

# Modeling Information- Based Strategy: Teaching Modeling and Strategic Consulting to Non-Programmers

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Information Strategy & Economics

The Wharton School

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# Context — Disconnect Between What Students Want and Need


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-  Students want to learn programming in R and SQL so they'll be “relevant” and “attractive” to the tech sector
-  Most students can't handle R, and it is the most frequently dropped course among MBAs
-  Students can't learn enough programming in a single semester to have a tech-based career
  -  *You want the Quant?*




# Context — Disconnect Between What Students Want and Need

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 Students can't learn enough programming in a single semester to have a tech-based career







 *You want the Quant?*

 *You can't handle the Quant!*








# Context — Disconnect Between What Students Want and Need

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-  Students aren't wrong — they really do need more problem solving skills than we are giving them
-  They need to be able to think rigorously, create a model, run the model, discuss the findings, and explore alternatives
  -  Strategic consulting is not just story telling!
-  But they don't need the kind of course I taught in computer science
-  They don't need a course in algorithms, data structures, computational complexity, or bubble sort
-  They need a course in modeling for intuition and judgment







# Context — Disconnect Between What Students Want and Need

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-  They need a course in modeling for intuition and judgment
-  The solution — using a special purpose simulation language, teaching them the building blocks of simulation programming
-  I use Goldsim, a version of Forrester's Industrial Dynamics that is free for students and faculty
-  Disclaimer — still a work in progress
  -  I'm not sure how it will scale

# A first course in modeling information-based strategy

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-  Perhaps *the* first course in simulation modeling of information-based strategy
-  Start with my all time favorite consulting interactions
  -  Modeling promotion competition between Procter and Lever, erosion of loyalty, gains for Lever, growth of private label
  -  Modeling Capital One's attack on Citi as a Newly Vulnerable market and possible responses available to Citi
  -  Modeling BA's attack on travel agencies, modeling Lever's eCommerce capitulation, and why the two were such different examples of vulnerability in online markets
  -  Even modeling the precision targeted crafting and precision targeted distribution of fake news

# A first course in modeling information-based strategy

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Perhaps we are the only ones on campus who can teach a course like this









We know how to program and how to teach programming



And collectively we have consulted for organizations ranging from BA and Lever to small craft brewers or dot.com startups, and from small non-profits to the London Stock Exchange and 4-Star Officers in the E-Ring of the Pentagon

# So how do we teach this?

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-  Teach them the theory, newly vulnerable markets, newly vulnerable online markets, newly vulnerable resonance markets
-  Teach them the components of simulation, especially flows among pools over time, stochastic and deterministic, with and without large shocks
-  With *lots* of tutoring in the computer lab
-  Almost an inverted teaching style
  -  We do the programming together
  -  They do the analyses in their groups



# An Example — Capital One's Attack on Dominant Banks

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## The parameters of the problem



Distribution of card-holders, including their average balances and their average revolving balances



