Maximizing Opportunity of Loans on Book



- LOSS PROVISIONING
- STRESS TESTING
- PRO FORMA FINANCIALS & BUDGETING
- COLLECTIONS & REMEDIAL ACTIVITY
- PREVENTITIVE ACTIVITY
- LIMIT SETTING & UTILIZATION
- RETENTION OF PROFITABLE RELATIONSHIPS
- CROSS-SELLING & UPSELLING
- DEPOSIT CAPTURE
- INTELLEGENCE GATHERING FOR NEW MARKETS, SEGMENTS & PRODUCTS

Problem

The convention approach manages each initiative independently

- Different Data
- Different Processes
- Little Management Coordination



VERDE INTERNATIONAL

About Us



Founded in 2006

- > Why? > We saw an unmet need to utilize big, unstructured data and perform complex statistical analyses for FI decision-making.
 - > The vast majority of FIs (large and small) need to translate insights into market action and loan decisions.
 - > Verde empowers lenders to make capital flow responsibly and at far greater scale, for the betterment of communities they serve.

REAL-WORLD SOLUTIONS

Verde Corona™

Browser-based Loan Origination

System

Verde Aurora™

Automated Loan Decisioning & Offer Optimization

Verde Allele™

Basel III, Account-level ALLL Forecasts & **Stress Testing**

REAL-WORLD EXPERIENCE (to name a few)

> AT&T

Citi

➢ RBC

- Banco Popular
- Itaú

Wells Fargo

> BMW

- > JP Morgan Chase
- Visa

Equifax

Mastercard

Local & Regional FIs

COUNTRIES

- Argentina
- Bangladesh
- Brasíl
- Canada

- Chile
- China
- India
- Mexico

- Mongolia
- Spain
- **>** U.S.
- > Any Market

SEGMENTS

- Administration
- Healthcare
- Retail

Agriculture

Automotive

- **▶** Import/Export Logistics
- Telecommunication

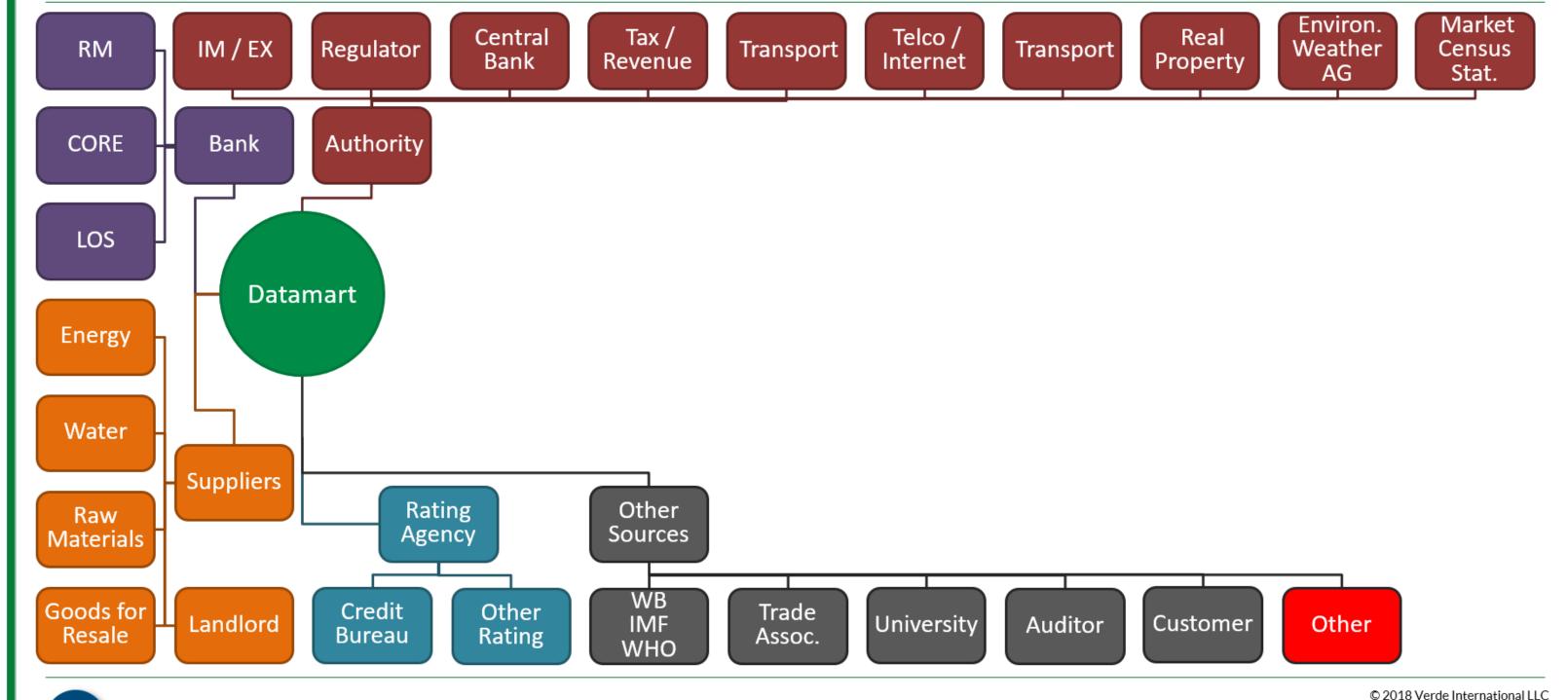
- Government
- Manufacturing
- Utilities

Service



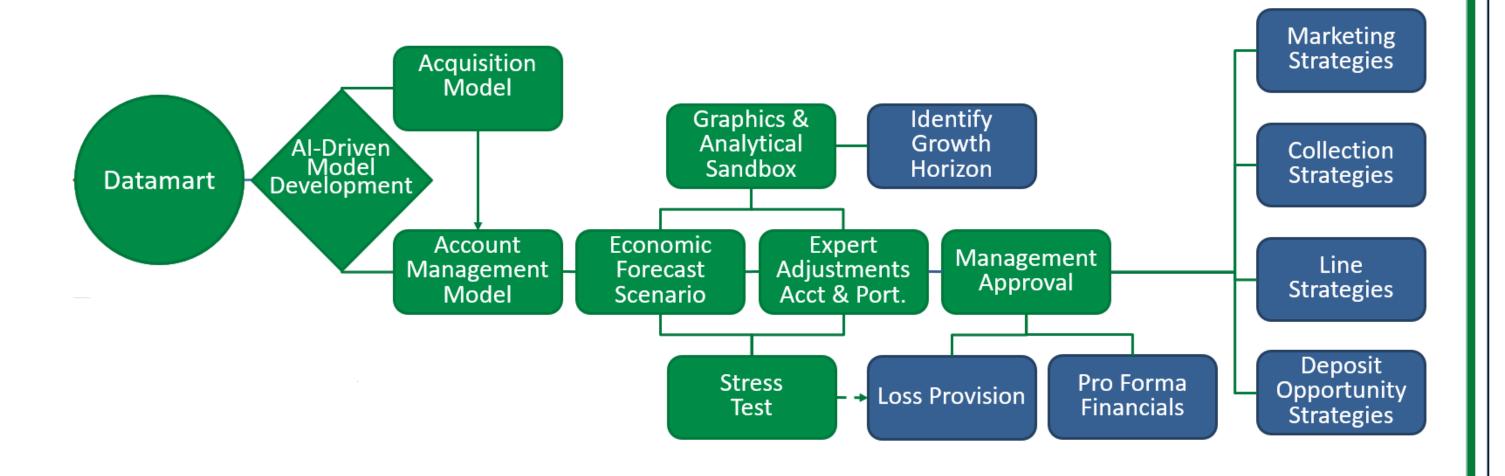
#1 Question Asked of Verde: "Where do you get your data?"





#1 Question Asked of Verde: "Where do you get your data?"

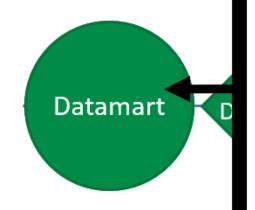






LOAN MANAGEMENT FU

#1 Question Asked of Ver



Upload Data for 1/31/2018

Select File

Drop CSV File Here -or-Click to Upload

Required Fields

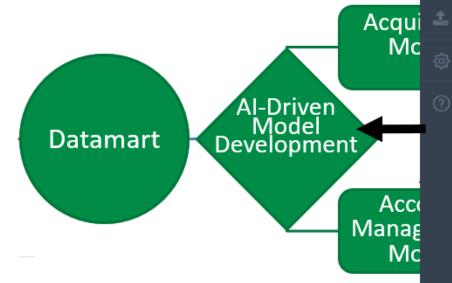
Order	Header	Data Type	Sample Value	Allele UI	Required
1	ReportDt	Date	2015/06/30	June 30,2015	Yes

ReportDt is the "Report date" of the data you're uploading.

