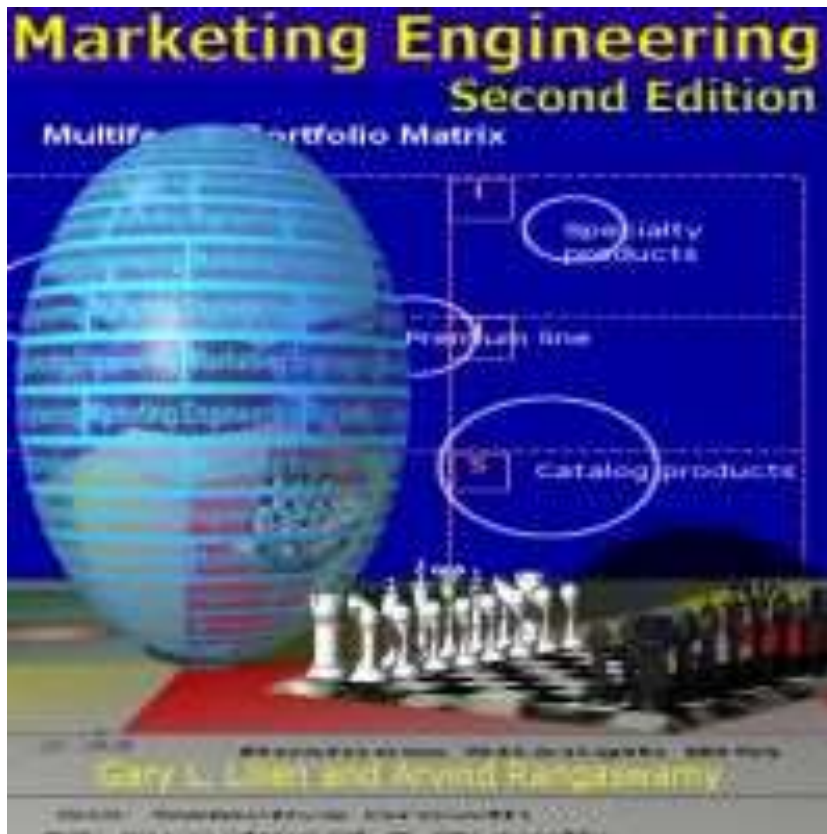


Typical Decisions Made by Marketing Managers (Preluare Marketing Engineering)



Market Response Modeling



□ Response Modeling Basics

Mulțumim, și pe această cale, autorilor acestui material, pentru generoasa permisiune de a-l folosi în scopuri didactice

Response Models



- Aggregate response models
- Individual response models
- Shared-experience models
- Qualitative response models

The Concept of a Response Model

Idea:

Marketing Inputs:

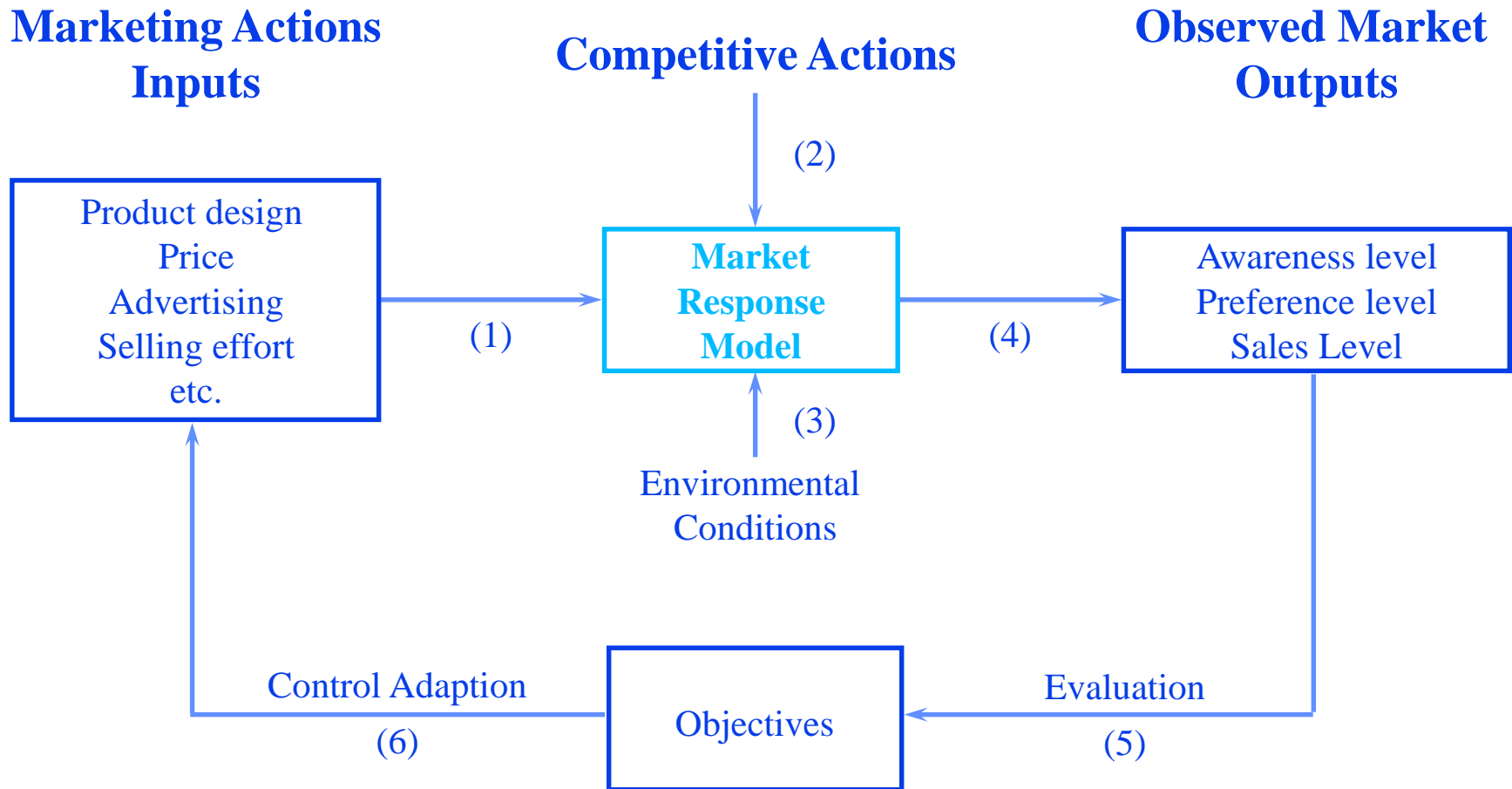
- Selling effort
- Advertising spending
- Promotional spending