In-play ratio for the different market segments



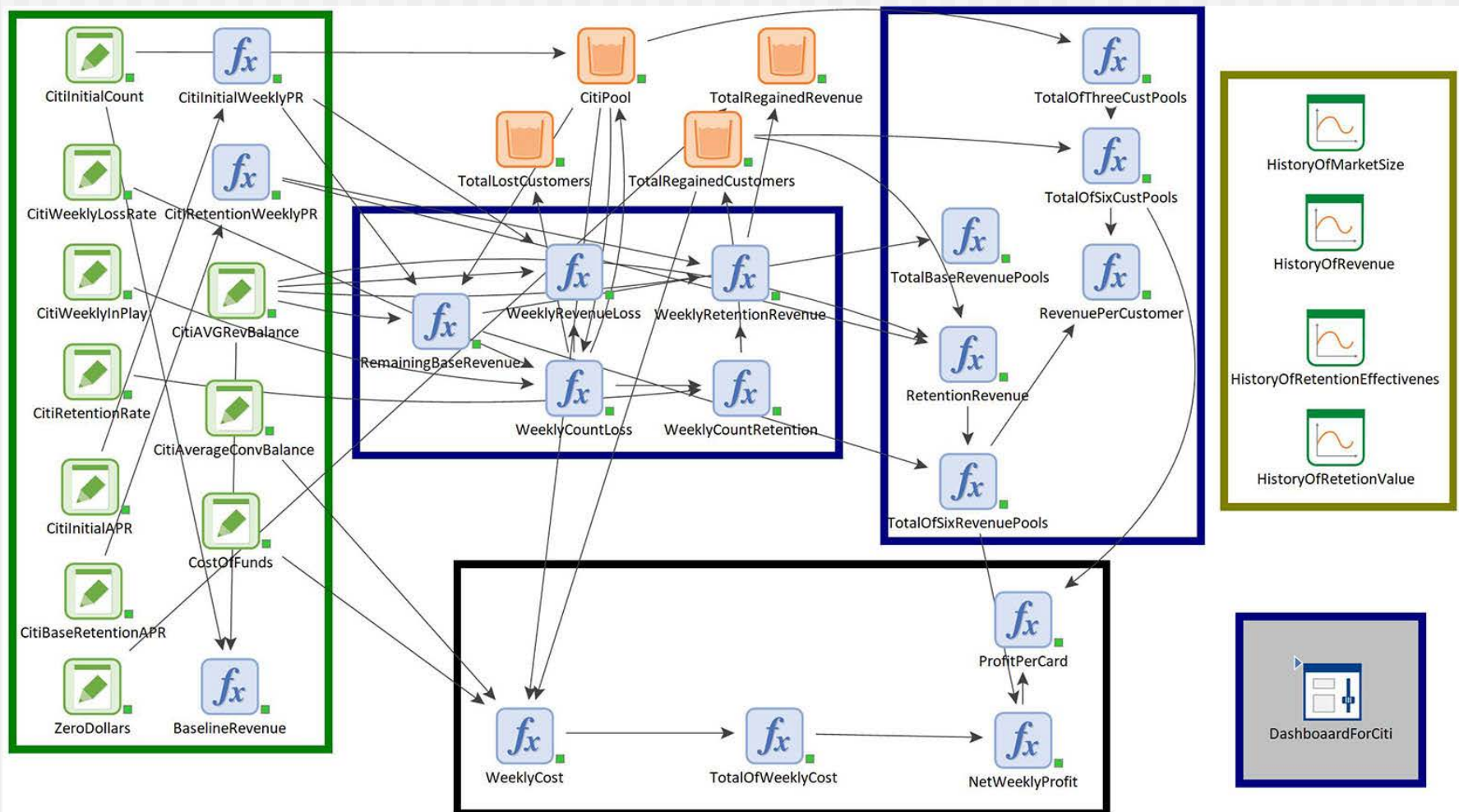
Switching rates for the different market segments



Retention effectiveness

# An Example — Capital One's Attack on Dominant Banks

 The overall structure of the “code”



# An Example — Capital One's Attack on Dominant Banks

And their “discoveries”

*Do nothing* is a *slow* disaster

Citi Weekly In Play

0.04

	CitiWeeklyLossRate [1/week]
LoveEms	0.075
Middle	0.0025
KillYous	0

	CitiRetentionRate
LoveEms	0
Middle	0
KillYous	0

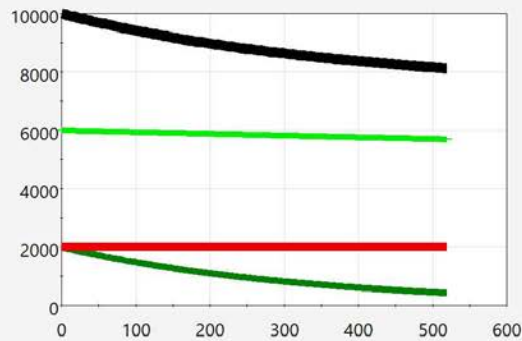
	CitiInitialAPR
LoveEms	0.198
Middle	0.198
KillYous	0.198

