



Evaluating Customer Acquisitions at American Express Using Multiple Objectives

by

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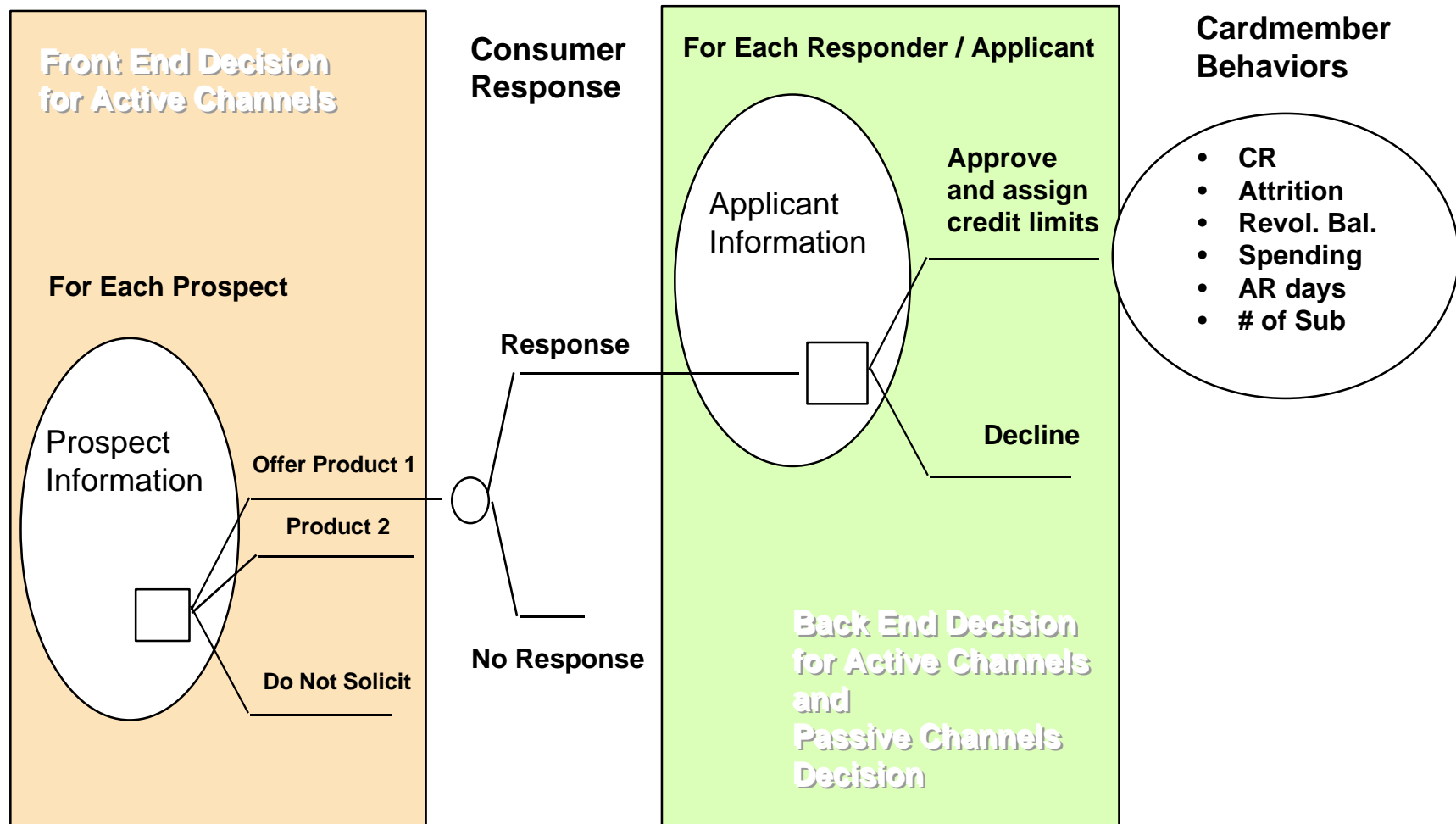
American Express

