



TransUnion Cards Advisory Board NPV-Based Decisioning System

Realize the power of your own data to transform your business

Brent Reynolds

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PROPRIETARY

A quick intro to Payson Solutions

At Payson, we are trusted advisors to fintechs and lenders. We help companies transform and grow their business with strategic, data-driven solutions.

We are on a mission to Democratize Data

Data is the lifeblood of the digital economy, yet so many companies struggle to make data accessible, meaningful, and integrated into their decisions. We want to change that.

Our belief is that a data-driven approach will create a competitive advantage for companies and lead to better products and experiences for consumers.

Agenda

- The importance of data
- NPV models and their benefits
- In action: multi-purpose use cases for NPV Models
 - ◆ Credit line decreases
 - ◆ Low & grow
 - ◆ Fraud prevention
 - ◆ Collections entry and intensity
 - ◆ Low rate offers
- Important concepts

Data is the lifeblood of the digital economy

Digital Economy

We are in the midst of a global revolution that will re-engineer our workforce and redefine our core industries.

- Artificial Intelligence
- Automation
- Next-gen analytics
- 5G connectivity

Available Data

Almost every action now leaves a digital footprint and generates data that can be used to build new and innovative products and experiences.

- Social Networks
- Mobile Apps
- Websites
- Corporate Applications
- Internet of Things

And yet, organizations struggle to unlock their data's power

Legacy Systems

Data must be clean and accessible before companies can build machine learning capabilities

Disparate data sources

Poor data quality

System migrations

Organizational Design

Organizations must be re-engineered so that data is integrated into the decision-making process

Talent gap

Functional silos

Decision-making culture

“Building the models isn't the hardest part. The hardest part is actually doing what the model tells you to do.”

- Brent Reynolds

NPV Model Benefits

A data-driven decisioning system underpinned by NPV models can unlock tremendous value for a business