	CitiRetentionAPR
LoveEms	0.0695
Middle	0.198
KillYous	0.198

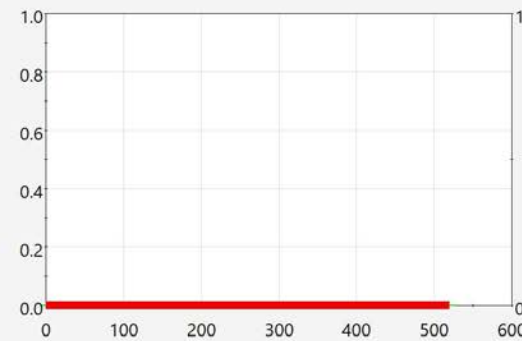
TotalCostOfFunds

0.019

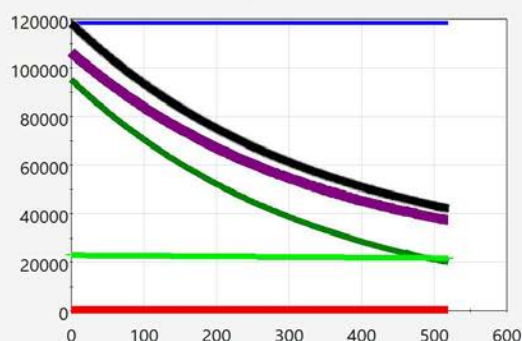
History of Market Size



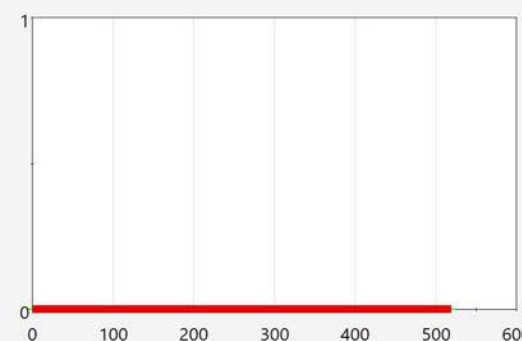
History of Retention Size



History of Original Revenues



History of Retention Revenues



Revenue Per Card

5.17861 \$

ProfitPerCard

4.59163 \$

Blue is Baseline Before Attack  
 Black is sum of original 3 pools  
 Gray is sum of 3 pools  
 plus retention  
 Purple is Gray adjusted  
 for cost of funds  
 Light Green is Middle  
 Dark Green is Love 'ems  
 Red is Kill Yous

# An Example — Capital One's Attack on Dominant Banks

And their “discoveries”

*Pre-emptively dropping rates* for all love 'em customers is a *fast* disaster

Citi Weekly In Play

CitiWeeklyLossRate [1/week]	
LoveEms	0.075
Middle	0.0025
KillYous	0
CitiRetentionRate	
LoveEms	0
Middle	0
KillYous	0

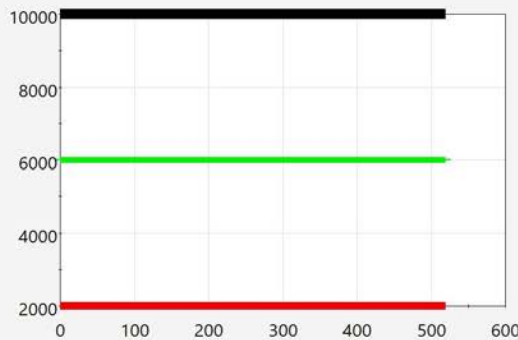
CitiInitialAPR	
LoveEms	0.0699
Middle	0.198
KillYous	0.198