Today's Presentation



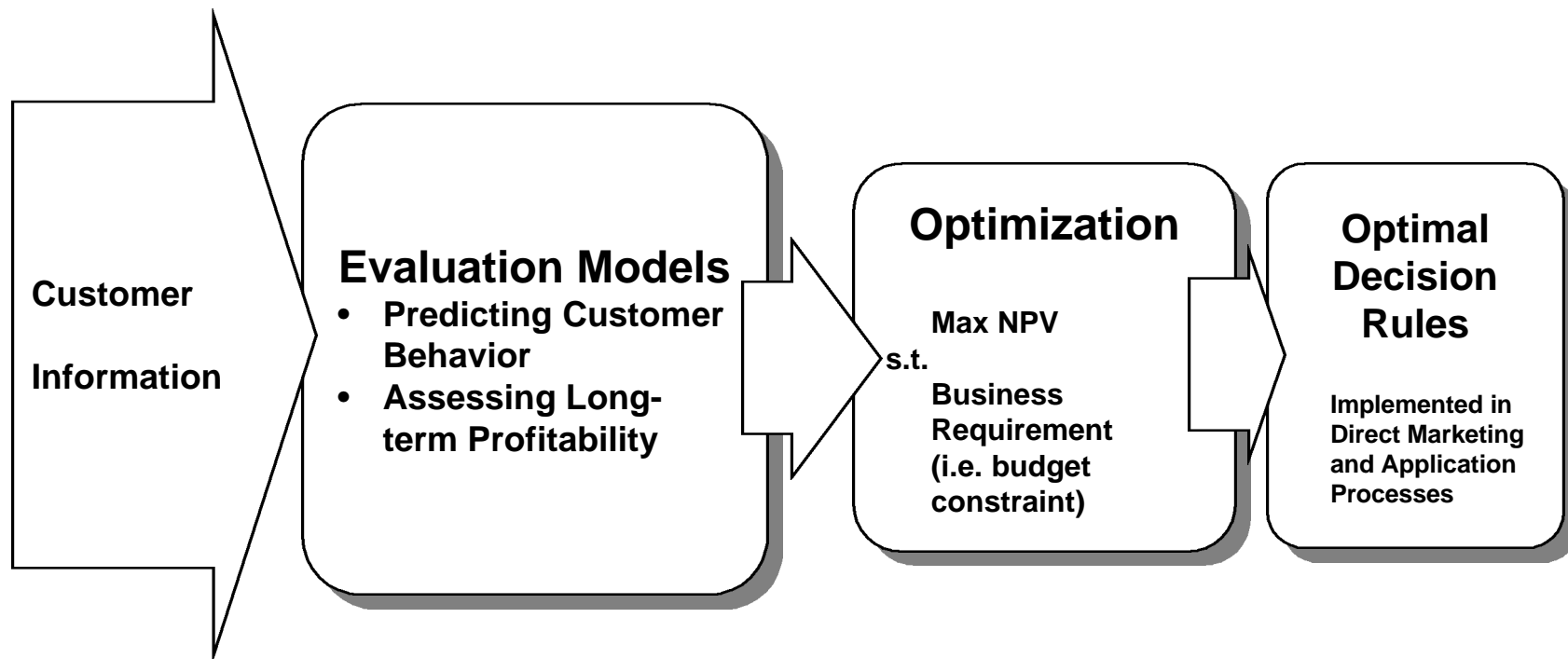
- Overview of Cardmember Acquisition Decisions
- Our Project: Add Market Share to Profit in Customer Acquisition Models
- Our Approach: Assess an Objective Function to Quantify American Express Values
- Implementation of the New Model
- Business Results