Think of your upload like a "snapshot" of info on every loan you've ever booked -- ReportDt is the final cut-off date for that snapshot. It includes everything booked up to and on that date.

±	2	LoanID	Unique Identifier	1048755	Loan 1048755	Yes
+	3	LoanAmt	Numeric	502750.25	\$502,750.25	Yes
±	4	IntRate	Numeric	0.0799	7.99%	Yes
±	5	Term	Integer	48	48 months	Yes
±	6	MonthlyPmt	Numeric	10763.45	\$10,763.45	Yes
±	7	OpenDt	Date	2013/04/17	April 17, 2013	Yes

#1 Question Asked of Verde: "Where d



VERDE ALLELE

Model Review

Reports / Model Review / December 31, 2016 v

Executive Summary

Forecast Changes

Asset Changes

Data Changes

1 Model Analysis

This report is an automatically generated look at the model presented below. It contains three major parts: the a look at the model, its predictiveness and robustness. The second is a per-variable report, it looks at the contreach variable makes to the model. The third is a look at the outliers in the data, automatically removing any and measuring changes in the model. This represents internal analysis of models by Verde Intl. and does not represent the final product, and should only be used as a preliminary analysis

2 Function predicting Defaulted

This function uses 42 terms to explain approximately 74.36% of the variance in Defaulted. To properly probability value, this model uses a logistic regression.

2.1 Model Statistics

Summary Statistics:

AIC: 794.98

Null deviance: 2764.73 on 3206 df Residual deviance: 708.98 on 3164 df

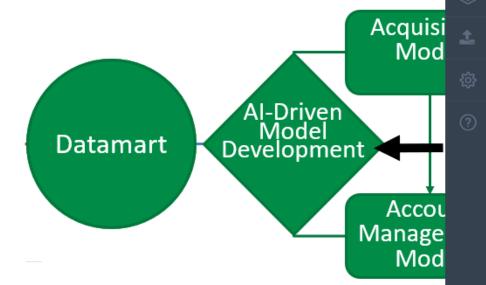
Efron's Pseudo R-Squared: 0.7436 on 3164 df

2.2 Model Formula

Defaulted = 1 / (1 + exp(-(-41.316 + -2.0749 * safeValue(valExists(LFPrimaryTaxReturnDate), 0) + -0.7423 * safeValue(safeLog(FRACurrentAmountOwed), 0)



#1 Question Asked of Verde: "Where do



VERDEALLELE

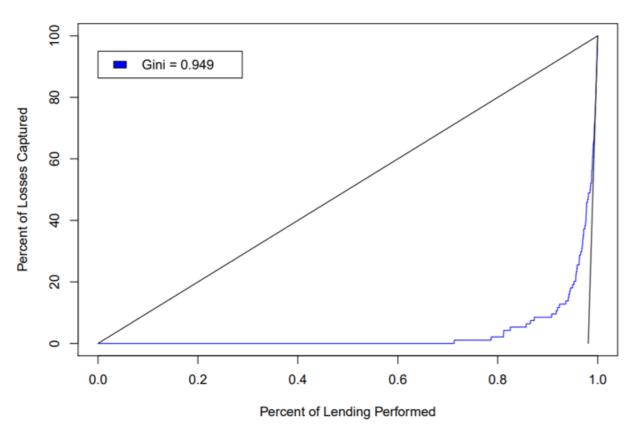
Model Review

Reports / Model Review / December 31, 2016 v

Executive Summary Forecast Changes Asset Changes Data Changes

3 Lorenz Curve

Lorenz Curve for Defaulted



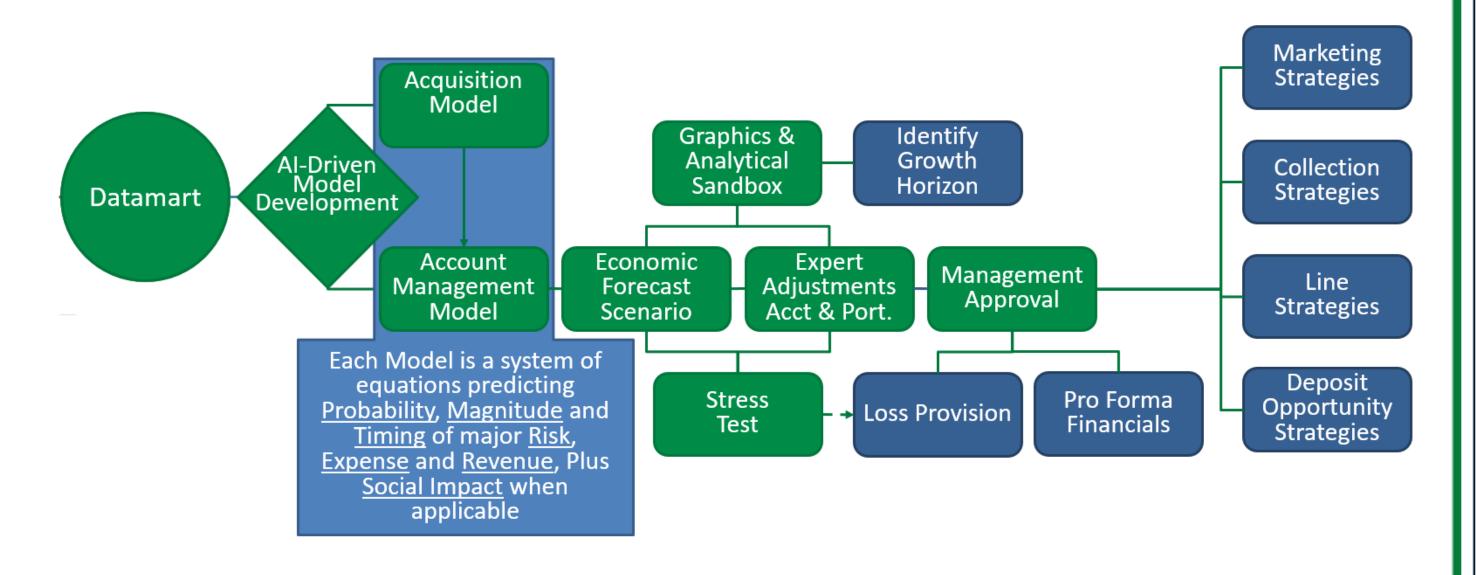


#2 Question Ask

2014-2017 © Verde Intl.

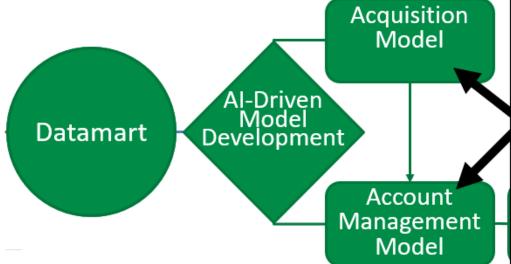
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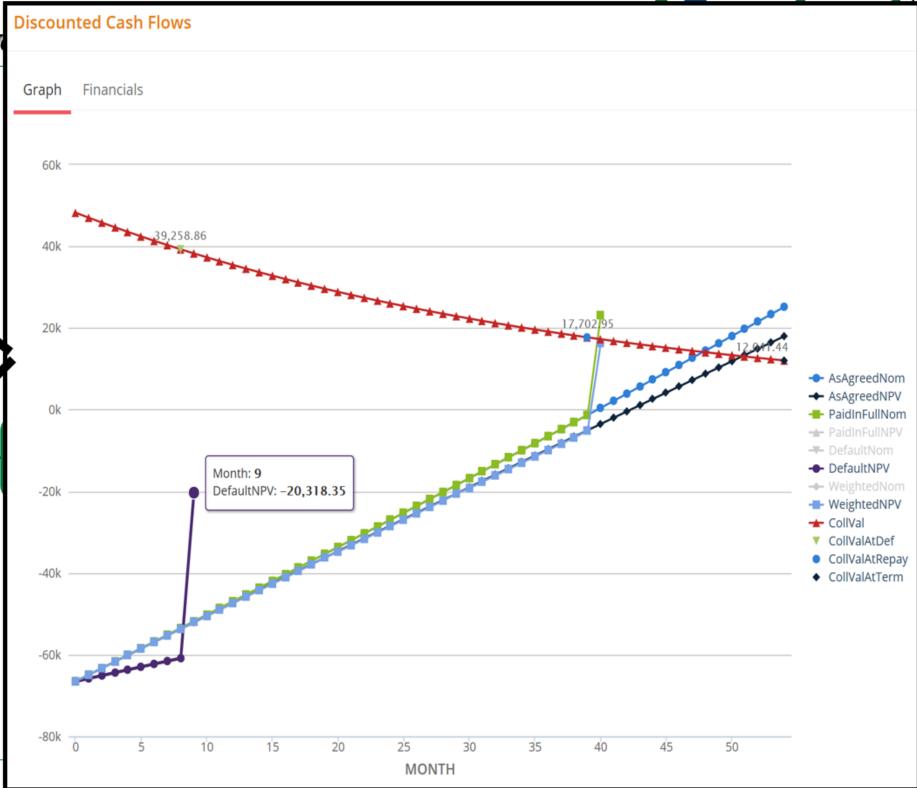






#1 Question Asked of Verde: "Where do you g







#2 Question Asked of Verde: "What Makes Verde Better?"

