FiTech: Data Driven Credit Card Design

Fitech Simulation[1]

Scenario Description and User Guide

One element of an information-based strategy in the credit card industry has been the careful attention given to the design of product offerings. The attributes of a credit card could be changed easily and rapidly. This exercise examines FiTech, a fintech company, and its attempt to implement an information-based strategy.

Credit Card Attributes

For the purposes of this exercise, we will consider the three major attributes of a credit card: annual percentage rate, annual fee, and fixed rate versus variable rate.

- **Annual percentage rate (APR):** The rate of interest charged on outstanding balances. The higher the APR, the more finance charges the customer accrued on outstanding balances. Although customers could avoid finance charges by paying their bill each month, only about 30% did so. Thus, APR was a key determinant of the credit card's profitability. For the purposes of this case study, we consider three levels of APR: 14.9, 16.8, and 19.8.
- **Annual fee:** Cardholders sometimes paid a fixed annual fee. We will consider two fee levels: no annual fee and a $20 annual fee.
- **Fixed or variable rate:** A variable-rate card's APR was expressed as a function of the prevailing prime interest rate. The advantage of a variable-rate card was that FiTech could pass along most of the interest-rate risk to the customer. Ordinarily, when the cost of funds went up, margins became smaller. With a variable-rate card, a rise in borrowing costs led to a rise in the price to the customer, which protected the margin. Consumers appeared to be aware of this phenomenon and responded less readily to variable-rate cards than to fixed-rate cards.

[1]This handout was prepared by Vincent Nijs, Associate Professor of Business Analytics and Marketing.

In summary, FiTech was considering offering 12 ($3 \times 2 \times 2$) possible products in its next solicitation.

Solicitation 23–1

In solicitation 23-1 approximately 750,000 people would be emailed a credit card offer. As with previous email campaigns, FiTech obtained these names from one of the national credit bureaus. For this campaign, FiTech ordered names of people with specified bankruptcy (BK) scores. One-third of the names had a BK score of 150, one-third had a BK score of 200, and one-third had a BK score of 250.[2] An individual's BK score was a measure of risk. The higher the score, the more likely that person was to default on a financial obligation. BK scores (available for a fee from the credit bureau) had a long and proven record of effectively predicting the creditworthiness of an individual. Through buying and using BK scores to select its email list, FiTech could target low-risk people.

Exhibit 1 shows the results of several of FiTech's recent email campaigns. Although the names being emailed in Solicitation 23-1 were similar to those used in the previous campaigns, many factors beyond FiTech's control had changed and could affect customers' responses. Several of FiTech's competitors had launched major marketing campaigns during the holiday season. One competitor was aggressively marketing no-fee cards and a second was offering a substantial rebate program. In addition, interest rates had increased: In the past six months, FiTech's cost of borrowing had increased more than a percentage point.

The fixed costs to design the solicitation were \$10,000, with \$1,000 for each additional product variation used. The variable costs totaled \$0.50 per email (i.e., email 'rental' cost charged by the credit bureau). Fixed email costs were negligible, about \$800 per campaign.

Customer Value

In order to design products, FiTech had to have some idea how the Customer Lifetime Value (CLV) varied across the candidate products. This question was particularly difficult in the credit-card industry because the cash flows from a customer could last for many years. In addition, the issuing company faced the risk of customers defaulting at some unknown future date. Because it would take years to track the eventual rate of default by customers who had responded to a solicitation, judging the profitability of any solicitation would take a long time.

Exhibit 2 outlines estimates of the lifetime value of customers acquired through each of the 12 candidate products. Notice that the values depend not only on the product offering, but also on the customer's BK score: The higher the BK score, the lower the CLV. In addition, the

[2] This is a simplification. In actuality, names with BK scores between an upper and lower limit would be provided.

higher the APR or annual fee, the higher the CLV. FiTech preferred variable-rate products, and this preference was accounted for in the CLV estimates.

The Decision

FiTech had little time to make the product-design decision and did not have much more information than what has been presented here. Using the URL provided by your instructor, maximize the profitability of the upcoming solicitation by deciding which of the 750,000 customers will receive which product offer. Instructions are included in the **Appendix** at the end of this handout.