CitiRetentionAPR	
LoveEms	0.198
Middle	0.198
KillYous	0.198

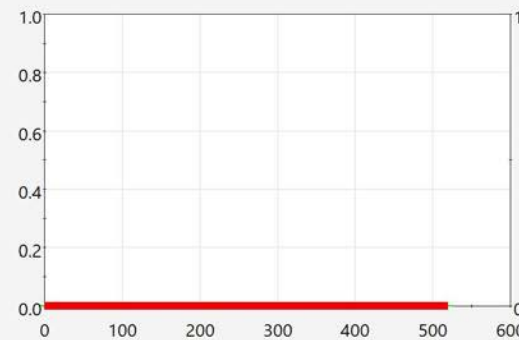
TotalCostOfFunds

0.019

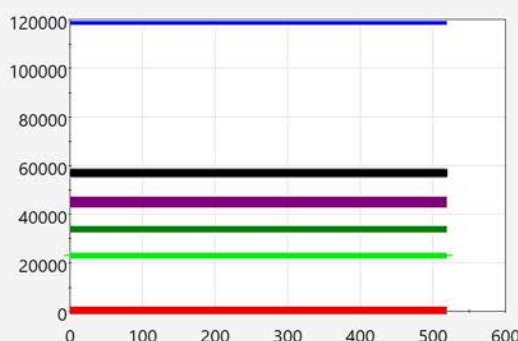
History of Market Size



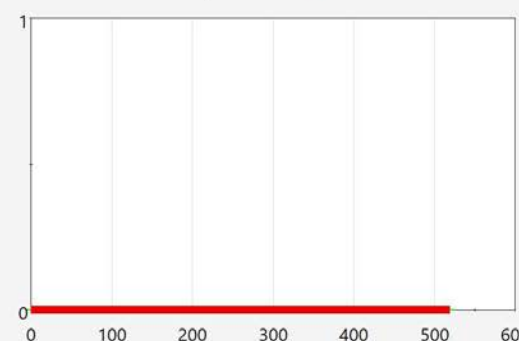
History of Retention Size



History of Original Revenues



History of Retention Revenues



Revenue Per Card

5.68327 \$

ProfitPerCard

4.47385 \$

Blue is Baseline Before Attack  
 Black is sum of original 3 pools  
 Gray is sum of 3 pools plus retention  
 Purple is Gray adjusted for cost of funds  
 Light Green is Middle  
 Dark Green is Love 'ems  
 Red is Kill Yous

# An Example — Capital One's Attack on Dominant Banks



And their “discoveries”



*Responding when a customer tries to leave* might be **best** — *if* ...

Citi Weekly In Play

0.04

	CitiWeeklyLossRate [1/week]
LoveEms	0.075
Middle	0.0025
KillYous	0

	CitiRetentionRate
LoveEms	0.75
Middle	0
KillYous	0

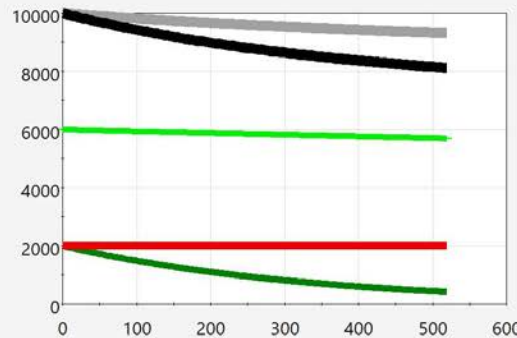
	CitiInitialAPR
LoveEms	0.198
Middle	0.198
KillYous	0.198

