

## Defining the Question (The Problem Statement).

During the Fiscal Year 2022-23, there was a huge public outcry regarding the state of Non-Performing Loans (NPLs) in the banking sector in Nepal. The purpose of this analysis is to figure out the state of loans provided by the BFIs in Nepal. Further, the study tries to find out the following:

- The proportion of fixed and current asset-based loans in the industry. The higher the proportion of fixed asset-backed loans, the lower the chance of banks being insolvent.
- To figure out the change in business models of individual banks. Significant changes in the proportion of loans to different sectors indicate a bank's interest in a specific industry.
- To find out the change in DSL (Deprived Sector Lending). We required this to assess the change in loans given to the Microfinance industry.

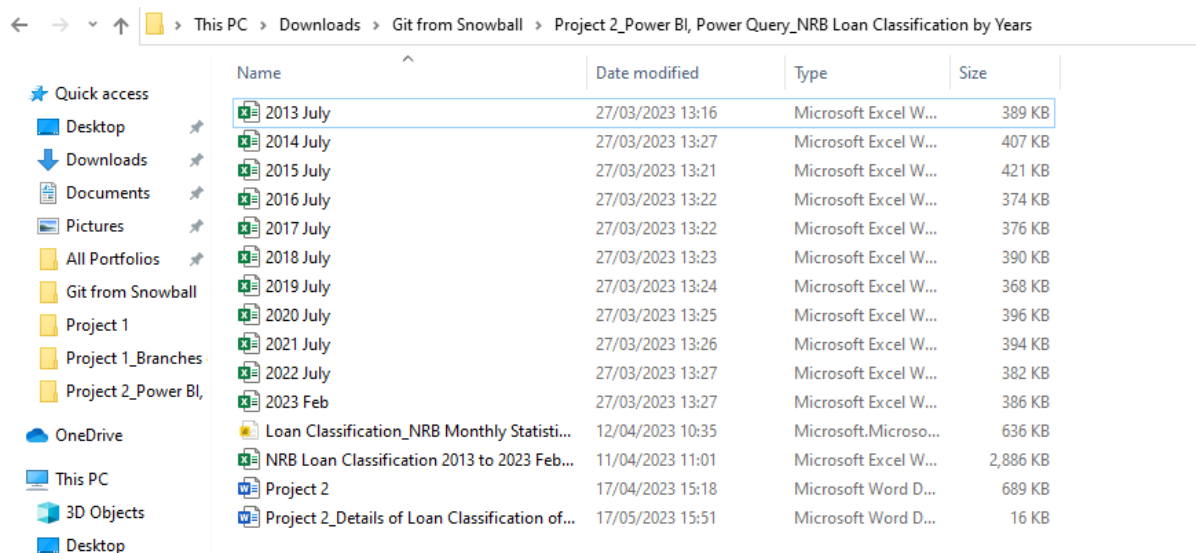
## Collecting the Data.

Data was collected from Nepal Rastra Bank's website. Nepal Rastra Bank or NRB is the central bank of Nepal. <https://www.nrb.org.np/category/monthly-statistics/?department=bfr>

**Time period of the study:** July 2013 to Feb 2023

**Background:** NRB publishes provisional Banking and Financial Statistics each month. Each publication is around 60 pages long and contains details of financial statements of loans and deposits of individual and industry-wise data of Commercial Banks, Development Banks, Finance Companies, and only industry-wise data of Microfinance Institutions.

Before July 2021, only pdf files were uploaded. We have converted the pdf files to Excel files using [www.ilovepdf.com](http://www.ilovepdf.com), and kept in a folder.