Cardmember Acquisition Decisions at American Express



Decision Infrastructure for Acquisition

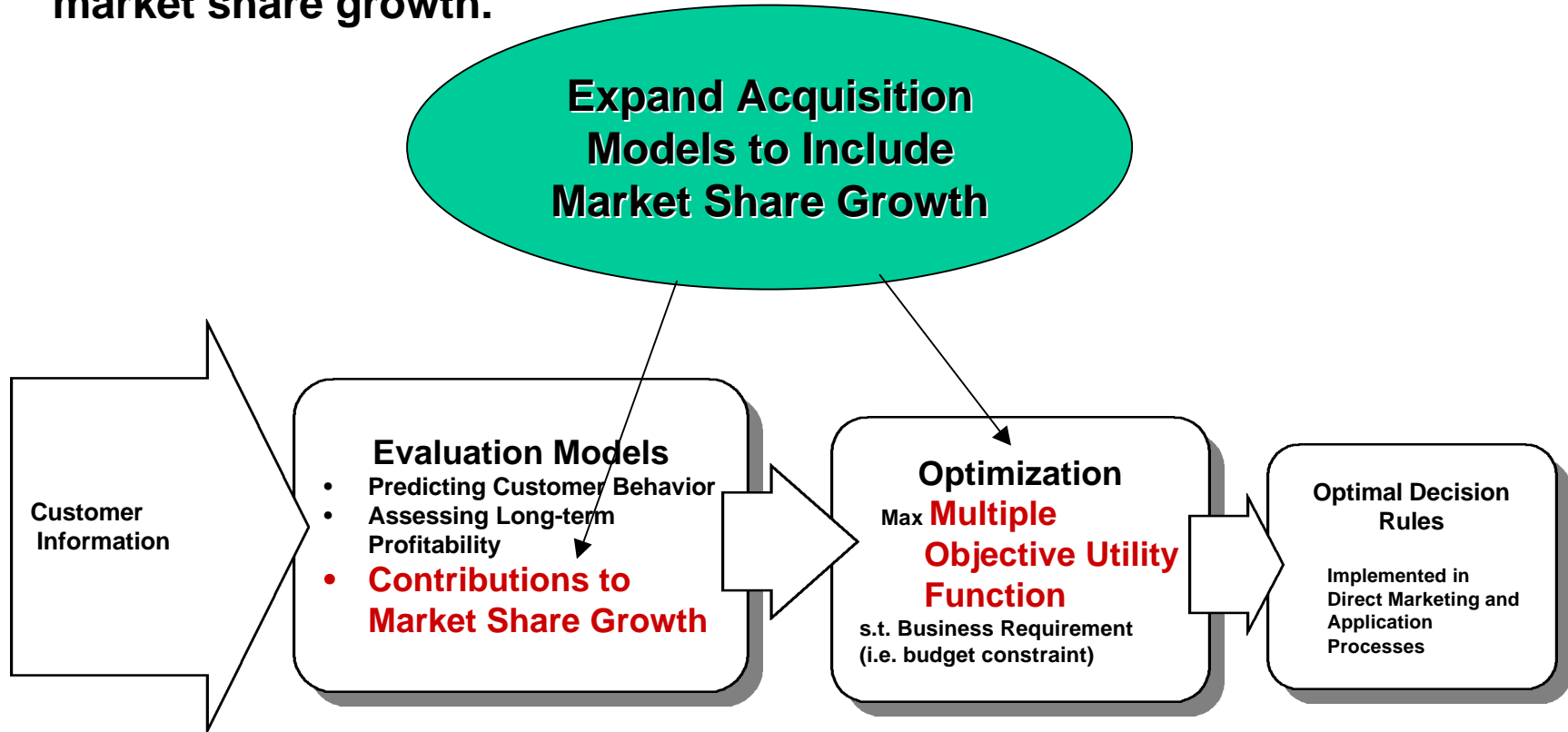
Since late 1980s, American Express has been leveraging decision science in its cardmember acquisition process to maximize long-term profitability



Our Project: Including Contribution to Market Share in Decision Models



In 1995, the company started to emphasize on strategic significance of market share growth. The cardmember acquisition business needed to expand its decision infrastructure to include market share growth.