	CitiRetentionAPR
LoveEms	0.0699
Middle	0.198
KillYous	0.198

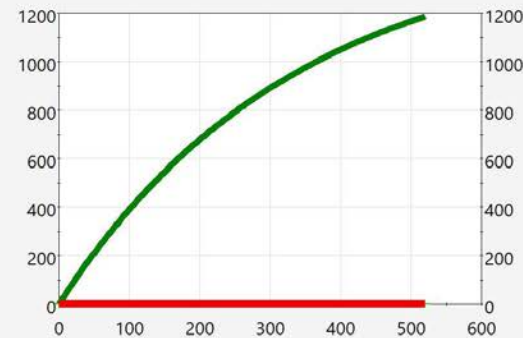
TotalCostOfFunds

0.019

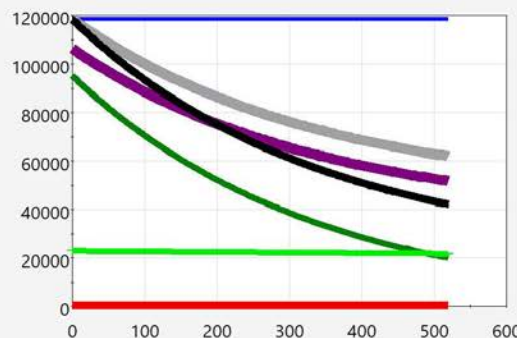
History of Market Size



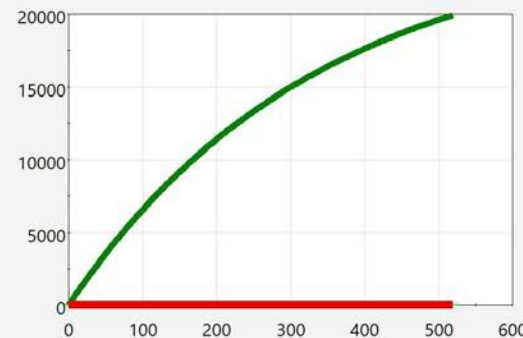
History of Retention Size



History of Original Revenues



History of Retention Revenues



Revenue Per Card

6.66031 \$

ProfitPerCard

5.56597 \$

Blue is Baseline Before Attack  
 Black is sum of original 3 pools  
 Gray is sum of 3 pools plus retention  
 Purple is Gray adjusted for cost of funds  
 Light Green is Middle  
 Dark Green is Love 'ems  
 Red is Kill Yous

# An Example — Capital One's Attack on Dominant Banks



And their “discoveries”



*Responding when a customer tries to leave might be best — but ...*

Citi Weekly In Play

0.04

	CitiWeeklyLossRate [1/week]
LoveEms	0.075
Middle	0.0025
KillYous	0

	CitiRetentionRate
LoveEms	0.25
Middle	0
KillYous	0

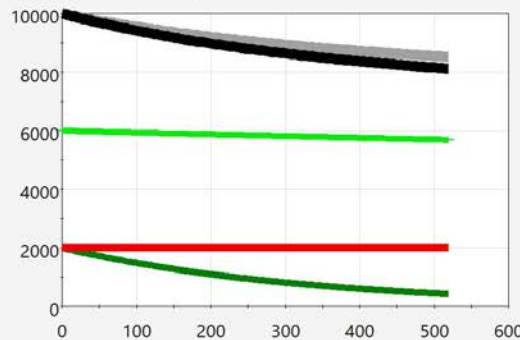
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LoveEms	0.0699
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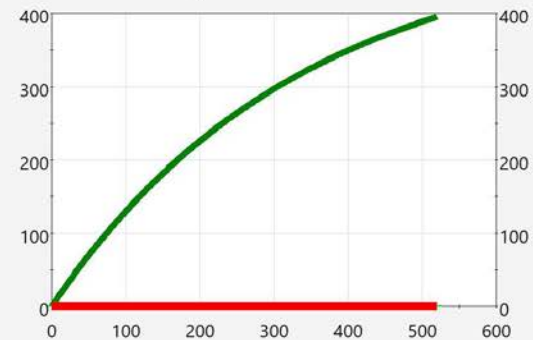
TotalCostOfFunds