Name	Date modified	Type	Size
2013 July	27/03/2023 13:16	Microsoft Excel W...	389 KB
2014 July	27/03/2023 13:27	Microsoft Excel W...	407 KB
2015 July	27/03/2023 13:21	Microsoft Excel W...	421 KB
2016 July	27/03/2023 13:22	Microsoft Excel W...	374 KB
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2018 July	27/03/2023 13:23	Microsoft Excel W...	390 KB
2019 July	27/03/2023 13:24	Microsoft Excel W...	368 KB
2020 July	27/03/2023 13:25	Microsoft Excel W...	396 KB
2021 July	27/03/2023 13:26	Microsoft Excel W...	394 KB
2022 July	27/03/2023 13:27	Microsoft Excel W...	382 KB
2023 Feb	27/03/2023 13:27	Microsoft Excel W...	386 KB
Loan Classification_NRB Monthly Statisti...	12/04/2023 10:35	Microsoft.Microso...	636 KB
NRB Loan Classification 2013 to 2023 Feb...	11/04/2023 11:01	Microsoft Excel W...	2,886 KB
Project 2	17/04/2023 15:18	Microsoft Word D...	689 KB
Project 2_Details of Loan Classification of...	17/05/2023 15:51	Microsoft Word D...	16 KB

Following is a snapshot of the data from the central bank's website.

Statement of Credit as on Mangsir end, 2079(Mid-Dec, 2022)

Amt in Mn of Rs

BFI Name	NBL	RBB	NABIL	NIBL	SCBNL	HBL	NSBI
<b>Sector Wise</b>							
Agricultural and Forest Related	7,242.71	16,336.47	15,763.86	7,185.78	8,144.76	10,246.31	6,693.11
Fishery Related	609.97	1,008.03	607.50	210.99	-	213.29	63.07
Mining Related	2,876.93	-	415.30	283.86	-	-	254.15
Manufacturing (Producing) Related	40,190.25	28,428.69	59,231.24	55,271.20	13,418.45	58,321.27	33,342.59
Construction	1,780.11	3,603.45	3,016.18	4,562.60	7,303.23	1,199.96	1,978.43
Electricity, Gas and Water	11,372.17	15,528.52	19,003.30	15,812.47	5,702.27	4,957.73	7,082.43
Metal Products, Mach. & Ele. Eqp.	4,730.10	2,388.22	3,229.50	1,439.65	3,321.86	10,078.98	2,261.24
Tras., Com. and Public Utilities	2,442.17	1,475.78	2,488.43	1,843.48	3,612.35	3,383.17	239.23
Wholesaler & Retailer	28,325.31	50,719.26	75,509.06	33,444.27	25,215.45	32,329.62	27,820.29
Finance, Insurance and Real Estate	8,328.16	26,661.08	12,620.24	12,028.79	5,100.72	13,932.69	5,443.88
Hotel or Restaurant	7,314.51	11,235.13	9,033.93	14,090.45	1,593.75	6,529.46	6,272.05
Other Services	6,759.30	7,525.22	27,006.40	17,427.63	1,695.91	4,711.34	1,987.16
Consumption Loans	53,448.69	63,408.07	39,909.76	10,919.95	15,821.04	9,888.60	16,158.09
Local Government	-	-	-	383.43	138.81	255.20	-
Others	2,608.54	828.33	49,224.97	4,031.05	227.05	5,858.26	9,630.61
<b>TOTAL sectorwise</b>	<b>178,028.93</b>	<b>229,146.25</b>	<b>317,059.67</b>	<b>178,935.59</b>	<b>91,295.65</b>	<b>161,905.86</b>	<b>119,226.33</b>

<b>Product Wise</b>							
Term Loan	40,052.59	50,364.53	57,089.15	59,996.43	7,806.60	40,307.02	28,202.28
Overdraft	33,383.71	23,928.31	47,075.58	20,695.67	6,222.12	15,146.74	1,133.63
Trust Receipt Loan / Import Loan	2,018.31	986.59	8,312.87	11,485.12	6,643.58	8,126.18	1,996.88
Demand & Other Working Capital Loan	29,888.50	37,790.39	91,072.70	55,787.10	31,151.90	65,618.82	44,504.08
Res. Per. H. Loan (Up to Rs. 15 mil.)	7,887.15	20,433.13	20,300.90	1,974.23	8,952.54	3,862.56	2,123.34
Real Estate Loan	9,465.50	16,363.89	17,519.60	7,756.06	7,601.84	6,896.43	5,470.63
Margin Nature Loan	3,546.08	4,424.49	6,892.64	1,760.97	-	1,208.87	32.41
Hire Purchase Loan	2,701.60	5,109.98	8,285.00	2,716.19	4,645.17	6,474.52	2,582.92
Deprived Sector Loan	10,844.94	16,267.94	17,131.28	10,576.87	5,188.81	8,244.40	6,494.16
Bills Purchased	2.80	8.52	9.03	563.74	312.81	21.50	0.08
Other Product	38,237.74	53,468.48	43,370.91	5,623.21	12,770.27	5,998.82	26,685.92
<b>Total Product wise Loan</b>	<b>178,028.93</b>	<b>229,146.25</b>	<b>317,059.67</b>	<b>178,935.59</b>	<b>91,295.65</b>	<b>161,905.86</b>	<b>119,226.33</b>

