

# SAS® GLOBAL FORUM 2016

IMAGINE. CREATE. INNOVATE.

SAS® ANALYTICS LENS ON

DEBT COLLECTION



#SASGF





# SAS® ANALYTICS LENS ON DEBT COLLECTION

Karush Jaggi, Thomas Waldschmidt, Dr. Goutam Chakraborty

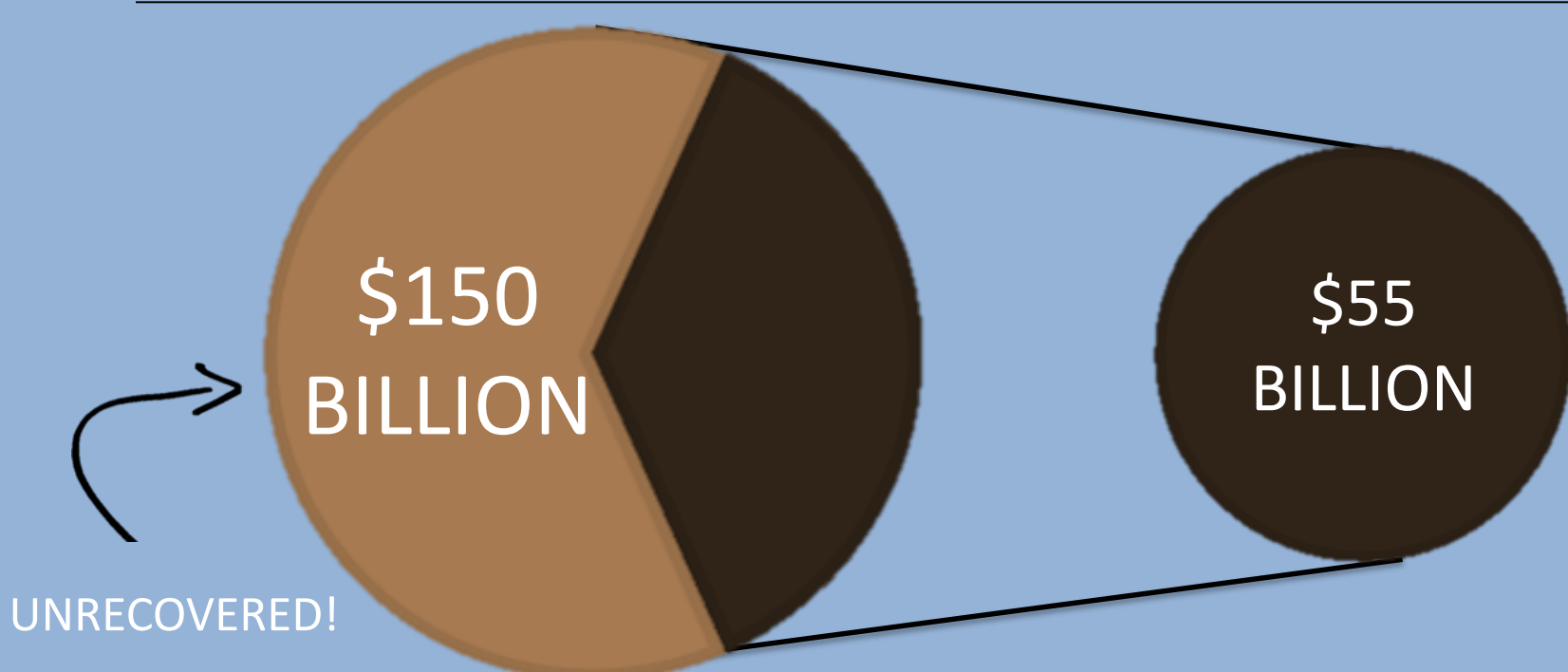
## INTRODUCTION TO DEBT COLLECTION



# \$55 BILLION

THIS MUCH MONEY CAN MAKE COLLEGE IN US FREE!

In 2013, collection agencies recovered approximately \$55.2 billion in total debt.



The recovered \$55 billion is actually only about a third of the total outstanding debt!



The collection of consumer debt also provides a valuable benefit to American households by returning an average savings of \$479 per household and keeping the costs of goods and services lower.