Our Approach

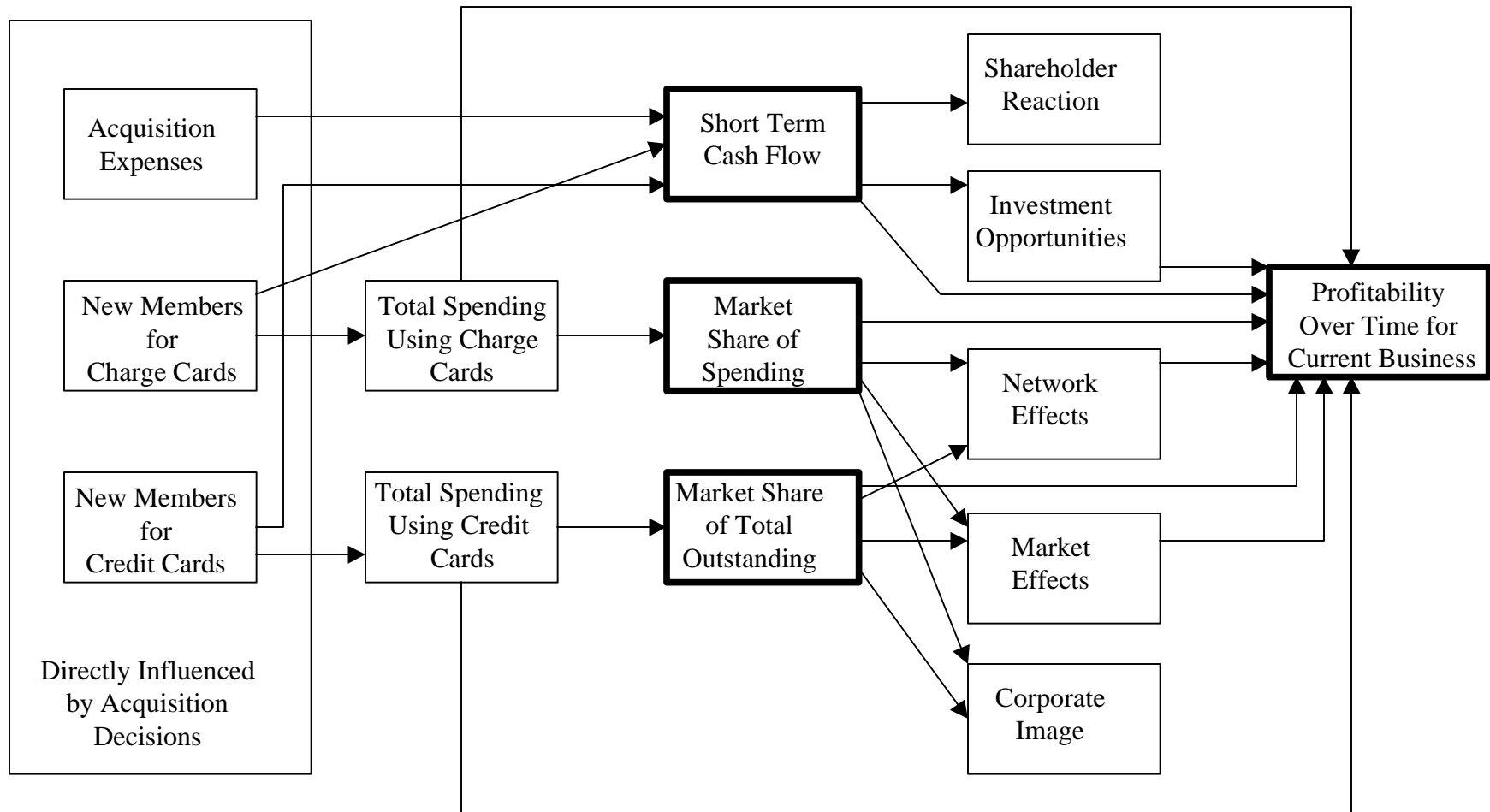
- Create and assess a multiple objective utility function for company's card business
- Derive from this a dynamic acquisition-level utility function for acquiring customers
- Revise the acquisition model to incorporate market share along with net present value of the profits
- Implement the revised model

Create and Assess a Multiple Objective Utility Function for American Express' Card Business