<b>Collateral Wise</b>							
Gold and Silver	16,916.68	18,289.73	560.65	1,825.93	-	-	-
Government Securities	0.84	1,520.52	24.81	2.00	3,000.00	-	-
Non Governmental Securities	196.38	4,424.49	6,850.03	1,754.34	-	1,208.87	32.41
Fixed Deposit Receipts	877.58	1,106.33	2,386.97	1,019.66	6,196.65	698.53	1,264.82
Own	877.58	1,106.33	2,210.01	1,018.16	6,192.38	698.53	1,264.82
Other Licences Institutions	-	-	176.96	1.50	4.28	-	-
Collateral of Properties	151,398.47	178,068.58	248,283.99	162,035.70	73,128.77	154,739.78	100,826.36
Fixed Assets	133,543.86	177,866.17	165,177.55	145,794.86	56,897.15	154,739.78	50,455.71
Current Assets	17,854.62	202.41	83,106.43	16,240.84	16,231.62	-	50,370.65
Against security of Bill	741.37	5.89	2,509.01	40.36	-	21.50	1,998.76
Domestic Bills	-	-	70.66	10.00	-	8.96	-
Foreign Bills	741.37	5.89	2,438.35	30.36	-	12.54	1,998.76
Against Guarantee	6,005.34	25,684.55	7,718.33	5,638.99	1,428.53	5,036.68	5,869.12
Government Guarantee	29.38	-	91.30	383.43	138.81	-	156.08
Institutional Guarantee	5,257.80	15,533.88	5,863.24	3,808.03	1,289.73	-	5,244.49
Personal Guarantee	278.82	10,106.07	1,755.82	1,447.09	-	-	-
Collective Guarantee	5.27	44.60	7.98	-	-	-	-
Int. Rtd. Foreign Bank's Guarantee	41.78	-	-	-	-	141.46	468.55
Other Guarantee	392.28	-	-	0.43	-	4,895.22	-
Credit Card	0.00	6.34	620.32	58.76	415.63	200.51	-
Others	1,892.27	39.82	48,105.57	6,559.84	7,126.06	-	9,234.85
<b>Total</b>	<b>178,028.93</b>	<b>229,146.25</b>	<b>317,059.67</b>	<b>178,935.59</b>	<b>91,295.65</b>	<b>161,905.86</b>	<b>119,226.33</b>

## Cleaning the Data.

Each of the 11 Excel files had at least 40 tables. Only 10-15 tables were required for our study.

Macros were used initially to convert the tables into Excel recognizable tables and nomenclature was given to each table as "TableN", where "N" stands for 1,2,3,..., N.

This nomenclature was required to distinguish the tables required for the study from other tables.

All 11 Excel files were loaded in a new Excel file using **Power Query**.

Only required tables were selected for the study using:

X ✓ fx		= Table.AddColumn(Source, "Workbook Objects", each Excel.Workbook(File.Contents([Folder Path]&"\"&[Name]),null,true))						
X ✓ fx		= Table.SelectRows("#Expanded Workbook Objects", each not Text.Contains([Name.1], "Table "))						
X ✓ fx		= Table.AddColumn(Source, "Workbook Objects", each Excel.Workbook(File.Contents([Folder Path]&"\"&[Name]),null,true))						
	Content	Name	Extension	Date accessed	Date modified	Date created	Attributes	Folder Path
1	Binary	2013 July.xlsx	.xlsx	17/05/2023 15:15:11	27/03/2023 13:16:21	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
2	Binary	2014 July.xlsx	.xlsx	17/05/2023 15:15:16	27/03/2023 13:27:59	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
3	Binary	2015 July.xlsx	.xlsx	17/05/2023 15:15:16	27/03/2023 13:21:16	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
4	Binary	2016 July.xlsx	.xlsx	17/05/2023 15:15:18	27/03/2023 13:22:01	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
5	Binary	2017 July.xlsx	.xlsx	17/05/2023 15:15:18	27/03/2023 13:22:39	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
6	Binary	2018 July.xlsx	.xlsx	17/05/2023 15:15:18	27/03/2023 13:23:19	20/03/2023 16:41:47	Record	C:\Users\user\Downloads\
7	Binary	2019 July.xlsx	.xlsx	17/05/2023 15:15:18	27/03/2023 13:24:16	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
8	Binary	2020 July.xlsx	.xlsx	17/05/2023 15:15:18	27/03/2023 13:25:21	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
9	Binary	2021 July.xlsx	.xlsx	17/05/2023 15:15:18	27/03/2023 13:26:27	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
10	Binary	2022 July.xlsx	.xlsx	17/05/2023 15:15:18	27/03/2023 13:27:21	17/03/2023 13:05:21	Record	C:\Users\user\Downloads\
11	Binary	2023 Feb.xlsx	.xlsx	17/05/2023 15:15:18	27/03/2023 13:27:55	20/03/2023 15:43:27	Record	C:\Users\user\Downloads\

The following steps were used to clean the data:

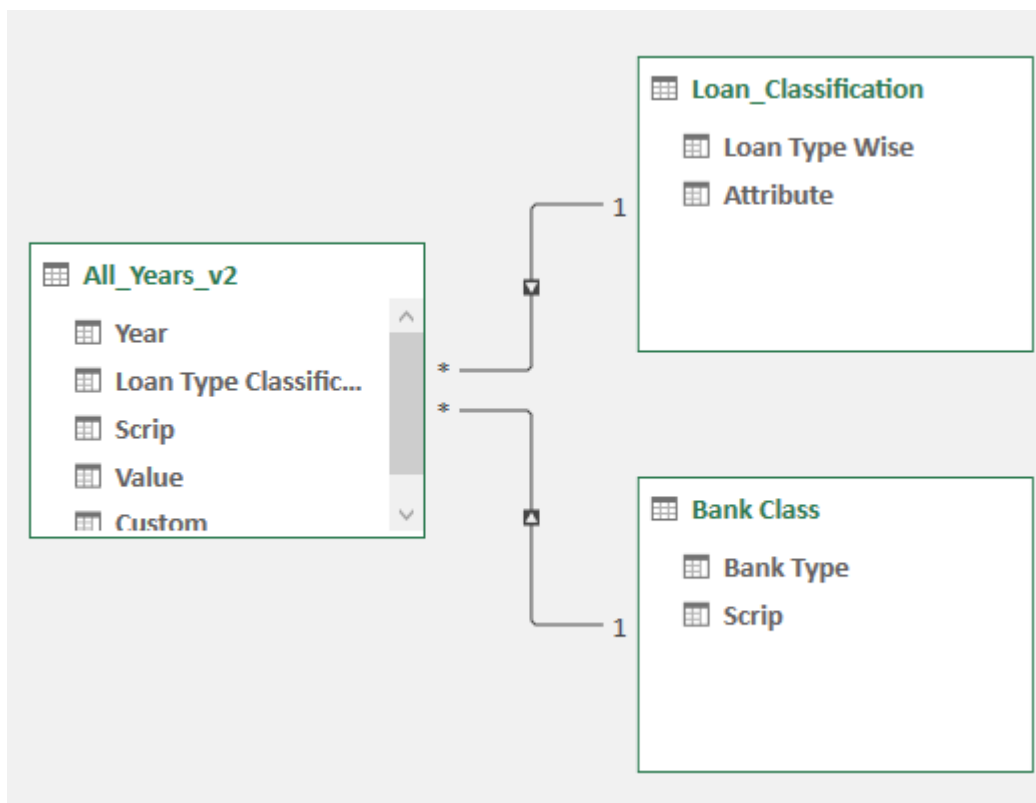
APPLIED STEPS	
Source	✖
Custom1	✖
Removed Columns	
Expanded Workbook Objects	✖
Filtered Rows	✖
Expanded Data	✖
Removed Columns1	
Unpivoted Other Columns	
Changed Type	
Replaced Errors	✖
Inserted Text Before Delimiter	✖
Reordered Columns	
Removed Columns2	
Renamed Columns	
Filtered Rows1	✖
Replaced Value	✖
Replaced Value1	✖
Replaced Value2	✖
Replaced Value3	✖
Replaced Value4	✖
Replaced Value5	✖
Replaced Value6	✖
Replaced Value7	✖
Replaced Value8	✖
Replaced Value9	✖
Rounded Down	
Added Conditional Column	✖
Removed Columns3	
Added Custom	✖