## DATA

FICO

Experian

TransUnion

EQUIFAX

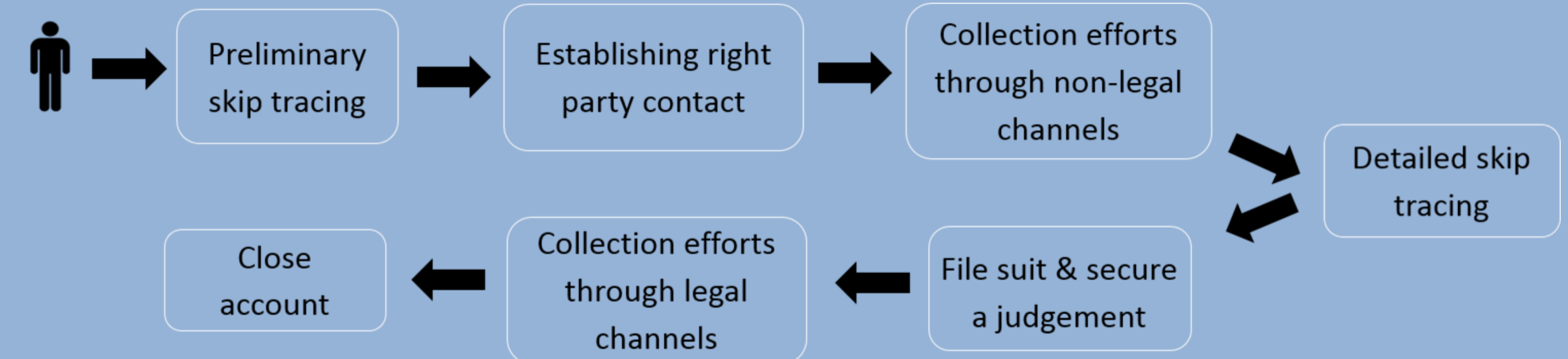


LexisNexis

United States  
Census  
Bureau

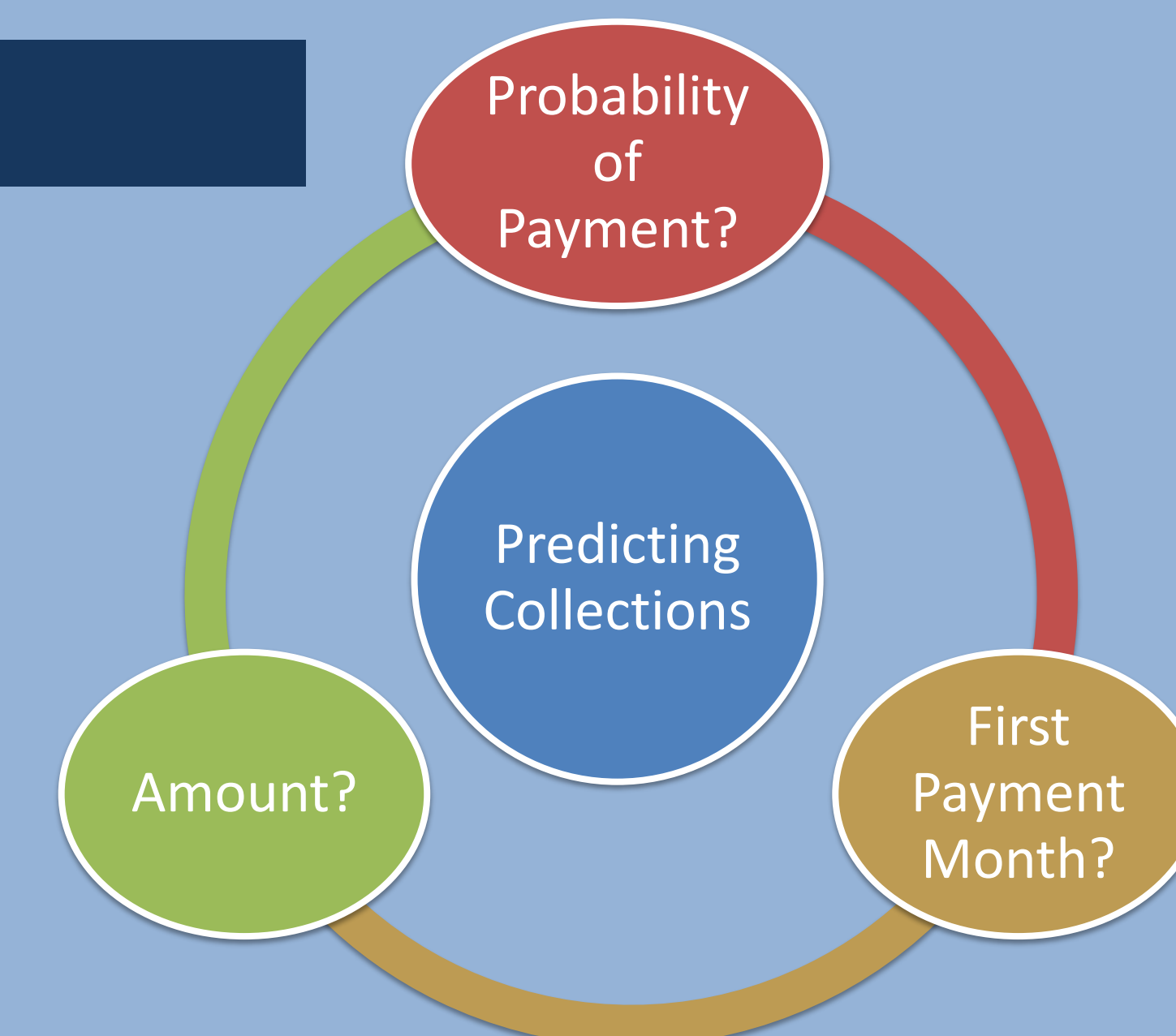
ATTRIBUTE	TYPE	USABLE TRANSFORMATION
ACCOUNT_OPEN_DATE	Date	DAYS_SINCE_ACCOUNT_OPENED
CHARGEOFF_DATE	Date	DAYS_SINCE_CHARGEOFF
DELINQUENCY_DATE	Date	DAYS_SINCE_DELINQUENT
LAST_PREPURCHASE_PAYMENT_DATE	Date	DAYS_SINCE_LAST_PREPURCHASE_PAYMENT
FIRST_PAYMENT_MONTH	Date	FIRST_PAYMENT_MONTH_FROM_PURCHASE
CHARGEOFF_AMOUNT	Numeric	USE AS IS
ORIGINAL_PURCHASE_AMOUNT	Numeric	USE AS IS
ORIGINAL_LOAN_AMOUNT	Numeric	USE AS IS
ORIGINAL_CREDIT_LIMIT_AMOUNT	Numeric	USE AS IS
INTEREST_RATE	Numeric	USE AS IS

## THE PROCESS



## PREDICTIVE MODELS

Getting in to the analytics side of this, a desired analytics process is one that will equip the collections agency with insights into basic questions like “What are the chances this customer will pay?”, “When is the right time to collect from this customer?”, “How much should be collected from this customer?” etc. With this in mind, aim of predictive models here is to help us identify factors playing an important role in maximizing collections and how we can capitalize on them. A few of the industry standard models that are usually used in tandem today are shown >>