Sales@VerdeIntl.com Phone: 1.770.804.9363 x15 Patrick Reily, CEO

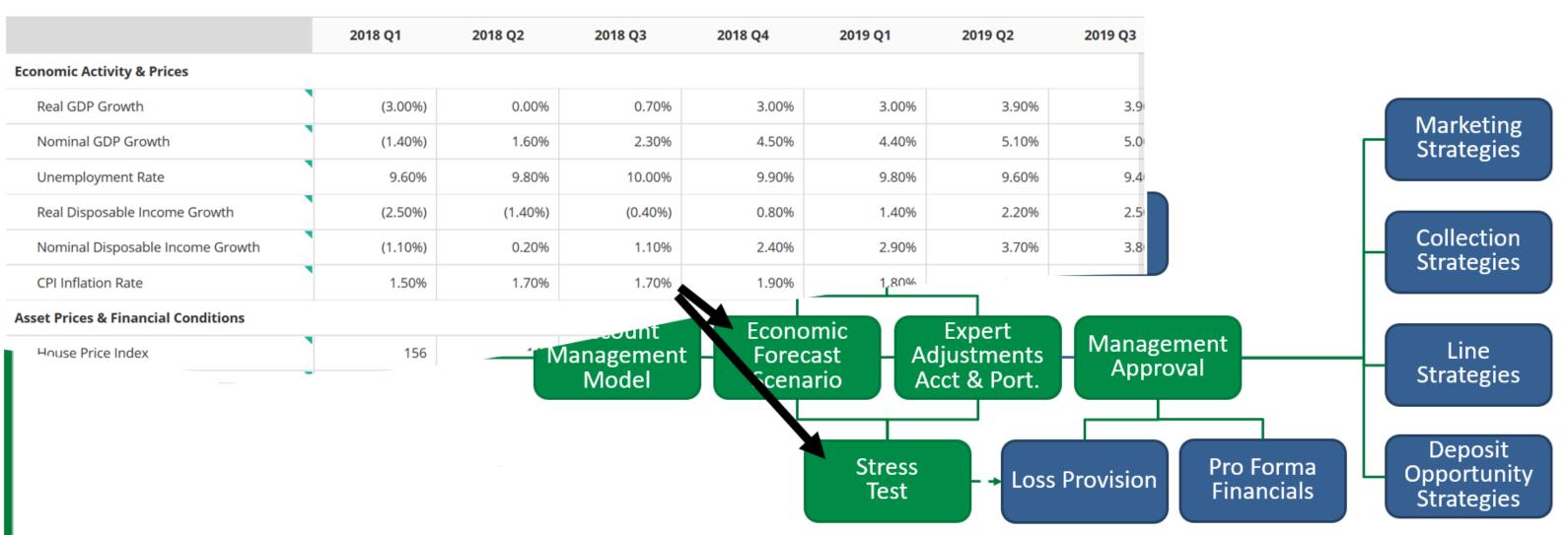
Scenario Detail

⑤ / Setup / Scenarios / Scenario Detail

🖺 Rename / Save



2017 Q1 - 2020 Q1 🛗





#2 Question Asked of Verde: "What Makes Verde Better?"

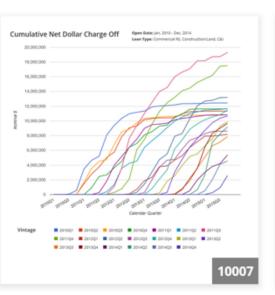
LOAN MANA #1 Question A

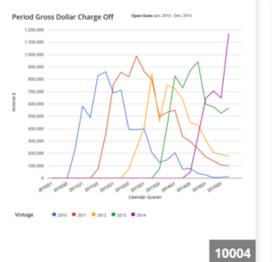
Saved Graphs

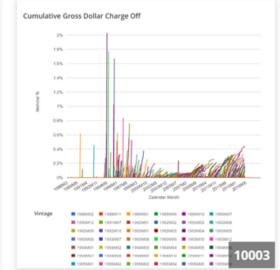
☼ / Graph Builder / Saved Graphs

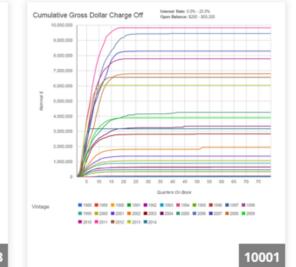
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Thumbnail







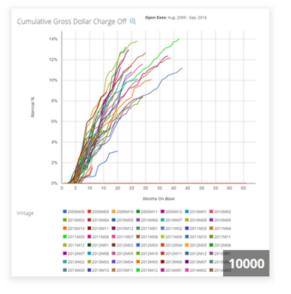


Marketing Strategies

Collection Strategies

Line Strategies

Deposit pportunity Strategies



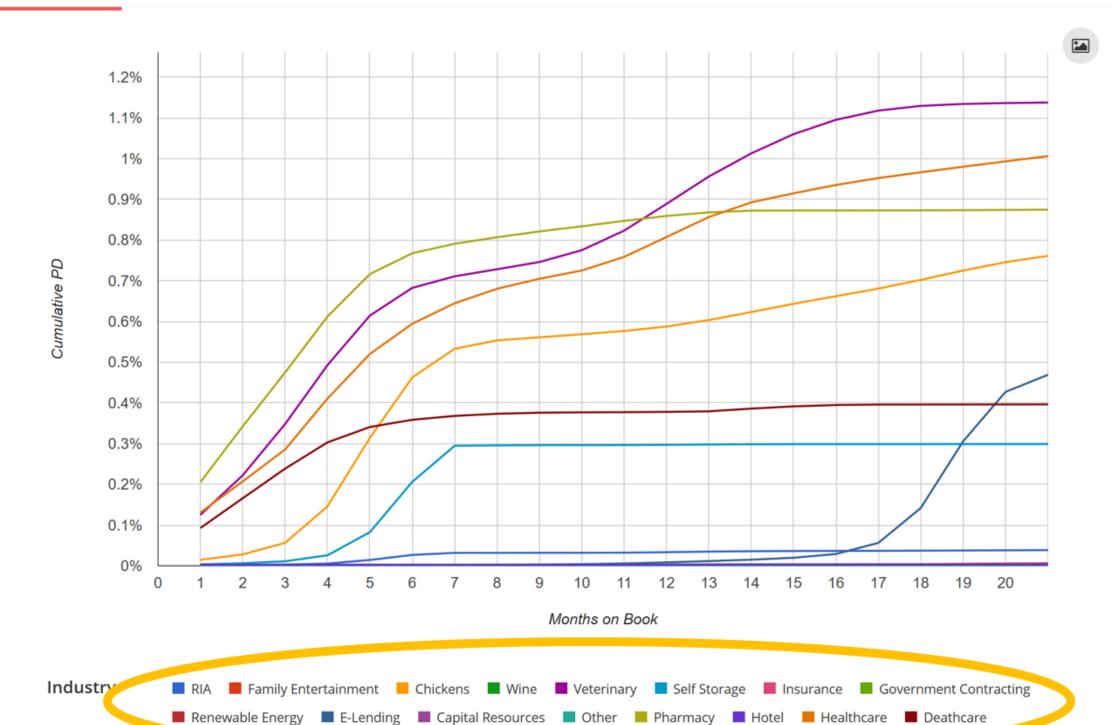
Page « 1 » of 1 | View 20 v records | Found total 5 records