Multiple “Replaced Value” was used to filter out the non-listed, merged, or acquired banks.

Finally, the data were transformed into five columns and 33,908 rows. It was then loaded to the Excel sheet and added to the data model.

	A <sup>B</sup> <sub>C</sub> Year	A <sup>B</sup> <sub>C</sub> Loan Type Classification	A <sup>B</sup> <sub>C</sub> Scrip	1 <sup>2</sup> <sub>3</sub> Value	ABC <sub>123</sub> Custom
1	2013	Agricultural and Forest Related	NBL	1038	10.38
2	2013	Agricultural and Forest Related	RBB	1271	12.71
3	2013	Agricultural and Forest Related	NABIL	806	8.06
4	2013	Agricultural and Forest Related	NIBL	1097	10.97
5	2013	Agricultural and Forest Related	SCBNL	470	4.7
6	2013	Agricultural and Forest Related	HBL	1305	13.05
7	2013	Agricultural and Forest Related	NSBI	1129	11.29
8	2013	Agricultural and Forest Related	NBB	214	2.14
9	2013	Agricultural and Forest Related	EBL	2085	20.85
10	2013	Agricultural and Forest Related	BOK	606	6.06
11	2013	Agricultural and Forest Related	NCC	589	5.89
12	2013	Agricultural and Forest Related	NIC	459	4.59
13	2013	Agricultural and Forest Related	Lumbini	409	4.09
14	2013	Agricultural and Forest Related	MBL	96	0.96

Following relationships were created among the three tables based on a primary fields “Scrip” and “Loan Type Classification”.



## Analyzing the Data.

**Pivot Tables** were used to analyse various useful trends.

Loan Type V Collateral V Year

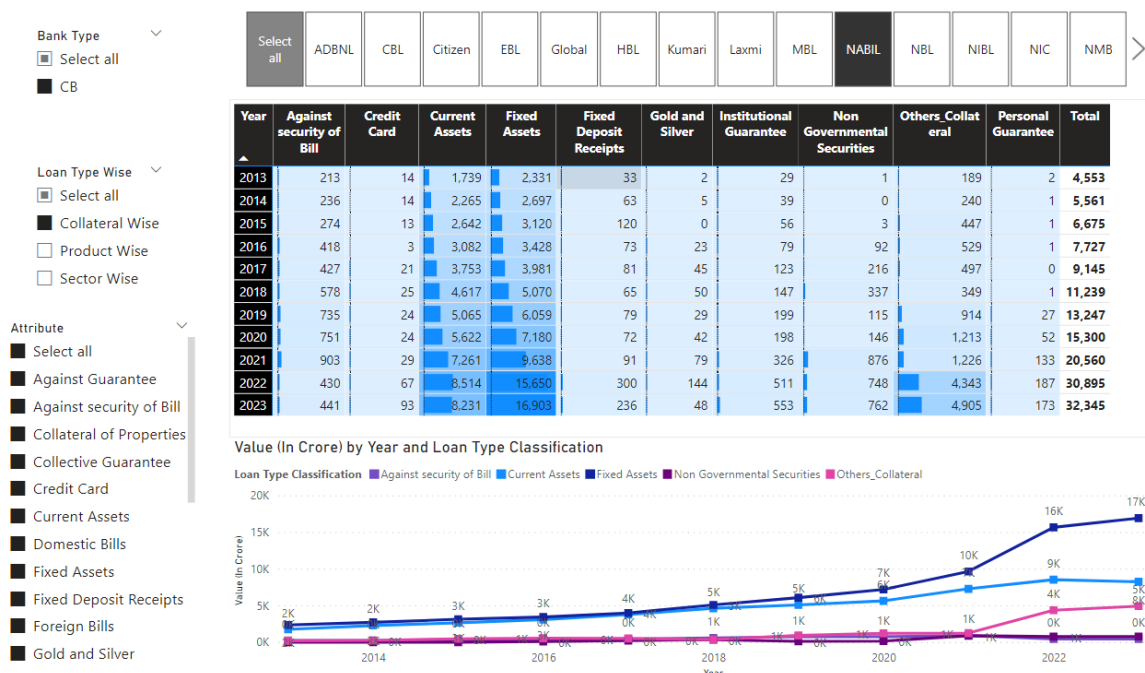
Sum of Custom	Column Labels	Current Assets	Fixed Assets	Institutional Guarantee	Non Governmental Securities	Others_Collateral	Grand Total
Row Labels							
2013		34%	63%	2%	1%	0%	100%
2014		38%	53%	3%	5%	1%	100%
2015		39%	50%	4%	8%	0%	100%
2016		42%	48%	4%	7%	0%	100%
2017		41%	52%	4%	3%	0%	100%
2018		34%	60%	5%	2%	0%	100%
2019		23%	72%	5%	1%	0%	100%
2020		11%	81%	7%	0%	0%	100%
2021		4%	88%	6%	2%	0%	100%
2022		3%	89%	5%	1%	2%	100%
2023		3%	90%	5%	0%	3%	100%
Grand Total		14%	78%	5%	2%	1%	100%

