

### Objective

- To get and compare the prediction accuracy of all Defaulters by Sriya Auto-AI and SXI enabled Precision AI<sup>2</sup>.
- Target **20% increase** in Non-Defaulters rate from current levels.

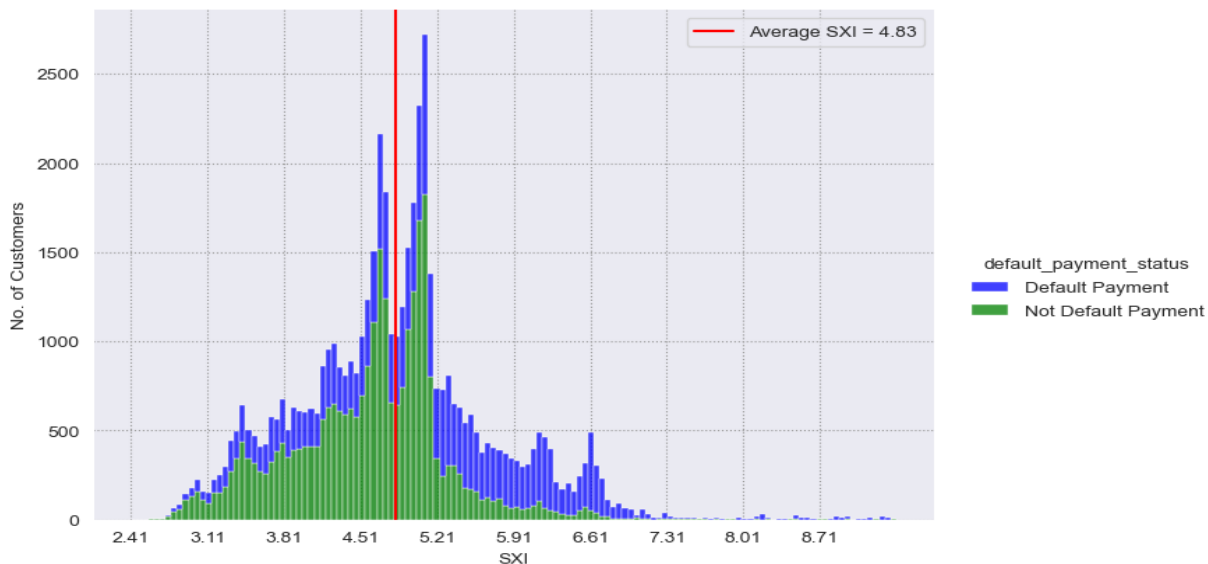
### SXI Hypothesis

- SXI is a proxy/surrogate for all features responsible for ensuring Default or Not Defaulters conversion rate.
- The lower the SXI, the better is the Not Defaulters conversion efficiency and hence decreasing SXI score should lead to decreased Defaulters conversion rate.

### SXI Definition

- **Sriya Expert Index (SXI)**: Dynamic score/index obtained from a proprietary formula consisting of weights from 10 ML algorithms. SXI is a super feature and is a true weighted representative of all important features. Converts a multi-dimensional hard to solve problem into a simpler 2-dimensional solution (problem solved).
- **SCORE + CORRELATE = IMPROVE**

## Discussion & Results



### 1. Exploratory Data Analysis

51,000 records were distributed to 28881 good and 22119 bad. Good are Non-Defaulters and Bad are defaulters. So, 56.62% is the current Non-Defaulters/good and 43.37% is Defaulters/bad.

## 2. SXI - Exploratory Data Analysis

Current Average SXI is **4.83**. No. of customers above 4.83 is **25186** and of these **13751** are defaulters and **11435** are non-defaulters. So, Defaulters (%) is **54.6%** and non-Defaulters is **45.4%**.

Correspondingly No. of customers below 4.83 is **25814** and of these **8368** are Defaulters and **17446** are non-Defaulters. So, Defaulters (%) is **32.41 %** and Not Defaulters is **67.58%**.

So SXI is a perfect proxy/surrogate for Defaulters and above average SXI ratio of good outcome is **0.8x** of the overall average and below average SXI ratio of good outcome is **1.19** overall average. So, the decrease in SXI leads to a decrease in Defaulters.