## VISUALIZING PROBABILITY OF PAYMENT





# SAS® ANALYTICS LENS ON DEBT COLLECTION

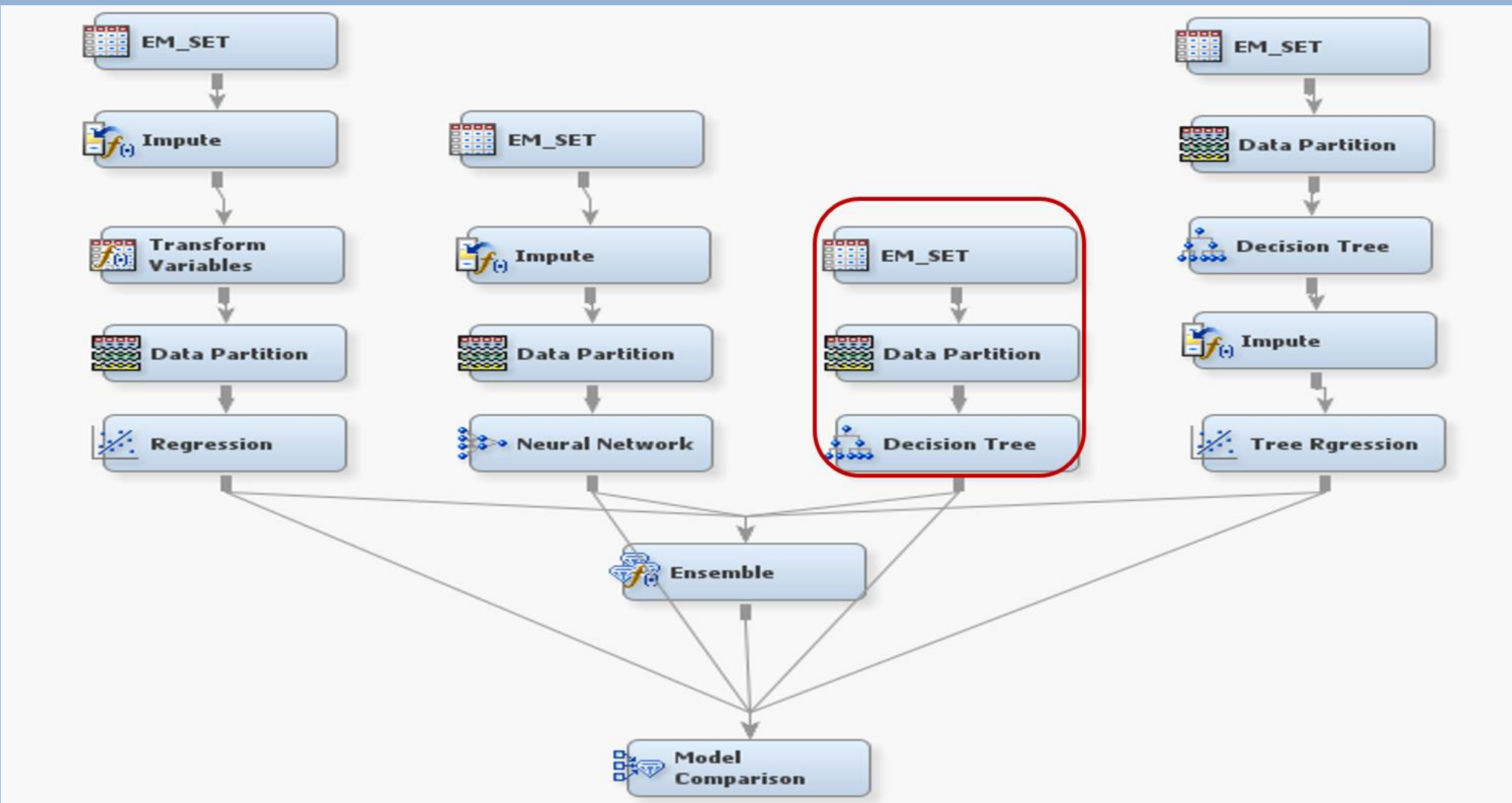
Karush Jaggi, Thomas Waldschmidt, Dr. Goutam Chakraborty

/\*NOTES\*/

## SAS CODE: Dates to Days

```
DAYS_SINCE_DELINQUENT =  
INTCK  
( "DAYS", DATEPART (DELINQUENCY_DATE), DATEPART (CHARGEOFF_DATE) )  
+ 1;
```