**Bank Type**

CB
DB
Finance

**Loan Type Wise**

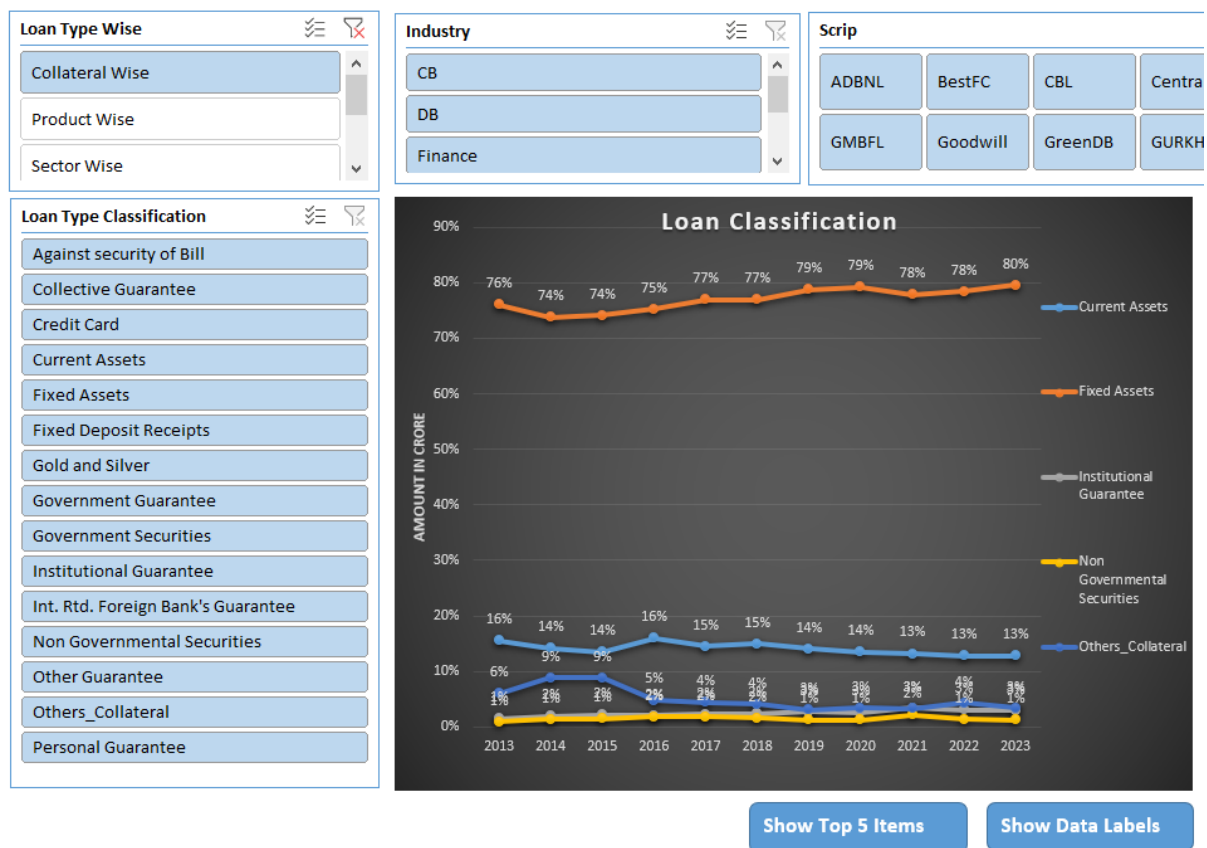
Collateral Wise
Product Wise
Sector Wise