## 3. Predictive AI

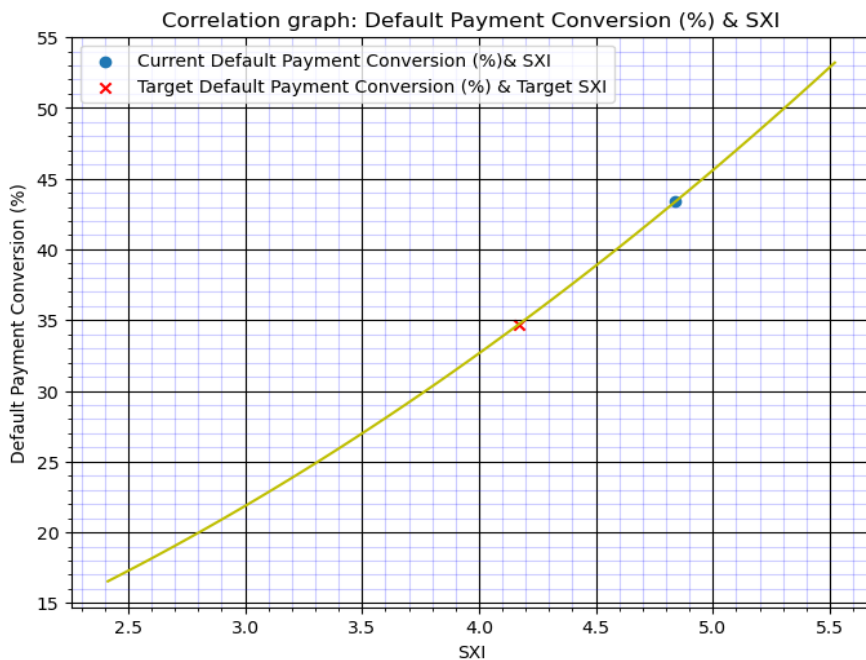
- Auto-AI Prediction accuracy is **93.79%** and the best performing algorithm is **Random Forest**.
- SXI Prediction accuracy of Defaulters is **99%**.
- Ratio of SXI/Auto-AI prediction accuracy is **1.05**.

## 4. Precision AI

The desired decrease in target outcome which is Defaulters rate is 20%. The original Defaulters % is **43.37%** so a **20%** decrease should lead to a **34.69%** of overall Defaulters ( $43.37 \times 0.8$ ). Which means **17695** of the customers from 51000 would become Defaulters rather than current **22119**.

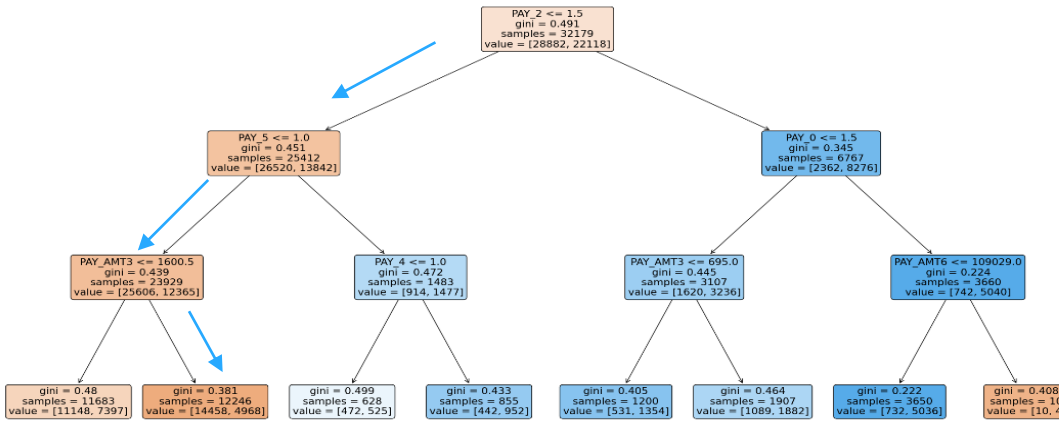
**4424 lesser number of people would default.**

The correlation between SXI and Defaulters Rate is **0.99**. This implies that SXI and Defaulters conversion rate are highly positively correlated to each other. Hence, a decrease in SXI will result in a decrease in Defaulters conversions.