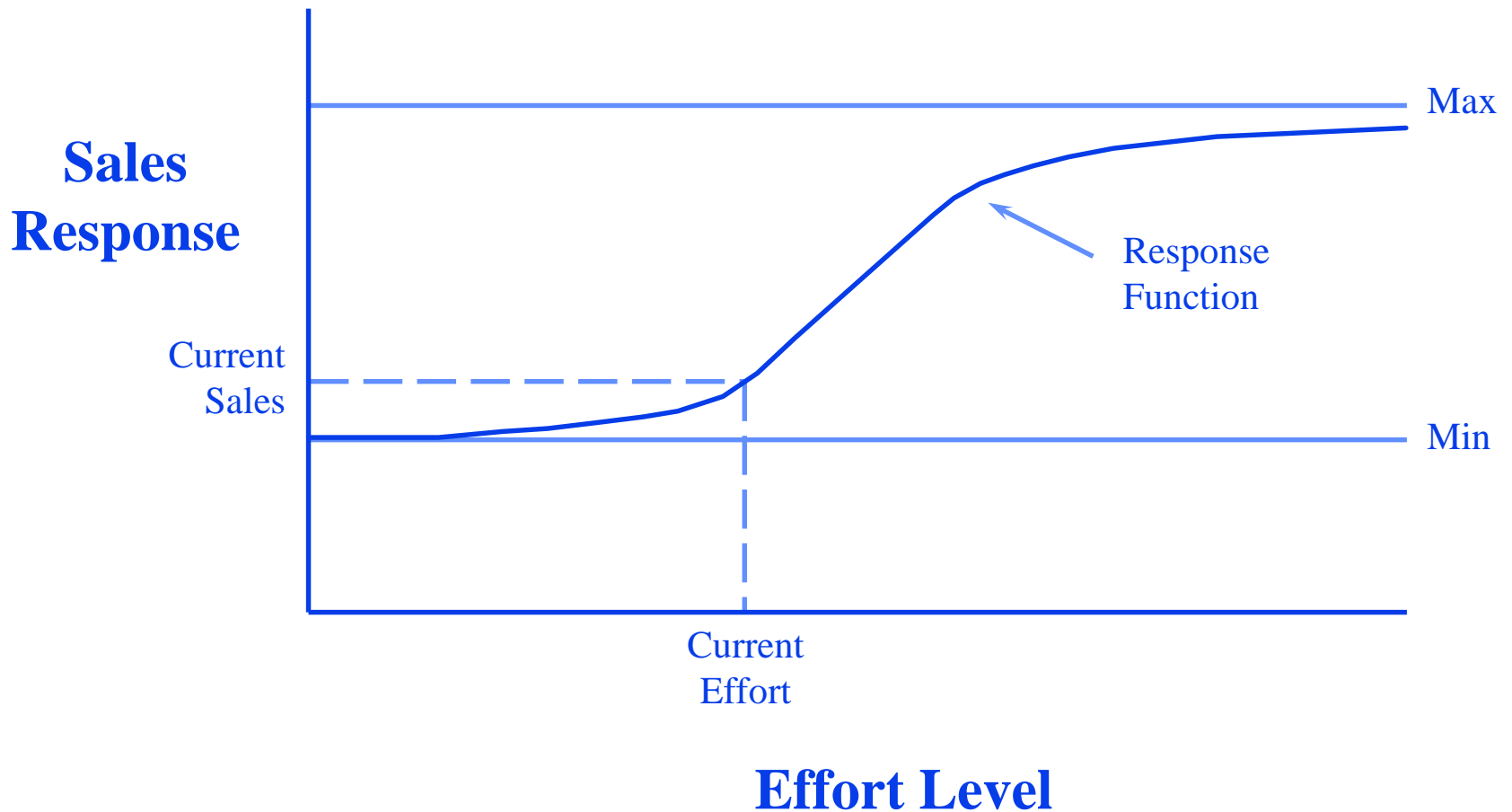
Marketing Outputs:

- Sales
- Share
- Profit
- Awareness, etc.