## Visualizing the Data.

A Dynamic visualization was possible using **Pivot Charts and Power BI** and the questions defined in the problem statement were answered.

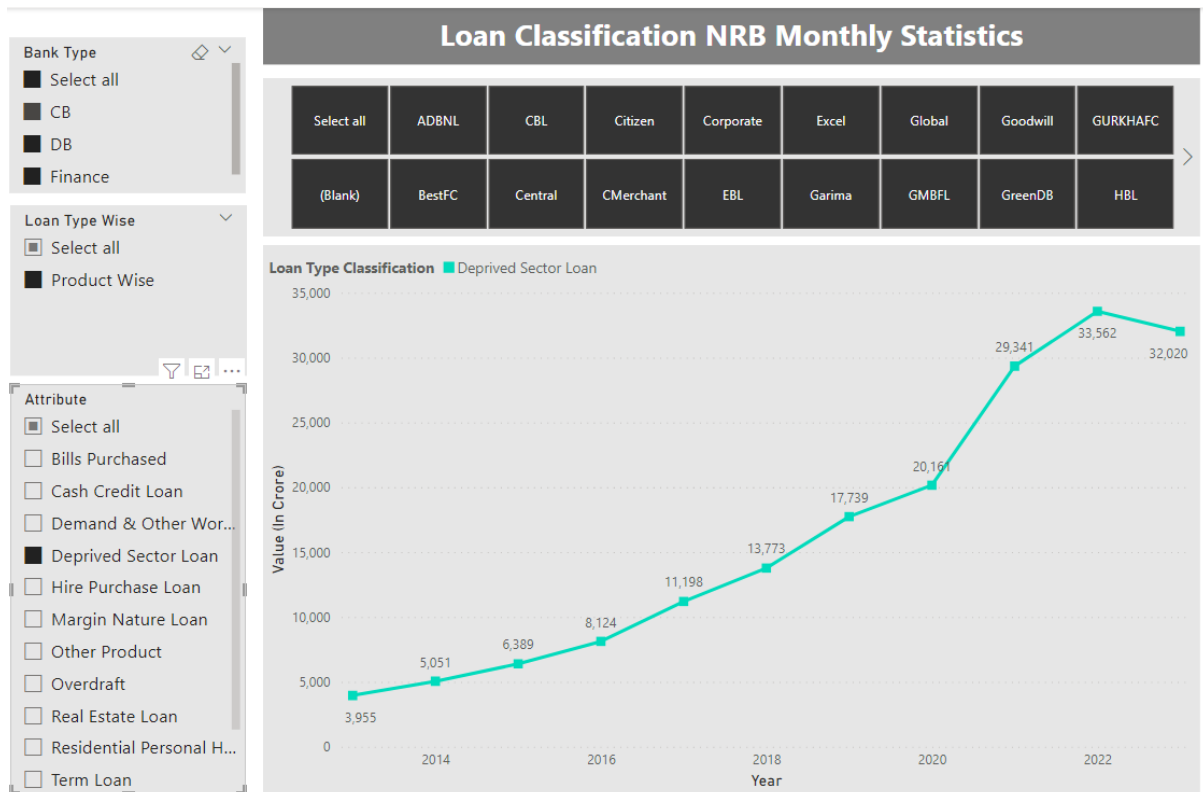
- 80% of loans from Commercial banks, Development banks, and Finance companies were backed by Fixed assets-based collateral. This indicates a strong position of banks in Nepal to recover losses as they are mostly backed by fixed assets.