## Current SXI and Target SXI Decision Trees

### a. Current SXI Decision Tree



#### Interpretation: -

**Node 1:** Repayment status in August more likely to be pay duly or payment delay for 1 month (No. of Non- Defaulter in parent node: 28882)

**Left split:** 26520 - majority positive class; gini:0.45, **Right Split:** 2362; gini:0.34

(Total value for the next split: 26520)

**Node 2:** Repayment status in May more likely to be pay duly.

**Left split:** 25606 - majority positive class; gini:0.43, **Right Split:** 914; gini:0.47

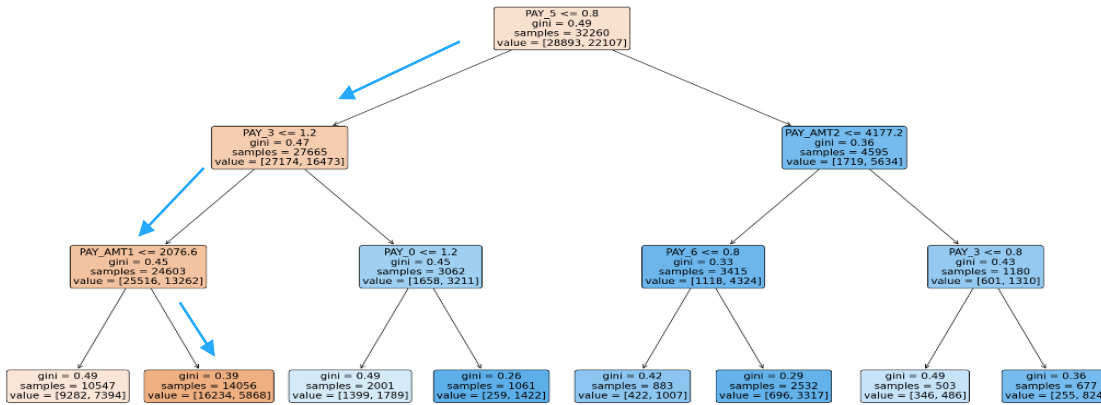
(Total value for the next split: 25606)

**Node 3:** Amount of previous payment in July in dollars  $\geq$  \$1600.5 (Right split so it is False symbol changes from  $<$  to  $>$ )

**Left split:** 11148; gini:0.48, **Right Split:** 14458 - majority positive class; gini:0.38 – Final Leaf Node

- ✓ **14458** customers are Non-Defaulters
- ✓ Success Ratio is: **54.51%**  $(14458/26520) * 100$  – (Total value of the positive class in the final leaf node/Total value of the positive class after first split) \* 100

**b. Target SXI Decision Tree**



Target SXI from correlation curve for 20% increase in target outcome of Non-Defaulters is **4.17**.

**Interpretation: -**

**Node 1:** Repayment status in May more likely to be pay duly (No. of Non-Defaulter in parent node: 28893)

**Left split:** 27174 - majority positive class; gini:0.47, **Right Split:** 1719; gini:0.36

(Total value for the next split: 27174)

**Node 2:** Repayment status in May more likely to be pay duly

**Left split:** 25516 - majority positive class; gini:0.45, **Right Split:** 1658; gini:0.45

(Total value for the next split: 25516)

**Node 3:** Amount of previous payment in September in dollars  $\geq$  \$2076.6 (Right split so it is False symbol changes from < to >)

**Left split:** 9282; gini:0.49, **Right Split:** 16234 - majority positive class; gini:0.39 – Final Leaf Node

- ✓ **16234** Customers are Non-Defaulters
- ✓ Success Ratio is: **59.74%** (16234/27174) \* 100 – (Total value of the positive class in the final leaf node/Total value of the positive class after first split) \* 100

## Conclusion

- SXI Prediction accuracy is **1.05** times Auto AI prediction accuracy and hence is **5%** superior.
- Customers whose SXI score is higher than current average SXI score of **4.83** have **83%** higher non-Defaulters rates than overall non-Defaulters average of all customers.
- Target **20%** decrease in Defaulters conversion rate is achievable by reducing target SXI to **4.17** from current **4.83** levels. This would result in **17695** were become Defaulters from current **22119** levels.

Initial Decrease from  
current levels:  
**20% or 4,424**

**SXI Impact  
Potential**

- This would result in **4424 lesser number of people as defaulters.**
- Based on the inference from the correlation graph w.r.t SXI there is a **potential 60% compounded decrease** if all recommendations in target SXI are completely implemented.

Compounding Decrease  
from current levels:  
**60% or 13,271**

**SXI Impact  
Potential**