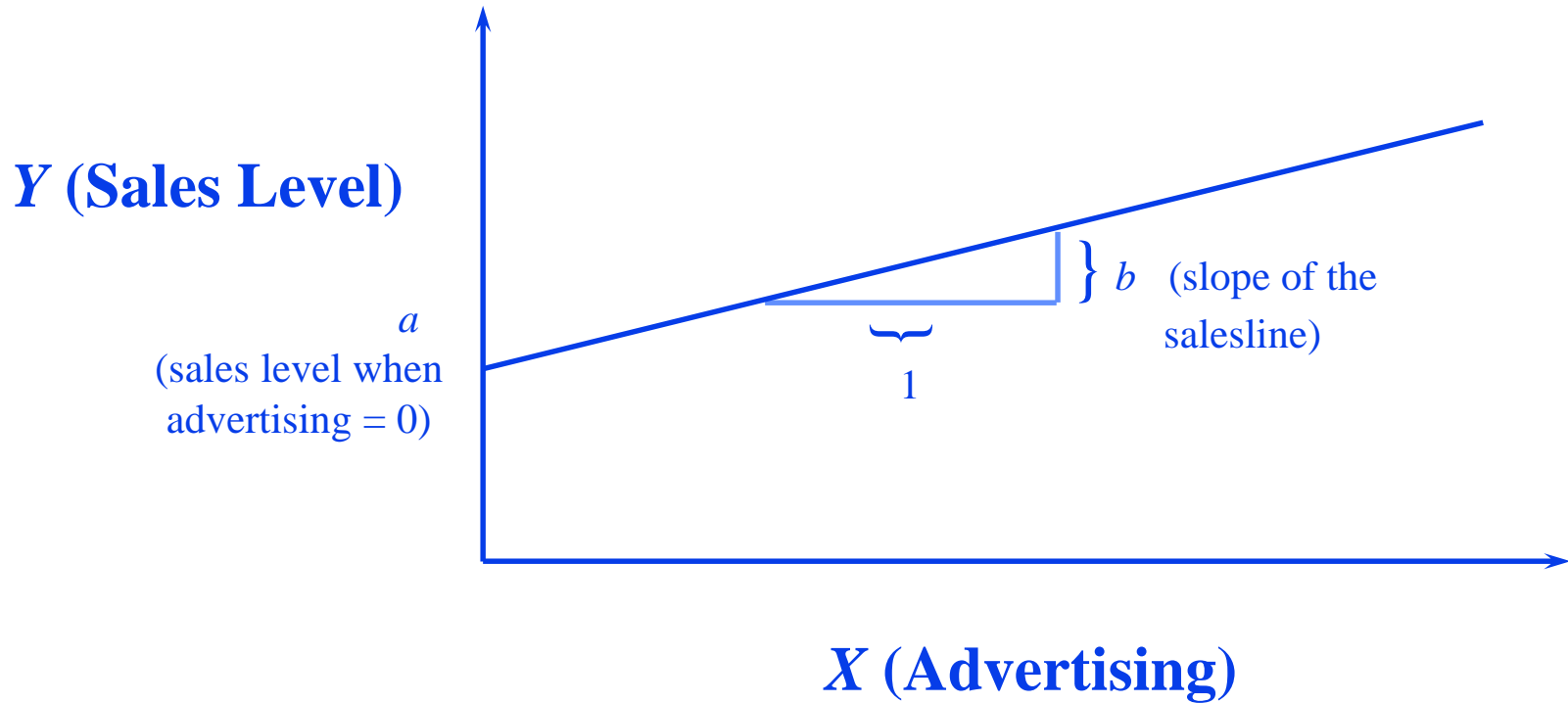
Input-Output Model



Response Function



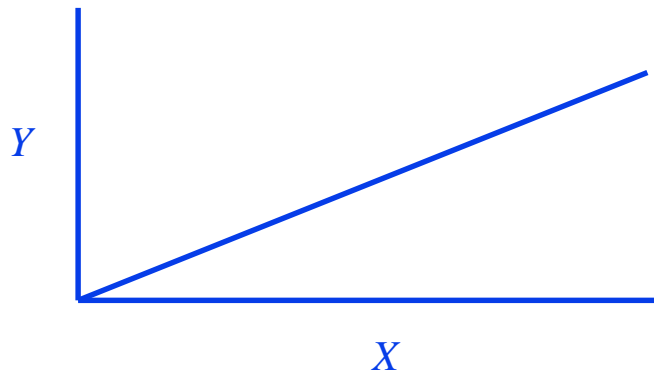
A Simple Model



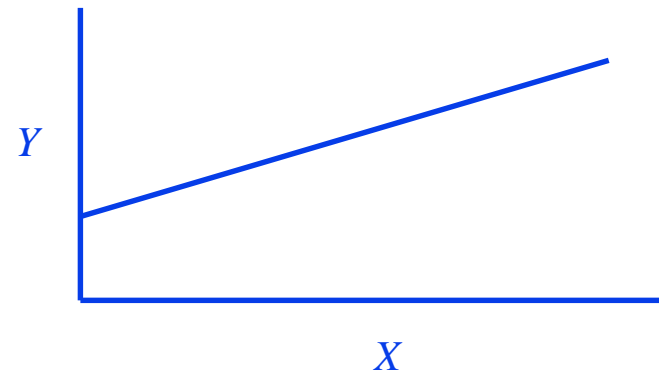
Phenomena



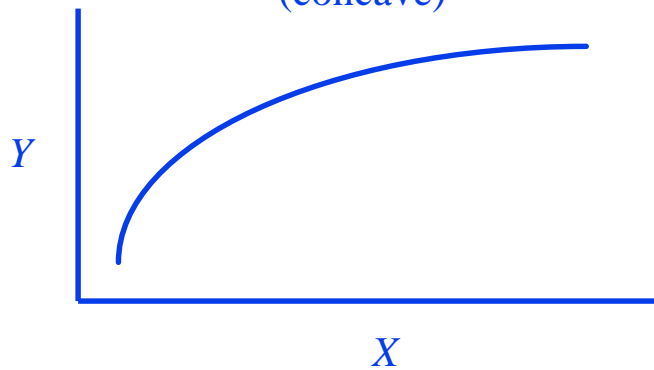
P1: Through Origin



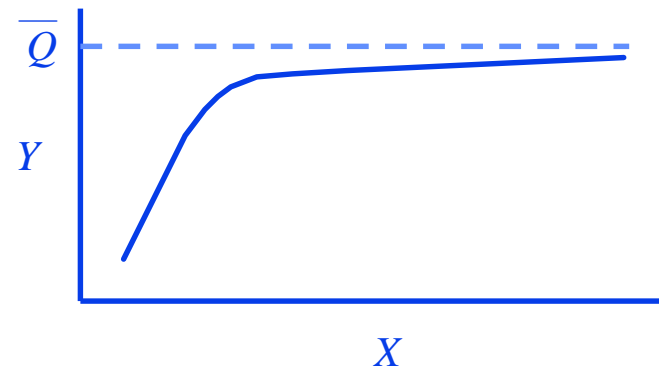
P2: Linear



P3: Decreasing Returns
(concave)



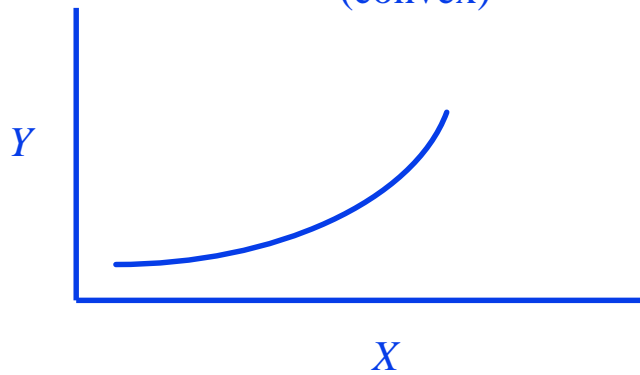
P4: Saturation



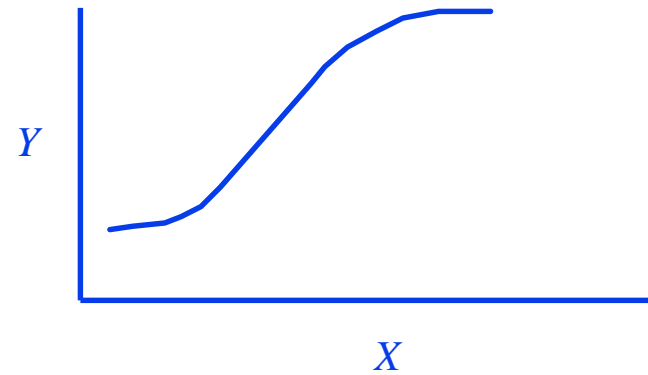
Phenomena