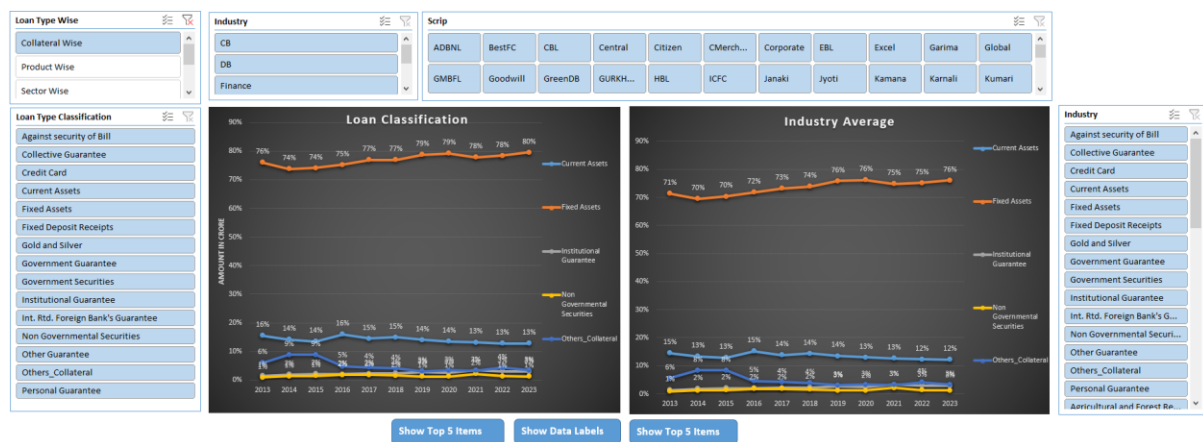
- We saw a change in NIC Asia Bank's business model from wholesale to retail from 2017 onwards as fixed assets-backed loans started to shoot up while the current assets-backed loans continued to decline.



- We figured out that the DSL, which was in increasing trend from 2013 to 2022, declined by 1,500 crores in Feb 2023. This might have negative implications for microfinance companies in the years to come.



## Dashboard in Excel:





## Dashboard in Power BI:

Bank Type

☐ Select all
 

☒ CB
 ☐ DB
 ☐ Finance

Loan Type Wise

☐ Select all
 

☒ Collateral Wise
 ☐ Product Wise
 ☐ Sector Wise

Attribute

☒ Select all
 ☐ Against Guarantee
 ☐ Against security of Bill
 ☐ Collateral of Properties
 ☐ Collective Guarantee
 ☐ Credit Card
 ☐ Current Assets
 ☐ Domestic Bills
 ☐ Fixed Assets
 ☐ Fixed Deposit Receipts
 ☐ Foreign Bills
 ☐ Gold and Silver

Loan Classification NRB Monthly Statistics

Select all

ADBNL

Citizen

Global

Kumari

MBL

NBL

NIC

NSBI

Prime

Sanima

SCBNL

(Blank)

CBL

EBL

HLB

Laxmi

NABIL

NIBL

NMB

Prabhu

RBB

SBL

Sunrise

Loan Type Classification

Current Assets

Fixed Assets

Institutional Guarantee

Non Governmental Securities

Others\_Collateral

Value (In Crore)

Year

Year	Current Assets	Fixed Assets	Institutional Guarantee	Non Governmental Securities	Others_Collateral
2013	1,390	1,997	193	48	91
2014	1,390	1,997	193	48	91
2015	1,390	1,997	193	48	91
2016	2,448	2,803	193	48	91
2017	3,731	3,731	193	48	91
2018	4,066	7,126	193	48	91
2019	3,364	10,679	193	48	91
2020	1,878	14,078	193	48	91
2021	1,016	23,220	193	48	91
2022	752	23,770	193	48	91
2023	724	24,968	193	48	91

Loans in Crore

28,218

Year

2013

2019

2014

2020

2015

2021

2016

2022

2017

2023

2018