- Identify and select objectives for assessment
- Select functional form for the utility function
- Assess the required information
 - Much interaction with senior managers throughout the process
 - Cycled through three times

Relationships Among Key Objectives Relevant to Acquisitions



(“ —————> ” means “influences”)



Additive Multiattribute Utility Function

$$U(X_1, X_2, X_3, X_4) = \sum_{i=1}^4 K_i U_i(X_i)$$

X_1 = short term cash flow

X_2 = profitability over time

X_3 = market share of charge volume

X_4 = market share of lending



The Measures for the Utility Function

Measure	Range	
	Bad	Good
X1 = NVP for next 3 years (\$ 1997 billions)	\$1.2	\$3
X2 = Long-term NVP after 3 years (\$ 1997 billions)	\$6	\$12
X3 = Charge volume market share (percent in 1999)	12%	20%
X4 = Lending outstanding market share (percent in 1/1/2000)	3%	6%



Summary of Input Value Judgments

1. (X1 = \$2.4 billion) ~ (X1 = \$3 billion, 0.5; X1 = \$1.2 billion, 0.5)
2. (X2 = \$10 billion) ~ (X2 = \$12 billion, 0.5; X2 = \$6 billion, 0.5)
3. (X3 = 17%) ~ (X3 = 20%, 0.5; X3 = 12%, 0.5)
4. (X3 = 16%) ~ (X3 = 17%, 0.5; X3 = 12%, 0.5)
5. (X4 = 4.75%) ~ (X4 = 6%, 0.5; X4 = 3%, 0.5)

Value Tradeoffs

6. (X1 = \$3 billion, X2 = \$6 billion) ~ (X1 = \$1.2 billion, X2 = \$7 billion)
7. (X2 = \$6 billion, X3 = 20%) ~ (X2 = \$9 billion, X3 = 12%)
8. (X2 = \$6 billion, X4 = 6%) ~ (X2 = \$8 billion, X4 = 3%)

(~ means is indifferent to)



The Utility Function

$$U(X_1, X_2, X_3, X_4) = K_1 U_1(X_1) + K_2 U_2(X_2) + K_3 U_3(X_3) + K_4 U_4(X_4),$$

where

$$K_1 = 0.052, K_2 = 0.625, K_3 = 0.204, K_4 = 0.119$$

and

$$U_1(X_1) = -0.3051(1 - e^{0.8074(X_1 - 1.2)}), 1.2 \leq X_1, \leq 3.0,$$

$$U_2(X_2) = -0.3051(1 - e^{0.2422(X_2 - 6)}), 6 \leq X_2, \leq 12,$$

$$U_3(X_3) = \begin{cases} -0.01955(1 - e^{0.656(X_3 - 12)}), & 12 \leq X_3, \leq 17, \\ +0.5 + 0.6526(1 - e^{-0.4844(X_3 - 17)}), & 17 \leq X_3, \leq 20, \end{cases}$$

$$U_4(X_4) = -1.0268(1 - e^{0.2267(X_4 - 3)}), 3 \leq X_4, \leq 6$$

Derive a Dynamic Acquisition-Level Utility Function for Acquiring Customers



- Identifying and selecting objectives for assessment
- Selecting a functional form for the utility function
- Specifying the utility function



Identify and Select Objectives

- Relate acquisition-level objectives to business objectives (hopefully one-to-one)