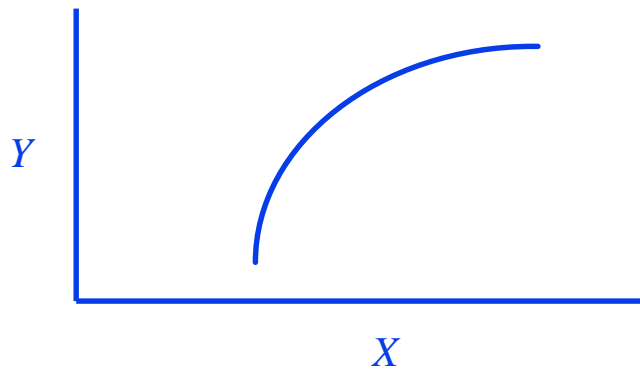
P5: Increasing Returns
(convex)



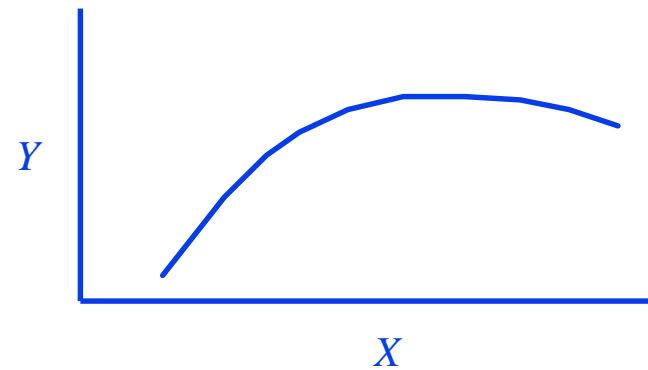
P6: S-shape



P7: Threshold



P8: Super-saturation



Aggregate Response Models: Linear Model

$$Y = a + bX$$

- Linear/through origin
- Saturation and threshold (in ranges)

Aggregate Response Models: Fractional Root Model

$$Y = a + bX^c$$

c can be interpreted as elasticity when $a = 0$.

Linear, increasing or decreasing returns
(depends on c).