VERDE ALLELE & Allele Admin







larketing trategies

ollection trategies

Line trategies

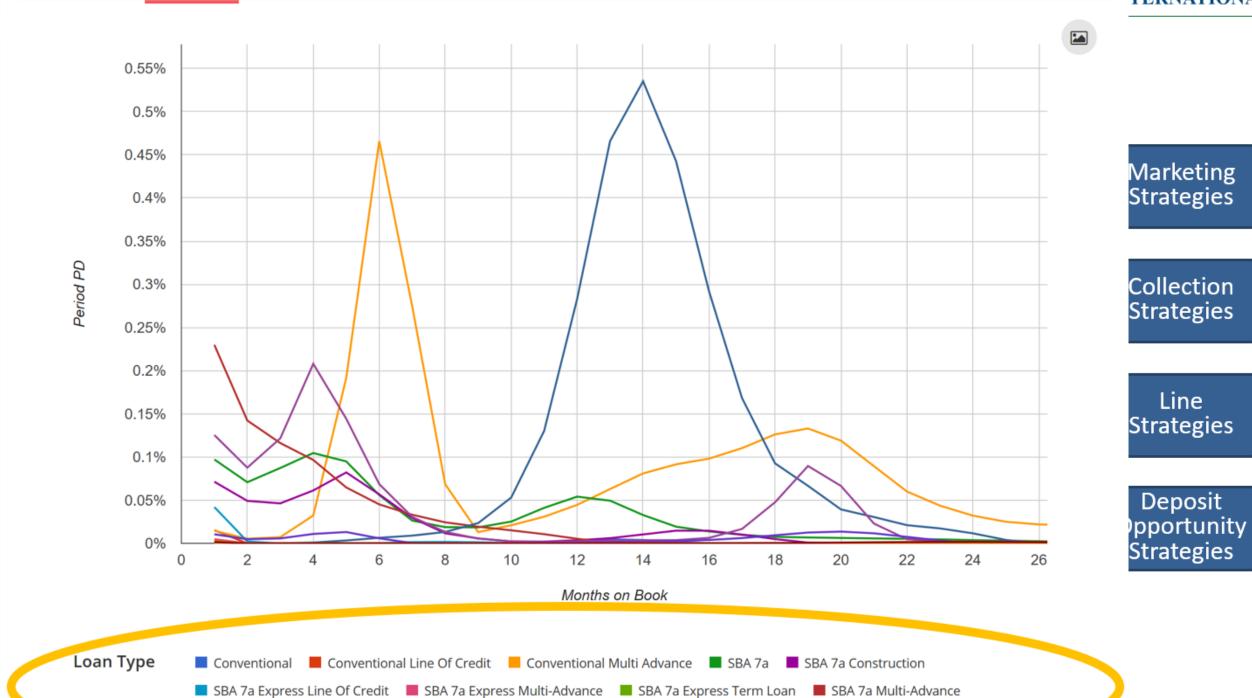
Deposit portunity trategies





VERDE ALLELE & Allele Admin





■ SBA 7a Pari Passu ■ SBA 7A Small Loan Advantage ■ SBA-504 ■ SBA-504 Construction ■ SLA Multi Advance ■ USDA B&I



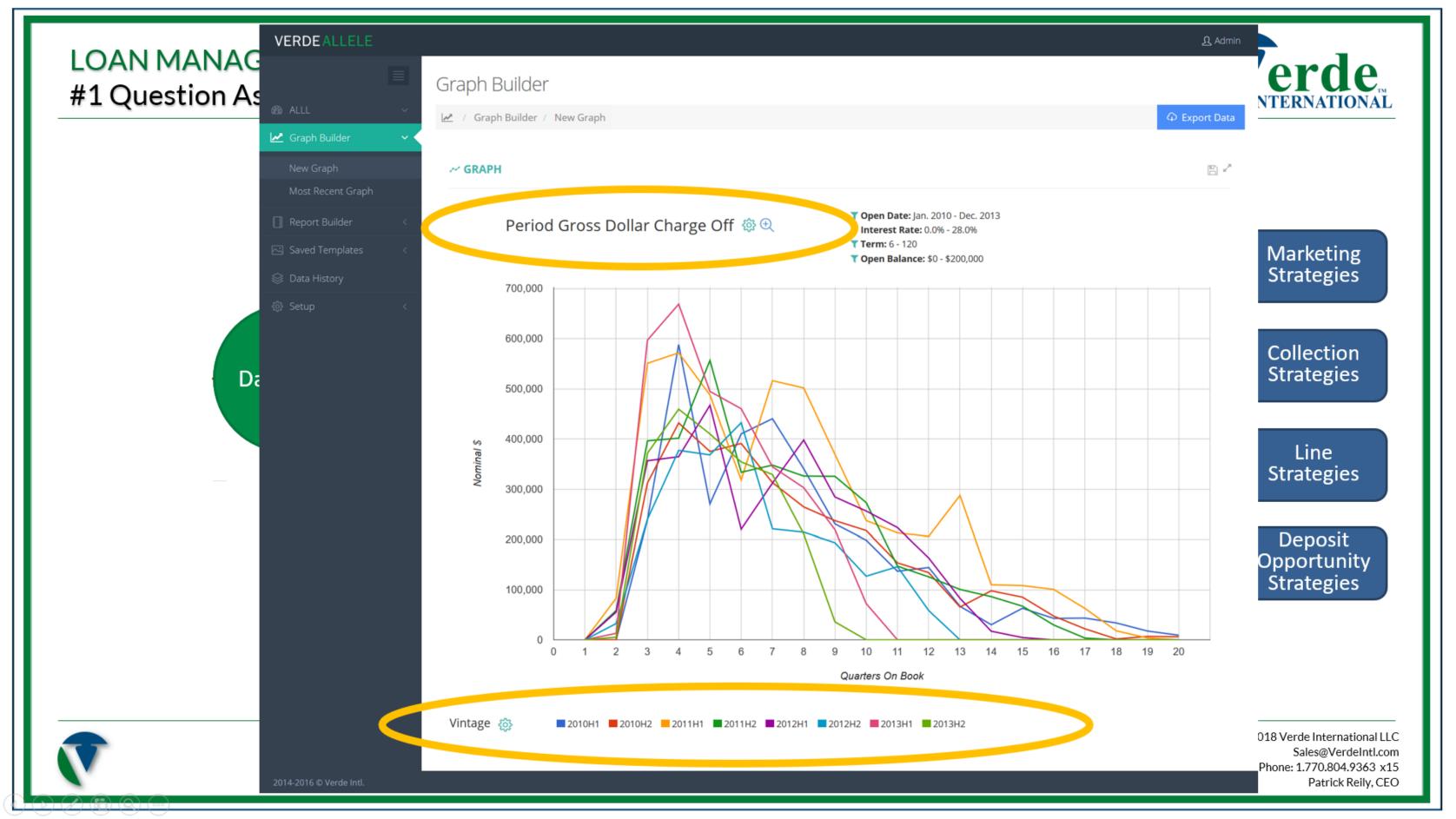
l8 Verde International LLC Sales@VerdeIntl.com hone: 1.770.804.9363 x15 Patrick Reily, CEO