Develop Better Products & Solutions



Unlock Growth Vectors



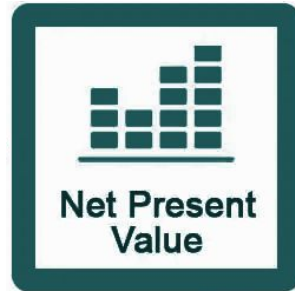
Optimize Segmentation Strategies

A quick refresher on NPV



Discounted life-time value of an income stream

Could be for an account or a treatment

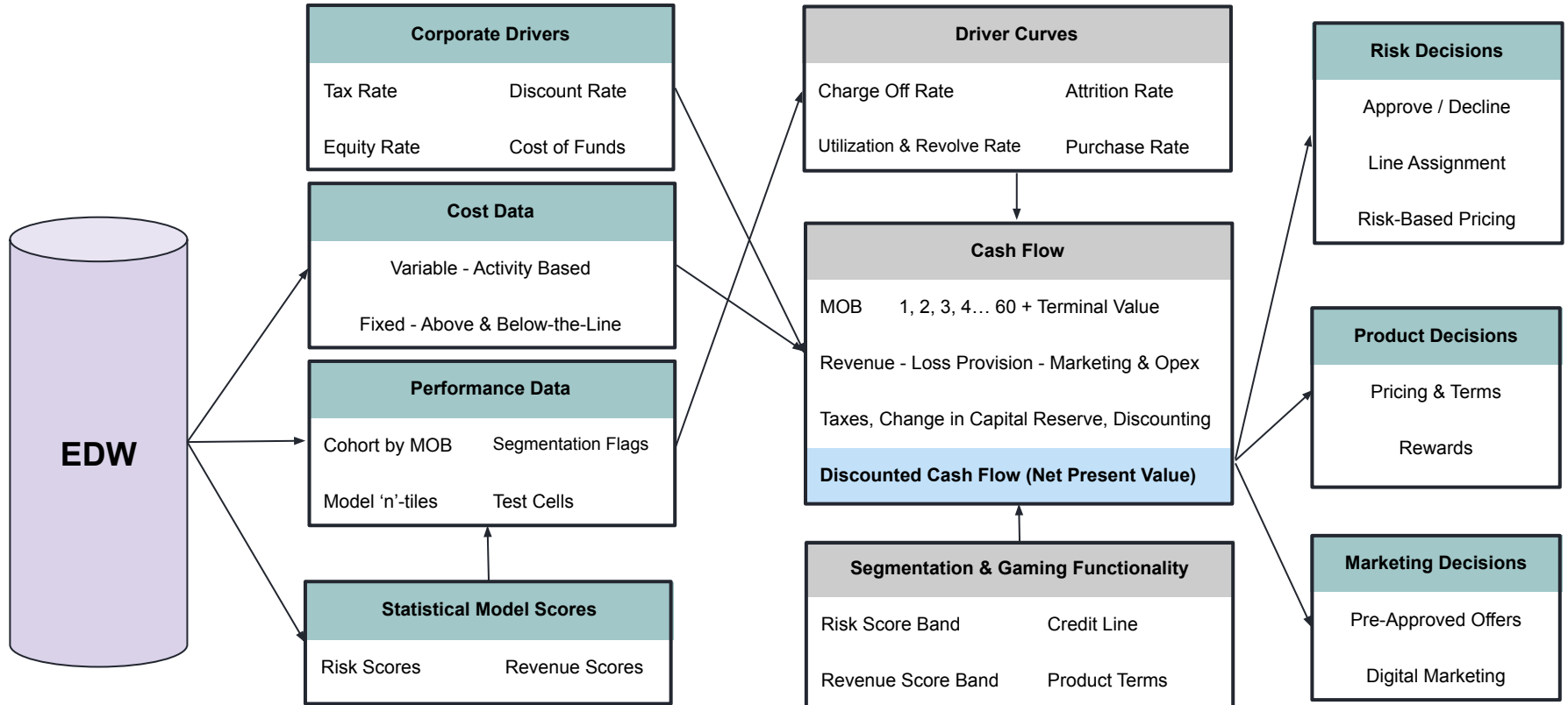


Expected PV less marketing costs

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+i)^t}$$

- CF_t : cash-flow in the period
- n : number of periods
- t : current period
- i : discount rate

Framework for an NPV-based decisioning system for Cards



Why is NPV the gold standard for an objective function?

Note: Alternative objective functions (NIBT, RAR, Payback Period, ROA/ROI/ROE, etc.) will also work within this broader system of data-driven decision making

The NPV Model Accounts For:

Full Income Stream
(Risk & Return)

Opportunity Cost &
Time Value of Money

Cash-Flow
Adjustments (e.g.,
Capital Reserves)

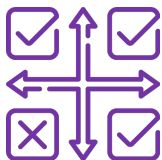
Full Lifetime Value
(LTV) of Account or
Treatment

There are three ways in which we seek to improve an NPV-based decisioning system



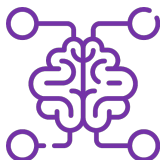
Accuracy

- Better forecasting techniques
- More frequent monitoring and updates to assumptions



Granularity

- Building powerful predictive (ML) models
- Deaveraging performance by getting more surgical through microsegmentation



Comprehensiveness

- Forecasting all future income streams associated with the decision (e.g., future upsell/cross-sell opportunities)

NPV Models can be applied to any optimization decision



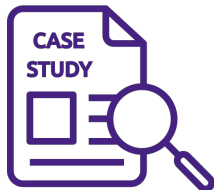
Credit & Risk
Strategy



Product & Pricing
Strategy



Marketing &
Acquisition



Let's dig into some case studies

Case Study #1: Credit Line Decrease (CLD)

Making integrated decisions that consider the risk and revenue impact



CLD is a popular tool during downturns

> 20%

of all credit card exposure was wiped out in the US in 2008-2009 during The Great Recession

CLD programs are rarely, if ever, profitable

→ An NPV model can expose the *false positive dilemma*

Case Study #1: Credit Line Decrease (CLD)

Making integrated decisions that consider the risk and revenue impact



CLD Basic Profit Equation:

$$(pBad) (\Delta LGD) - ((1-pBad) (\Delta ADB) (Yield \%))$$

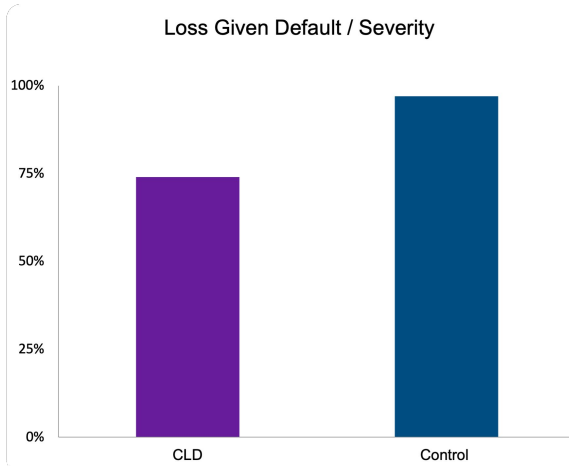
Must have a powerful Bad Rate model that can detect charge-off risk *before* accounts have ramped up their balances