Measures for the Acquisitions Utility Function

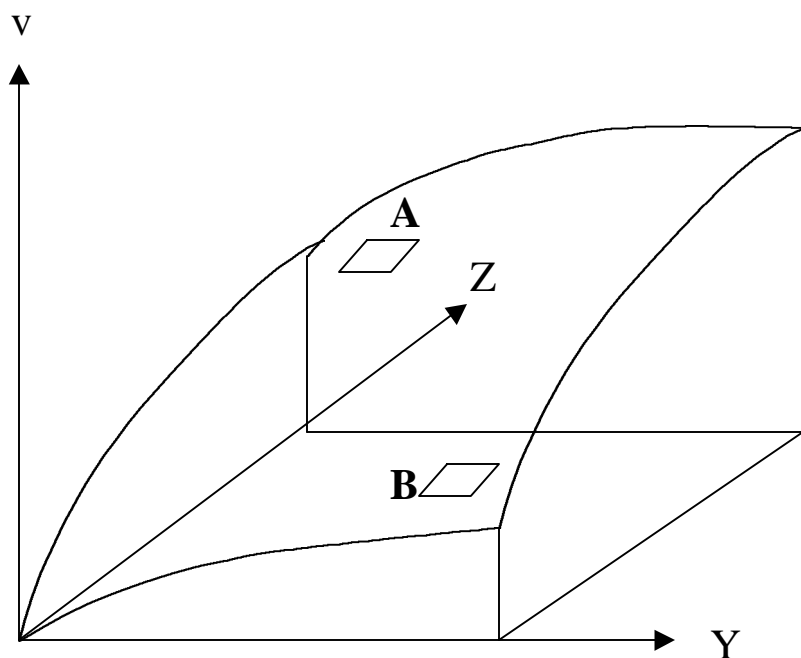
x_1 = expected NPV for next three years (\$1997 millions)

x_2 = expected contribution to NVP of current business
(\$1997 millions)

x_3 = charge volume in three years (for 1999 in \$1997
millions)

x_4 = outstanding lending balances at end of year 3 (on
January 1, 2000 in \$1997 millions)

Selecting Functional Form for the Acquisitions-Level Utility Function



$$v(y,z) = k_y (y) + k_z (z)$$

at **A**, $k_y = 0.7$, $k_z = 0.3$

at **B**, $k_y = 0.2$, $k_z = 0.8$

Calculating the Acquisition-Level Utility Function



$$u(x_1, x_2, x_3, x_4) = \sum_{i=1}^4 k_i x_i$$

Let (X_1, X_2, X_3, X_4) be company status quo

Relative k_i :

$$k_1 \sim U(X_1 + \Delta_1, X_2, X_3, X_4) - U(X_1, X_2, X_3, X_4)$$
$$k_2 \sim U(X_1, X_2 + \Delta_2, X_3, X_4) - U(X_1, X_2, X_3, X_4)$$