Aggregate Response Models: Exponential Model



$$Y = ae^{bx}; x > 0$$

Increasing or decreasing
returns (depends on b).

Aggregate Response Models: Modified Exponential Model



$$Y = a(1 - e^{-bx}) + c$$

Decreasing returns and saturation.

Widely used in marketing.

Aggregate Response Models: Adbudg Function

$$Y = b + (a-b) \frac{X^c}{d + X^c}$$

S-shaped and concave; saturation effect.

Widely used.

Amenable to judgmental calibration.

Aggregate Response Models: Multiple Instruments



- Additive model for handling multiple marketing instruments

$$Y = af(X_1) + bg(X_2)$$

Easy to estimate using linear regression.

Aggregate Response Models: Multiple Instruments cont'd

- Multiplicative model for handling multiple marketing instruments

$$Y = aX_1^b X_2^c$$

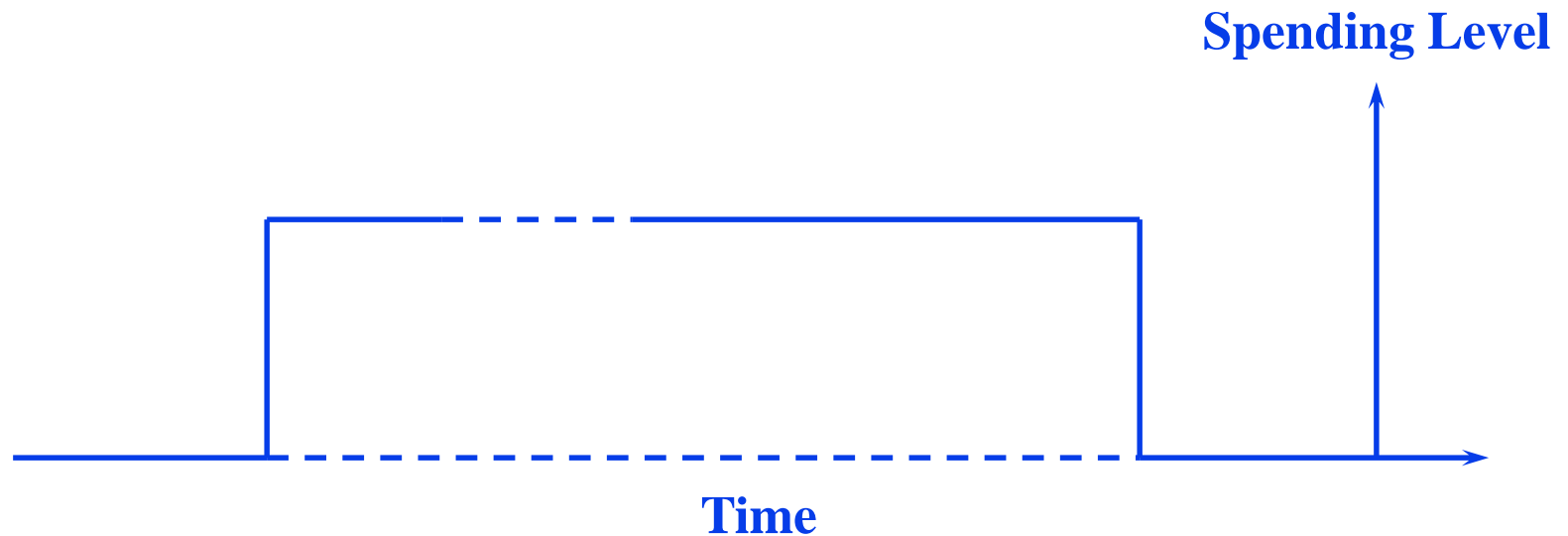
b and c are elasticities.

Widely used in marketing.

Can be estimated by linear regression.