False Positives are very expensive, as they have a high propensity to carry large revolving balances

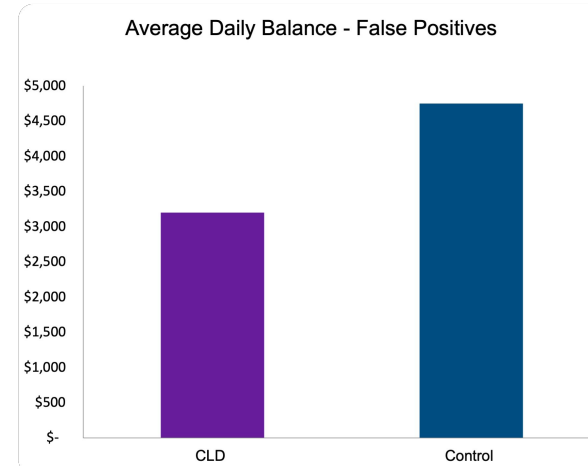
False Positive Dilemma: $pBad = f(\text{Utilization})$

Case Study #1: Credit Line Decrease (CLD)

Making integrated decisions that consider the risk and revenue impact



True Positives skew to those with less Open to Buy, reducing loss savings



Balance Attrition from False Positives is costly, as they are your most profitable accounts

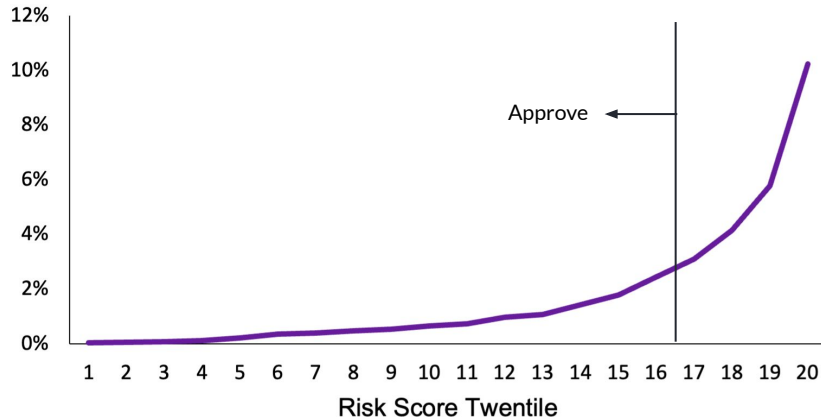
A comprehensive NPV Model can help quantify false positives and drive more profitable decisions

Case Study #2: Low & Grow

Teasing out the wheat from the chaff to reduce Net Credit Loss % by growing “good” balances

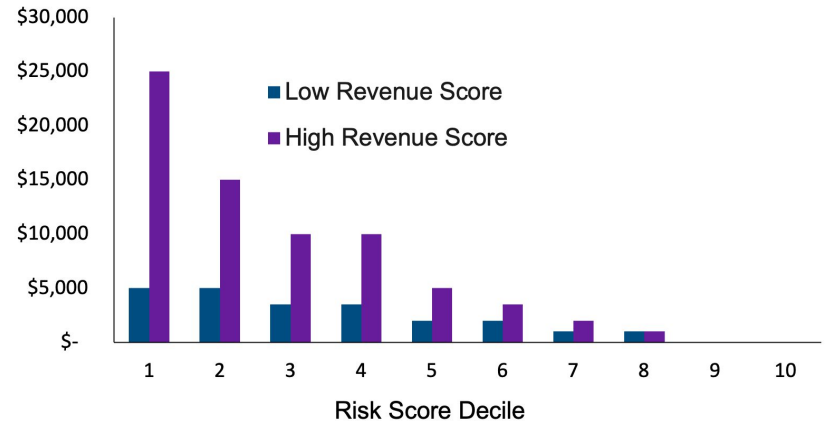


pBad



Powerful ML Risk Models

Line Assignment



Aggressive Line Sloping Based on NPV

Case Study #2: Low & Grow



Teasing out the wheat from the chaff to reduce Net Credit Loss % by growing “good” balances