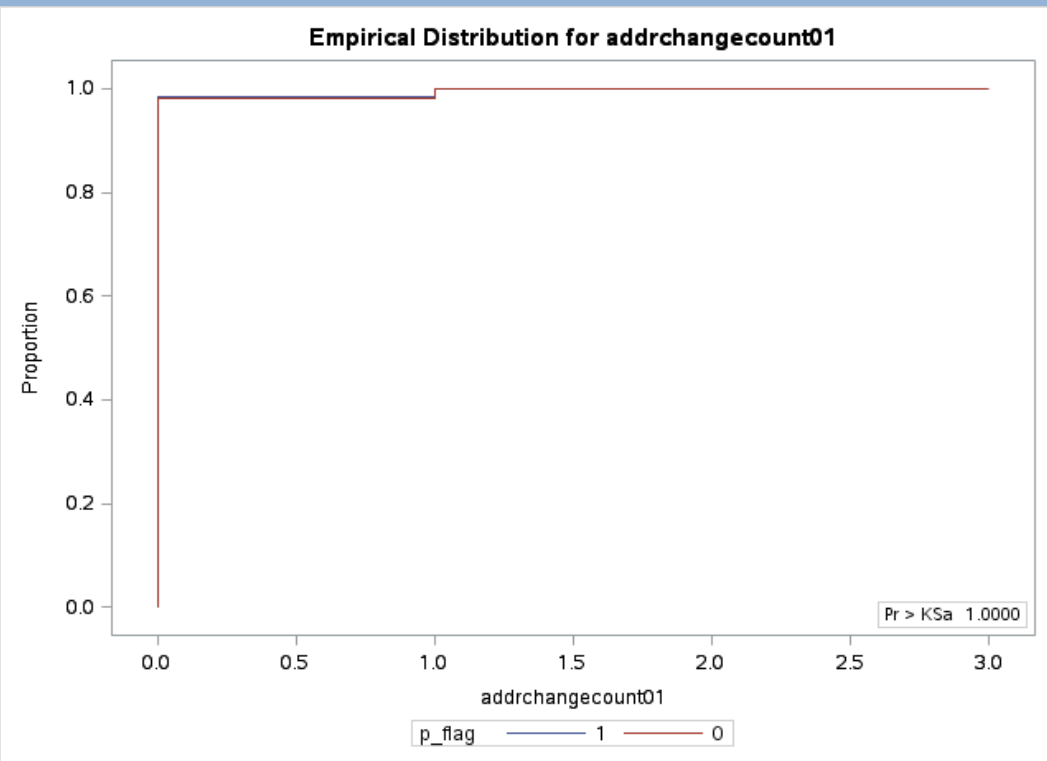
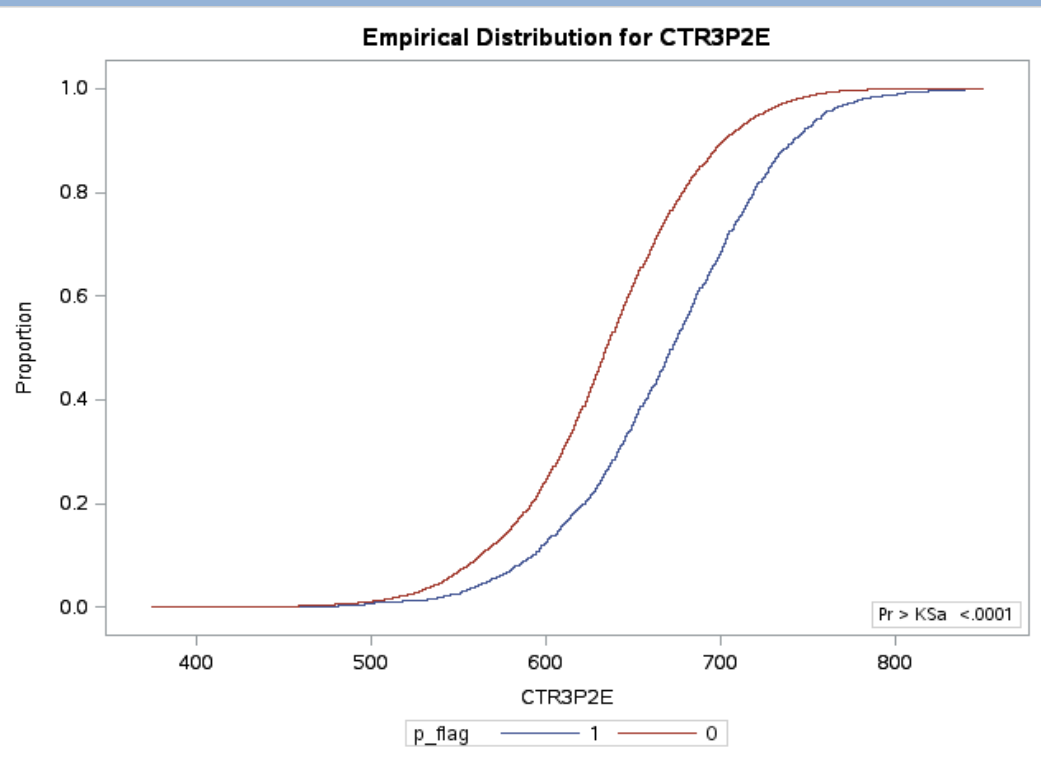
## SAS® Enterprise Miner™ Workflow Sample