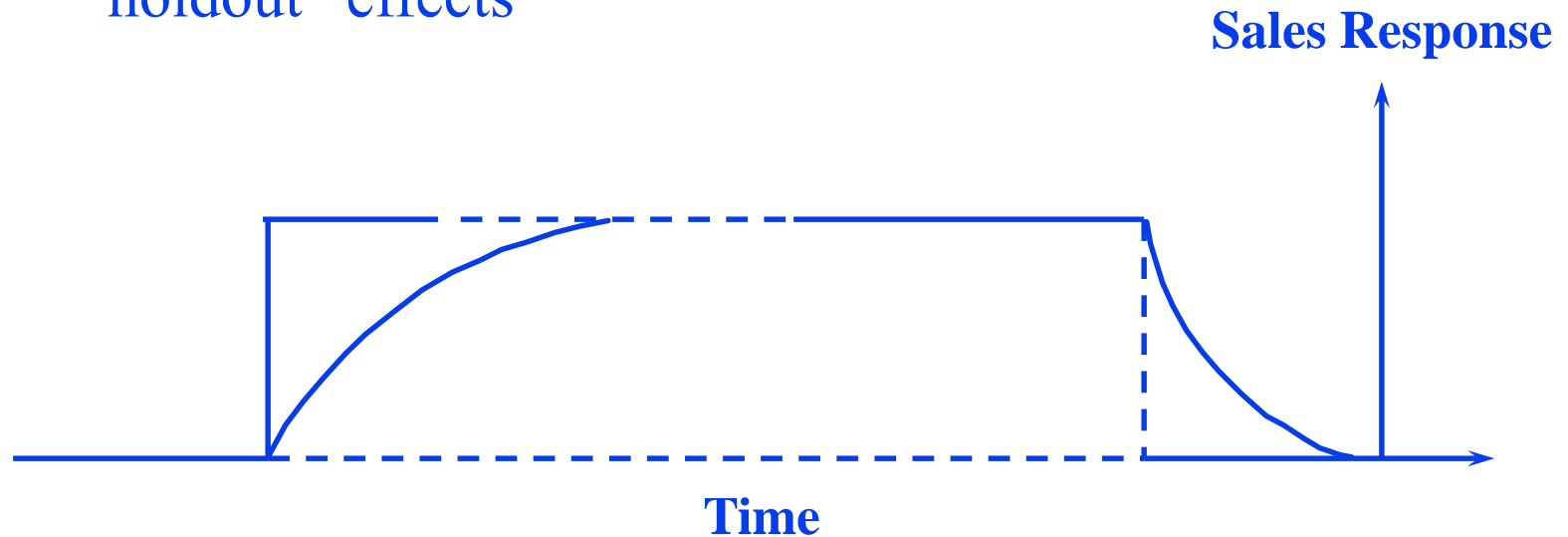
Dynamic Effects

- 1. Marketing Effort
eg, sales promotion



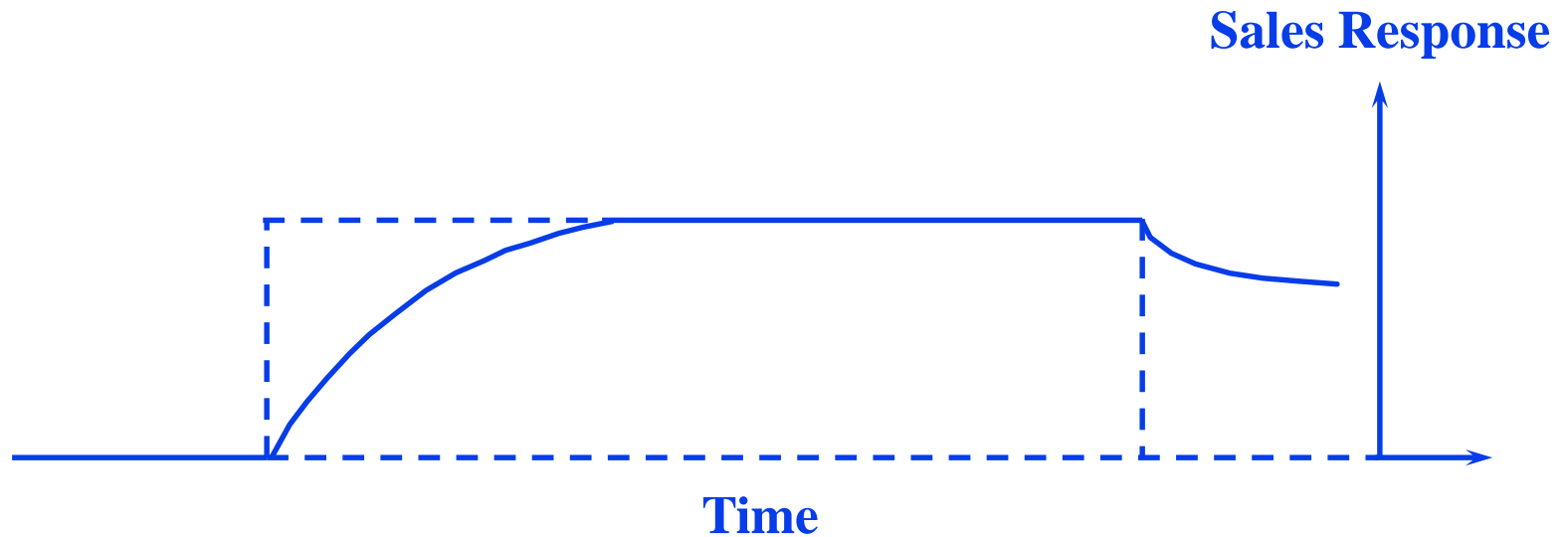
Dynamic Effects

- 2. Conventional “delayed response” and “customer holdout” effects



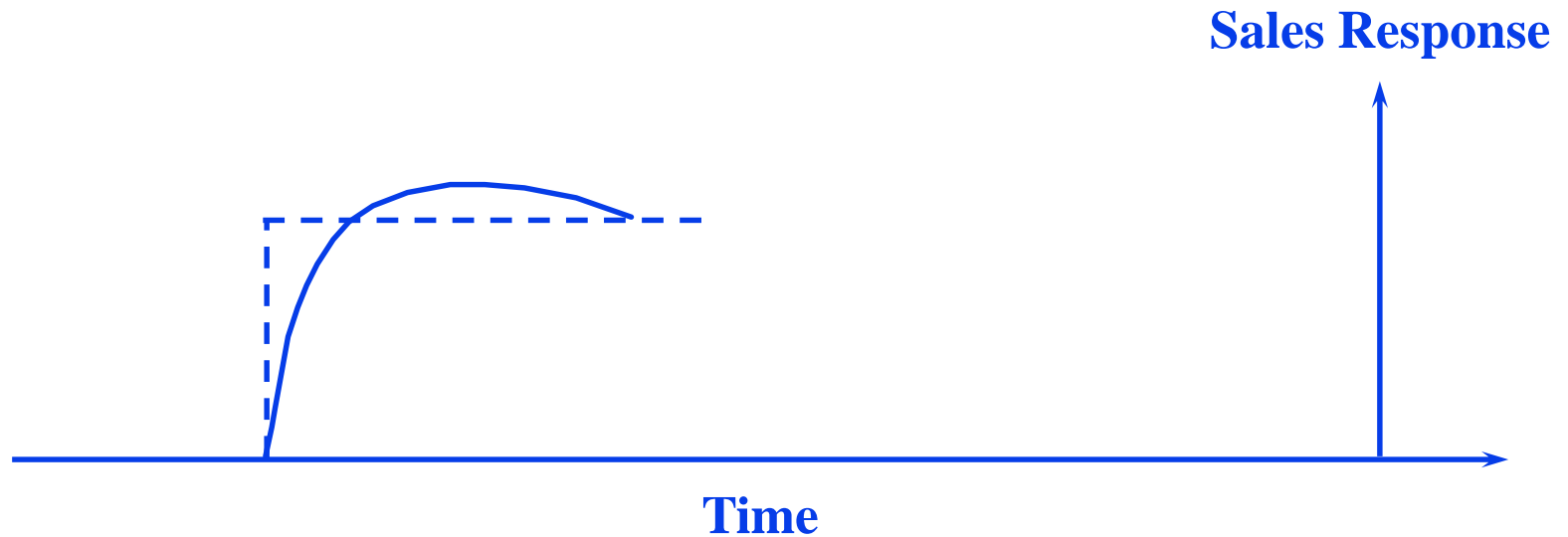
Dynamic Effects

3. “Hysteresis” effect



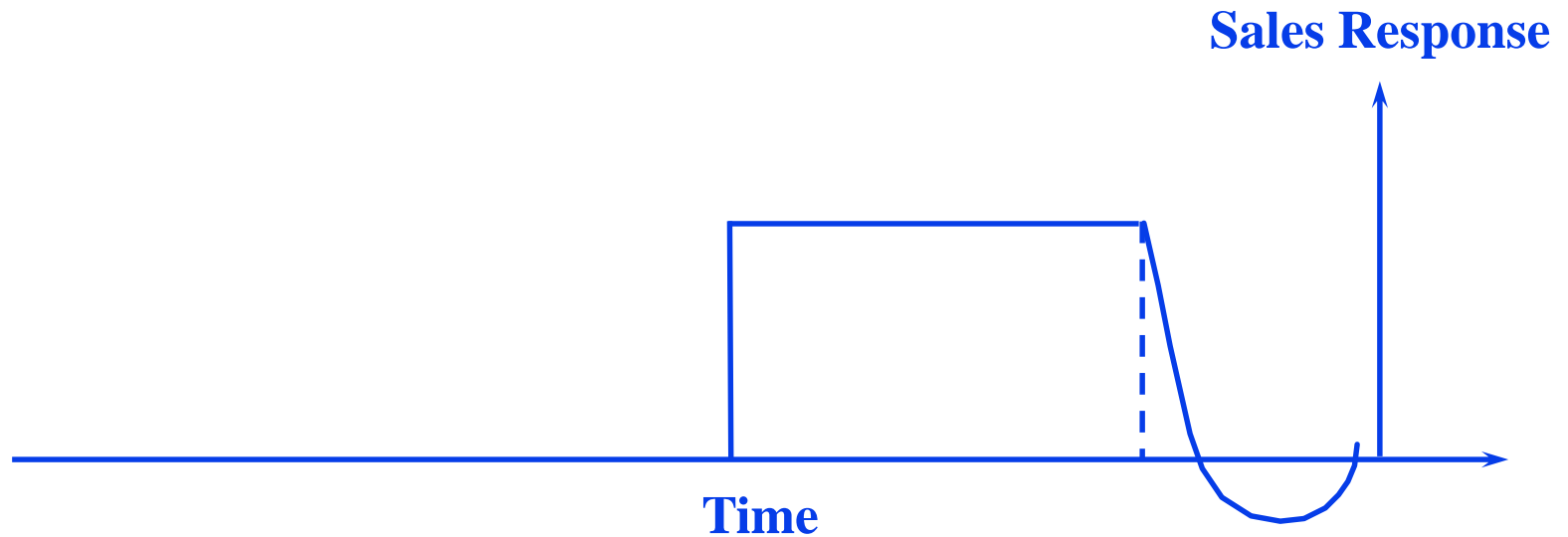
Dynamic Effects

- 4. “New trier”
“wear out” effect



Dynamic Effects

5. “Stocking” effect



Aggregate Response Models: Dynamics

- Dynamic response model

$$Y_t = a_0 + a_1 X_t + \lambda Y_{t-1}$$

↑
current
effect

↑
carry-over
effect

Easy to estimate.

Aggregate Response Models: Market Share



- Market share (attraction) models

$$M_i = \frac{A_i}{A_1 + A_2 + \dots + A_n}$$

A_i = attractiveness of brand i .

Satisfies sum (market shares sum to 1.0) and range constraints (brand share is between 0.0 and 1.0)

Has “proportional draw” property.

Individual-Level Response Models: Requirements



- Satisfies sum and range constraints.
- Is consistent with the “random utility” model.
- Has the “proportional draw” property.
- Widely used in marketing.

Individual-Level Response Models

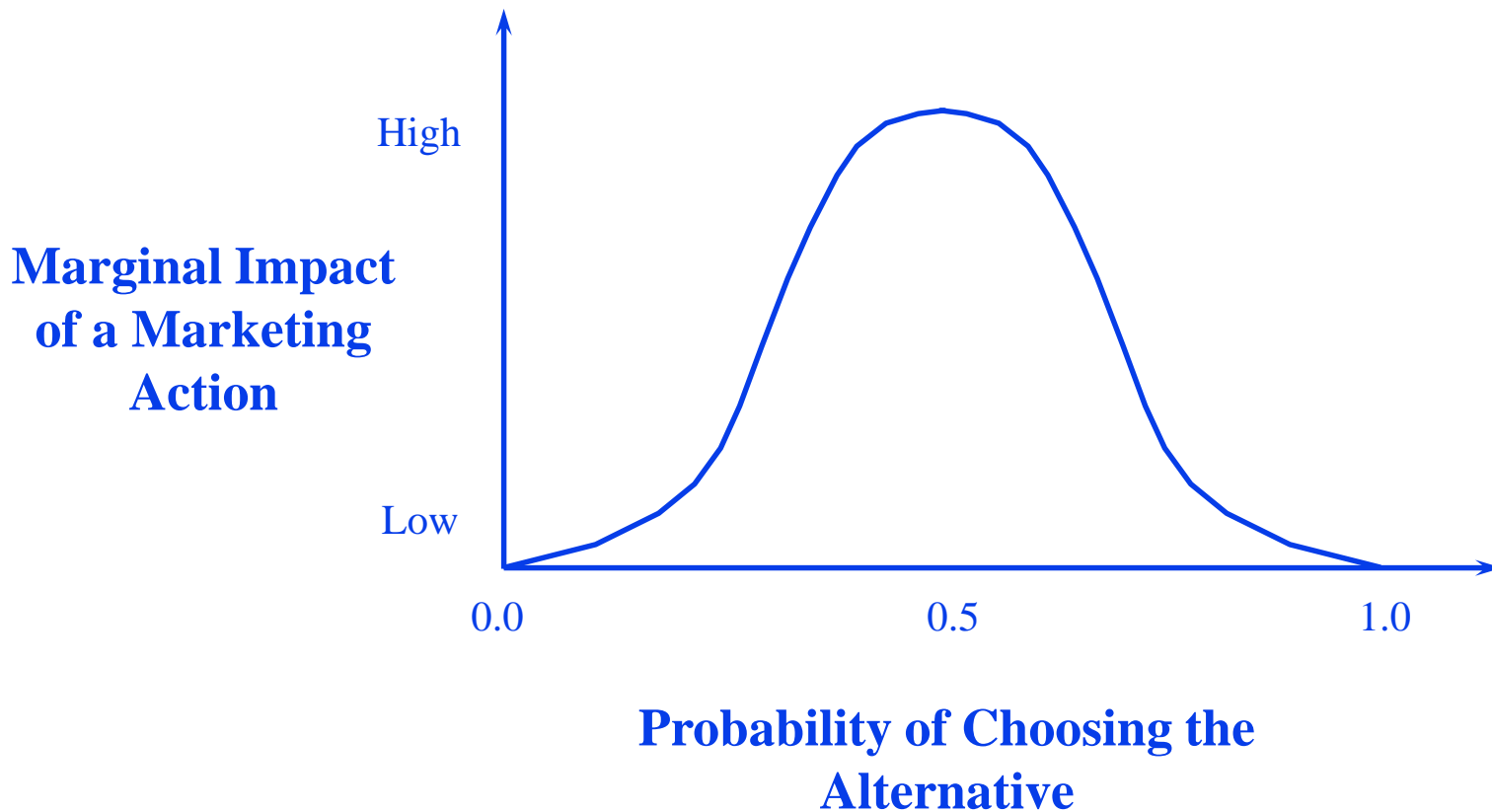
MNL

- Multinomial logit model to represent “probability of choice.” The individual’s probability of choosing brand 1 is:

$$P_{i1} = \frac{e^{A_1}}{\sum_j e^{A_j}}$$

where $A_j = \sum_k w_k b_{ijk}$

Logit Model Implications . . .



Attribute Ratings per Store



Store	Variety	Quality	Parking for Money	Value
1	0.7	0.5	0.7	0.7
2	0.3	0.4	0.2	0.
3	0.6	0.8	0.7	0.4
4 (new)	0.6	0.4	0.8	0.5
Importance Weight	2.0	1.7	1.3	2.2

Shares per Store

	(a)	(b)	(c)	(d)	(e)
Store	$A_i = w_k b_{jk}$	e_i^A	Share estimate without new store	Share estimate with new store	Draw (c)–(d)
1	4.70	109.9	0.512	0.407	0.105
2	3.30	27.1	0.126	0.100	0.026
3	4.35	77.5	0.362	0.287	0.075
4	4.02	55.7		0.206	

Objectives



- Profit
(= Sales × Margin – Costs)
- Sales
- Market share
- Time horizon
- Uncertainty
- Multiple goals
- Multiple points of view
- Others ??

Shared Experience Models



- Base the response model on behavior observed at other leading firms:
 - Advisor model
 - PIMS model

Qualitative Response Models



Rules to capture qualitative response:

The retailer will accept the trade deal, but what he does with it is based on coop advertising dollars. If the deal includes coop money, the retailer will accept the deal and pass on all of the discount to the consumer. If the discount is greater than 30 percent, he will put up a big display. Otherwise, the retailer leaves the item at regular price and does not use an ad feature or a display.

ADCAD