Exhibit 1

Results of Recent Solicitations

Date	APR	Fixed/Variable	Annual Fee	Visa/ Master Card (MC)	Number Mailed	Number of Accounts	BK Score
April	16.8	Fixed	$20	MC	167,000	1,533	200
April	16.8	Fixed	0	MC	81,000	2,896	200
April	19.8	Fixed	$20	MC	143,000	590	200
April	19.8	Fixed	0	MC	100,000	2,052	200
September	14.9	Fixed	$20	Visa	177,000	4,329	250
September	14.9	Variable	$20	Visa	170,000	3,004	250
September	16.8	Fixed	$20	Visa	255,000	2,983	250
September	19.8	Fixed	$20	Visa	35,000	175	250
September	16.8	Fixed	0	Visa	65,000	2,516	250
September	19.8	Fixed	0	Visa	95,000	2,115	250
November	14.9	Fixed	$20	Visa	82,000	1,761	150
November	14.9	Fixed	0	Visa	50,000	2,451	150
November	14.9	Variable	$20	Visa	50,000	708	150
November	16.8	Fixed	$20	Visa	50,000	372	150

Exhibit 2

FiTech Product Design: CLV Estimates

APR	Fixed/Variable	Annual Fee	BK Score 150	BK Score 200	BK Score 250
14.9	Fixed	$20	$83	$63	$33

APR	Fixed/Variable	Annual Fee	BK Score 150	BK Score 200	BK Score 250
14.9	Variable	$20	$93	$73	$43
14.9	Fixed	0	$52	$32	$2
14.9	Variable	0	$62	$42	$12
16.8	Fixed	$20	$103	$83	$53
16.8	Variable	$20	$113	$93	$63
16.8	Fixed	0	$72	$52	$22
16.8	Variable	0	$82	$62	$32
19.8	Fixed	$20	$131	$111	$81
19.8	Variable	$20	$141	$121	$91
19.8	Fixed	0	$100	$80	$50
19.8	Variable	0	$110	$90	$60

Appendix

User Guide

Overview

This interactive simulation emulates the product-design process using an information-based strategy. FiTech has a variety of products (i.e., 12 versions of a credit card) and detailed information (summarized by a single credit score) on several thousand potential customers. The question at hand is which product(s) should be offered through email to which customers.

Your team will plan and implement two rounds of email of up to 12 different product solicitations to as many as 750,000 prospects. After reading the relevant text for Round 1 (test), enter your Round 1 decisions (i.e., how many customers to send which offer) and click on the "Submit Round 1 (test)" button. After clicking the button, you Round 1 results will be shown. Once you are ready, enter your Round 2 (rollout) decisions, click on the Submit button, and view the Round 2 results. The profit achieved by each team will be revealed during class.

Signing In and Starting the Game

To access the exercise, open the URL provided by your instructors.

Round 1 Decisions

1. **Prepare:** Carefully read the scenario.
2. **Economics:** Review the costs table.
3. **Decide:** Enter your decision into the 36 test cells. Once entered, click on the "Submit Round 1 (test)" button to confirm your decision.

After submitting, you'll be provided with an overview Round 1 results.

Round 2 Decisions

Based on your results in Round 1, you will make your decision for the final email campaign. Enter your decision into the 36 test cells in the matrix and click on the "Submit Round 2 (rollout)" button. Confirm your decision when prompted.

After clicking the Submit button, you will see Round 1 results, Round 2 results, and Cumulative Results. This concludes the exercise.

Understanding the Simulation Results

After each round, you'll see a set of metrics to help analyze the outcomes of your decisions:

- **Sent**: Number of emails sent
- **Responses**: Shows the number of accounts opened in response to each product
- **Value**: Indicates the estimated Customer Lifetime Value from the newly opened accounts
- **Email cost**: Indicates the estimated Customer Lifetime Value from the newly opened accounts
- **Profit**: Profitability for new accounts

Use these metrics to adjust your strategy in Round 2, aiming to maximize overall profitability by choosing the most suitable product for each customer BK-score segment.

Tips for Maximizing Profitability

1. **Target Low-Risk Customers**: Customers with lower BK scores typically have higher lifetime values and lower default rates, making them more profitable.
2. **Balance APR and Annual Fee**: A higher APR or annual fee generally increases CLV, but may reduce response rates. Finding an optimal balance is key.
3. **Fixed vs. Variable Rate**: Fixed rates may attract more customers due to perceived stability, while variable rates help offset risk. Use each strategically based on target segments.

Again, carefully review you results after Round 1 to refine your approach and achieve the best possible outcome for Round 2.

Concluding the Exercise

After submitting your decisions for Round 2, you will see a final summary of your team's performance, including cumulative profitability. This summary will be used in class to compare strategies and discuss insights gained during the exercise.