0.019

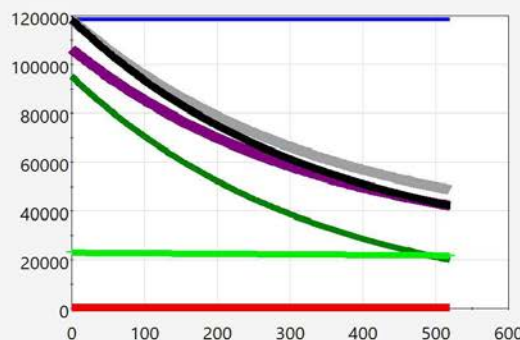
History of Market Size



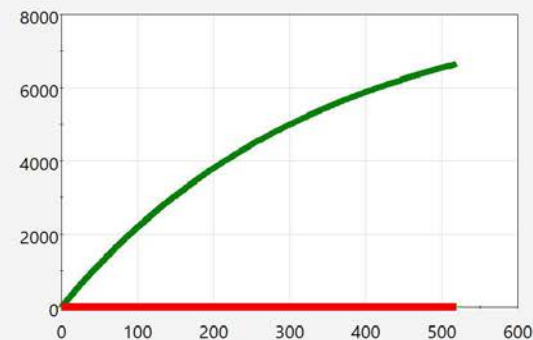
History of Retention Size



History of Original Revenues



History of Retention Revenues



Revenue Per Card

5.71838 \$

ProfitPerCard

4.94657 \$

Blue is Baseline Before Attack  
 Black is sum of original 3 pools  
 Gray is sum of 3 pools plus retention  
 Purple is Gray adjusted for cost of funds  
 Light Green is Middle  
 Dark Green is Love 'ems  
 Red is Kill Yous

# An Example — Capital One's Attack on Dominant Banks

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And their “discoveries”



Principal discovery is that there really is no effective response to an attack on a dominant player in a newly vulnerable market



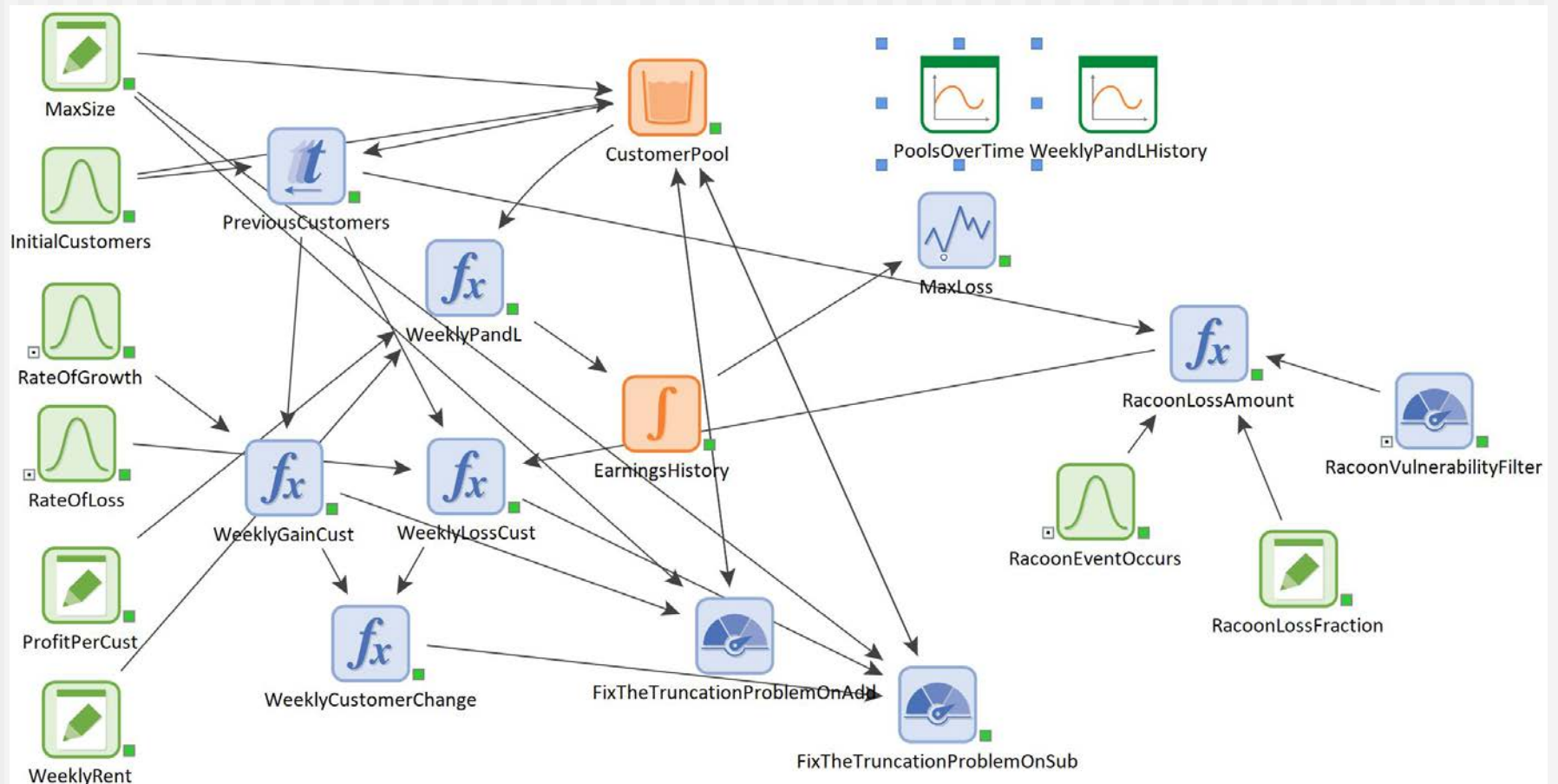
Citi chose to copy the strategy and attack HSBC in Hong Kong, which worked