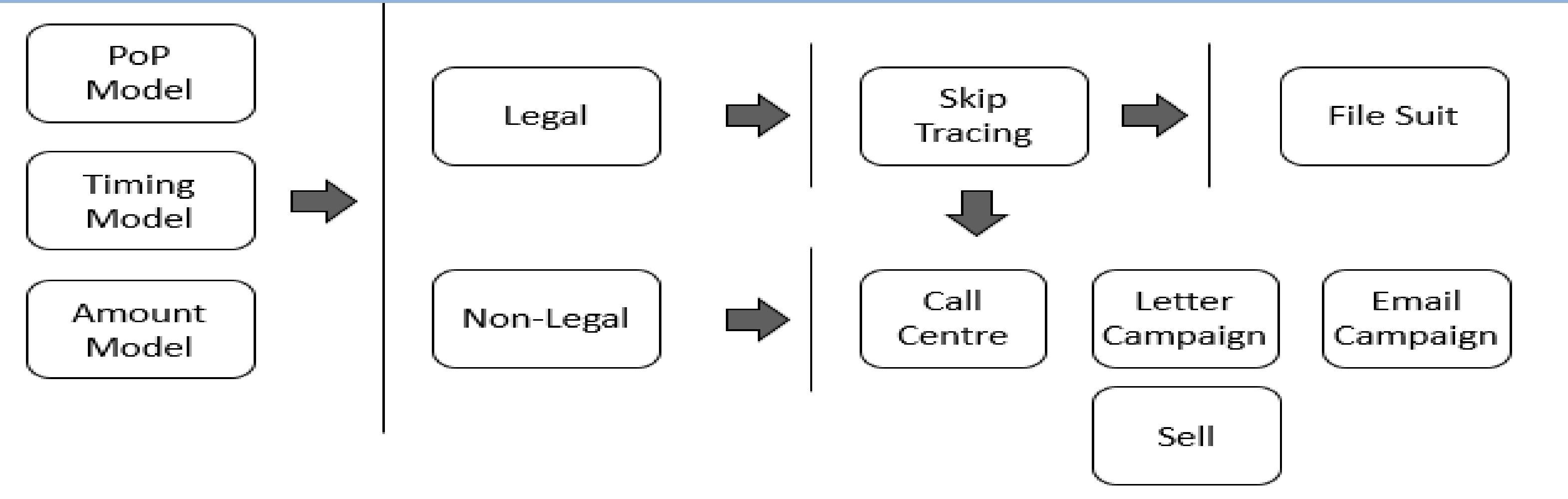
Use Frozen Tree	No
Use Multiple Targets	No
Precision	4
Splitting Rule	
Interval Criterion	ProbF
Nominal Criterion	ProbChisq
Ordinal Criterion	Entropy
Significance Level	0.2
Missing Values	Use in search
Use Input Once	No
Maximum Branch	2
Maximum Depth	15
Minimum Categorical Size	5
Split Precision	4
Node	
Leaf Size	5
Number of Rules	5
Number of Surrogate Rules	0
Split Size	.
Split Search	
Use Decisions	No
Use Priors	No
Exhaustive	5000
Node Sample	20000
Subtree	
Method	Assessment
Number of Leaves	1
Assessment Measure	Average Square Error
Assessment Fraction	0.25

## SAS CODE: KS Statistic & Plot

```
ODS GRAPHICS ON;  
PROC NPAR1WAY EDF DATA=LIB.DATASET;  
CLASS PAYER_FLAG ;  
VAR ADDRCHANGECOUNT01 CTR3P2E;  
OUTPUT OUT = LIB.OUTPUT (KEEP = _VAR_ _KS_ _D_);  
RUN;
```



## APPLICATION







# SAS<sup>®</sup> GLOBAL FORUM 2016

IMAGINE. CREATE. INNOVATE.

LAS VEGAS | APRIL 18-21

#SASGF