The Acquisition Utility Function

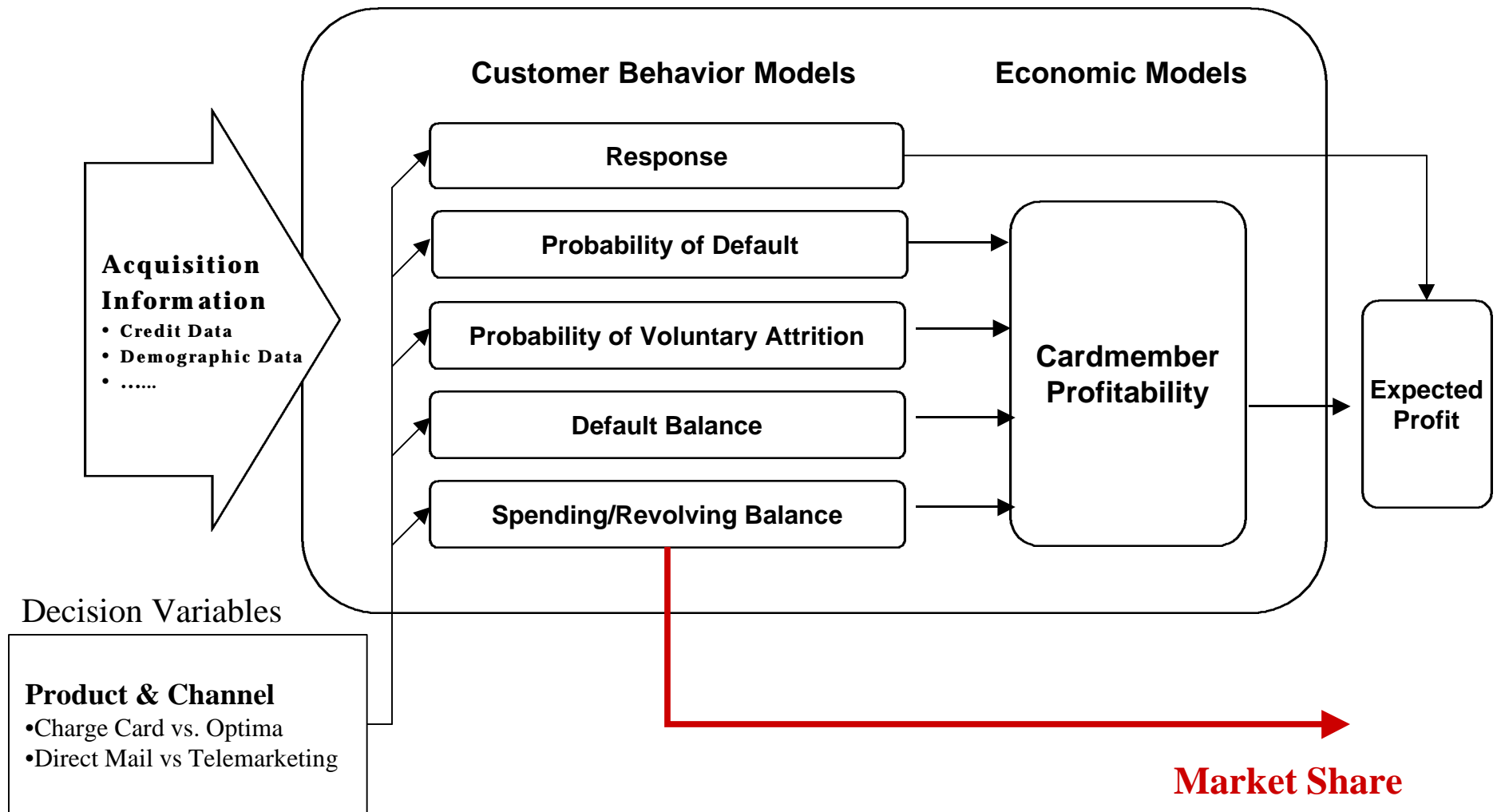
$$u(x_1, x_2, x_3, x_4) = k_1x_1 + k_2x_2 + k_3x_3 + k_4x_4.$$

Given: $X_1 = \$1.7$ billion, $X_2 = \$8$ billion, $X_3 = 14.5\%$, $X_4 = 3\%$ then
 $k_1 = 0.26$, $k_2 = 1.0$, $k_3 = 0.02$, $k_4 = 0.08$

Given: $X_1 = \$1.7$ billion, $X_2 = \$8$ billion, $X_3 = 16.5\%$, $X_4 = 3\%$ then
 $k_1 = 0.26$, $k_2 = 1.0$, $k_3 = 0.07$, $k_4 = 0.08$



The Revised New Business Acquisition Model



Implementation



- Implemented in 1995
- Used for over 50 million prospective customers
- Facilitated group decisions among Marketing, Risk Management and Finance
- Significantly altered prospect targeting strategies, focusing more on higher usage and higher risk group
- Significantly increased customer acquisition volume, exceeding business goals of acquisition for 1996 by a large number

What Occurred



- In first six-months of 1997, AXP market share of domestic credit card market increased from 18.31% to 18.90%, whereas it had lost market share over the previous ten-year period.
- Translating the value of the increase of 18.31% to 18.90% into NVP of the current business using the business utility function yields \$447 million.

Impact of This Work



- Cause and effect is hard to discern. Other factors such as the economy and actions of competitors affect market share.
- An explicit focus on market share may have significantly helped.

Two Quotes



“You’ve got to give credit to American Express for overcoming huge obstacles to growth through creative marketing...”

H. Spencer Nilson, publisher of Nilson Report
in WSJ (Sept. 22, 1997)

“Market share has been a very key focus for our card business over the last three years and I think what you’re seeing is that we have had a very strong effect in increasing spending on our card products and our cards in force.”

Kenneth I. Chenault, AX President
in WSJ (Sept. 22, 1997)