Cumulative PD

Period PD

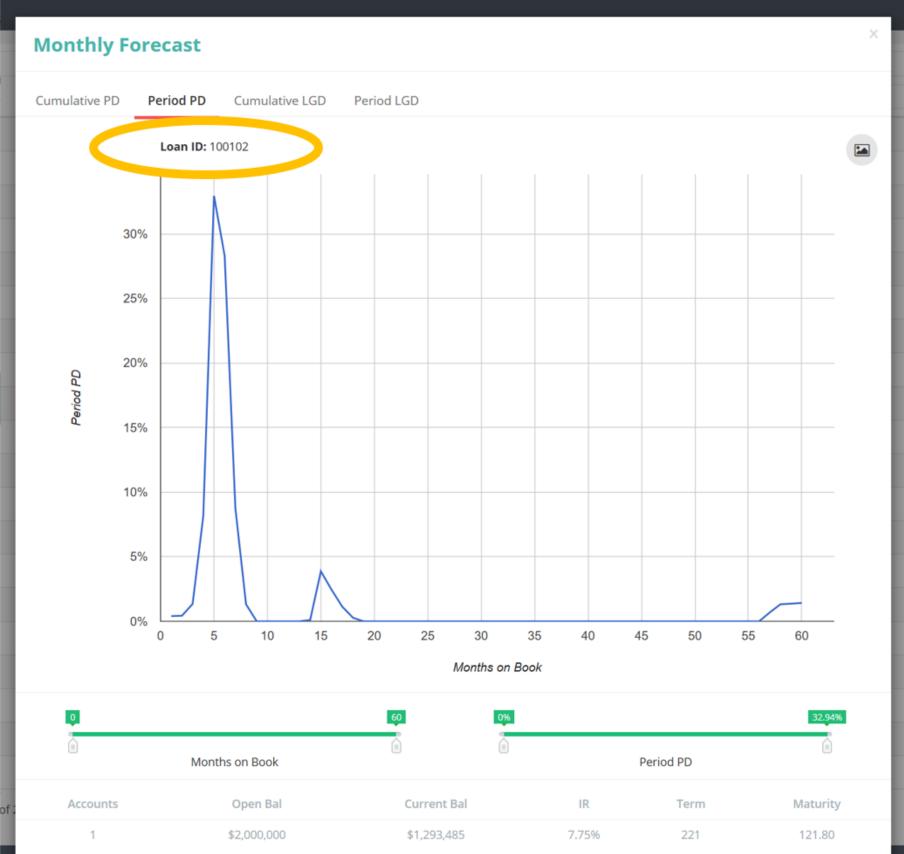
Cumulative LGD

Period LGD



#1 Question Asked of \







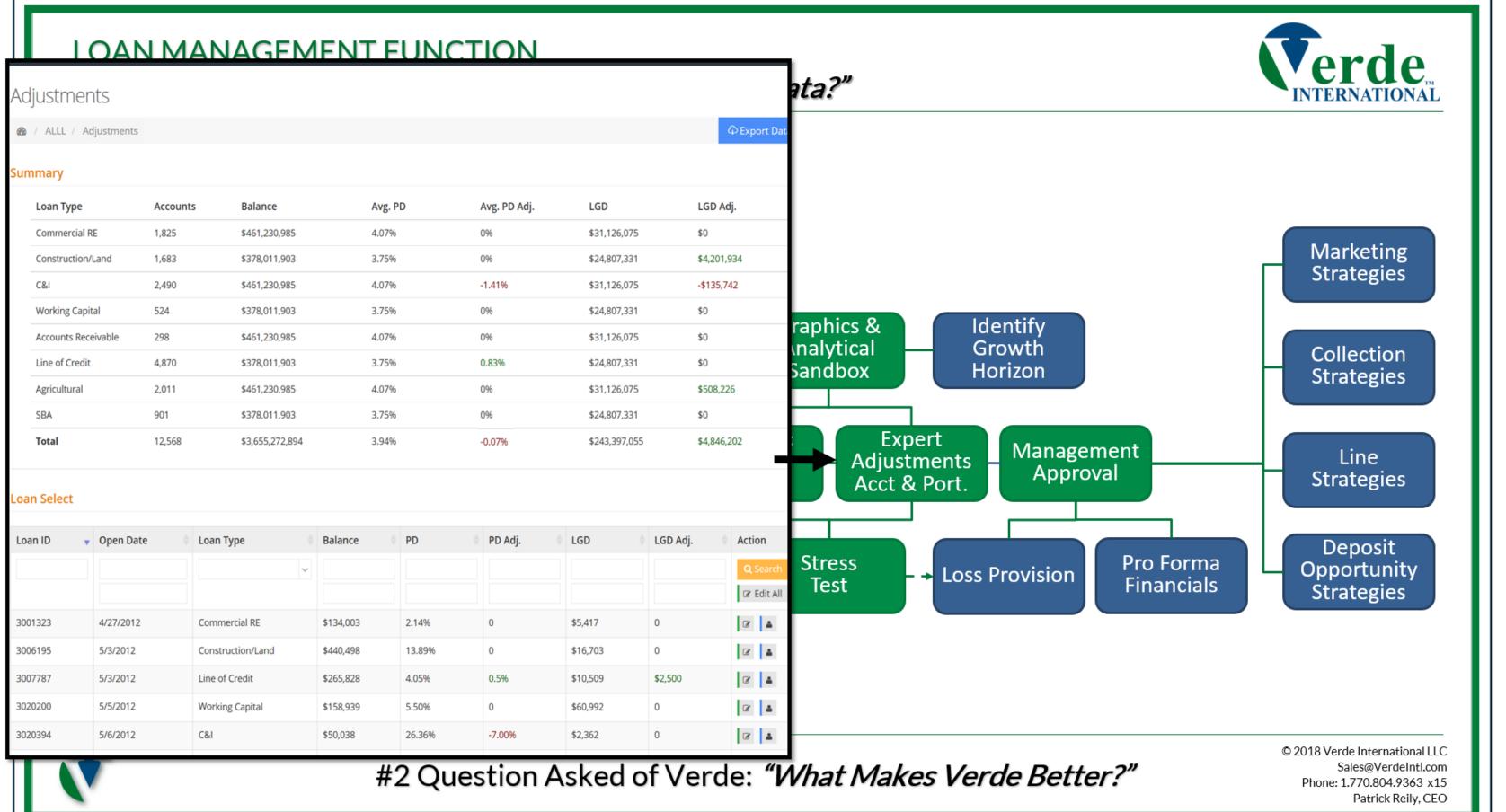
Marketing Strategies

Collection Strategies

Line Strategies

rma ials Deposit Opportunity Strategies

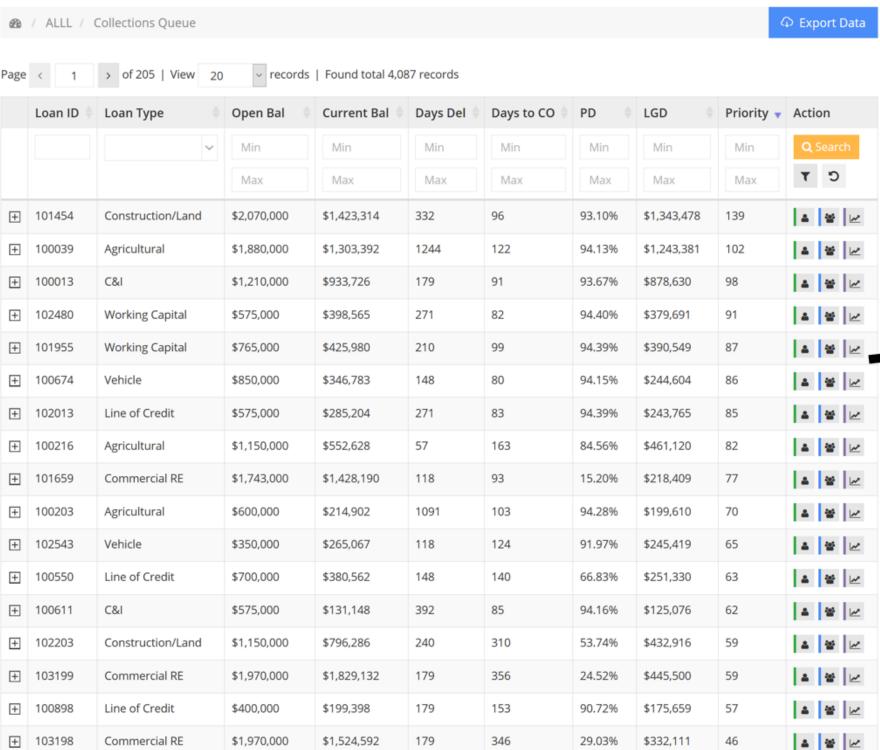




Verde INTERNATIONAL

Collections Queue

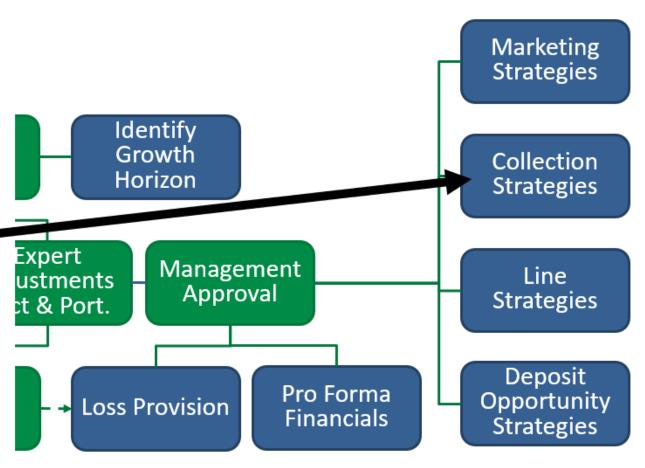
6



152

118

6.48%



akes Verde Better?"

≜ ₩ ⊬

42

\$106,515

© 2018 Verde International LLC Sales@VerdeIntl.com Phone: 1.770.804.9363 x15 Patrick Reily, CEO

101277

+

C&I

\$2,000,000

\$1,628,505

VERDEALLELE

Allele Admin

Marketing Queue

+

+

100766

100861

100930

Agricultural

Construction/Land

Construction/Land

\$1,100,000

\$1,600,000

\$1,800,000

\$2,006,817

\$2,130,309

\$2,450,466

♠ / ALLL / Marketing Queue Export Data v records | Found total 4,087 records > of 205 | View 20 Loan ID 🏺 Loan Type Open Bal **Amount Paid** Mos to Term Mos to Repay Value at Risk Priority V Action Min Min Min Min Min Min CT Max Max Max Max Max Max **≗ ≅** ⊬ \$217 242.8 0.2 \$11,995,568 113 103840 Commercial RE \$3,825,000 + **≗ * ∠** + C&I \$2,000,000 \$2,659,516 121.8 0.1 \$1,964,918 110 100102 **≗ ≅** ⊬ + \$2,362,084 188.6 0 \$3,034,124 108 100099 Agricultural \$2,100,000 **≜** ≅ ∠ 0 \$1,121,655 105 + Line of Credit \$475,250 \$412,660 224.6 100289 100356 Line of Credit \$475,000 \$580,126 215.7 0 \$1,015,198 103 **≗ ≅** ⊬ 2 + \$2,906,296 126.6 101 100501 Commercial RE \$1,800,000 \$2,240,460 **≗** 😤 🗠 2 98 100535 \$2,000,000 \$2,488,517 44.6 \$1,011,835 + Construction/Land **≗ ≅** ⊬ 1.7 + 100637 Commercial RE \$1,925,000 \$2,359,653 48 \$1,059,251 98 **≜ ≅** ⊬ \$1,200,000 \$1,728,106 108 1.8 \$1,478,972 98 100634 Agricultural **≗ ≅** ⊬ \$406 294 1.1 \$8,872,305 95 + 104140 Working Capital \$2,200,000 C&I \$434 91 + 104340 \$2,500,000 235.8 1.4 \$7,249,081 **≗** 😤 🗠 Line of Credit \$82 2.1 90 + 104409 \$500,000 248.6 \$1,651,350 **≗ **** ⊬ Vehicle \$675,000 \$1,098,585 169 2.4 \$1,183,794 84 + 100668 **≗** 😤 🗠 C&I + \$2,000,000 \$2,563,890 49.8 2.2 \$1,124,005 82 100697 Commercial RE \$2,000,000 \$2,607,025 51.5 2.2 \$1,187,376 77 +100742 **≗ ≅** ⊬