Citi also tried to hire a consulting anthropologist and find ways to make their unprofitable accounts profitable


# Start off with Simpler Models, Cascade Concepts and Skills

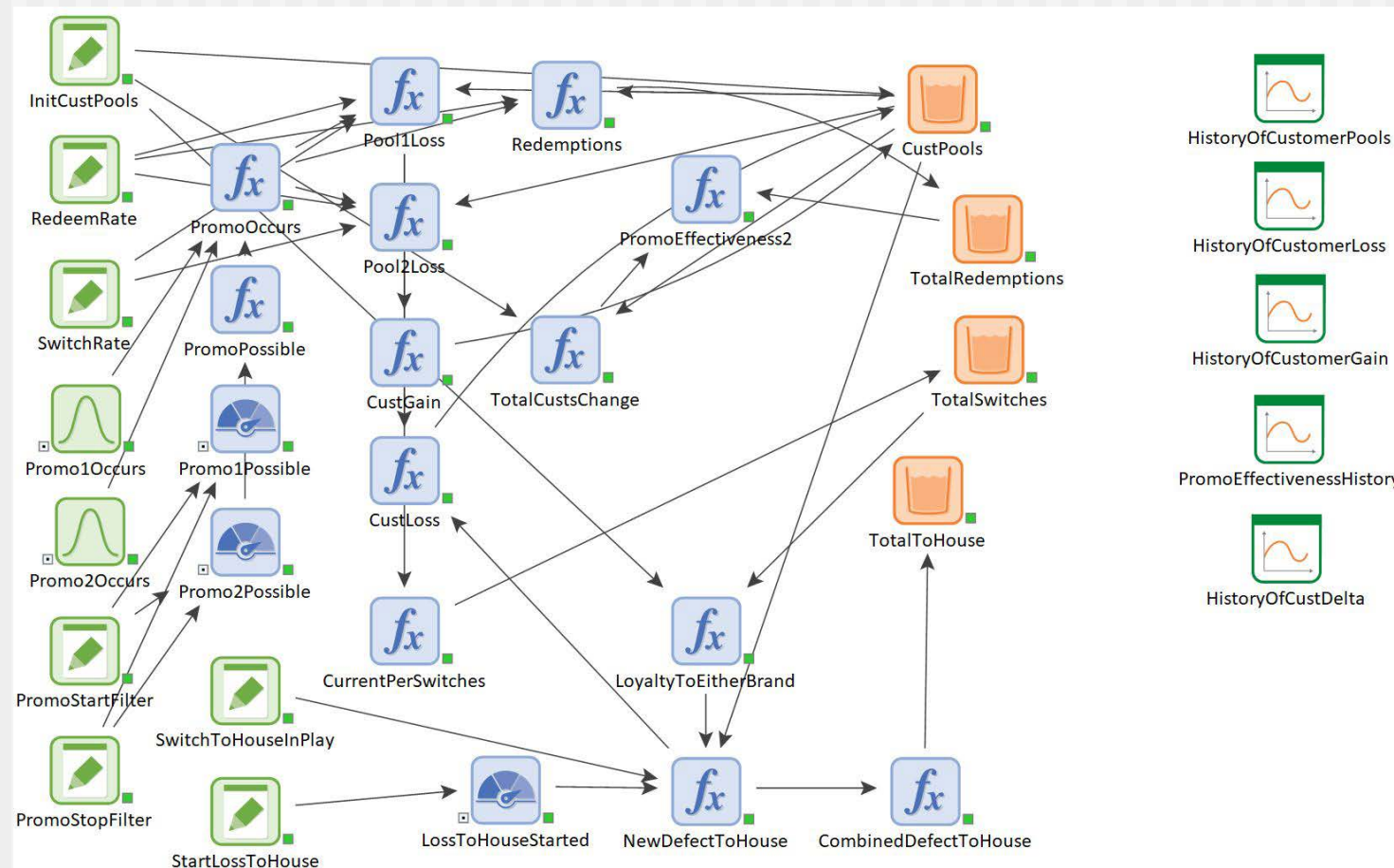
 The Yongle Le Golden Roof Tea Shop — for pools changing evolving over time