Illustrative Example of a Credit Line Increase Strategy

LGD = 100%
Util = 67%
iCL = 500
pBad = 10%

$$NCL\% = \frac{pBad \times LGD}{ADB}$$

$$NCL\% = \frac{(10\%)(100\%)(\$500)}{(67\%)(\$500)}$$

$$NCL\% = 15\%$$

→ Give half of the accounts a Line Increase

LGD = 100%
Util = 60%
CL = 2000
pBad = 4%

LGD = 100%
Util = 80%
iCL = 500
pBad = 16%

$$NCL\% = \frac{\$2000(4\%) + \$500(16\%)}{\$2000(60\%) + \$500(80\%)}$$

$$NCL\% = 10\%$$

By growing “good” balances, NCL% decreases

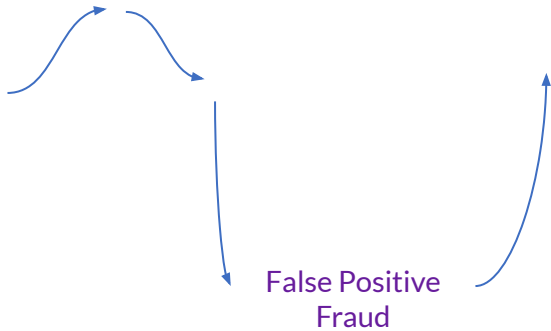
Granular NPV Models are crucial in establishing the best treatment for each group

Case Study #3: Fraud Prevention

How technology and CX can flip the False Positive Dilemma



Fraud is a “moment that matters”



Historically, false positives meant a:

- Cancelled card, with 7-10 day delivery of re-issue
- Loss of First in Wallet status
- ~30% reduction in future spend

Case Study #3: Fraud Prevention

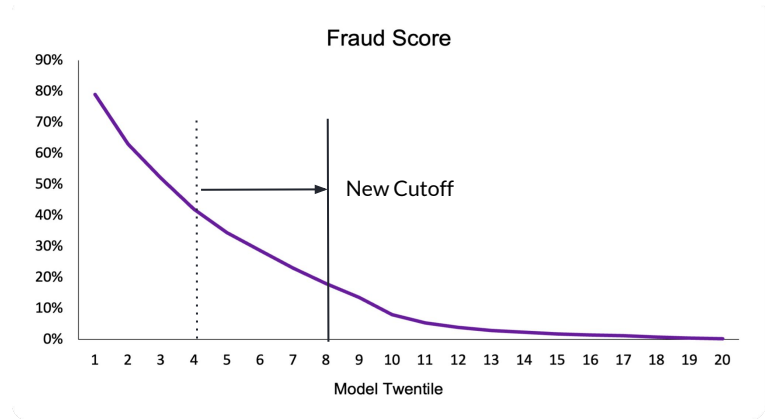
How technology and CX can flip the False Positive Dilemma



With real time notifications, false positives no longer interrupt the spend cycle...



... allowing you to cast a wider net, prevent more fraud, and protect more customers.



NPV Models help us understand that the initial investment in the technology will pay back

Case Study #4: Collection Entry & Intensity

Understanding the positive second order effects of early intervention



Main Question in Collections:

How early and how often do you contact accounts?

Traditional Thought:

Optimize for \$ collected less direct costs (staffing expenses or commissions)