232.5

55.8

58.9

2.1

2.4

2.5

\$2,717,369

\$1,033,046

\$1,230,439

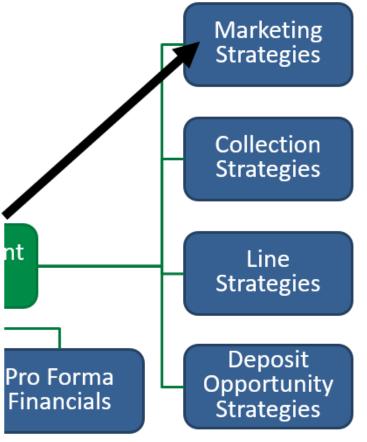
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69

68

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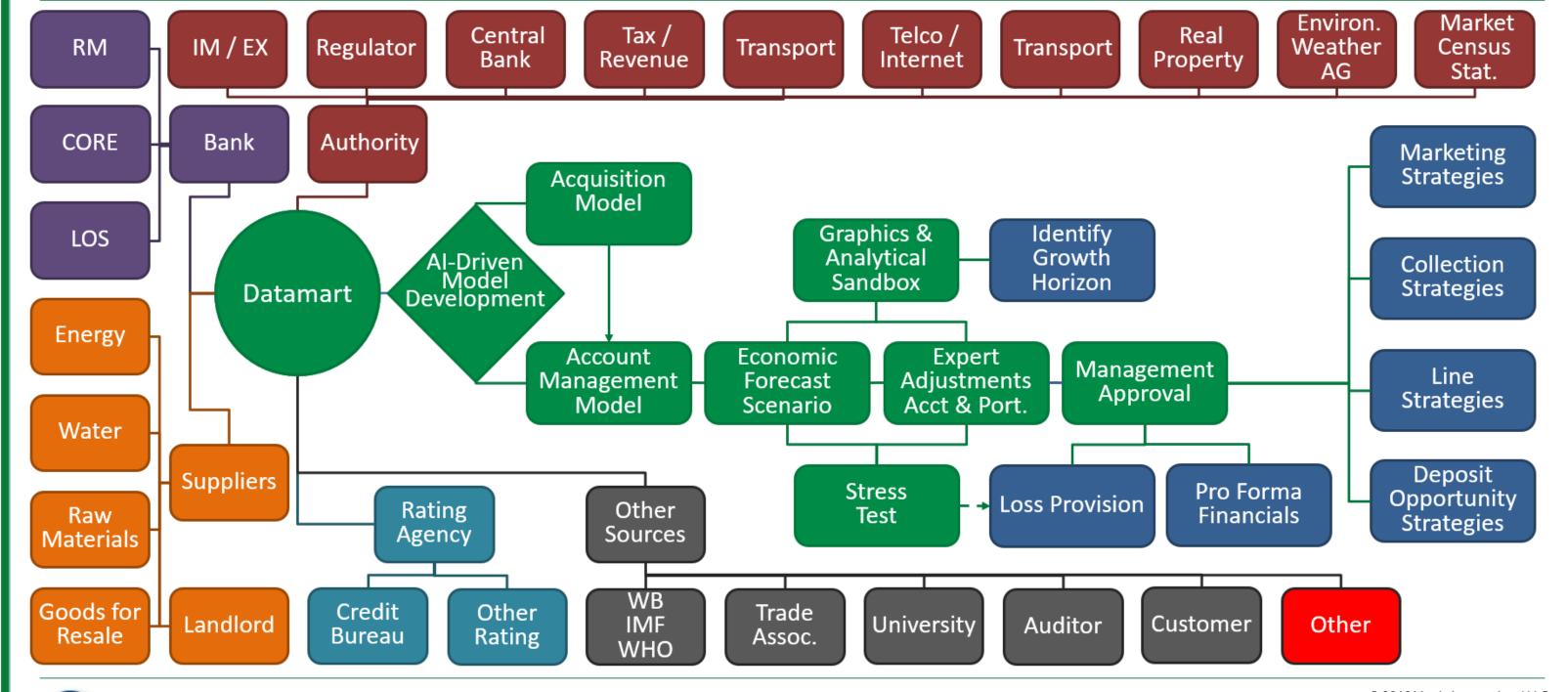
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#1 Question Asked of Verde: "Where do you get your data?"





#2 Question Asked of Verde: "What Makes Verde Better?"

VERDE ALLELE™

Making The Most From Loans On Book – Case Studies



Growth Via New Markets, Customer

Segments and Products is Imperative

Rapid Learning Models Quickly Detect and Adapt

Descriptive Model Structure Drives Insights

For New Product and Process Development

Target, Prioritize and Time Interaction

Optimize Value Creation for Lender,

Client, Social & Economic Impact

X-Sell, Up-Sell, Build Deposits

Build Relationship Value and

Wallet Share

Forecast to Minimizing Risk, Maximizing Opportunity

Basel III Advanced Approach Compliant Syncs Underwriting Projections w/ Downstream Forecasts

Full Financial Forecast on Every Loan PD, LGD, NPV, Monthly Cash Flow

Common Data & Methodology Keeps All Stakeholders on the Same Page

Not All Missed Payments are the Same Volatile vs. Uncertain Cashflows

Account Level Determination of Best Collections Strategy

Optimize Actions to Maximize the Change in Economic Outcome

Missed Payment Precursor Detection is an Extension of Stress Testing

Engage Clients Up To 12mo. Before "Stresses Drive Missed Payments

Applicable to Change in Client Business, Economics, Environmental Disaster

Loss Provision, **VERDE ALLELE™** Stress Testing Loan Management & Pro Forma

New Markets, Segments

> **Products** X-Sell, Up-Sell

> > Restructure

Retention Line

Utilization

Performance Management

Predict Early Repayment Up to 12mo. Ahead

Automated & Objective Line Mgt. & Line Utilization Strategy

Sustaining High Credit Quality Balances Higher Profitability & Lower Loss Rates

Proactive Care Disaster

Relief

Risk Mitigation

Collections

Remediation

WELLS Commerce Bank

LIVE OA

CHASE

WACHOV

larani**a**

Pan American Ban

VERDE ALLELE™

Making The Most From Loans On Book – Case Studies



Who:

Full Service Bank, LAC Mkts Problem:

8.5% Loss Rate, ~0% ROA, near C&D Many w/ no formal credit experience Vital inclusion & development lender

Solution:

Verde Aurora/Corona origination & Allele - prioritize & clarify collections

Often Late/Low risk ◆AG volitile ◆Ed. gap ◆Literacy gap ◆Collateral risk, Etc.

Outcome:

Lower portfolio losses by 36% (315bp)

Who:

2nd Largest US SB lender Problem:

0.5% Loss Rate -> 1.75% -> 350%

Regulator Panics -> Bank Panics
Add more people to same bad process

Solution:

Allele: Basel III, Stress testing, High precision, customer insights.

Outcome:

Fewer FTE & happy regulators.

<u>Uncovered new markets</u>

& retention strategies.