# Start off with Simpler Models, Cascade Concepts and Skills

 The Promotional Warfare Model — multiple pools, and networks of pools leaking into each other over time



# Start off with Simpler Models, Cascade Concepts and Skills

 The Promotional Warfare Model — multiple pools, and networks of pools leaking into each other over time

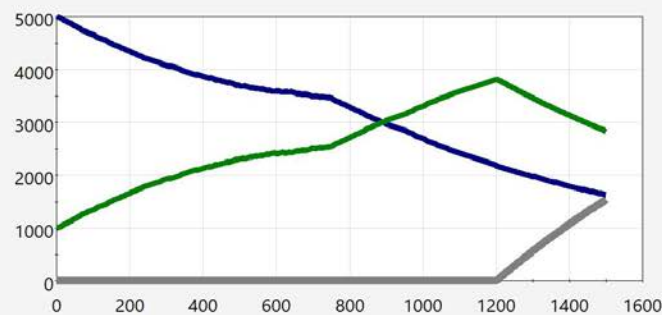
Redemption Rate for All Promotions

Promotion Stop Dates

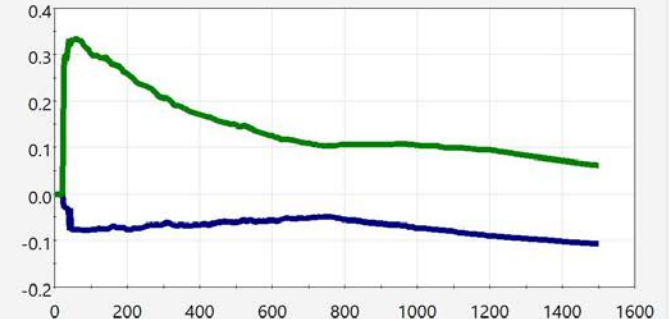
	PromoStopFilter
Grumble	750
Plover	1200

Promotion Switch Rate

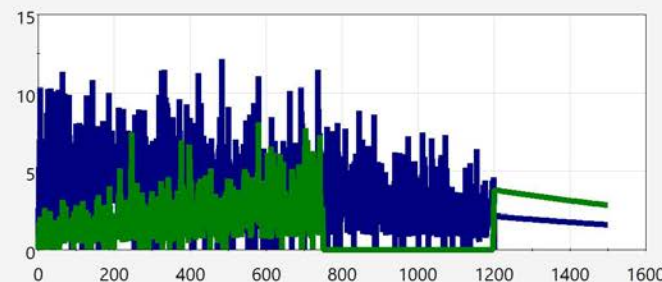
History of Both Customer Pools -- Green is Plover, Gray is Private Label



History of Promotion Effectiveness -- Green is Plover



History of Customer Losses -- Green is Plover








Launch Date for Private Label

Adoption Rate for Private Label

# Conclusions

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-  Start with the necessary theory for consulting in information-based strategy
-  Teach the class how to construct models of nonlinear interactions, ebbs and flows, over time
-  Teach the class how to analyze their results, including sensitivity analyses and Monte Carlo bounding of results
-  Teach them to run models rather than present from power points
-  Still in proof of concept stage — will it scale?