said data.

7. Working with a team in an organizational hierarchy

19. References

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