Who:

Leading CAC Bank

Problem:

Develop Micro Finance Program

Largely unbanked w/ informal business

Solution:

Big data models found nonbank, non Bureau data for underwriting & MGT

Data begets data — Credit behavior expressed in prod & service – post boxes

Outcome:

1st time ever profitably MSME @ IR benefitting client & community Now 6% of bank book

Who:

Large Canadian Bank

Problem:

New immigrant SME ≒ mainstream

Solution:

Allele identifies outliers profiles & nonbureau attributes for underwriting New products & alt data underwriting

Outcome:

Alt data process profitably approves ~70% of all new immigrant applicants

Who:

Bank: SME & Retail + Trade

Problem:

No disaster mgt. strategy or tactics Eco. recovery requires capital flow

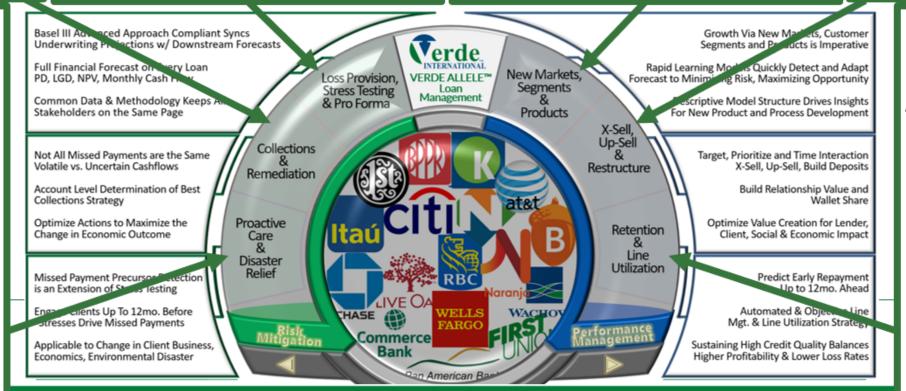
Solution:

Allele models: Acct-level & descriptive Not: Al-black box or naïve stats Answers critical SME client questions:

Already struggling? •Growth mode?
 Risk in crisis & long-term?
 Cyclic, countercyclic, pro-recovery?
 Descriptive models > Prescriptive Acts

Outcome:

Low losses, high wallet & retention



Who:

\$100B+ National Lender

Problem:

Attrition: most valuable SMEs = 18%/yr. (>\$20KNI/Yr./SME)

<u>Solution:</u>

Verde Allele predicts attrition +-1mo. 12mo. ahead, enabling highly targeted Prod. & service learning experiments Tailored retention strategies to clients

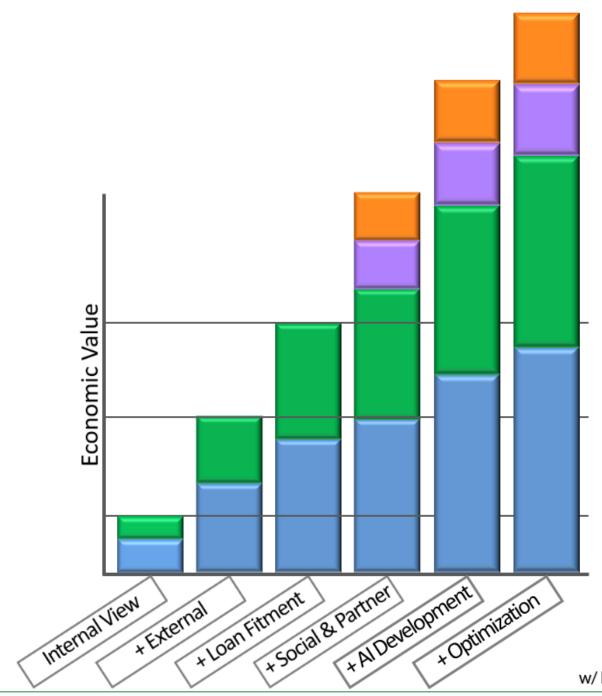
Outcome:

Cut attrition in half Profit improvement \$65million/Yr.

VERDE LENDING SOLUTIONS

A Systematic Approach to Underwriting & Loan Management





Al-Driven Model
Development

Probability of Response

Probability of Default

Time To Default

Probability of Early Repay

Time to Early Repay

X-sell & Retention

SME Business Growth

Financial, Economic & Social Value

2: Model Development & Form Al-Driven Reviewable Econometric & Behavioral System



"What If" Testing
Best Loan Structure
Best Loan term
Best Loan Size
Best APR

Internal View: + Ex Popularized by credit Rec

bureaus, FICO & Like Le
Borrower & Lender are
assumed to be
unchanging

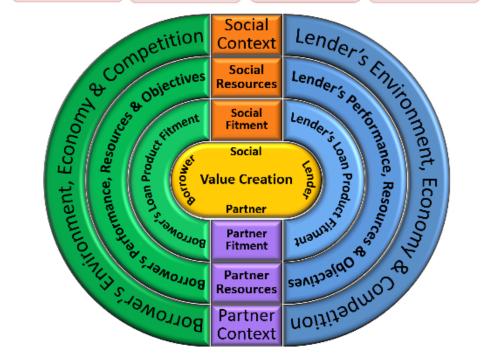
:

Recognizes Borrower & Borr Lender performance adap behavior and objectives on le are influenced by the pack world around them

Loan Fitment:

Borrowers and lenders adapt behaviors based on loan pricing & packaging Social & Partne

Community, Capital Partners & 3rd Parties with development, inclusion and other objectives are considered



1: Big Data & Model Design Predicting Behaviors is Key to Predicting Value

3: Loan Optimization & Stress Testing w/ Economic & Loan Attributes, AI Systems Price, Structure & Stress Test Each Loan



VERDE ALLELE™ Loan-Level Forecasting & Account Management

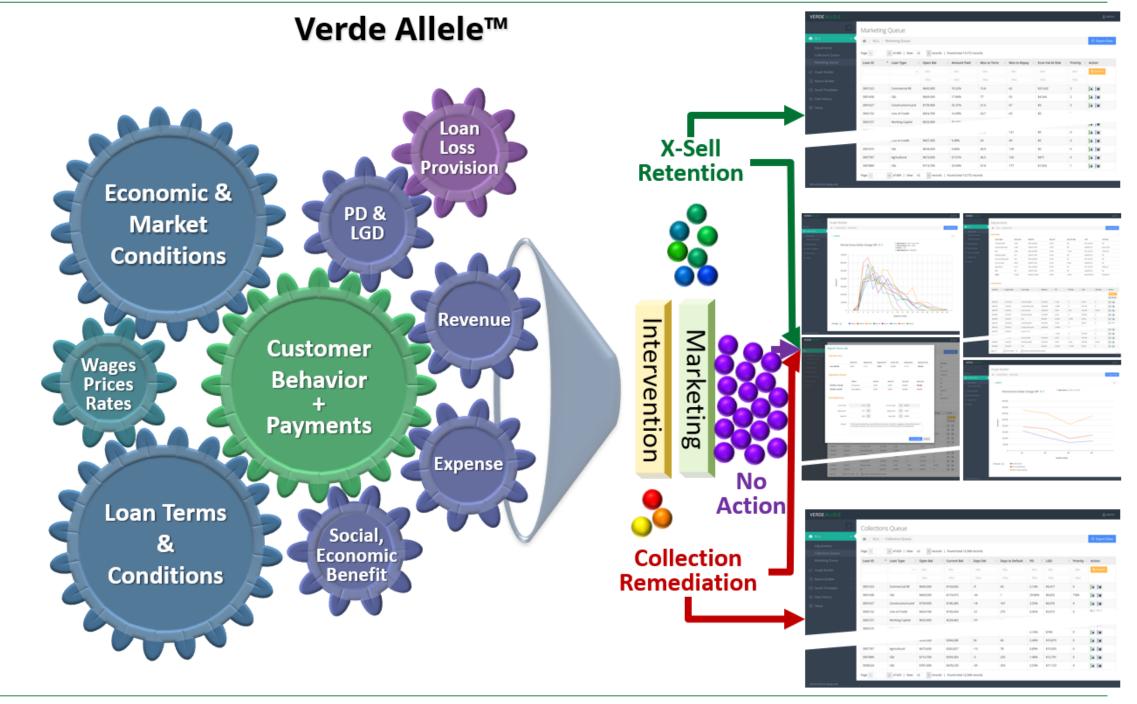
Make the Most of Existing Loan Relationships