This objective function ignores the second order effects of intervention timing

Case Study #4: Collection Entry & Intensity

Understanding the positive second order effects of early intervention



Test Stream

Early Entry

3 X Intensity

1

30

Suspend

120

Permanent
Restriction

180

Charge Off

Days Delinquent

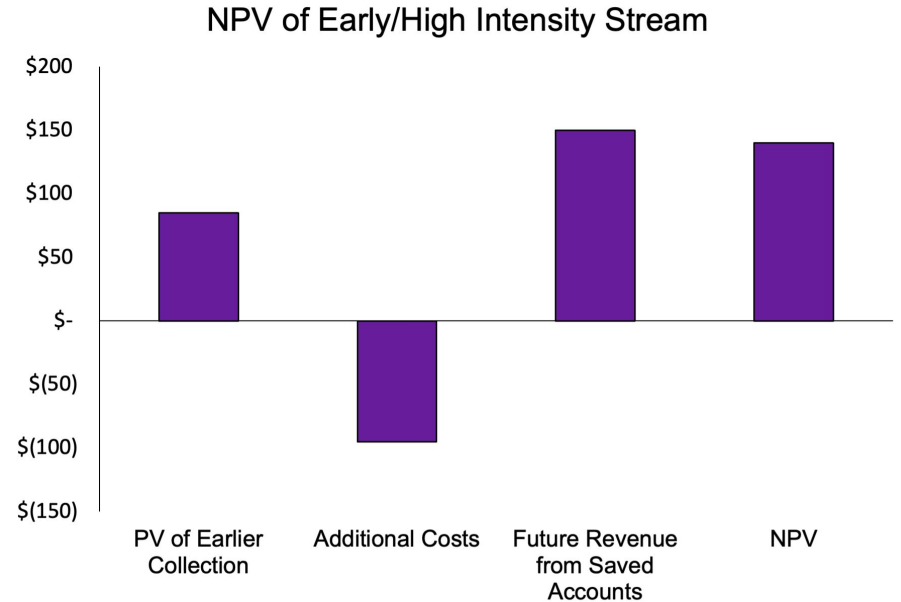
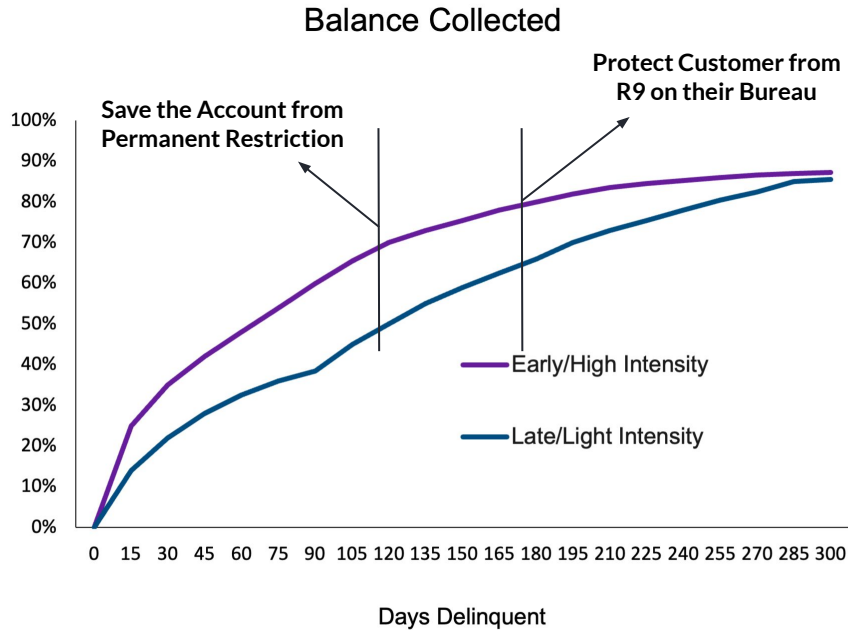
Late Entry

1 X Intensity

Control Stream

Case Study #4: Collection Entry & Intensity

Understanding the positive second order effects of early intervention



A win-win is created for the customer and the business by integrating testing results into an NPV decisioning framework

Case Study #5: Low Rate Offers

How positive selection can have a flywheel effect for profitable growth



Assume we are testing two
APRs in the market

Prime +
4.99%



Prime +
6.99%



Simple analysis:

What incremental balances do you
drive?

$$NPV = \Delta ADB_t (\text{yield}) - ADB_c (200 \text{ bps})$$

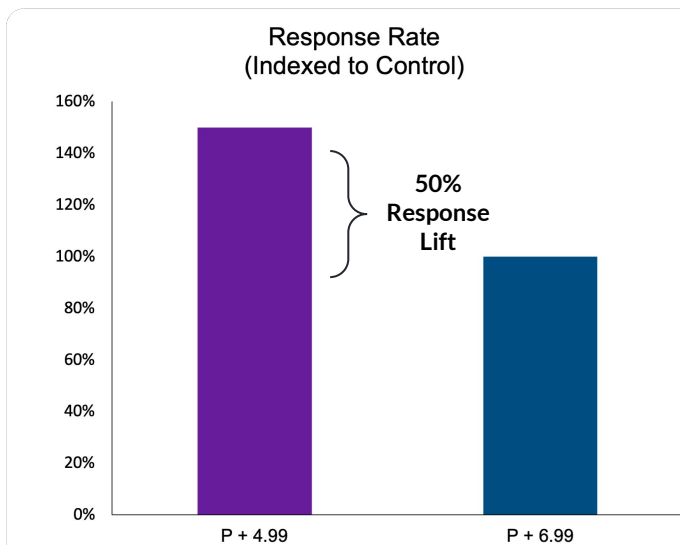
Accounts for first order variables:

- Yield drop
- Higher take up
- Higher balances

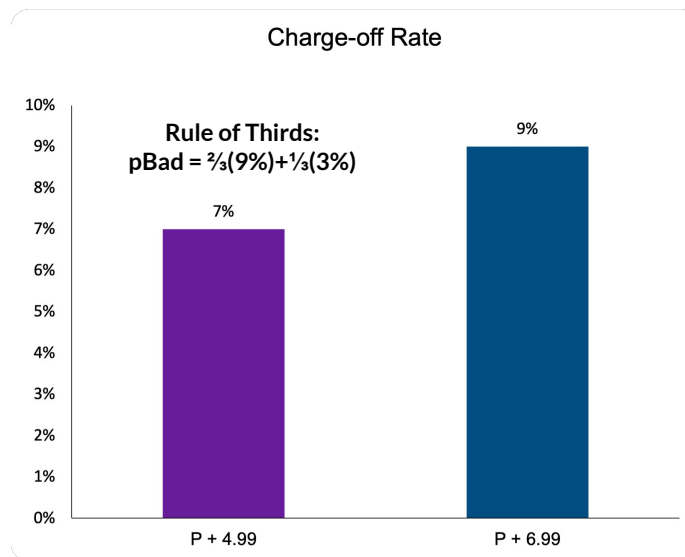
Ignores **positive selection** second order
effect

Case Study #5: Low Rate Offers

How positive selection can have a flywheel effect for profitable growth



“Rule of Thirds”
Incremental Responders are $\frac{1}{3}$ the risk of Base Responders



Accounting for the second order effect of positive selection in the NPV model can lead to higher balances and lower risk

Important concepts to keep in mind when decisioning

Adverse/Positive Selection



A consequence of asymmetric information in the system.

*"Privately informed risky borrowers are willing to pay higher interest rates than privately informed safer borrowers are despite collateral requirements in place to deter them."*¹

Second Order Effect



Every change you make to a system will have Second-Order Effects, which may affect the system's functionality.²

E.g., Lending additional credit to an existing customer will increase chance of default.

Regression to the Mean



RTTM suggests that loss rate volatility will eventually revert to its long-term average levels.

E.g., Risk models will split risk levels by score band in the short term, but will regress back to the mean over time.

Exogenous Factors



A term borrowed from biology to describe something growing or originating from outside an organism.

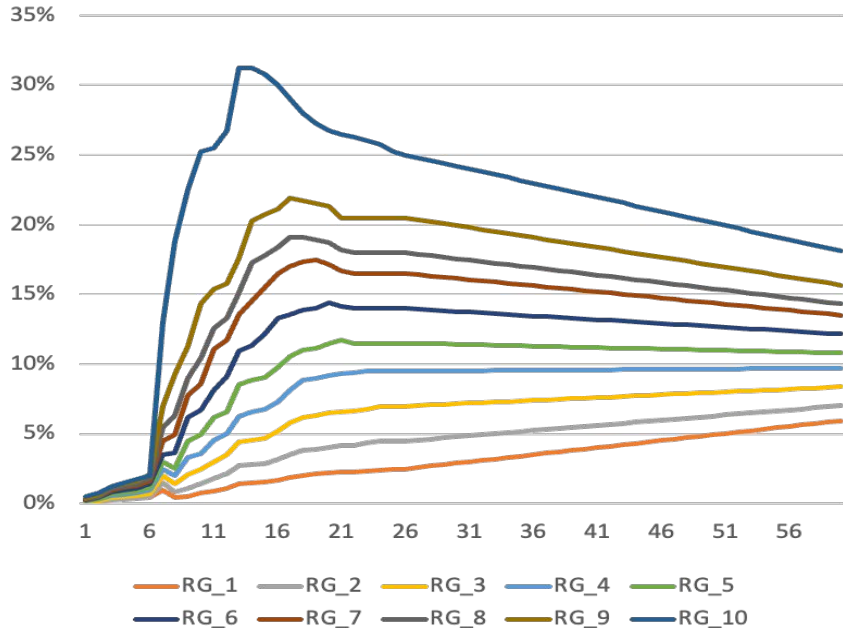
When monitoring and building models, it's important to normalize for exogenous factors (e.g., COVID).