- Loan Loss
 Provisioning
- Continuous

 Customer
 Monitoring,
 Valuation &

 Stress Testing
- Targeting for Customer
 Management, Marketing,
 Collections



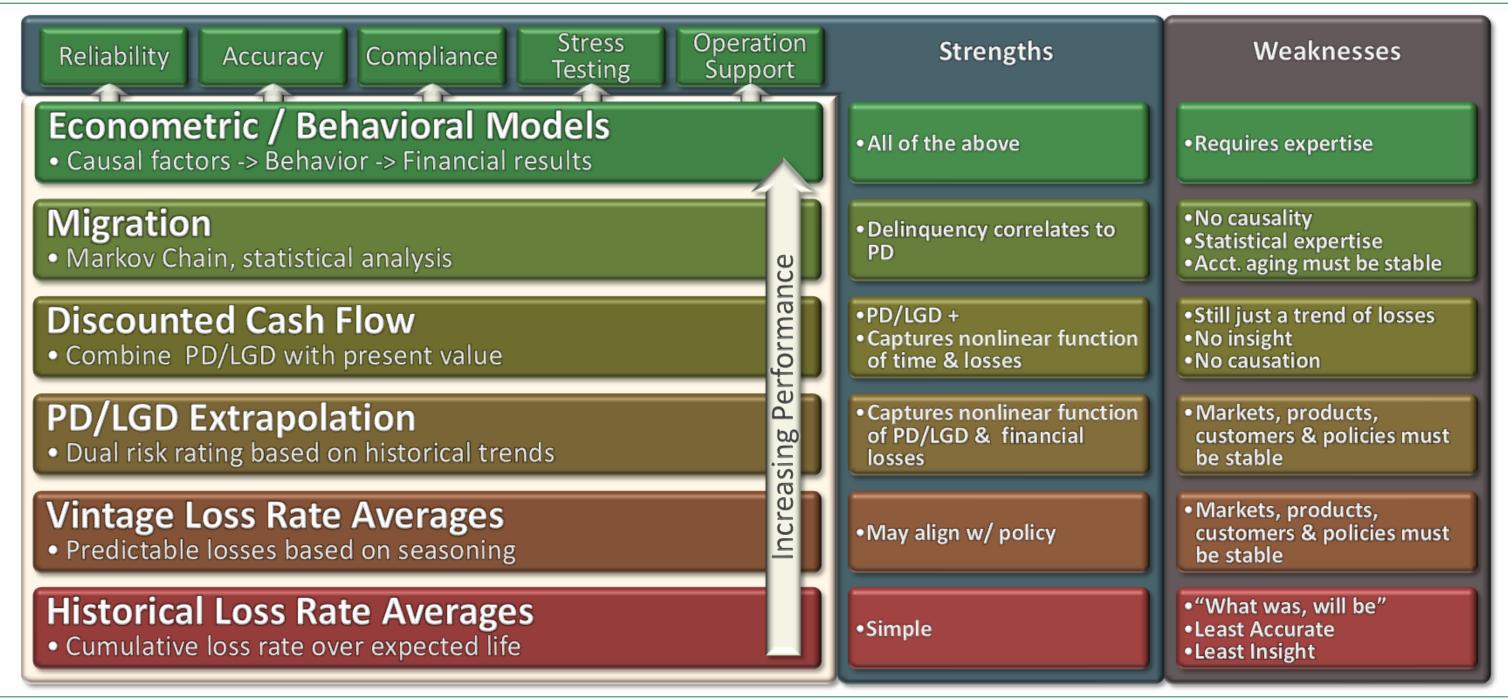


Loan Loss Provision ● Stress Testing ● Account & Portfolio Valuation ● Strategic Planning ● Market Assessment

X-Sell • Activation • Retention • Deposit Capture • Reminders • Collections • Pre-Delinquency Intervention

VERDE ALLELE™ CECL / ALLL / CCAR Model Sophistication

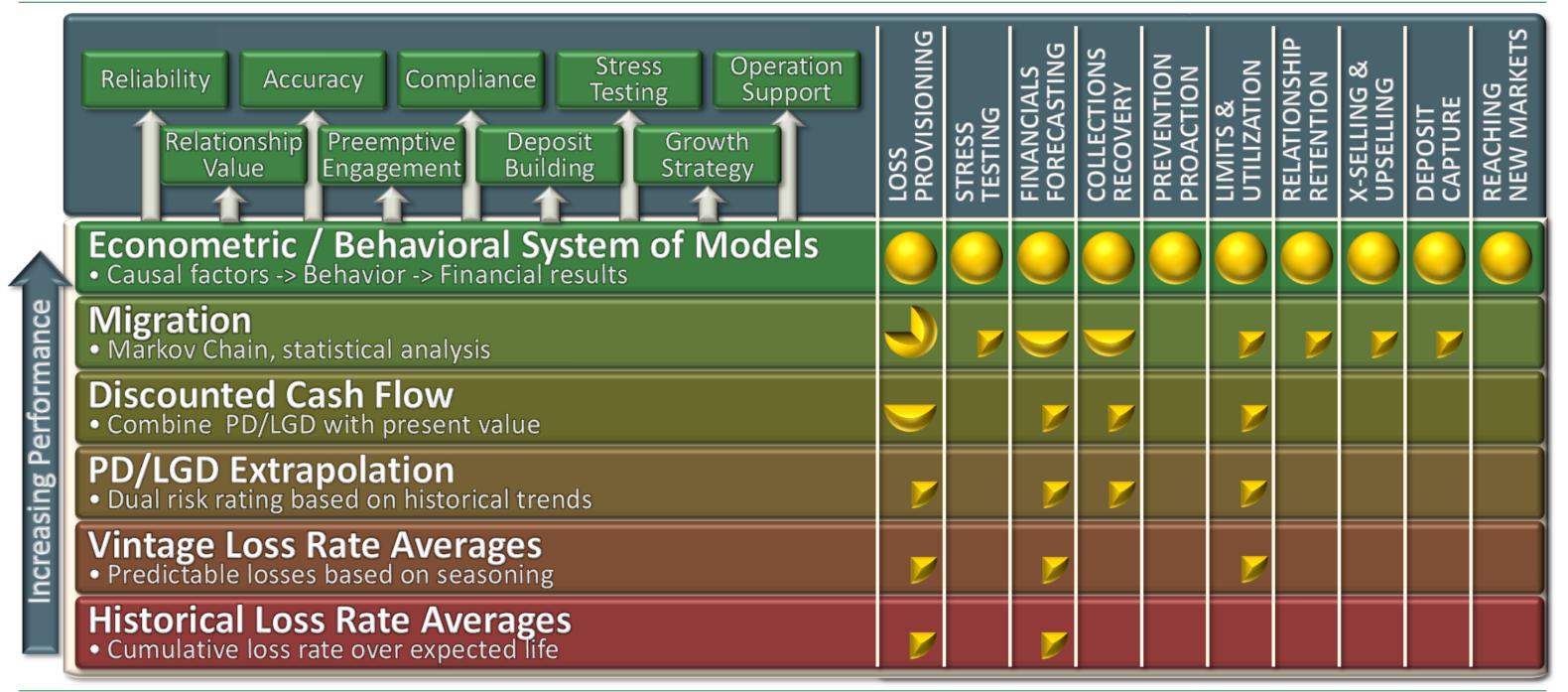






VERDE ALLELE™ CECL / ALLL / CCAR Model Sophistication







VERDE AURORA™

Big Data Useful for Lending



Ecosystem Perspective

ECONOMIC CONDITIONS

- Market Demand & Competition
- Local Market Conditions
- National & Global Conditions

REGULATORY EXPECTATIONS

- Safety & Soundness
- Fairness & Inclusivity
- Competitive Practice
- Economic Development

CAPITAL PARTNER INTERESTS

- Financial Performance & ROI
- · Soundness & Reporting
- Development & Inclusivity

LENDER GOALS, COST & OPERATIONS

- Financial Performance
- Capital Optimization
- Operational Efficiency & Scalability

BORROWER GOALS, ABILITY & BEHAVIOR

- Goals & Economic Opportunities
- · Financial Performance & Plasticity
- Financial Behavior & Resourcefulness

Borrower's Economic World: Trends and Measures from Macro to Very Local

Borrower Behaviors: Determination, Resourcefulness, Resilience, Goal Attainment, Self Sacrifice, Tenacity, Obligation

Loan Purpose & Collateral: Practicality, Goal Fitment, Vested Interest, Efficiency, Realized Value, Confidence

Roadways & Transportation

- Roadway KM
- Traffic Counts
- Construction
- Transit Counts
- Ubiquity

· Mobile Data Detail

- Tower
 - Capability
 - Capacity
 - Utilization
- Phone Ownership
- Phone Usage
- Data Usage
- Mobile Payments

Collateral

- Valuations
- · Details
- Population

Labor Statistics

- Employment
- Unemployment
- Wages
- Other Income
- Employers
- Occupations
- Strike & Stoppage

Government

- Spending
- Regulation
- Permitting
- Zoning

Weather

- Temperature
- Precipitation
- Air Quality
- Inclemency
- Pestilence
- Migration

· Commercial Statistics

- Production
- Bus. Financials
- Sales
- Consumption
- Pricing
- Imports
- Exports
- Tariffs
- Competition

Housing

- Home/Apt Pricing
- Foreclosures
- Permitting
- Construction
- HH Size

Community

- Tenure
- Affiliation
- References

Banking & Finance

- Interest Rates
- Deposit Detail
- Loan Detail
- Equity Markets
- Debt Markets
- Payments & Flows

Bankruptcy

· Health & Education

- Attainment
- Literacy
- Facilities
- Economics

Other Demographics

Occupancy Rates

- Residential
- Commercial

Internet

- Access
- Usage



VERDE AURORA™

Big Data Useful for Lending



Ecosystem Perspective

ECONOMIC CONDITIONS

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Potentially Useful Data Is More Plentiful Than Most Imagine.

For example, in **India**:

Verde analyzed nearly **2 billion** data series in a recent study for predicting lending behavior.

And, in **Bangladesh**:

Verde has amassed **over 60,000 data series**, and we expect the number to quickly double.

Throughout our relationships, we continually identify new sources and work to build access.