Let's take a closer look

Regression to the Mean (RTTM)

Accounting for both the level and shape of key metrics over time

pBad per Open (Annualized)

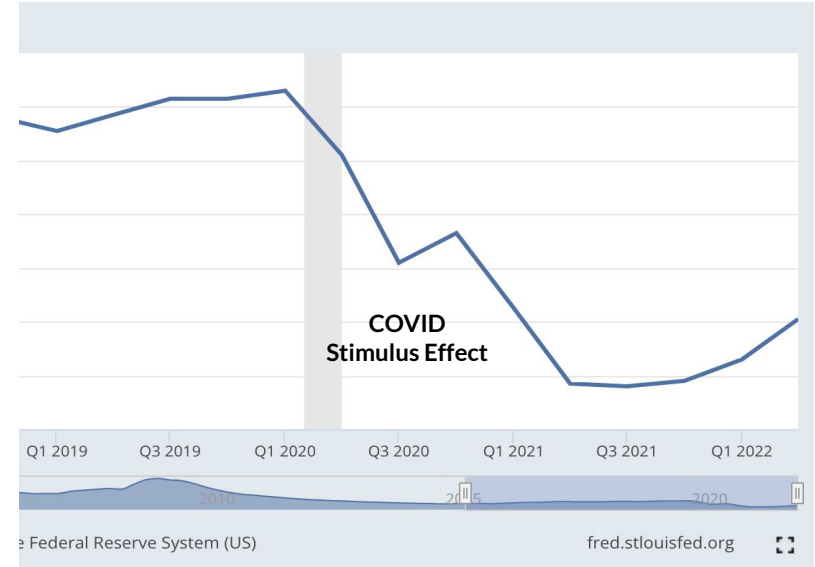
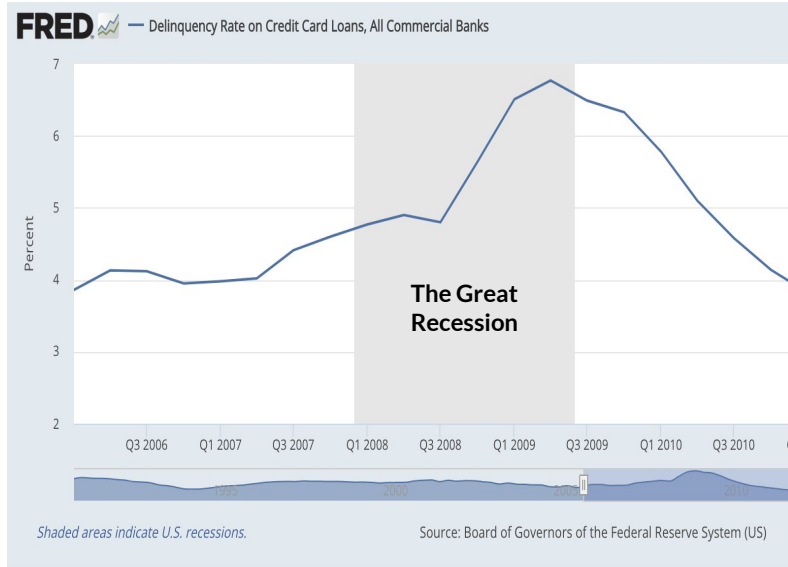


Factoring RTTM into our NPV model allows us to:

- Approve deeper at the margin
- Avoid granting too much exposure to lower risk bands

Exogenous Factors

Normalizing performance data to remove temporal effects



With exogenous factors like the Great Recession or COVID, it's important to normalize your data in order to avoid the "rear-view mirror trap".

About Brent



Brent founded Payson Solutions in 2018 to provide strategic, data-driven solutions to companies looking to transform their business.

Since then, Payson has helped dozens of companies across the globe realize the power of their own data, with a diverse client base that includes top-tier banks, credit unions, fintechs at both start-up and growth stage, collection agencies, and alternative lenders.

Learn More:

