

Marketing Analytics – Sungyun Moon

Session 1 – Introduction to Marketing Analytics

Definition and Importance of Marketing Analytics

What is Marketing

Myth 1. Marketing is Advertising. “Marketing is to communicate with customers”

Myth 2. Marketing is sales. “Marketing is to build relationship in the long-term”

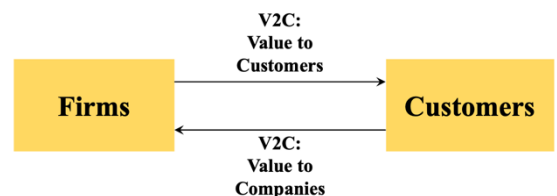
Myth 3. Marketing is cost. “Marketing is investment”

“**Marketing** is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large” (AMA).

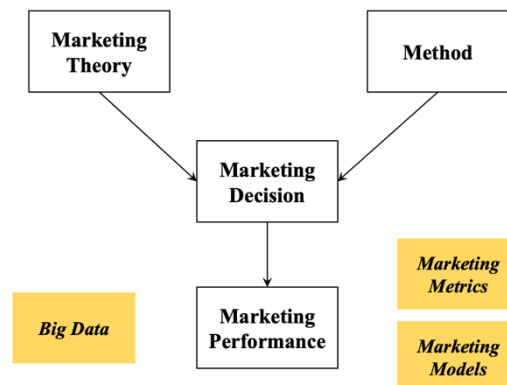
“**Marketing** is satisfying needs and wants through an exchange process.” (Philip Kotler)

“**Marketing** is to know and understand the customer...”
(Peter Drucker)

“**Marketing is to create value through customer acquisition and retention**”.

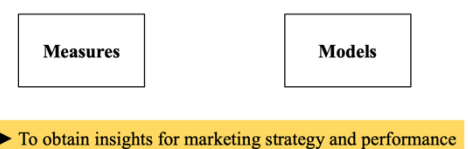


What is Marketing Analytics?



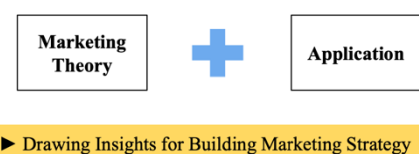
“**Marketing Analytics**” is a technology-enabled and model-supported approach to harness customer and market data to **enhance marketing decision making**. – Lilien, Gary L. (2011), Journal of Marketing.

“**Marketing analytics** is defined as the **methods for measuring, analyzing, predicting, and managing marketing performance** with the purpose of maximizing effectiveness and return on investment (ROI)” – Wedel and Kannan 2016).



Background of Marketing Analytics

It is **interdisciplinary**: The nexus of marketing and other areas of business, mathematics, statistics, economics, econometrics, psychology, psychometrics, and computer science.



Why Marketing Analytics?

Because we need to understand consumers better:

- Consumer preference changes faster than ever.
- Consumers get more sophisticated.
- Consumers are often skeptical about marketing.

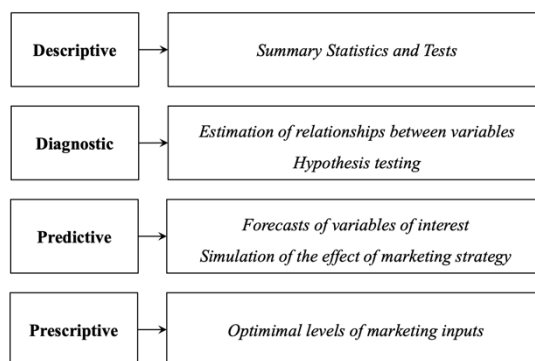
Because we need to understand competitors too:

- There is not only a firm in markets.
- Competitors react.
- How do a firm respond to this?
- How do customer respond to this?
- **Marketing Accountability**
 - “It’s a noisy laboratory in which a marketing leader is going to try to make the connection between an action and an outcome”.
 - “Marketers do face challenges including proving the effectiveness of their work, which is complicated because customers, competitors, and large forces continually change.”

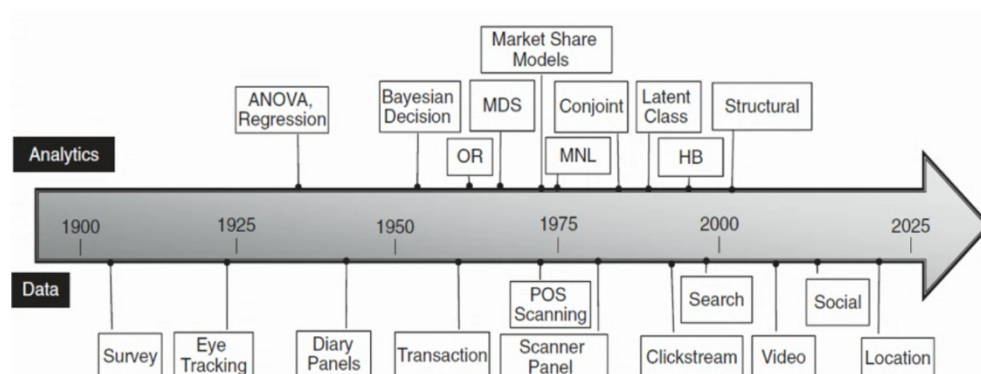
Because we can:

- Data Explosion
 - Volume
 - Velocity
 - Variety
- Enhanced computing power
- New and improved techniques
 - For gathering data
 - For analyzing data

Marketing Analytics Provides...



Timeline of Marketing Data and Analytics



What Should We Do?

TECHNOLOGY

Amazon Moves to Cut Checkout Line, Promoting a Grab-and-Go Experience

By NICK WINGFIELD DEC. 5, 2016

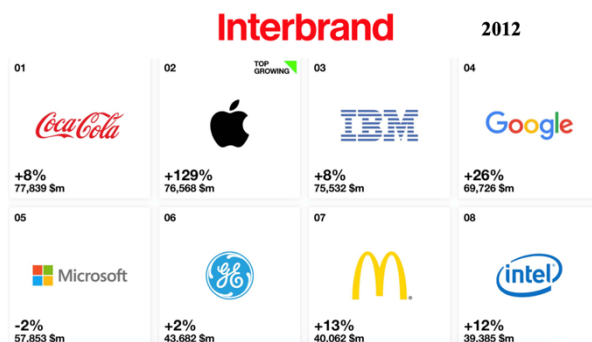
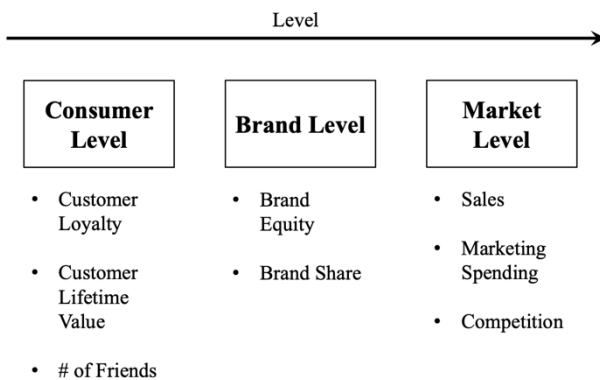


Current trends in traditional offline retail

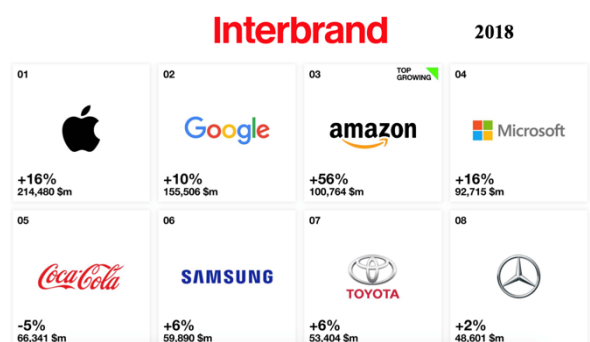
- Sensors capture all activities in front of a shelf.
- The following actions are registered:
- Touch
- Pick-Up
- Return



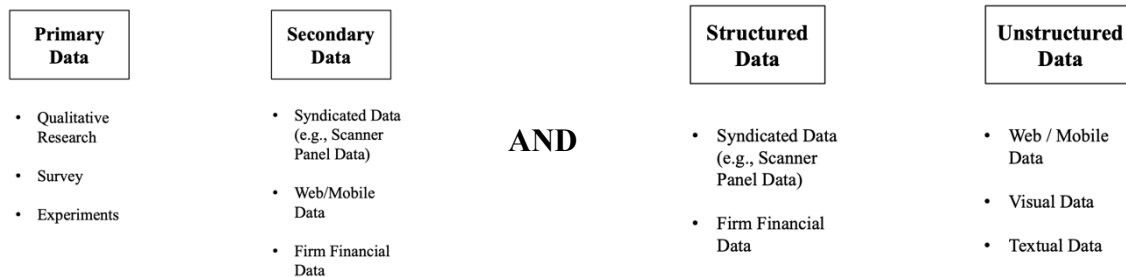
Types of Marketing Metrics



Coca-Cola strongly decreased in Equity.

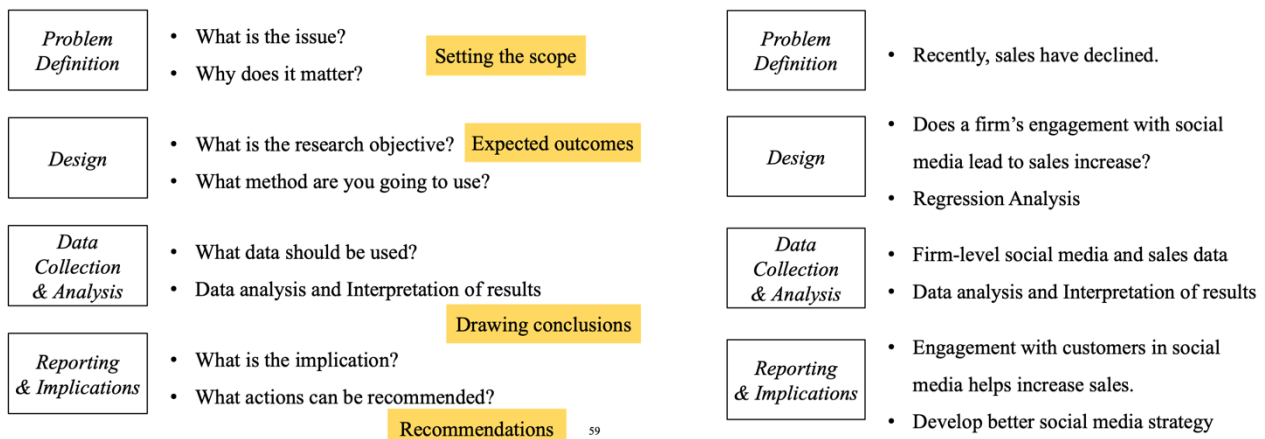


Types of Data and Data Collection



The difference between **Primary** and **Secondary data** is whether the researchers have clear research objectives for that data or not, which means having collected the data explicitly for that purpose.

Process for Marketing Analytics The Research Process



Ethical Issues in Marketing Analytics

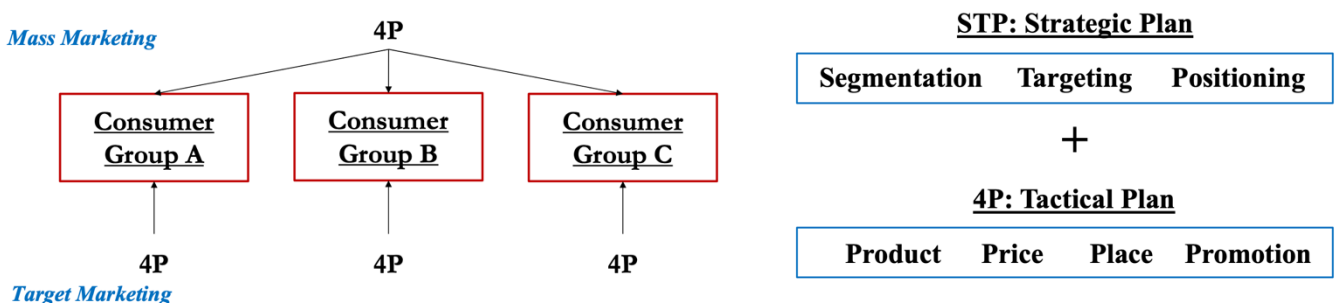
- 50% of consumers believe online advertisers (e.g., websites) do not comply with privacy laws. More than 75% of consumers think: firms have more information about them than they are comfortable with.
- What would be the consequence? How does the ethical concern affect marketing analytics? There will be increased emphasis on **data minimization** and **anonymization**.
- **Data minimization** is the process of limiting the type and amount of data firms collect.
- Less individual data may be available for marketing analytics.
- We need methods and models to **protect data security and privacy** and **maximize personalized marketing opportunities**.

Session 2 – Identifying and Analyzing Markets

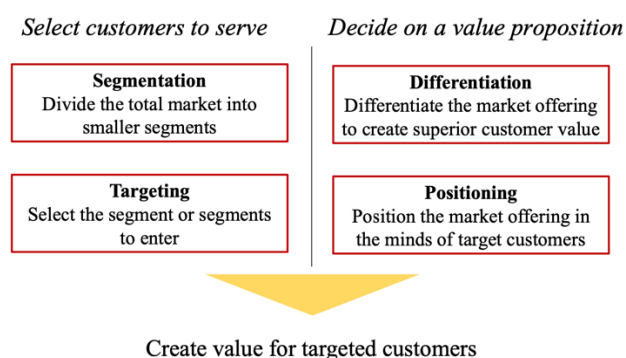
Identifying Markets – Marketing Process

Marketing is a process for value creation.

- Companies can't appeal to all consumers in the markets.
- To create customer value, companies need to understand different types of consumers.



Customer-Driven marketing Strategy



How to Analyze Markets?

- **Market Level Analysis** → Gain Market & Competitive Insights
- **Consumer Level Analysis** → Gain Customer Insights

Market & Competitive Analysis

Understanding Market Characteristics and Competitors

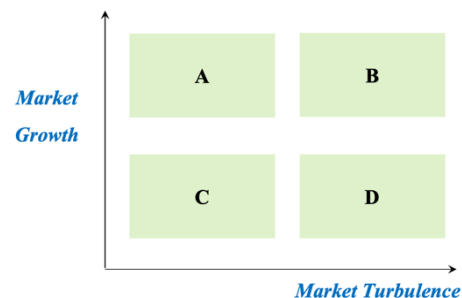
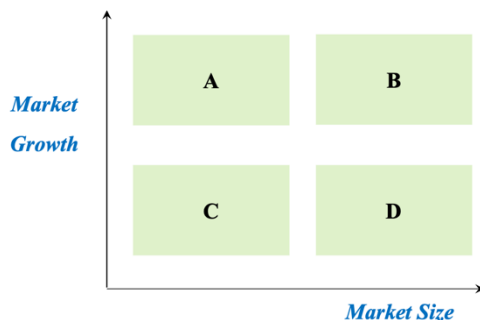
Market Size

Market Growth

Market Turbulence

Competition

- Market Size = Sales of all firms in the market.
- Market Growth = $(\text{Sales}_t - \text{Sales}_{t-1}) / \text{Sales}_{t-1}$.
- Market Turbulence = SD of 3 or 5 years Sales / Mean of 3 or 5 years Sales.
- Where are more opportunities?
- What does market turbulence suggest?



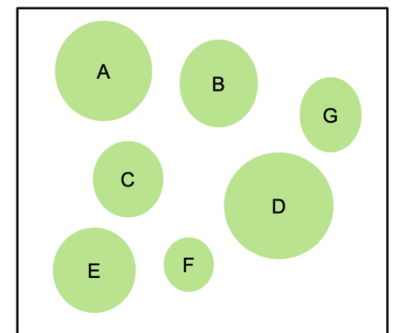
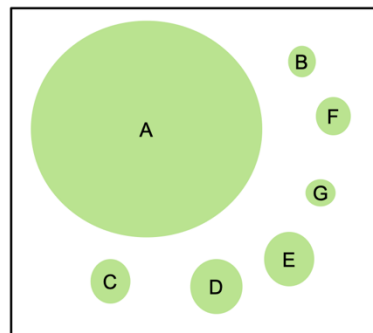
How to Analyze Markets?

- Competition: Number of Competitors
- Are number of competitors a good measure for competition?
- Herfindahl-Hirschman Index (HHI): Market concentration
- How do we interpret this metric?
- Which market is more competitive or more concentrated?
- The closer a market is to a monopoly, the higher HHI.
 - Only one firm in a market, a firm's market share = 100% then $\text{HHI} = 10,000$
 - Thousands of firms in a market, then $\text{HHI} = \text{approx. } 0$.

$$\text{HHI} = (s_1)^2 + (s_2)^2 + (s_3)^2 + \dots + (s_n)^2,$$

where S_n is the market share percentage of firm n

Market share = a firm's sales / sales in the whole market



*How to evaluate if it is competitive?
According to U.S. Department of Justice...*

HHI < 1,500
Competitive Market

1,500 ~ 2,500
Moderately Concentrated Market

HHI > 2,500
Highly Concentrated Market

Example of Calculation

- Firm A's market share = 40% / Firm B's market share = 35%
- Firm C's market share = 15% / Firm D's market share = 10%
- $\text{HHI} = 40^2 + 35^2 + 15^2 + 10^2 = 3150$

Let's compare... Which market is more competitive than others?

- (1) Firm A: 50% and Firm B: 50% = ?
- (2) Firm A: 80% and Firm B: 20% = ?
- (3) Firm A: 20%, Firm B: 30%, Firm C: 50% = ?
- (4) Firm A: 25%, Firm B: 30%, Firm C: 45% = ?

What is the advantage of HHI? It's simple and easy to calculate.

What is the disadvantage? Fails to take into account the complexities of various markets.

Alternative Perspective? Text-Based Analysis for Competition

Product Market Fluidity (not covered in the final exam)

- Text-based algorithm to capture *product similarity*.
- Measuring *the extent to which* words in a firm's product description in a firm's financial reports (i.e., 10K reports) *overlap* with those words in the product market universe: *similarity score*.
- This measure indicates *competitive threats* in product markets.



Item 1. Business

Company Background

The Company designs, manufactures and markets mobile communication and media devices and personal computers, and sells a variety of related software, services, accessories and third-party digital content and applications. The Company's products and services include iPhone®, iPad®, Mac®, Apple Watch®, AirPods®, Apple TV®, HomePod™, a portfolio of consumer and professional software applications, iOS, macOS®, watchOS® and tvOS™ operating systems, iCloud®, Apple Pay® and a variety of other accessory, service and support offerings. The Company sells and delivers digital content and applications through the iTunes Store®, App Store®, Mac App Store, TV App Store, Book Store and Apple Music® (collectively "Digital Content and Services"). The Company sells its products worldwide through its retail stores, online stores and direct sales force, as well as through third-party cellular network carriers, wholesalers, retailers and resellers. In addition, the Company sells a variety of third-party Apple-compatible products, including application software and various accessories, through its retail and online stores. The Company sells to consumers, small and mid-sized businesses and education, enterprise and government customers. The Company's fiscal year is the 52- or 53-week period that ends on the last Saturday of September. The Company is a California corporation established in 1977.

Apple 10K report 2018

Netflix, Inc.

Item 1. Business

ABOUT US

Netflix, Inc. ("Netflix", "the Company", "we", or "us") is the world's leading internet television network with over 117 million streaming memberships in over 190 countries enjoying more than 140 million hours of TV shows and movies per day, including original series, documentaries and feature films. Our members can watch as much as they want, anytime, anywhere, on nearly any internet-connected screen. Members can play, pause and resume watching, all without commercials or commitments. Additionally, in the United States ("U.S."), our members can receive DVDs delivered quickly to their homes.

We are a pioneer in the internet delivery of TV shows and movies, launching our streaming service in 2007. Since this launch, we have developed an ecosystem for internet-connected screens and have added increasing amounts of content that enable consumers to enjoy TV shows and movies directly on their internet-connected screens. As a result of these efforts, we have experienced growing consumer acceptance of, and interest in, the delivery of TV shows and movies directly over the internet.

Netflix 10K report 2017

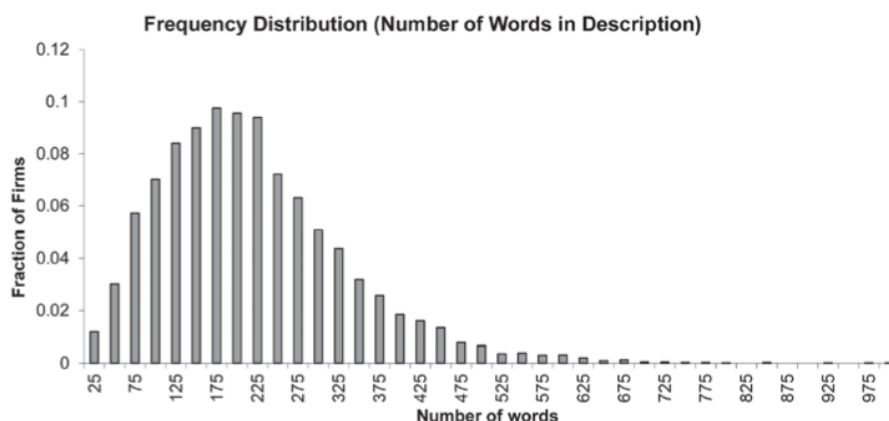
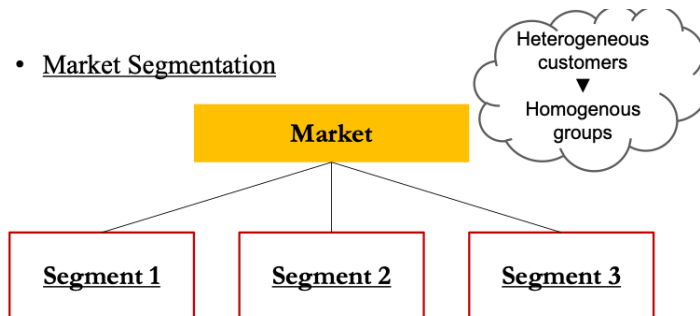


FIG. 1.—Frequency distribution of unique non-common noun and proper noun words in 10-K product descriptions. Color version available as an online enhancement.

Fundamentals of Marketing Plan: STP

- **Segmentation**
 - Determine segmentation basis & method
 - Create segments
 - Describe segments
- **Targeting**
 - Select one or more segments
- **Positioning**
 - Develop strategy & tactics for selected target segment(s)...**Differentiation!**

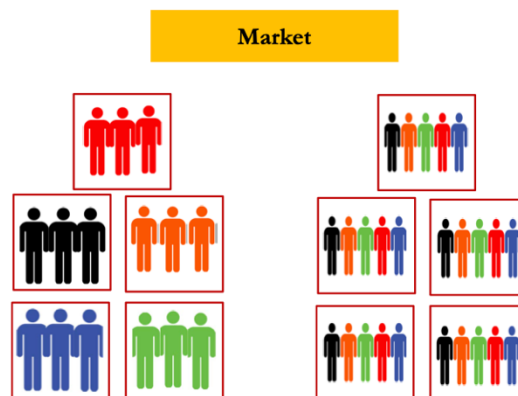
Aim



Market Segmentation involves:

- Viewing a heterogeneous market as a number of smaller homogenous markets.
- Building marketing strategy based on the differences between segments.

Good Segments?



Geographic

Demographic

Market Segmentation

There are many ways to segment a market.

The following can be used alone or in combination:

Psychographic

Behavioral

- **Geographic Segmentation**
 - Dividing the market into different geographical units. (Nations, regions, states, cities or neighborhoods).
- **Demographic Segmentation**
 - Divides the market into segments based on: Age, life-cycle stage, income, occupation, education, religion, ethnicity, generation.
 - The most popular approach
 - Easier to measure than most of other approaches
 - Needs tend to vary with demographic variables.

- **Psychographic Segmentation**
 - Divides consumers into the segments based on: Lifestyles, Personality.
 - Lifestyles: The products people buy reflect their lifestyles.
 - Personality: Practical, do-it-yourself, outgoing, etc.
 - Same demographic groups but different psychographic characteristics.
 - May be observable or not.
- **Behavioral Segmentation**
 - Divides consumers into segments based on: Knowledge, Attitudes, Uses or responses to a product.
 - Occasions
 - When do consumers buy or use the product?
 - Gift-giving.
 - Benefits
 - A powerful form of segmentation, example: segmentation based on benefits (ipad configuration)
 - User Status: non-user, ex-user, potential users, first-time users, regular users.
 - Usage Rate
 - Light, Medium and heavy users.
 - Heavy users are a small percentage of the market but account for a high % of total consumption.
 - Loyalty status
 - The degree of loyalty.
 - Brand-level (Tide), Store-level (Esselunga), Company-level (Apple).

Requirements for Effective Segmentation

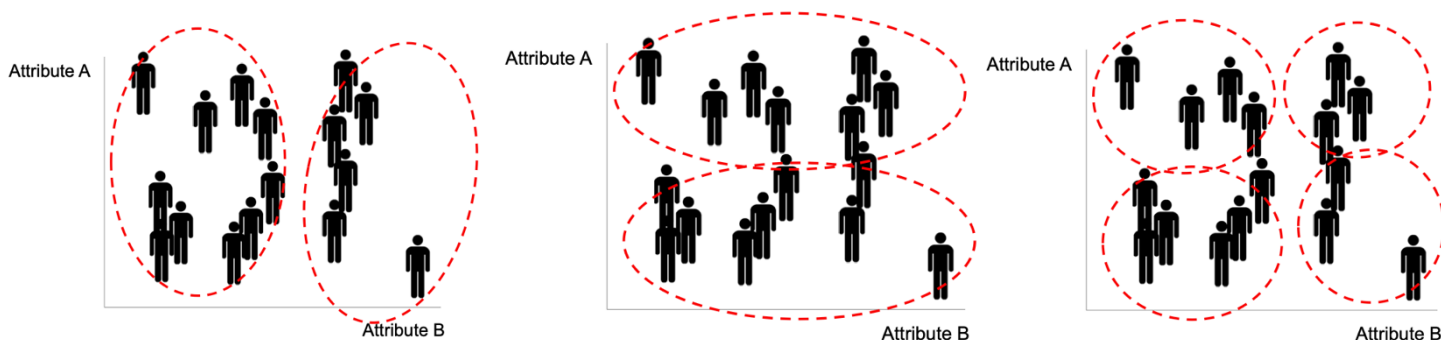
- **Measurable:** size, purchasing power and profiles of the segments.
- **Accessible:** effectively reached and served.
- **Substantial:** large or profitable enough to serve.
- **Differentiable:** distinguishable and responding differently to marketing mix.
- **Actionable:** effective marketing programs can be designed.

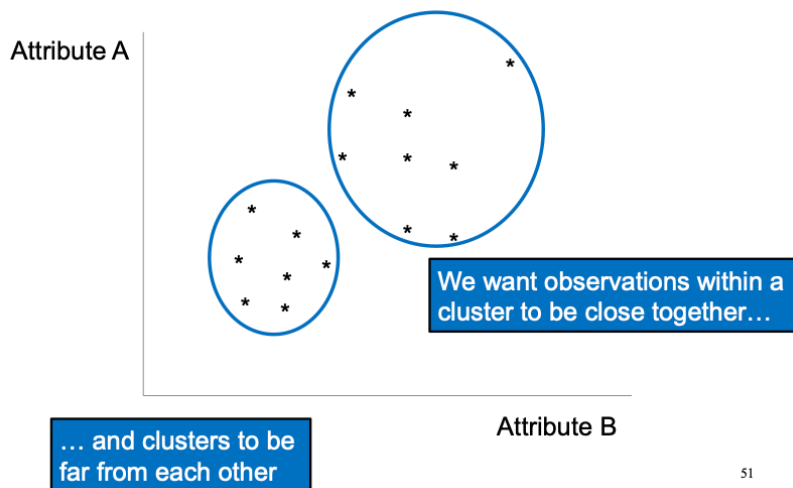
Segmentation Methods

How can we form clusters?

- **A Priori (Naïve)**
 - Segments determined by a researcher
 - E.g., young and old customers, female/male customers.
- **Post-Hoc**
 - Based on analyses: cluster analysis.

Intuition of Cluster Analysis





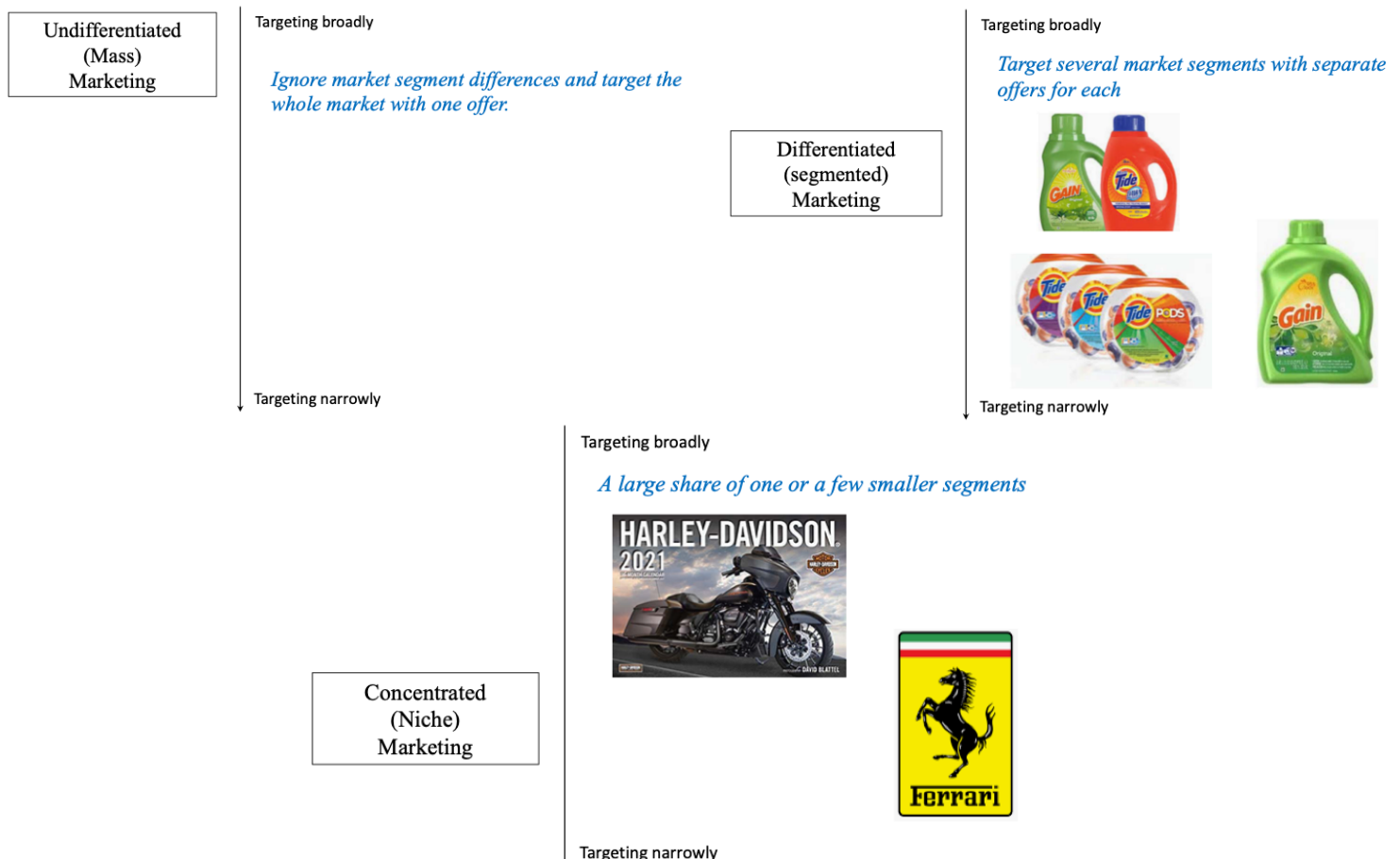
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Targeting and Positioning

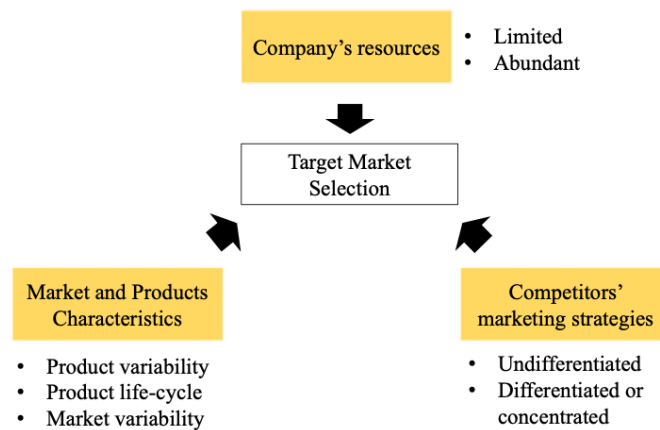
Evaluating Segments

- Segment size
- Segment growth
- Segment structural attractiveness
 - Competitors and new entrants
 - Substitute products
 - Power of buyers
 - Powerful suppliers

Selecting Target Markets



Choosing a Target Market



Choosing a Targeting Strategy

- The company's resources
 - Limited or abundant?
- The degree of product variability
 - Grapefruit or steel?
 - Cameras, cell phones, or cars?
- Product Life Cycle (undifferentiated → differentiated)
- Market variability: the extent to which consumer preference is different.
- Competitors' marketing strategies.

Positioning

- A Value Proposition
 - How does a company create differentiated value for targeted segments?
 - What position does a company want to occupy in those segments?
- Product Position
 - The way a product is defined by consumers on important attributes: the complex set of perception, impression and feeling.
 - **The place a product occupies in consumers' minds relative to competing products.**
- Consumers are overloaded with information about products and services
 - Limited attention and limited cognitive resources.
 - Can't reevaluate products every time.

Positioning Maps

- Perceptual maps
 - Consumer perceptions of the brand versus their competing brands on important dimensions.

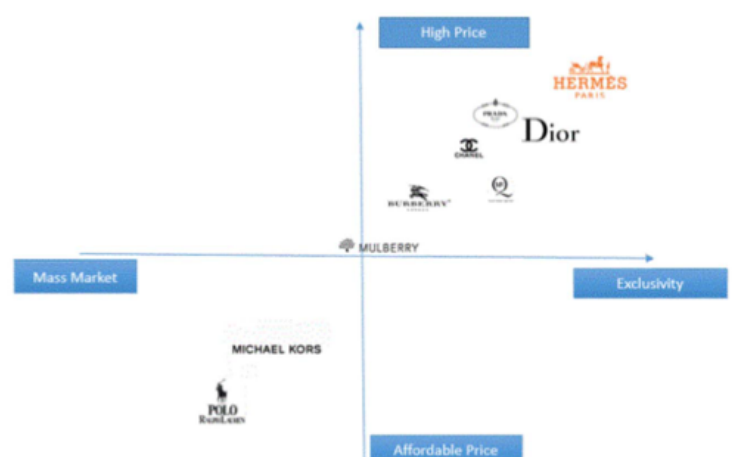
Differentiation and Positioning Strategy

Should provide superior customer value, how?

- Lower Price
- More benefits

Answer the question, "Why should I buy your brand?"

Case of IKEA.



Session 3 – Building Models and Using Regression in Marketing

How to Build a Model? – Modelling Marketing

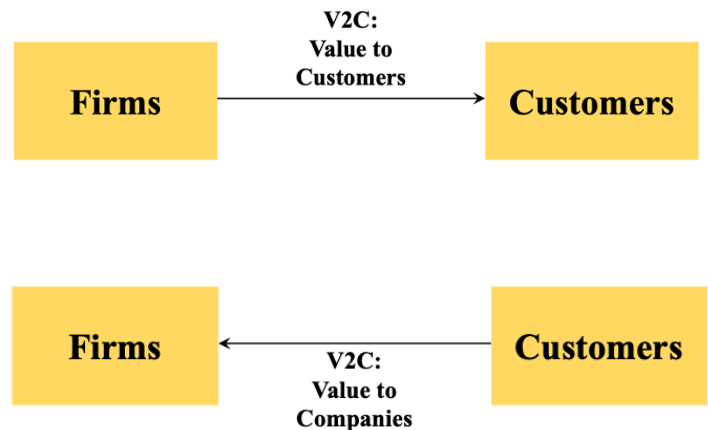
Phenomena - What is Marketing?

What do managers do? Marketing Actions:

- Product Introductions.
- Pricing.
- Distribution Channels.
- Advertising and Other Promotion Activities.

How do consumers respond? Consumer responses:

- Choice (When, What, Where, How much, etc.)
- Loyalty and Satisfaction
- WOM (Positive vs Negative)



What is a Model?

A **simplified representation** of a system or phenomenon, as in the sciences or economics, with any hypotheses required to describe the system or explain the phenomenon, often mathematically.

“A **representation** of the most **important elements** of a **perceived real-world** system”.

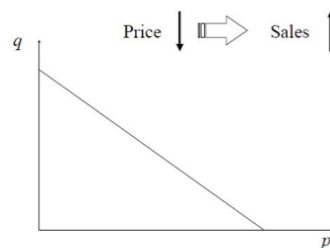
- Real-World System
 - Real phenomenon
 - Managers’ decision
 - Consumer behaviors
- Perceived
 - Model building is a subjective process
 - Different models for the same phenomenon
- Most important elements
 - Real world (e.g., consumer behavior) is too complex to model
 - Ceteris paribus, the simpler the better.
- Representation
 - Text, symbols, graphics, etc.
 - Ceteris paribus, the simpler the better

“All models are wrong. Some are useful” – George E. P. Box.

Example

If price decreases, demand increases.

Verbal Model



Graphical / Conceptual Model

$$q = 100 - 2.5 \cdot p$$

Mathematical (= Quantitative) Model

Challenges in Modelling Marketing Phenomena

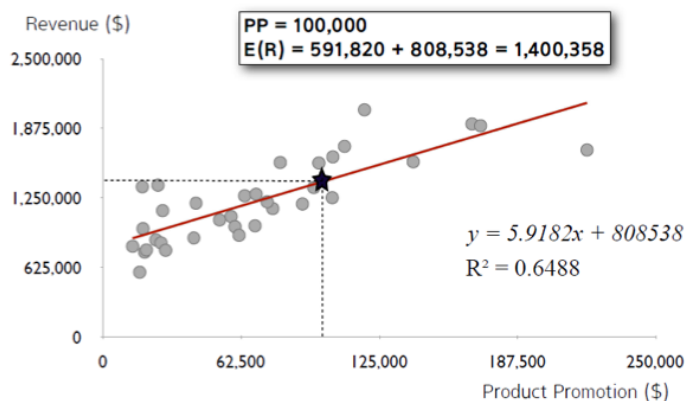
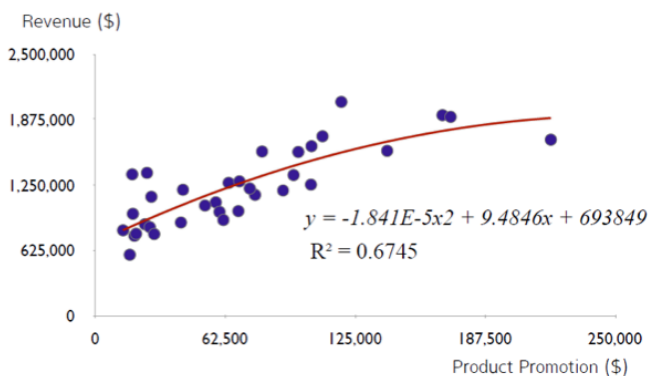
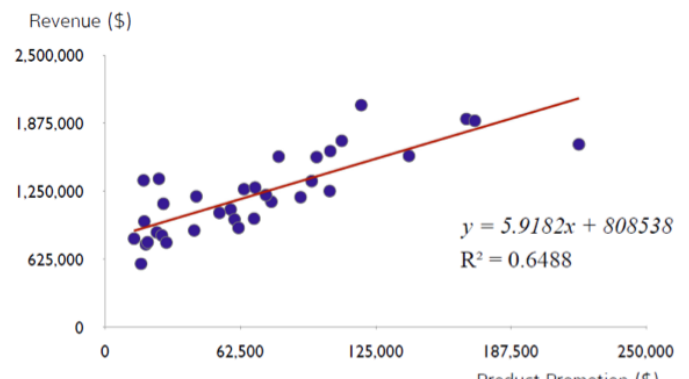
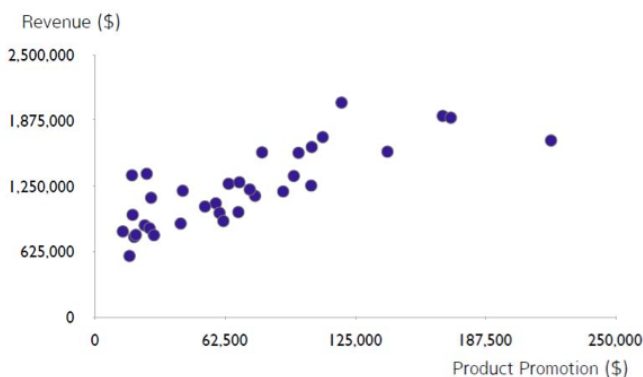
- Who buy the product/service?
 - Heterogenous consumers → Aggregation from individual responses
- Only one action?
 - No! (price, ad, product, etc.) → Marketing mix interaction
- Only us?
 - No! → Competitive reaction
- Immediate response?
 - No! → Delayed response
- Only one region?
 - No! → Multiple territories

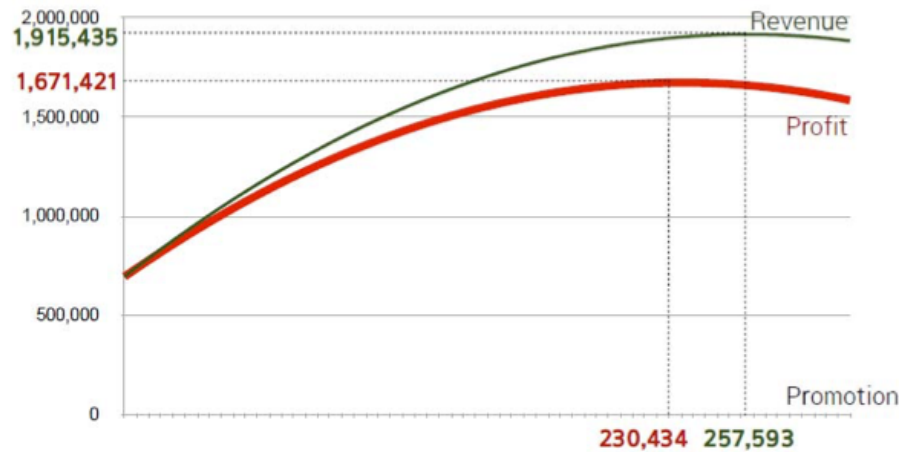
Why Do We Need a Model?

- Better understanding on the relationship between actions (e.g., price promotion) and results (e.g., brand sales).
- Quicker but better decision (e.g., price promotion → advertising).
- Finding new problems (e.g., price vs sales vs ads).
- Wiser & wider usage of existing data: Data tell you the answer to the question.
- Justifying more data collection.

The Model Building Process

- Why?
 - Explain or measure something?
 - Forecasting?
 - Finding Optimal Solutions?
 - Proving theory?

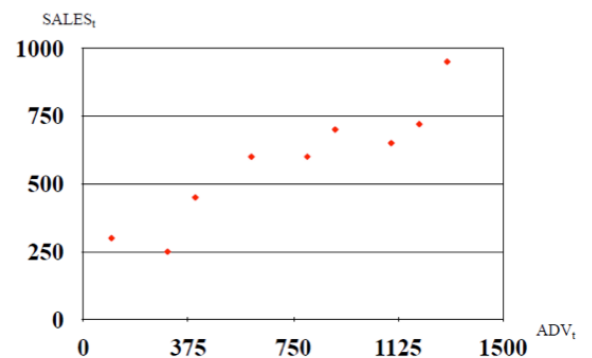




- What?
 - What do we want to explain? (i.e., dependent variable).
 - What provides the explanation? (i.e., explanatory or independent variables).
 - Any hypothesis?
 - What are the data?
- How?
 - How do we represent the real world? (i.e., specification)
 - Elements
 - Relationship
 - How do we find the parameter? (i.e., estimation or solution)
- Valid?
 - Consistent with theoretical expectation or well-known facts?
 - Useful?
 - Simple enough? (i.e. parsimony)
 - Accurate?
 - Robust?

Example: Sales vs Advertising

- Goal setting: to understand the relationship between the amount of advertising and sales quantity.
- Model Elements
 - Dependent Variable?
 - Independent Variables?
 - Data?
- How? Model Specification



$$SALES_t = \alpha + \beta ADV_t, \quad t = 1, 2, \dots, T$$

Elements:

Dependent Variable: SALES at time t
Independent Variable: ADV at time t

Relationship:

Additive & Linear in parameters and variables

$$SALES_t = \alpha + \beta ADV_t + \epsilon_t, \quad t = 1, 2, \dots, T$$

Error term!

Issues in Model Elements

- Measurement (i.e., variable operationalization)
 - How can we measure a marketing variable?
 - Aggregation: this is related with unit of analysis

- Entity: buyer aggregation & product aggregation.
 - Temporal: weekly, monthly, quarterly, yearly.
 - Spatial: store, city, country, ...
- Proxy for latent variables: scale development
- Measurement Scale
 - Metric variables (interval, ratio) vs. Categorical variables (nominal, ordinal)
 - Continuous (advertising spending) vs. Discrete variables (advertising frequency)

Dummy Variables

"Sales are generally higher in Christmas season".

$$SALES_{jt} = \beta_0 + \beta_1 ADV_{jt} + \beta_2 D_t + \epsilon_{jt}$$

What can the subscript j mean here?

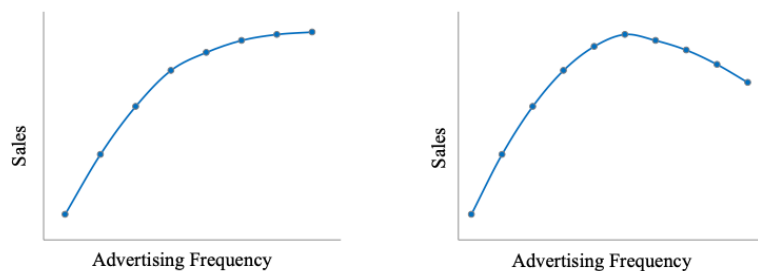
where $D_t = 1$ if $t = \text{Dec}$, 0 otherwise.

Issues in Mathematical Relationship

- Linearity? Or Non-Linear Relationship?
- An error term
 - Given the assumption of regression, an error term should be random.
 - Researchers generally impose a distributional assumption on the error term (e.g., normal distribution).
- Heterogeneity

Advertising and Sales

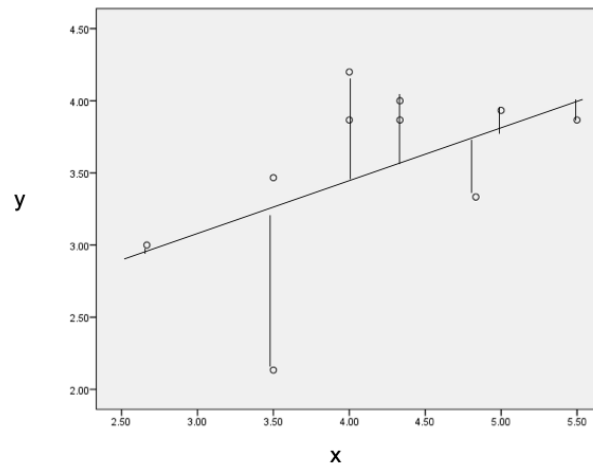
- How would be the relationship between advertising (frequency) and sales?



- Validation: the extent to which the model is valid
 - Check on assumptions
 - Face validity
 - Alternative model specification: performance vs. parsimony
 - Simpler model?
 - More sophisticated and complex model?
 - Alternative estimation methods
 - Alternative variable operationalization
 - Predictive accuracy
 - In sample
 - Out of sample (data split)

Overview of Regression

Regression: Intuition



Calculate the distance from the observation to the fitted line

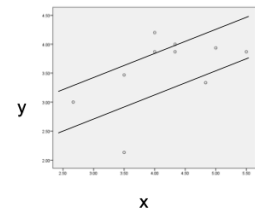
Regression: Equation

$$y_i = \alpha + \beta x_i + \varepsilon_i$$

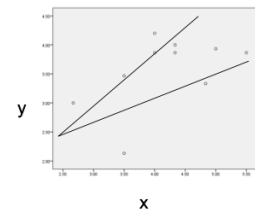
- α is the intercept or constant
- β is the slope parameter for x
- ε is the disturbance or error term
- i is the observation

Regression: Alpha and Beta

Higher alpha



Higher beta



Regression: Simple and Multiple

- Simple regression:

$$y_i = \alpha + \beta x_i + \varepsilon_i$$

- Multiple regression:

$$y_i = \alpha + \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + \varepsilon_i$$

Regression: Terminology

$$y_i = \alpha + \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + \varepsilon_i$$

Dependent variable (DV)

Independent variables (IVs)

$$Sales_i = \alpha + \beta_1 Price_i + \beta_2 Advertising_i + \varepsilon_i$$

$$y_i = \alpha + \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + \varepsilon_i$$

Regression coefficients

$$Sales_i = \alpha + \beta_1 Price_i + \beta_2 Advertising_i + \varepsilon_i$$

Why Multiple Regression?

- We want to test the effect of multiple variables at the same time.
- E.g., sales as a function of price and advertising or other marketing actions.
- If we omit price, the effect of advertising is not clean (omitted variable bias).

Which IVs Should We Include?

- Use theory and intuition.
- Do not just include all variables in your dataset!
- You may use stepwise regression: this is more empirical approach as opposed to theoretical approach (For exploratory research!)

Regression: Model Fit and R²

- The R² indicates the proportion of variance in the dependent variable that is explained by the independent variables.
- R² varies between 0 and 1
 - 0: 0% of the variance is explained
 - 1: 100% of the variance is explained
- Definition of “good R²” heavily depends on context!

Regression: R² and the Number of Variables

- If we add a variable, the R² will always increase or stay the same.
- Hence, if we compare the following two models,

$$Sales_i = \alpha + \beta_1 Price_i + \varepsilon_i$$

$$Sales_i = \alpha + \beta_1 Price_i + \beta_2 Advertising_i + \varepsilon_i$$

the second model will always “win” (i.e., higher R²).

Regression: Adjusted R²

- However, we would like to keep our model as compact as possible
 - Based on the R², the model would keep on growing!
- We use the adjusted R² which gives a penalty for using an additional variable.
 - Only when the better fit outweighs the “cost” of having an additional coefficient, the adjusted R² will increase.

TABLE 5
The Association of Strategic Emphasis, Relative Performance, and Demand Instability with Firm-Idiosyncratic Risk

	Model 1: Controls		Model 2: Main Effects		Model 3: Two-Way Interactions		Model 4: Three-Way Interactions	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Intercept	.033***	.003	.056***	.001	.056***	.001	.056***	.001
ROA _{<i>i</i>}	-.003**	.001	-.002	.003	-.002	.003	-.002	.003
Leverage _{<i>i</i>}	.001	.001	.005**	.002	.005***	.002	.005***	.002
Liquidity _{<i>i</i>}	.000***	.000	.000***	.000	.000***	.000	.000***	.000
Dividend payout _{<i>i</i>}	-.007**	.003	-.004	.003	-.004	.003	-.004	.003
Service ratio _{<i>i</i>}	.001	.002	-.001	.002	-.002	.002	-.002	.002
Firm scope _{<i>i</i>}	-.001**	.000	.000	.000	.000	.000	.000	.000
Firm size _{<i>i</i>}	-.005***	.000	-.006***	.000	-.006***	.000	-.006***	.000
Inverse Mills ratio _{<i>i</i>}			.012	.009	.013	.008	.013	.008
Control function _{<i>i</i>}			-.012***	.003	-.011***	.003	-.011***	.003
Strategic emphasis _{<i>i-1</i>}			-.020**	.009	-.027***	.009	-.028***	.008
Positive relative performance _{<i>i-2</i>}			-.012***	.003	-.011***	.003	-.010***	.003
Negative relative performance _{<i>i-2</i>}			.006***	.002	.007***	.002	.006***	.002
Demand instability _{<i>i-1</i>}			-.006	.023	-.002	.022	.018	.023
H ₁ : Strategic emphasis _{<i>i-1</i>} × Positive relative performance _{<i>i-2</i>}					.037***	.014	.042***	.014
H ₂ : Strategic emphasis _{<i>i-1</i>} × Negative relative performance _{<i>i-2</i>}					.015***	.004	.015***	.004
Strategic emphasis _{<i>i-1</i>} × Demand instability _{<i>i-1</i>}							-.729***	.225
Positive relative performance _{<i>i-2</i>} × Demand instability _{<i>i-1</i>}							-.167	.163
Negative relative performance _{<i>i-2</i>} × Demand instability _{<i>i-1</i>}							-.211*	.128
H ₃ : Strategic emphasis _{<i>i-1</i>} × Positive relative performance _{<i>i-2</i>} × Demand instability _{<i>i-1</i>}							4.297***	1.651
H ₄ : Strategic emphasis _{<i>i-1</i>} × Negative relative performance _{<i>i-2</i>} × Demand instability _{<i>i-1</i>}							1.099***	.406
R ²	.560		.576		.579		.581	
Adjusted R ²	.557		.574		.576		.578	
Incremental R ²			.016***		.003***		.002***	

*p < .10.

**p < .05.

***p < .01.

Notes: n = 13,880. All models include industry and year dummies.

Regression: Coefficient Significance

- To assess coefficient significance, we look at the t-test and p-value.
- T-value = coefficient / standard error
- P-value < 0.05 then the coefficient is significant!

Regression: Coefficient Interpretation

- Only interpret if significant

$$Sales_i = \alpha + \beta_1 Price_i + \beta_2 Advertising_i + \varepsilon_i$$

- If price goes up with 1 unit, sales change with β_1 units.
- If advertising goes up with 1 unit, sales change with β_2 units.
- Expected Signs? Positive or Negative?

Regression: Fitted Values

- We can use the regression model

$$Sales_i = \alpha + \beta_1 Price_i + \beta_2 Advertising_i + \varepsilon_i$$

- To calculate fitted values:

$$\widehat{Sales}_i = \alpha + \beta_1 Price_i + \beta_2 Advertising_i$$

- We can compare the fitted values to the observed values.

Scenarios and Forecasting

- More importantly, we can use to run scenarios

$$\widehat{Sales}_i = \alpha + \beta_1 Price_i + \beta_2 Advertising_i$$

advertising

- Given a price and level, what would sales be?
- We can also predict the future, predict other brands, other respondents, etc.
- Very important in practice!

Association vs Causation

- Be careful of interpreting regression coefficients as causal relationship.
- Regression is based on association between variables.
- Then for causality?

Regression Application in Marketing – What Other Cases?

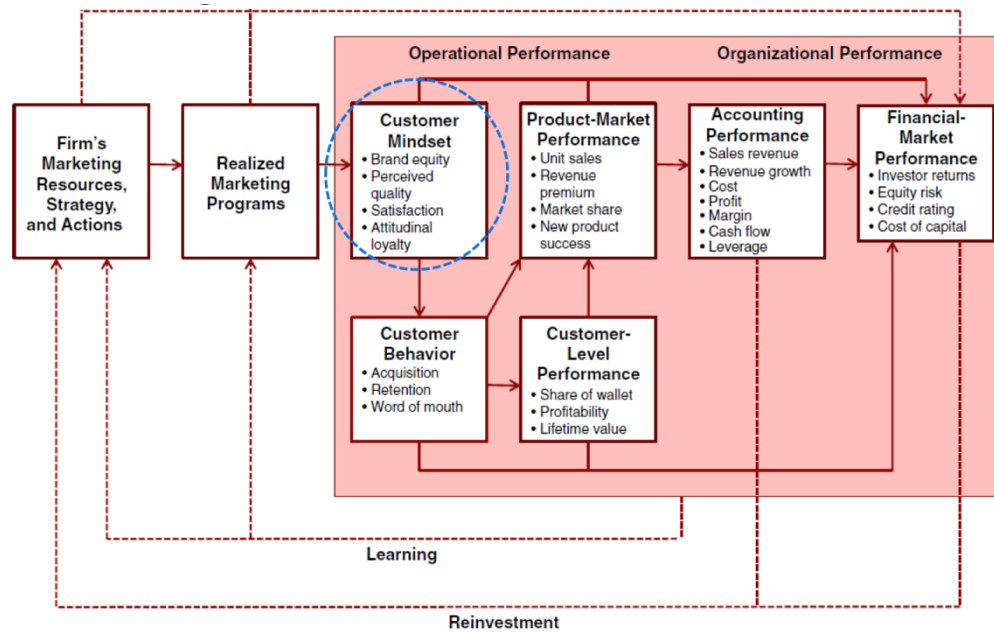
- Sales and Marketing Actions.
- Customer Satisfaction/Loyalty and its drivers.
- Consumer choice and its determinants.

Session 4 – Understanding Consumers I

Survey Research and Marketing Analytics

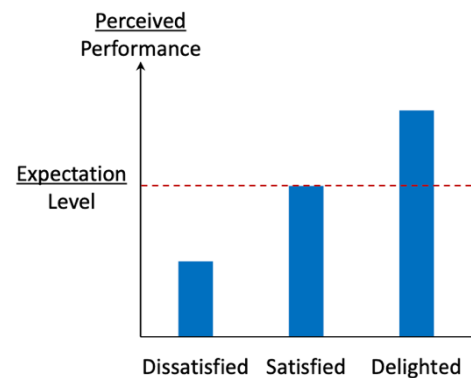
- **Attitudes**, overall assessment, etc.
 - E.g., consumer awareness, knowledge, or perceptions.
- Personal, Telephone, and Self-administered surveys (mail, email, and web-based, etc.)
- Advantages:
 - It can collect a great deal of data about an individual respondent at one time.
 - Versatility.

Marketing Performance Outcome Chain

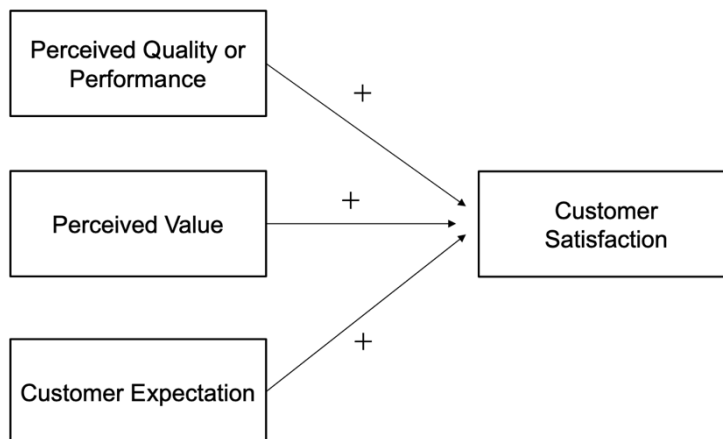


Customer Satisfaction

- Measure of loyalty and quality of the customer base of a firm.
- Firms invest considerable resources in measuring customer satisfaction.
- A latent variable that is not directly observed.



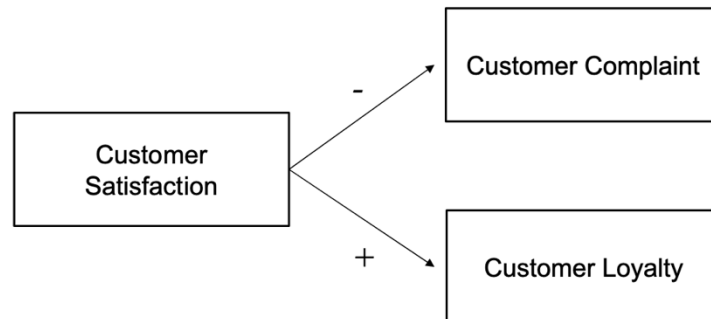
What Drives Customer Satisfaction?



- **Perceived Quality of Performance:** Evaluation of consumption experience
 - **Customization**, the degree to which the firm's offering is customized to meet heterogenous customer needs.
 - **Reliability**, the degree to which the firm's offering is reliable, standardized and free from deficiencies.
- **Perceived Value:** Price information into the measure
 - Rating of value given price.
 - Rating of price given value.
- **Customer Expectation:** A forecast of the firm's ability to deliver quality in the future

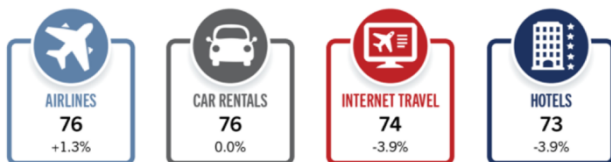
- Customization (pre-purchase).
- Reliability (pre-purchase).

What is the Consequence?

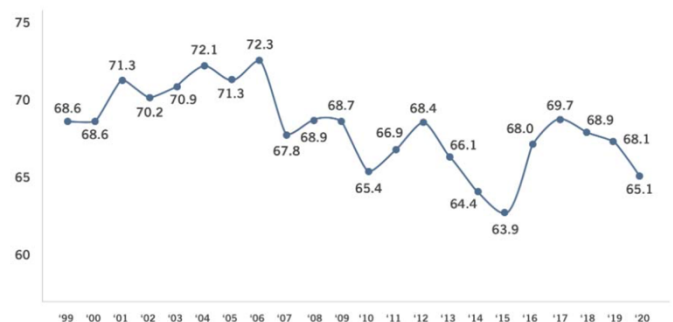


Customer Satisfaction With Airlines Soars, While Hotels Hit Worst Mark in More Than a Decade, ACSI Data Show

AMERICAN CUSTOMER SATISFACTION INDEX: TRAVEL REPORT 2020-2021



CITIZEN SATISFACTION WITH FEDERAL GOVERNMENT SERVICES



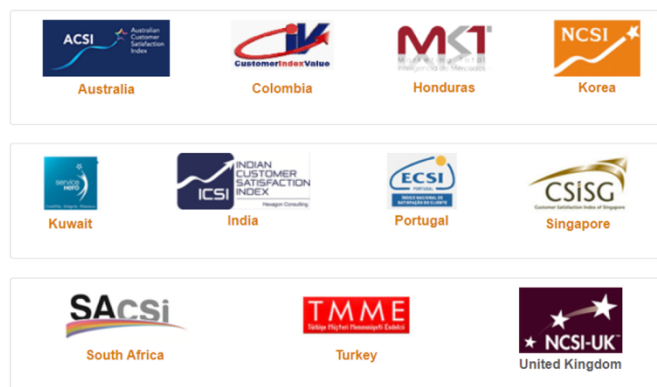
Customer Satisfaction

American Customer Satisfaction Index

- Interviews about 180,000 customers annually.
- Durable goods, services, non-durable goods, government services etc.
- Rating from 1 to 10.
- Three questions:

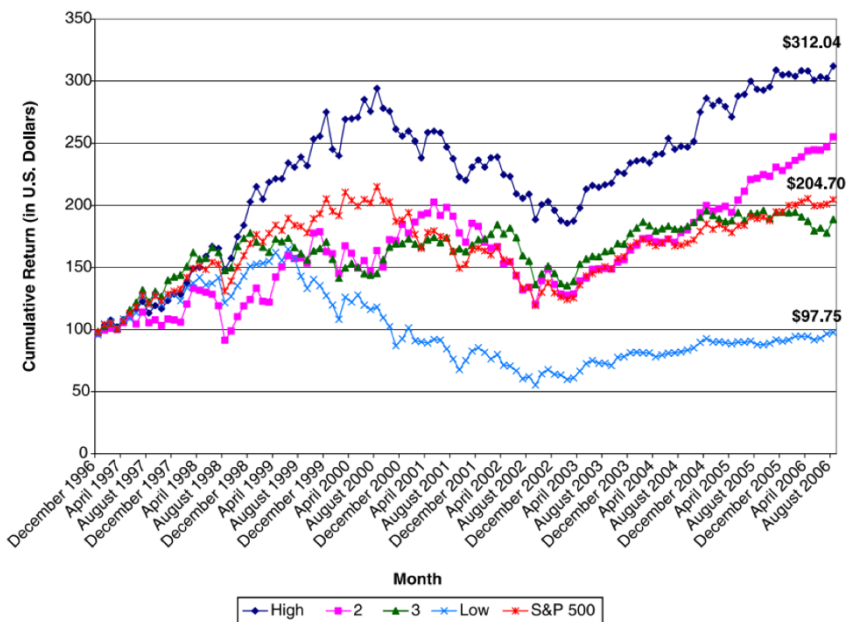
Questions	1	10
1. Overall Satisfaction	Very dissatisfied	Very satisfied
2. Expectancy Disconfirmation	Falls short of expectations	Exceeds expectations
3. Comparison to an ideal	Not very close to the ideal	Very close to the ideal

Not Only in US but also...



Other Economic Impacts?

FIGURE 1
Customer Satisfaction Portfolio Cumulative Returns Versus the S&P 500 Index Cumulative Return



Customer Satisfaction and Stock Returns Risk

FIGURE 1
Cumulative Returns: ACSI Top 20% Versus DJIA (1997-2003)^a

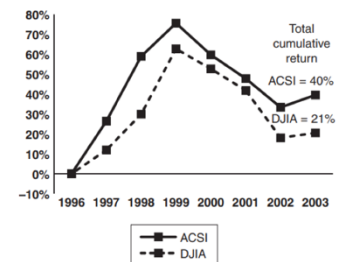
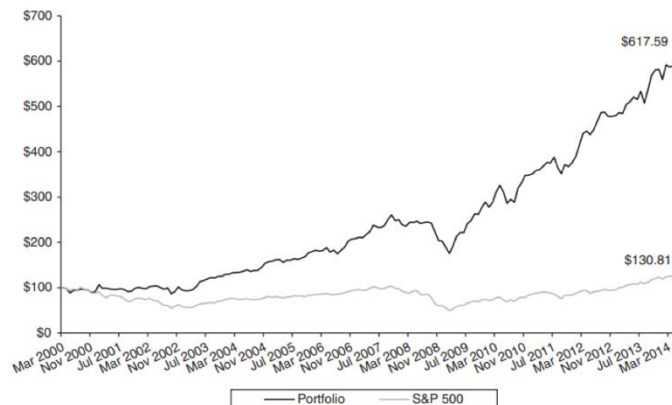


FIGURE 2
Cumulative Returns on \$100 Invested in Customer Satisfaction: Portfolio Versus the S&P 500 (April 2000 Through June 2014)



Why Does Customer Satisfaction Matter?

- Loyal customers are less costly to serve.
- They are willing to pay more than others.
- They are more likely to accept product extensions.
- They can create barriers to entry for potential competitors.
- Firms can defend from competitors' attack (e.g., cutting prices).

Customer Loyalty Matters!

- Repeating purchasing the product / continuously using the product (**Retaining Customers!**).
- Customers are loyal if they buy products / services from the same company repeatedly rather than from other suppliers.
- Loyal customers are engaged with advocate behaviors such as generating positive word-of-mouth both online and offline. (**Help acquiring new customers!**).

Food for Thoughts

Recency: If consumers recently buy the product, then?

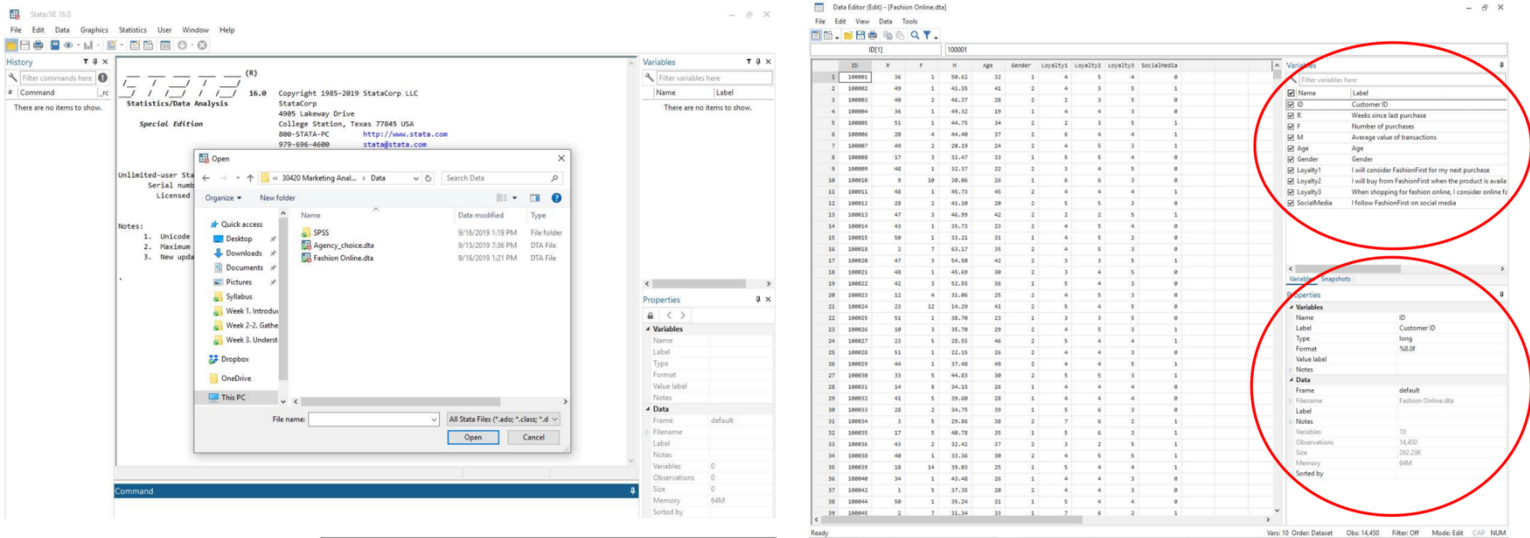
Frequency: If consumers buy the product frequently, then?

Mean: If consumers buy and pay more, then?

Session 4.2 – Regression Application and Introduction to STATA

Introduction to STATA and Data Setup

One of the most used software for data analysis in social science. Both User-friendly and Coding Options. A number of statistical methods are available. STATA is a software, not a method of analysis.

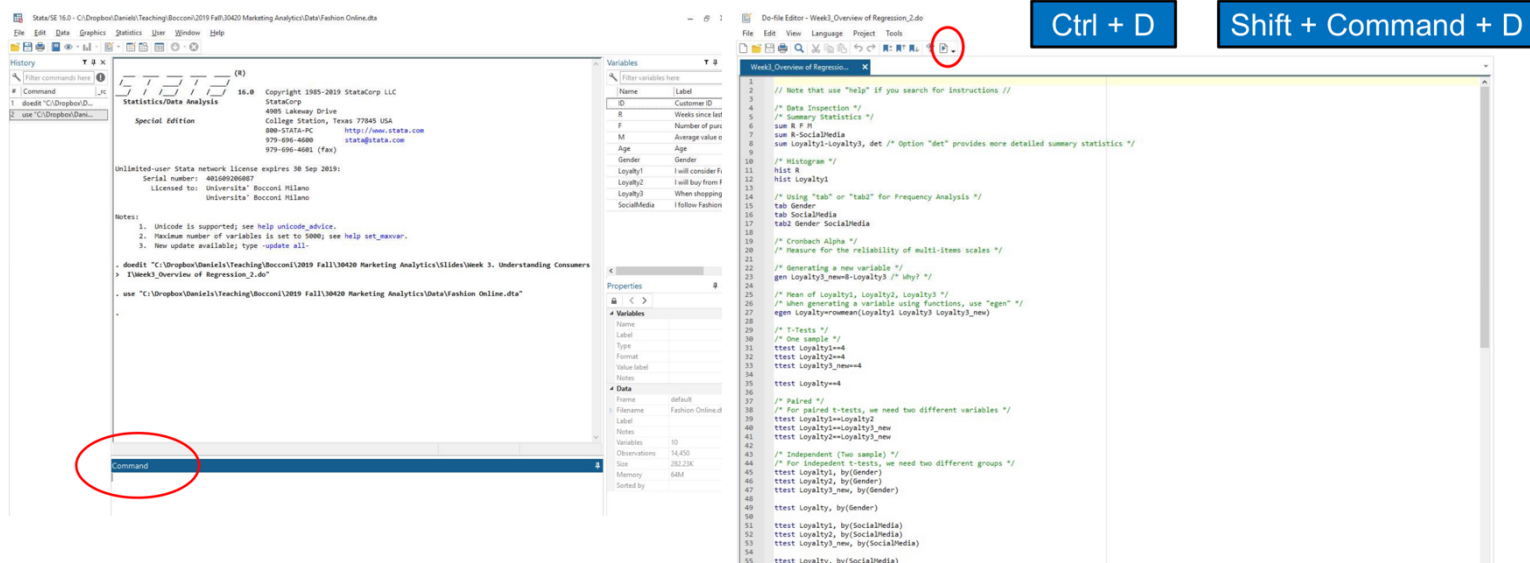


Open your dataset or type in data

Row? And Column

Data Inspection

You can put the code in “command” or make the **do-file**. Use “**summarize (or sum) variable name**” to check the summary statistics such as # of observations, mean, standard deviation, min, or max. Use “**det**” option to return the detailed statistics. To see the histogram of a variable, use “**hist variable name**”. “**tab**” & “**tab2**”: Frequency.



Ctrl + D

Shift + Command + D

Variable	Obs	Mean	Std. Dev.	Min	Max
Loyalty1	14,450	4.536747	1.095577	1	7
Loyalty2	14,450	4.549965	1.103616	1	7
Loyalty3	14,450	3.454118	1.103731	1	7

I will consider FashionFirst for my next purchase

Percentiles	Smallest		
1%	2	1	
5%	3	1	
10%	3	1	Obs
25%	4	1	Sum of Wgt.
50%	4		Mean
75%	5	Largest	Std. Dev.
90%	6	7	Variance
95%	6	7	Skewness
99%	7	7	Kurtosis

Gender	Freq.	Percent	Cum.
Male	6,005	41.56	41.56
Female	8,445	58.44	100.00
Total	14,450	100.00	



I follow FashionFirst on social media	Freq.	Percent	Cum.
No	8,957	61.99	61.99
Yes	5,493	38.01	100.00
Total	14,450	100.00	

Gender	I follow FashionFirst on social media		Total
	No	Yes	
Male	4,122	1,883	6,005
Female	4,835	3,610	8,445
Total	8,957	5,493	14,450

Data Preparation

Some variables need to be recorded:

- Grouping
- Reverse scale

Some variables need to be combined into one variable:

- Multi-item scales: Loyalty1, Loyalty2, Loyalty3

Data Preparation - Cronbach Alpha

- Three different loyalty measurement items: Loyalty1, Loyalty2, Loyalty3.
- How do we generate one integrated measure for Customer Loyalty?
- Are our measurement items reliable?
- When to Use it? In survey research, when we have **multiple items** to measure one variable, we need to check **the consistency** among multiple items.
- Why? Usually, we use **mean of multiple items** (think about the case of customer loyalty). Thus, the internal consistency matters.
- What does it suggest? If the Cronbach alpha is sufficiently high (i.e., higher than 0.6), then we consider there is high internal consistency.

Data Preparation - Inter-Item Reliability

- Do the items really measure the same construct?
- Cronbach's alpha (1951).

- Formula:

$$\alpha = \frac{N * \bar{r}}{1 + (N - 1) * \bar{r}}$$

Test scale = mean(unstandardized items)

Average interitem covariance: .8808563
Number of items in the scale: 3
Scale reliability coefficient: 0.8886

Conclusion?

- Scores over **0.6** are considered to have a high internal consistency
 - r: average inter-item correlation
 - N: number of items

	Loyalty1	Loyalty2	Loyalt~w
Loyalty1	1.0000		
Loyalty2	0.7265	1.0000	
Loyalty3_new	0.7241	0.7295	1.0000

Data Preparation - What if Cronbach's Alpha < 0.6?

- Leave out an item
- Check again
- If necessary, leave out another item, etc.

Data Analysis – Regression and Model Selection

Source	SS	df	MS	Number of obs	=	14,450
Model	748.068435	6	124.678072	F(6, 14443)	=	1527.42
Residual	1178.92991	14,443	.081626387	Prob > F	=	0.0000
				R-squared	=	0.3882
				Adj R-squared	=	0.3879
Total	1926.99834	14,449	.133365516	Root MSE	=	.2857

Loyalty	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
R	-.0150961	.0001706	-88.49	0.000	-.0154305 -.0147617
F	-.0418367	.0008609	-48.60	0.000	-.0435241 -.0401492
M	.0007118	.0002954	2.41	0.016	.0001327 .001291
Age	-.0002317	.0003502	-0.66	0.508	-.0009181 .0004546
Gender	-.176562	.0048635	-36.30	0.000	-.1860951 -.1670289
SocialMedia	.0035287	.0056863	0.62	0.535	-.0076173 .0146747
_cons	5.052421	.0189359	266.82	0.000	5.015304 5.089538

Source	SS	df	MS	Number of obs	=	14,450
Model	748.037001	5	149.6074	F(5, 14444)	=	1832.91
Residual	1178.96134	14,444	.081622912	Prob > F	=	0.0000
				R-squared	=	0.3882
				Adj R-squared	=	0.3880
Total	1926.99834	14,449	.133365516	Root MSE	=	.2857

Loyalty	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
R	-.0150978	.0001706	-88.51	0.000	-.0154322 -.0147635
F	-.0417719	.0008545	-48.88	0.000	-.0434468 -.0400969
M	.0007141	.0002954	2.42	0.016	.0001351 .0012932
Age	-.0001265	.0003064	-0.41	0.680	-.000727 .000474
Gender	-.1761741	.0048231	-36.53	0.000	-.1856279 -.1667203
_cons	5.049693	.0184182	274.17	0.000	5.013591 5.085795

Data Analysis – What Factors Are Important?

Source	SS	df	MS	Number of obs	=	14,450
Model	748.037001	5	149.6074	F(5, 14444)	=	1832.91
Residual	1178.96134	14,444	.081622912	Prob > F	=	0.0000
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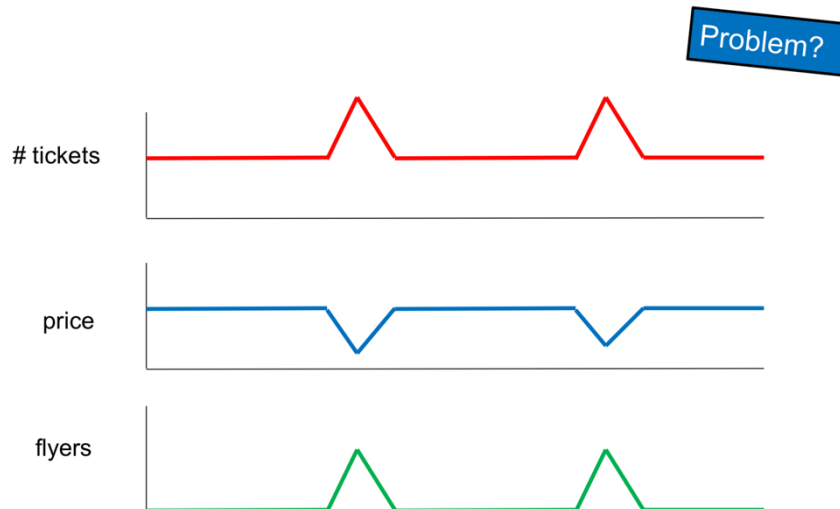
Regression Diagnostics – Multicollinearity

- One assumption of OLS is that the **independent variables** are **independent** of each other.

- What if this assumption is violated?
- If this assumption is violated, we deal with **multicollinearity**.
- One independent variable in a multiple regression model can be explained by **the other independent variables** in the model with **the high degree of accuracy**.
- Why does it matter?
 - Coefficients depend on other variables in the model.
 - The precision of the coefficients can decrease.
 - Significance of the coefficient can change.

Example

- To attract more visitors, a cinema decides to lower the price of a ticket and distribute flyers in some weeks.
- Now, the management wants to assess the effectiveness of the price discounts and flyers.



Regression Diagnostics – How To Detect Multicollinearity?

- Correlation Matrix
 - Relationship between:
 - X1 and X2
 - X1 and X3
 - X2 and X3
 - Etc.
- **Very High Correlations** indicate multicollinearity
 - Cutoff arbitrary, e.g., 0.9.

Regression Diagnostics – Correlation Matrix

	Loyalty	R	F	M	Age	Gender	Social~a
Loyalty	1.0000						
R	-0.4675	1.0000					
F	-0.0325	-0.5369	1.0000				
M	0.0247	0.1781	-0.3346	1.0000			
Age	-0.0083	0.0076	-0.0037	0.0071	1.0000		
Gender	-0.2344	-0.0041	-0.0010	0.0088	0.0084	1.0000	
SocialMedia	-0.0231	-0.0808	0.1331	-0.0306	0.4771	0.1156	1.0000

Regression Diagnostics – Better Approach?

- Not only bivariate relationships matter (e.g., X1 and X2)

- But also it is a problem is one IV is a linear function of other IVs (X1 is a function of X2, X3 and X4).

Variance Inflation Factors (VIFs)

- To obtain VIFs, we estimate the following regression models:

$$x_{1i} = \beta_0 + \beta_1 x_{2i} + \beta_2 x_{3i} + \dots + \beta_k x_{k+1,i} + \varepsilon_i$$

$$x_{2i} = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{3i} + \dots + \beta_k x_{k+1,i} + \varepsilon_i$$

...etc.

We use IVs as DVs

- For each model, we determine the R^2
- The VIF now is given by:

$$VIF = \frac{1}{(1 - R^2)}$$

Why use R^2 ?

- High R^2 , high VIF
- Cutoff arbitrary again, e.g. 10

(VIF > 10) = problem

What if VIF > 10?

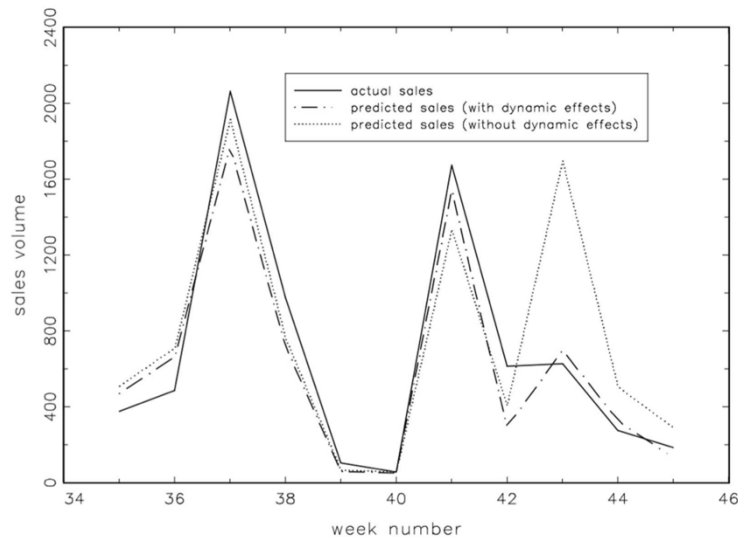
- Leave out one variable (Effect captured by other variable(s), e.g., flyer effect incorporated in price effect).
- Combine variables in one variable
 - Sum of competitors' advertising expenditures instead of a variable for each competitor.
 - Factor analysis.

Session 5 – Understanding Consumers II

Marketing and Consumer Choice

Consumer choice model in marketing has been improved in many ways. What marketing scholars have found:

- Consumer choice can be affected by sales promotion. In this case, brand switching, timing acceleration, quantity acceleration, stockpiling prevails.
- Consumer choice can differ a lot due to preference heterogeneity. Marketing scholars start estimating individual consumer choice using Bayesian modeling.
- Consumers are learning and make a decision strategically. For example, consumers learn about the timing of sales promotion and delay the purchase till the anticipated sales promotion.



van Heerde, Leeflang, and Wittink (2000), *Journal of Marketing Research*

In marketing, there are many cases where consumers make a choice.

- Do consumers **buy** the product?
- Do consumers **click** the advertising?
- Do consumers **respond** to marketing actions?
- Do consumers **like** our brand?
- Do consumers **follow** us in social media?

Thus, in marketing, we have many cases where the dependent variable is a binary variable: 1 or 0.

Then, How Do We Model Consumer Choice Behavior? Regression Model?

Suppose we set up the following linear regression model:

$$Choice_i = \beta_0 + \beta_1 X_i + \dots + \varepsilon_i$$

Where $Choice_i = 1$ or 0 and X_i is an independent variable for consumer i .

Let's Do It in STATA

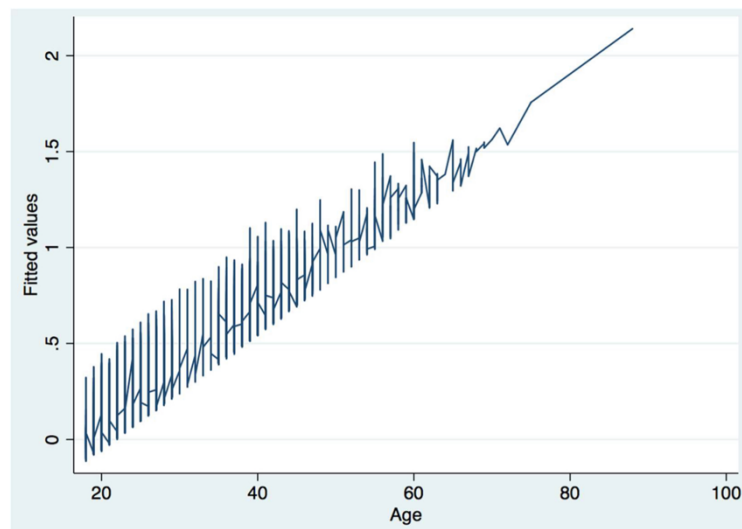
Let's run the following model: $SocialMedia_i = \beta_0 + \beta_1 R_i + \beta_2 F_i + \beta_3 M_i + \beta_4 Age_i + \beta_5 Gender_i + \varepsilon_i$

```
. reg SocialMedia R F M Age Gender
```

Source	SS	df	MS	Number of obs	=	14,450
Model	880.464002	5	176.0928	F(5, 14444)	=	1007.55
Residual	2524.43572	14,444	.174774004	Prob > F	=	0.0000
				R-squared	=	0.2586
				Adj R-squared	=	0.2583
Total	3404.89972	14,449	.235649507	Root MSE	=	.41806

SocialMedia	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
R	-.0004715	.0002496	-1.89	0.059	-.0009607	.0000178
F	.0183652	.0012504	14.69	0.000	.0159142	.0208161
M	.0006496	.0004323	1.50	0.133	-.0001977	.001497
Age	.0298218	.0004483	66.52	0.000	.0289431	.0307004
Gender	.1099231	.0070576	15.58	0.000	.0960894	.1237569
_cons	-.7730145	.0269513	-28.68	0.000	-.8258426	-.7201865

Nothing Happens? What If We Predict the DV?



In Linear Regression Model...

$$Choice_i = \beta_0 + \beta_1 X_i + \dots + \varepsilon_i$$

Is the relationship between X_i and $Choice_i$ linear?



Then, How Do We Set Up a Model?

Logistic Regression – Modeling Consumer Choice

When the DV is binary, we can use logistic regression. To do so, we need to understand “odd”. Odd 0 $p(\text{occurring}) / p(\text{not occurring}) = p / (1 - p)$ where p = the probability of choice.

Logistic regression:

$$z_i = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 X_i + \dots + \varepsilon_i$$

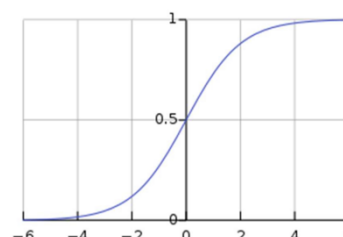
where p_i = probability of ($Z_i = 1$)

- Instead of relating the independent variables directly to the response, we first define an intermediate variable z :

$$z_i = \beta_0 + \beta_1 X_i + \dots + \varepsilon_i$$

- Next, we relate z to response:

$$\text{Probability of Choice}_i = \frac{e^{z_i}}{1+e^{z_i}}$$



Let's estimate this logistic regression model in STATA! Find out which customers are most likely to follow us on social media.

$$\text{Social Media}_i = z_i = \ln[p/(1-p)] = \beta_0 + \beta_1 R_i + \beta_2 F_i + \beta_3 M_i + \beta_4 \text{Age}_i + \beta_5 \text{Gender}_i + \varepsilon_i$$

Responses in our case is whether a customer follows us on social media.

Model Significance and Fit

How Do We Evaluate the Model Fit?

- After running the model, we can read LR chi2 (df) and check the p-value.
- Pseudo R2: this is analogous to R2 and we should not interpret this statistic as the proportion of the variance of the DV explained by the independent variables.
- How to check the predictability of the model in STATA? **estat classification**.

Hit Rate

. estat classification

Logistic model for SocialMedia

Observed

Classified	True		Total
	D	~D	
+	2980	1200	4180
-	2513	7757	10270
Total	5493	8957	14450

Predicted

Classified + if predicted Pr(D) >= .5
True D defined as SocialMedia != 0

Sensitivity	Pr(+ D)	54.25%
Specificity	Pr(- ~D)	86.60%
Positive predictive value	Pr(D +)	71.29%
Negative predictive value	Pr(~D -)	75.53%
False + rate for true ~D	Pr(+ ~D)	13.40%
False - rate for true D	Pr(- D)	45.75%
False + rate for classified +	Pr(~D +)	28.71%
False - rate for classified -	Pr(D -)	24.47%
Correctly classified		74.30%

Coefficients Interpretation

- Note that we use logistic regression when the DV is binary and the model uses “log(p/(1-p))” when estimating the coefficients.
- **Thus, the interpretation of the coefficient shouldn't be the same as that in linear regression.**
- Interpretation: If one unit of X increases, log-odds increases or decreases.

Predicting the Probability in STATA.

After running logistic regression, you can use “**predict variable name, pr**” to generate the predicted probability for each observation.

. predict Social_Pr, pr

. sum Social_Pr

Variable	Obs	Mean	Std. Dev.	Min	Max
Social_Pr	14,450	.3801384	.2520349	.0337377	.9999133

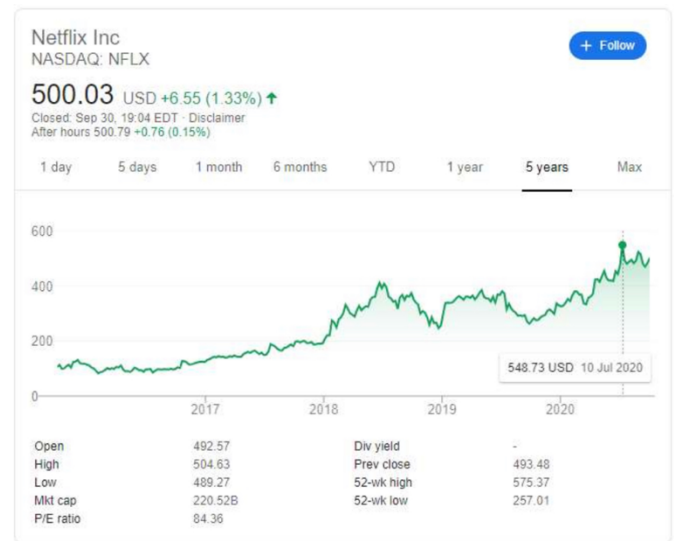
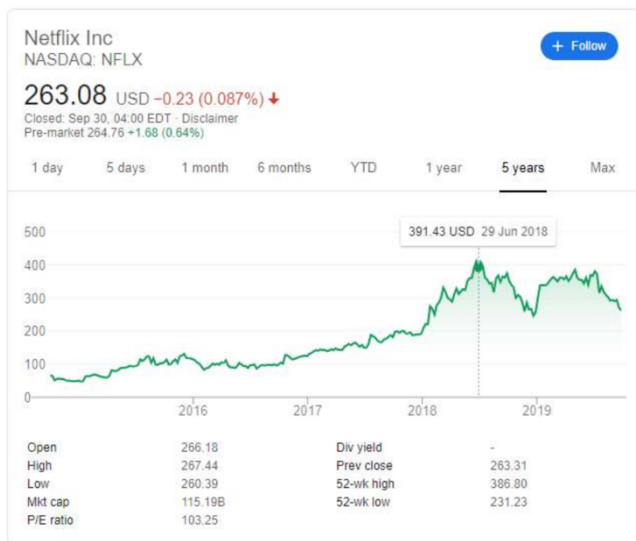
. sum Social_Pr, det

Pr(SocialMedia)			
Percentiles	Smallest		
1%	.0542883	.0337377	
5%	.0816907	.0343986	
10%	.1057097	.0351915	Obs
25%	.1706288	.0353952	Sum of Wgt.
			14,450
50%	.3108001		Mean
			Std. Dev.
75%	.5479162	.9977825	
90%	.7889748	.9983983	Variance
95%	.8839243	.9992492	Skewness
99%	.9736103	.9999133	Kurtosis
			2.487408

Consumer Decision Making Process

Marketing Research and Consumer Behavior – Netflix Case

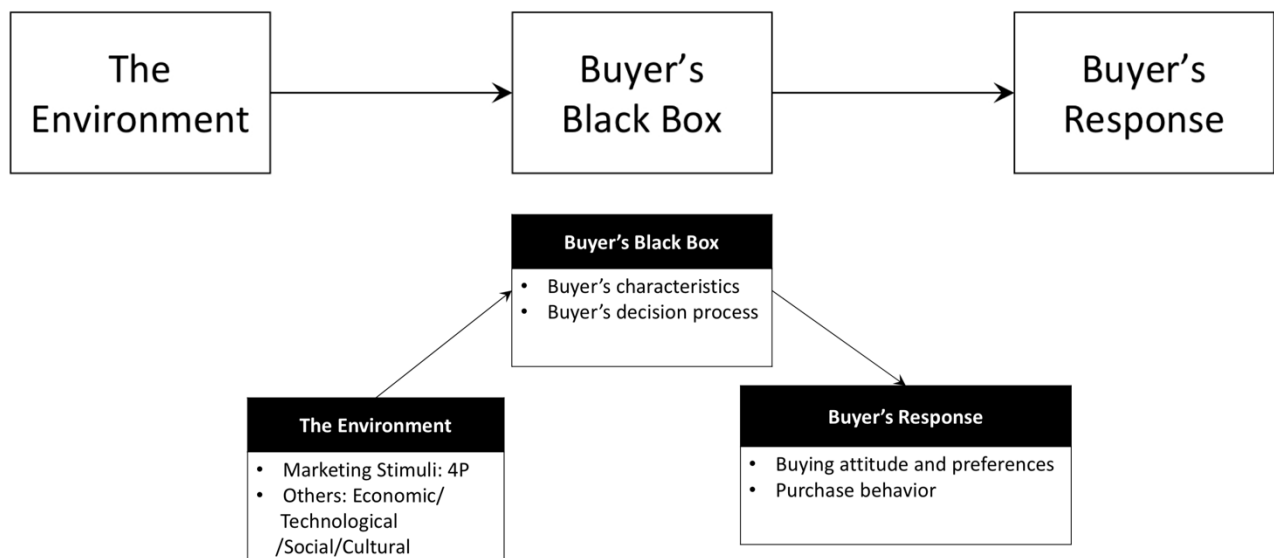
- More than 60,000 titles
- 154 million subscribers worldwide
- Watching 3.8 billion hours every month
- Revenue: US\$ 15.8 billion
- Income: US\$ 1.6 billion.
- Big Data Insights: **Personalized Recommendations**
- How accurate are Netflix's recommendations? **75% of viewing activity results from these suggestion.**



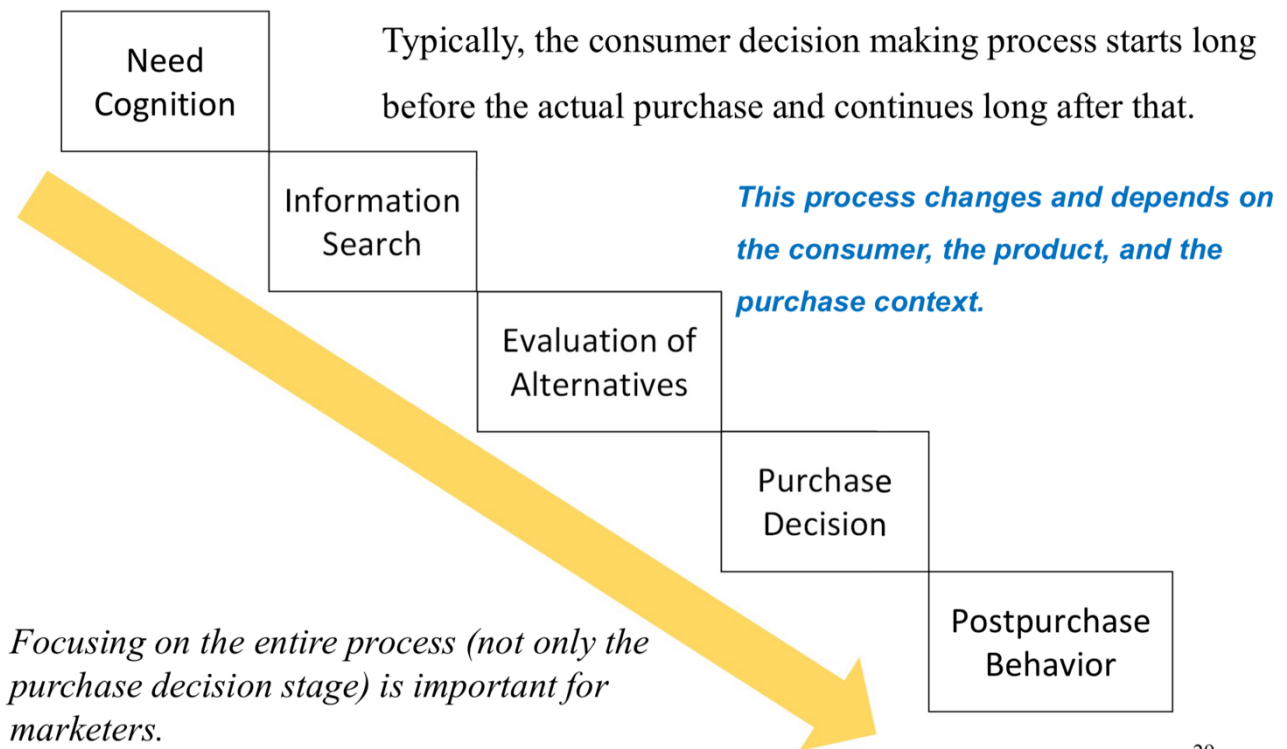
Not Marketing Analytics but Any Other Perspective? Consumer Behavior?

Marketing Research and Consumer Behavior - Model of Consumer Behavior

- Marketing = understanding consumers
- Central question for marketers: How do consumers **respond to various marketing efforts** the company might use?



Consumer Decision Making Process



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Need Cognition

- The process starts with need recognition.
- Consumers recognize a problem or needs.
- Internal stimuli (e.g., hunger or thirst).
- External stimuli (e.g., advertisement or chatting).

In this stage, marketers should research:

- What kind of needs or problems?
- What brings them?

Information Search

- Once consumers recognize needs, they are usually motivated to **search for more information on products/services**.
- Consumers obtain information from various sources:
 - Personal sources
 - Commercial sources
 - Public sources
 - Experiential sources

This stage is important because consumers create “**consideration sets**”.

Evaluation of Alternatives

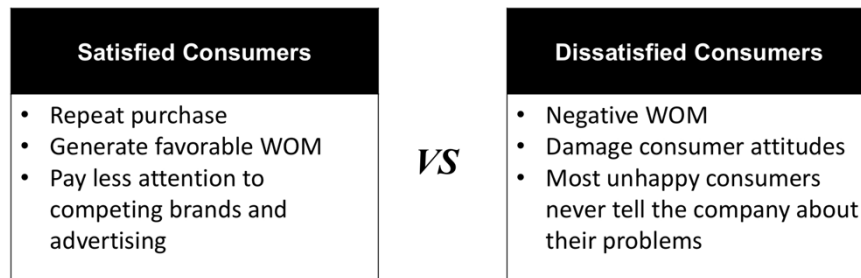
- Once consumers select brands for the **consideration set** (i.e., a set of final brand choices), they evaluate alternatives only in the consideration set.
- Careful calculation and logical thinking vs. little or no evaluation.
- In this stage, consumers evaluate products based on several attributes with difference importance!

Purchase Decision

- Form purchase intention and buy the most preferred brand.

Post-Purchase Behavior

- Both satisfied and dissatisfied consumers engage in the post-purchase behavior.
- What determines customer satisfaction: Expectation and Perceived Performance.
- The gap between expectation and perceived performance determines satisfaction.
- Marketers should promise only what their brands can deliver!
- Cognitive Dissonance: Discomfort caused by post-purchase:
 - Avoid acquiring drawbacks of the product they buy.
 - Avoid losing the benefits of products they do not buy.



- Marketers?
 - Should measure customer satisfaction regularly.
 - Set up a system to encourage dissatisfied consumers to complain and share problems.

Why don't dissatisfied consumers complain?

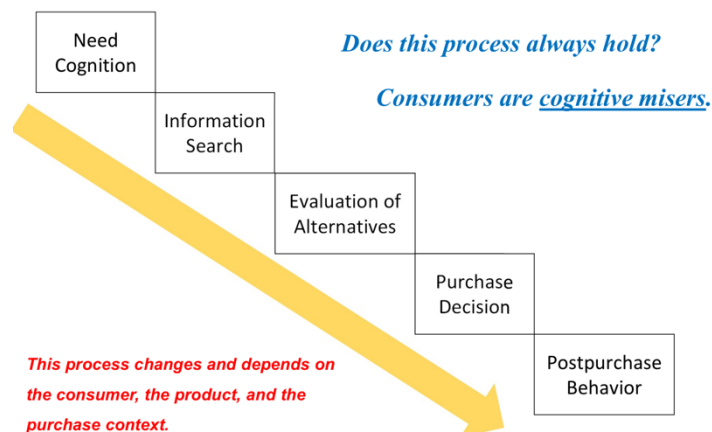
- They think it is not worth the time and effort.
- They think no one would be concerned about their problem or solve it.
- They do not know where to go or what to do.

What are the Implications for Marketers?

- By studying the overall buyer decision process, marketers may be able to **find ways to help consumer move through it.**
- E.g., Consumers do not buy a new product because they do not perceive a need for it, marketers can launch advertising messages that **trigger the need and show how the product solves customers' problems.**
- Marketers change consumers' unfavourable attitudes about their brands.

Implications for Modeling Consumer Choice?

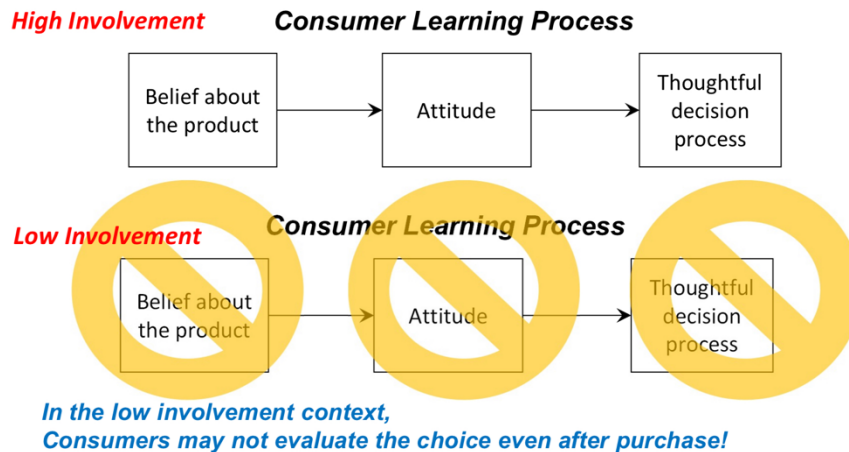
Do consumer Always Follow This Decision Making Process?



What is Consumer Involvement?

- Consumer involvement: the degree of information processing and the amount of importance a consumer attaches to a product while purchasing it.
- Consumers are **highly involved** in the decision making process when the product is expensive, risky, purchased infrequently, and highly self-expressive.
- Consumer involvement is **low** when a product is relatively inexpensive and frequently purchased.

Types of Consumer Decision Making Behavior



Consumer Decision Making Process

There are Different Lens! Cognitive vs Emotional Decision Making

- In many cases, consumer decision making is cognitive (Economically optimal and rational choice).
 - Deliberative and careful
 - Information-based processing of product attributes
 - E.g., buying a house, choosing a university, buying an insurance.
- But some decisions are driven by emotion, subjective liking or feeling.
 - Subjective liking
 - Feeling
 - E.g., a person living in Bali or Singapore or Bangkok buys and wears a wool-lined leather jacket.

Many purchases have both components (cognitive and emotional).

- **Cognitive:**
 - Price of the phone
 - Any bundle?
 - Cost of service plan
 - Warranty
 - Performance (e.g., battery or storage)
- **Emotional:**
 - Considered “cool”
 - Favorite color (e.g., rose gold, metal black, titanium gray)
 - A personalized unique case

Why Should Marketers Determine It?

- Marketing strategies vary and depend on the decision making process.

- Cognitive decision making is often slow, more systematic, and exhaustive than emotional decision making.
- Emotional decision making is quicker and more spontaneous.

Different Marketing Strategies!

- Product Placement? Where to place the product?
- Advertising? What to emphasize?

Modeling Issue?

- Which variables should we include in the model to explain consumer choice.

Session 6 – Developing and Evaluating – Marketing Strategy I

Developing Marketing Strategy

- Implementing Marketing Actions
- Generating Marketing Assets
- Providing Marketing Information

Branding

What is a Brand?

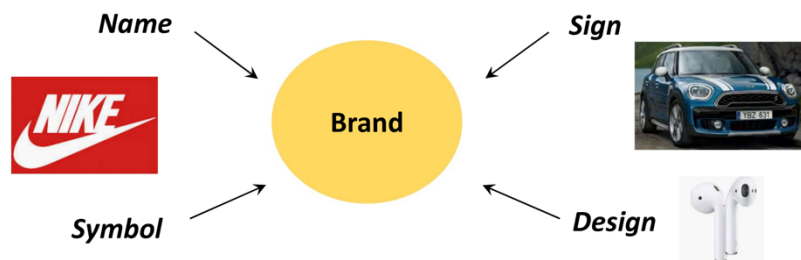
“Products are created in the factory, but brands are created in the mind” – Walter Landor

Brands: A name, term, sign, symbol, or design or a combination of these that identifies the maker or seller of a product or service.

However, marketing managers refer to a brand as more than that. Something that has actually created awareness, reputation, prominence, etc.

A brand is crucial to identify the goods and services of the seller, but also to differentiate it from its competitors.

The Most Distinctive Skill of Marketers: Building and Managing Brands.



However, marketing managers refer to a brand as more than that. Something that has actually created awareness, reputation, prominence, etc.

Why Brand?

- To identify the goods and services of the seller.
- To differentiate it to its competitors.

Brands versus Product

Brand

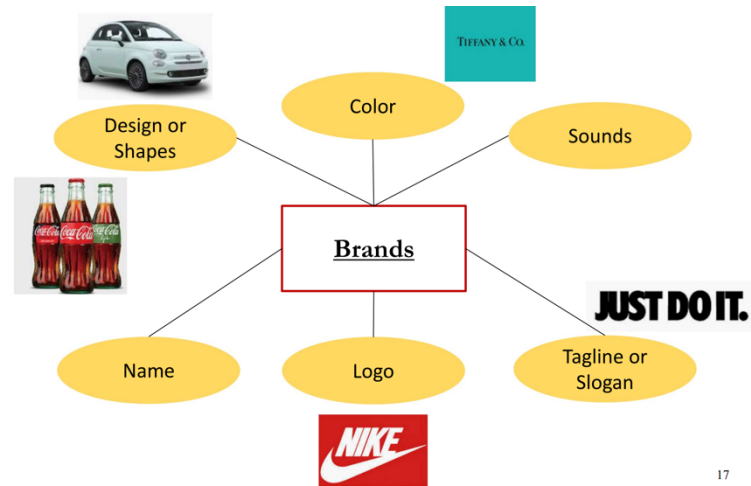
- More than a product
- Has the dimension that differentiate it in some way from other products designed to satisfy the same need.
- Differences may be:
 - Rational and tangible: related to product performance.

- Symbolic, emotional, and intangible: related to what the brand represents.

Product

- Something that a company offers to satisfy consumer needs or wants.
- A physical good.

Elements of a Brand



Why Does a Brand Matter?

Firms

- Differentiate the product from competing products.
- Reducing marketing costs.
- Premium price.
- Signaling level of quality.
- Competitive advantage and entry barriers.

Consumers

- Information about product quality: reducing risk.
- Reducing time and effort for decision making.
- Helping consumers express themselves: meaning.

Types of Risk a Consumer has to bear

- Functional (He is not sure that the products work as expected)
- Financial (He is not sure whether the price is worth)
- Psychological
- Social (Social embarrassment)
- Physical (Not sure whether it is physically safe or not).
- Time (Value of losing time)

How to Build a Strong Brand?

Building Strong Brands – Sources of Brand Equity

- **Brand Awareness**, it consists of **brand recognition** and **brand recall**.
 - **Brand Recognition**
 - Consumers' ability to confirm prior exposure to the brand.
 - Are consumers able to recognize the brand as one exposed to them?
 - **Brand Recall**
 - Consumers' ability to retrieve the brand from memory when given the product category, the needs fulfilled by the category, or a purchase or usage situation as a cue.

As a first step to build a strong brand: Creating **Brand Awareness**

- **Increasing familiarity**

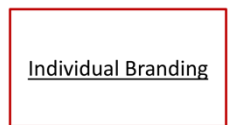
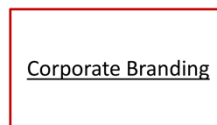
- Repeated exposure probably through advertising.
- Establishing strong association with the product category, other relevant purchase or consumption cues.
- **Brand Image**, given a sufficient level of brand awareness → Crafting a **brand image**.
 - **Brand Association**
 - Brand association can be brand attributes (descriptive features of the product) or brand benefits (personal value and meaning attached to the product or service attributes).
 - Strong Association
 - Favorable Association
 - Unique Association

Brand Positioning

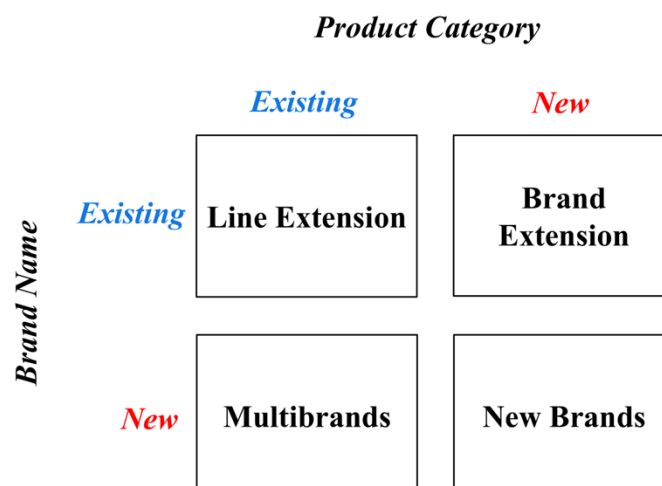
- Marketers need to position the brands clearly in target customers' minds.
- Product Attributes
- A Desirable Benefit
- Strong Beliefs and Values
 - Engaging customers on a deep and emotional level
 - A deeper meaning connected with the value that they play in customers' lives and relationships.
 - Lovemarks brands: customers have strong emotional connections with the brands and love them unconditionally.

Branding Strategy

- National Brands (Manufacturer's) versus Store Brands.
- National Brands: Corporate Branding vs. Individual Branding.
- Corporate Branding: a firm uses its corporate name to all products.
- Individual Branding (or Multi-Branding): different brands for different products.
- Store Brand (Private Brand)
 - Recent private brand boom
 - When the level of differentiation in the category is low, consumers are likely to buy it due to reasonable price.



Brand Development



- Line Extension
 - Extending existing brand names to new forms, colors, sizes, ingredients, or flavors of an existing product category.
 - Burger King Whopper Line
 - Low cost, Low risk, but overextended brand name might cause consumer confusion or lose some of its specific meaning.
- Brand Extension
 - A current brand name to new or modified products in a new category.
 - Create immediate new-product familiarity and acceptance at lower costs.
 - A brand extension strategy involves some risk.
 - May confuse the image of the main brand (Ferrari perfume).
- Multibrands
 - New brand names in the existing product category.
 - PepsiCo: 8 soft drinks + 3 sports and energy drinks + 4 bottled teas and coffee brands + 3 bottled water brands + 9 fruit drinks.
 - A way to establish different features that appeal to different customer segments and capture large market shares.
 - Each might have a small market share and is not profitable.
- New Brands
 - Concern about waning the power of the existing brand.
 - Offering too many new brands → requires huge costs.
 - Kindle, iPhone.

Brand Valuation

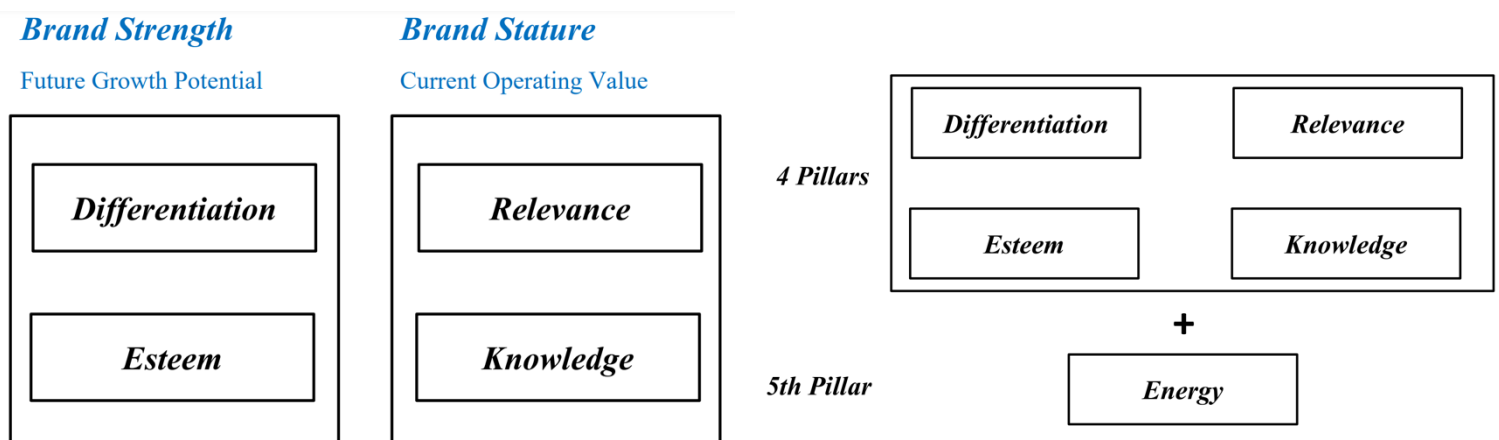
Brand Equity

Challenges for Measuring Brand Equity

- Brand equity is crucial but notoriously difficult to measure.
- There are various ways – suggested by many firms – to measure it.
- Brands are commonly assessed by customer mind-set measures such as awareness and attitudes.
- These metrics do not translate into monetary value.

Though it is challenging to measure Brand Equity. It is important for marketing managers to measure it. Why?

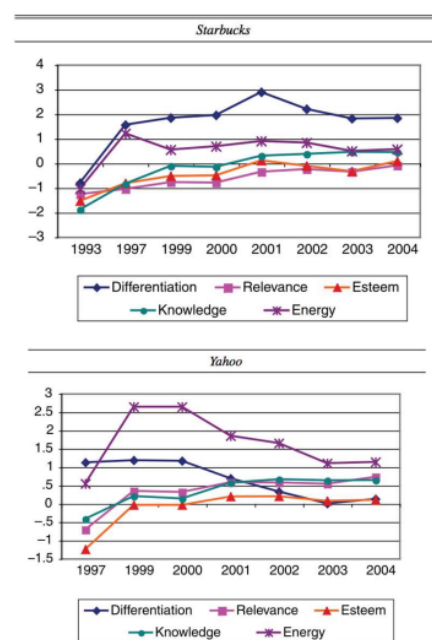
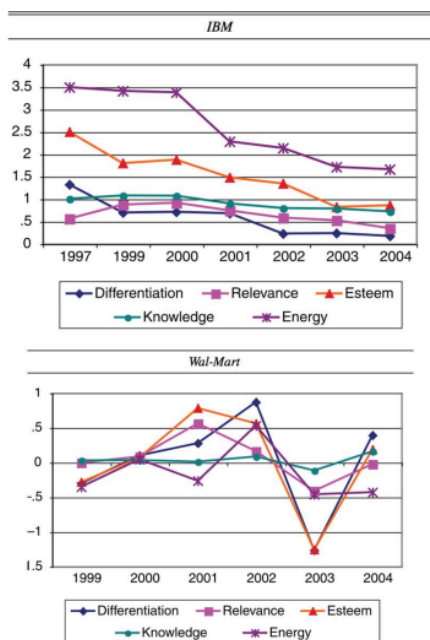
- **Brand Asset Valuator (Young & Rubicam BAV)**



- **Differentiation**
 - The ability of the brand to stand apart from its competitors and is a central component in brand equity.

- It is measured by whether consumers perceived the brand as unique and distinctive.
- **Relevance**
 - Personal appropriateness of the brand to consumers.
 - It is measured by the extent to which the brand is relevant to consumers.
- **Esteem**
 - The level of respects, deference, and regard a consumer holds for a given brand.
 - It is measured the four components:
 - High Quality: if consumers believe the brand is of high quality.
 - Leader: if consumer believe the brand is reliable.
 - Reliability: if consumer believe the brand is reliable.
 - Personal Regard: if consumers have personal regard for the brand.
- **Knowledge**
 - Reflects brand awareness and the extent to which consumers recall and recognize the brand.
 - It is measured by the extent to which consumers are familiar with the brand.

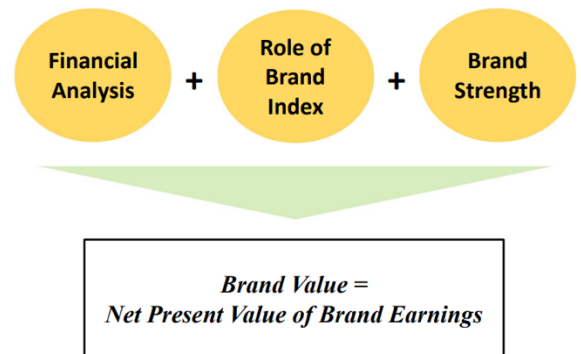
<i>BAV Pillar</i>	<i>Perceptual Metrics</i>	<i>Survey Scale</i>	<i>BAV Data</i>
• Differentiation	1. Unique	Yes/No	% of “yes”
	2. Distinctive	Yes/No	% of “yes”
• Relevance	1. Relevant to me	1-7 scale	Average score
• Esteem	1. Personal regard	1-7 scale	Average score
	2. Leader	Yes/No	% of “yes”
	3. High Quality	Yes/No	% of “yes”
	4. Reliable	Yes/No	% of “yes”
• Knowledge	1. Familiar with the brand	1-7 scale	Average score



- Brand Valuation Model (Interbrand)

Interbrand publishes the Best Global Brands (the world's 100 most valuable brands) report on an annual basis. Interbrand's brand valuation model examines three key aspects that contribute to a brand's value:

- The financial performance of the branded products or service.
- The role the brand plays in influencing consumer choice.
- The strength of the brand has to command a premium price, or secure earnings for the company.



▪ **Brand Valuation Methodology**

- **Financial Analysis:** Economic profits, i.e., the after-tax operating profit of the brand minus the cost used to generate the brand revenue and margins.
- **Role of Brand:** The portion of the purchase decision attributable to the brand, as opposed to other factors (e.g., factors such as price, convenience, or product features). This is so-called Role of Brand Index.
- **Brand Strength:** The ability of the brand to create loyalty and, therefore, sustainable demand and profit into the future.
 - **Internal Dimensions:** Clarity, Governance, Commitment, and Responsiveness.
 - **External Dimensions:** Authenticity, Consistency, Relevance, Presence, Differentiation, Engagement.

Internal Dimensions



Clarity

Clarity internally about what the brand stands for in terms of its values, positioning and proposition. Clarity too about target audiences, customer insights and drivers.



Governance

The degree to which the organization has the required skills and an operating model for the brand that enables effective and efficient deployment of the brand strategy.



Commitment

Internal commitment to the brand, and a belief internally in its importance. The extent to which the brand receives support in terms of time and influence.



Responsiveness

The organization's ability to constantly evolve the brand and business in response to, or anticipation of, market changes, challenges and opportunities.

External Dimensions



Authenticity

The brand is soundly based on an internal truth and capability. It has a defined story and a well-grounded value set. It can deliver against the (high) expectations that customers have of it.



Consistency

The degree to which a brand is experienced without fail across all touchpoints or formats.



Relevance

The fit with customer/consumer needs, desires, and decision criteria across all relevant demographics and geographies.



Presence

The degree to which a brand feels omnipresent and is talked about positively by consumers, customers and opinion formers in both traditional and social media.



Differentiation

The degree to which customers/consumers perceive the brand to have a differentiated proposition and brand experience.



Engagement

The degree to which customers/consumers show a deep understanding of, active participation in, and a strong sense of identification with, the brand.

Marketing Strategy and Elasticities

Interpretation Regression Coefficient

- $Sales_i = \beta_0 + \beta_1 Price_i + \dots + \varepsilon_i$
- If price goes up by 1, then sales change by β_1
- e.g.
✓ if $\beta_1 = -1.5$, a price increase of 1 gives a sales decrease of 1.5

Elasticities

- Managers are more interested in elasticities.
- 1% price increase $\rightarrow$..% sales change
- Formally:
$$Elasticity = \frac{\% \Delta Sales}{\% \Delta Price}$$

Derivation Elasticities

$$\begin{aligned} Elasticity &= \frac{\% \Delta Sales}{\% \Delta Price} = \frac{(Sales_{new} - Sales_{old}) / Sales_{old}}{(Price_{new} - Price_{old}) / Price_{old}} \\ &= \frac{Sales_{new} - Sales_{old}}{Sales_{old}} * \frac{Price_{old}}{Price_{new} - Price_{old}} \\ &= \frac{Sales_{new} - Sales_{old}}{Price_{new} - Price_{old}} * \frac{Price_{old}}{Sales_{old}} \end{aligned}$$

One Final Step

$$\begin{aligned} &\frac{Sales_{new} - Sales_{old}}{Price_{new} - Price_{old}} * \frac{Price_{old}}{Sales_{old}} \\ &= \frac{\Delta Sales}{\Delta Price} * \frac{Price_{old}}{Sales_{old}} \end{aligned}$$

- If we make the Δ very small, we obtain:

$$Elasticity = \frac{d(Sales)}{d(Price)} * \frac{Price}{Sales}$$

What Does This Mean?

- Let's start with a basic equation:
- $Sales_i = \beta_0 + \beta_1 Price_i + \beta_2 Advertising_i + \varepsilon_i$
- What is $\frac{d(Sales)}{d(Price)}$? β_1
- What is $\frac{Price}{Sales}$? $\frac{Price}{\beta_0 + \beta_1 Price_i + \beta_2 Advertising_i}$

Price Elasticity

- What is $\frac{d(Sales)}{d(Price)}$? β_1
- What is $\frac{Price}{Sales}$? $\frac{Price}{\beta_0 + \beta_1 Price_i + \beta_2 Advertising_i}$
- Hence, the price elasticity is:

$$\frac{\beta_1 Price}{\beta_0 + \beta_1 Price_i + \beta_2 Advertising_i}$$

Key Takeaway

In a linear regression model, the elasticity depends on the values of **the focal IV** and **all other IVs**. This is not useful in practice! It makes things complicated, and interpretation is not straightforward.

Introducing the log-log Model

- Let's slightly change our model
- We can make our life easier by using the log-log model.

This is a log-log model

- $\ln(Sales_i) = \beta_0 + \beta_1 \ln(Price_i) + \beta_2 \ln(Advertising_i) + \varepsilon_i$
- Now, let's determine the price elasticity again...

The Log-Log model is popular in marketing to estimate the elasticity of marketing strategies.

Putting It All Together

- The price elasticity now is:

$$\beta_1 * e^{\beta_0} * Price^{\beta_1 - 1} * Advertising^{\beta_2}$$

- multiplied by

$$\frac{Price}{e^{\beta_0} * Price^{\beta_1} * Advertising^{\beta_2}}$$

- which gives

$$\frac{\beta_1 * e^{\beta_0} * Price^{\beta_1 - 1} * Advertising^{\beta_2} * Price}{e^{\beta_0} * Price^{\beta_1} * Advertising^{\beta_2}}$$

Elasticity in log-log Model

- $\ln(Sales_i) = \beta_0 + \beta_1 \ln(Price_i) + \beta_2 \ln(Advertising_i) + \varepsilon_i$
- $Sales_i = e^{\beta_0 + \varepsilon_i} * Price_i^{\beta_1} * Advertising_i^{\beta_2}$

- What is $\frac{d(Sales)}{d(Price)}$?

$$\beta_1 * e^{\beta_0} * Price^{\beta_1 - 1} * Advertising^{\beta_2}$$

- What is $\frac{Price}{Sales}$?

$$\frac{Price}{e^{\beta_0} * Price^{\beta_1} * Advertising^{\beta_2}}$$

Let's Simplify!

- We had:

$$\frac{\beta_1 * e^{\beta_0} * Price^{\beta_1 - 1} * Advertising^{\beta_2} * Price}{e^{\beta_0} * Price^{\beta_1} * Advertising^{\beta_2}}$$

- which is equal to:

$$\frac{\beta_1 * e^{\beta_0} * Price^{\beta_1} * Advertising^{\beta_2}}{e^{\beta_0} * Price^{\beta_1} * Advertising^{\beta_2}}$$

- which is:

$$\beta_1$$

Key Takeaway

A log-log model gives constant elasticities. (Elasticity does not depend on values of IVs). This makes interpretation super easy! If price goes up by 1%, sales change by β_1 %.

Can We Apply the Log-Log Model to Other Contexts in Marketing?

Session 7 – Developing and Evaluating Marketing Strategy II

Dummy Variables – Marketing Variables

Continuous variables:

- All (many) values possible
- Brand quality
- Advertising expenditures

Categorical variables:

- Limited number of values possible
 - Gender_new (0 or 1)
 - Age bracket (1, 2, 3, 4)
 - Favorite color (1 = blue, 2 = red, 3 = green).
 - Product type

Is the Linear Relationship Appropriate?

How can we interpret the mean of favorite color? Imagine that we have the variable of locations in a regression model. How can we interpret the coefficient of favorite color or locations?

$$\text{Willingness to Pay}_i = \alpha + \beta_1 \text{Favorite Color}_i + \varepsilon_i$$

where favorite color_i = 1 if white, 2 if green, 3 if red, and 4 if blue

$$\text{Sales}_i = \alpha + \beta_1 \text{Location}_i + \varepsilon_i$$

where location = 1 if Milan, 2 if Florence, 3 if Turin, 4 if Venice, 5 if Rome

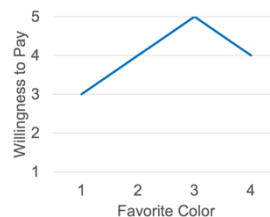
If $\beta_1 = 0.5$, can you interpret this coefficient?

When we include age bracket as a continuous variable in a regression model, we assume a linear relationship.

Then, How Do We Model It?

Dummy Variables

Dummy Coding: we recode Age bracket into 4 new variables:



What if willingness to pay is highest for red color?

We cannot obtain this result if we assume a linear relationship!

ID	Age bracket	Bracket1	Bracket2	Bracket3	Bracket4
1	1	1	0	0	0
2	2	0	1	0	0
3	3	0	0	1	0
4	2	0	1	0	0
5	4	0	0	0	1
6	1	1	0	0	0

Dummy Variables in Regression

$$\text{Loyalty}_i = \beta_0 + \beta_1 \text{Bracket1}_i + \beta_2 \text{Bracket2}_i + \beta_3 \text{Bracket3}_i + \varepsilon_i$$

Instead of

$$\text{Loyalty}_i = \beta_0 + \beta_1 \text{AgeBracket}_i + \varepsilon_i$$

We should leave out one dummy variable (Bracket4), this is our reference category (i.e., as a baseline). It can be Bracket1, 2 or 3.

Interpretation

$$Loyalty_i = \beta_0 + \beta_1 Bracket1_i + \beta_2 Bracket2_i + \beta_3 Bracket3_i + \varepsilon_i$$

- If Age bracket = 1
✓ $Loyalty_i = \beta_0 + \beta_1$
- If Age bracket = 2
✓ $Loyalty_i = \beta_0 + \beta_2$
- If Age bracket = 3
✓ $Loyalty_i = \beta_0 + \beta_3$
- If Age bracket = 4
✓ $Loyalty_i = \beta_0$

Any More Applications? When to use Dummy Variable Regression?

Application of Dummy Variables in Marketing

- Measuring product category effects
- Measuring different effects in different times or regions
- Controlling for geographic effects
- Controlling for time effects
- Controlling for economic shocks

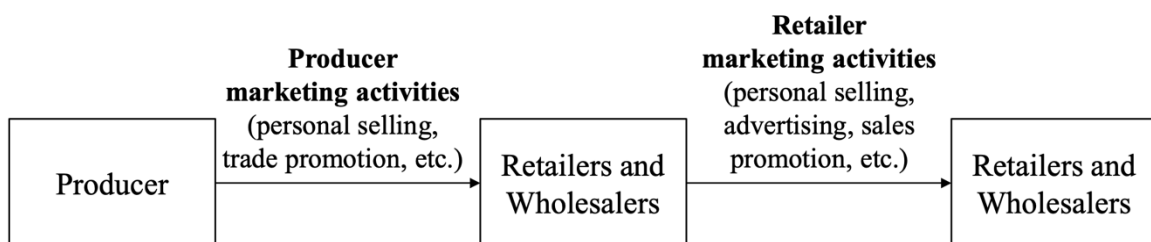
Can we apply dummy variables to experiments?

Advertising

Shaping the Overall Promotional Mix – Promotion Mix Strategies: Push vs Pull Strategy

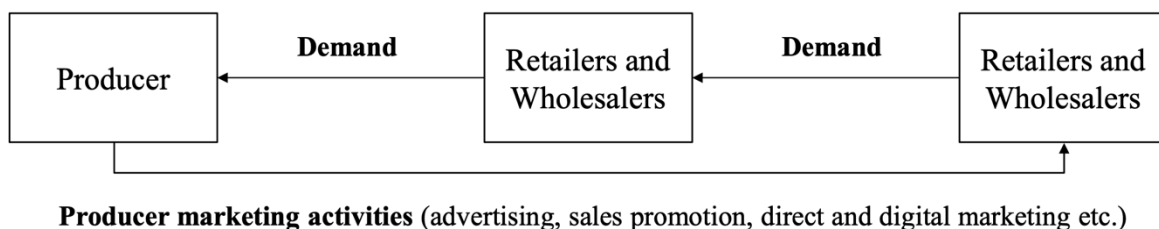
Push Strategy

A push strategy involves “pushing” the product through marketing channels to final consumers. Companies direct marketing activities toward channel members to induce them to carry the product and promote it to final consumers. Example: Medicine or products for kitchens or toilets with IKEA.



Pull Strategy

Under a pull strategy, consumer demand “pulls” the product through marketing channels. Companies direct marketing activities toward final consumers to induce them to buy the product. Example: Coca-Cola.



Marketing and Advertising

Does advertising matter for companies?

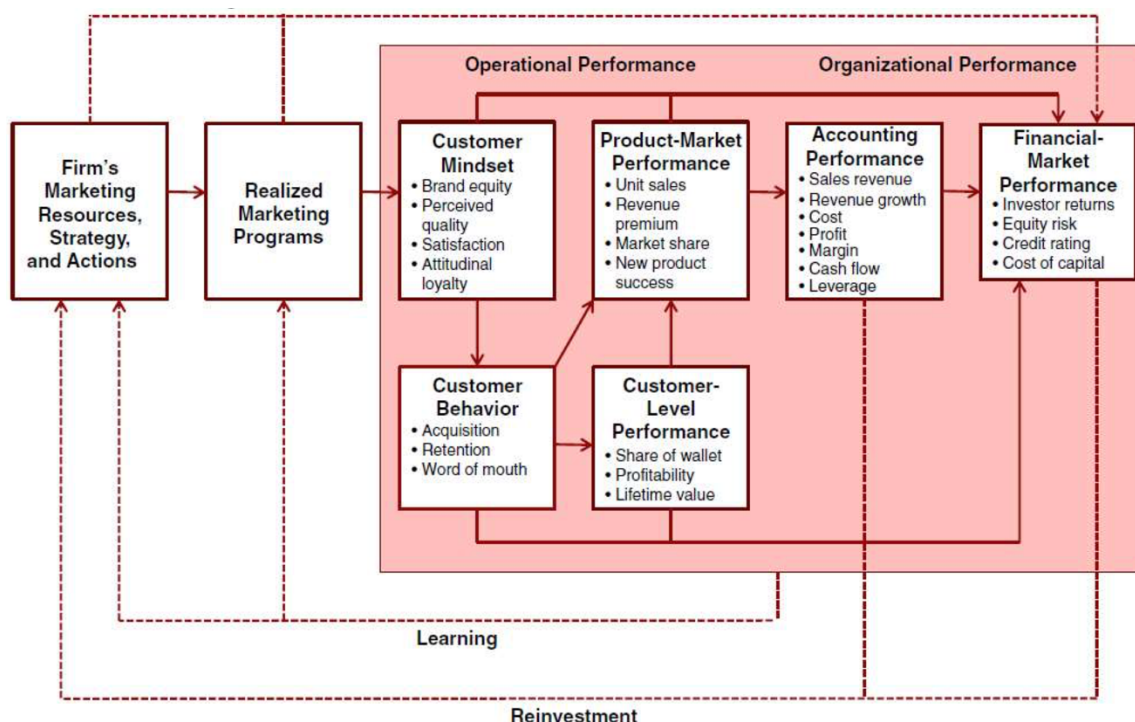
- P&G spent \$8 billion on advertising in 2016.
- Apple spent \$1.8 billion in 2015.
- Many companies increasingly spend a lot on advertising.

Advertising is one of the most important elements of the marketing mix: the key element of marketing expenditure:

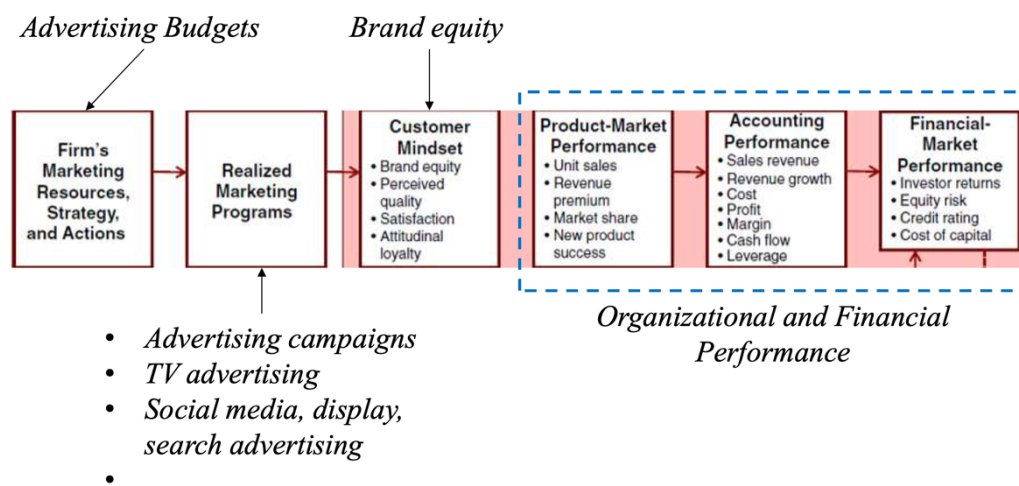
“Our spending on advertising and marketing as a percentage of sales increased by 40 basis points” – Indra K. Nooyi, Chairman & CEO (Pepsi 2017).

“We are expecting increases in advertising spend this year versus last” – Jon Moeller, CFO (P&G 2016).

Marketing Performance Outcome Chain



Why Is Advertising Important?



The Role of Advertising

There are two different theoretical view on the role of advertising.

**Advertising as
Information view**

VS

**Advertising as
Persuasion view**

Advertising as Information.

- Advertising merely informs consumers about product availability and increases awareness.
- Consumers can't buy a product if they don't know it is available.

Advertising as Persuasion.

- Advertising not only informs consumers about product availability but also creates brand loyalty.
- Advertising persuades consumers that the product is superior (i.e., the product provides superior customer value).

Which one do you agree with?

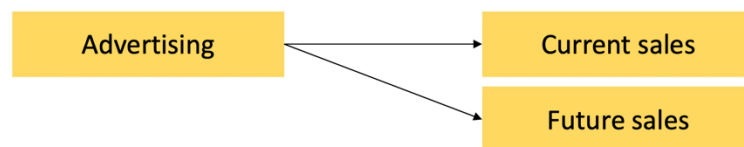
How Do These Theoretical Views Relate to Measuring Advertising Effects on Sales?

The Effectiveness of Advertising

Advertising as information view: this view suggests advertising increases the current sales.



Advertising as persuasion view: this view suggests advertising increases not only the currents sales but also future sales (through brand equity).



The Effectiveness of Advertising

Then, how do we measure **advertising** and its **effectiveness**? Measure issue: there are multiple metrics to measure advertising, each of which capture different aspects.

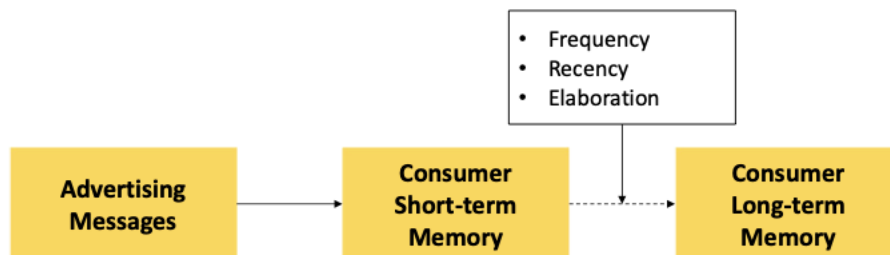
Model Issues:

- Linear or Non-Linear?
- Lag Effect?
- Competitive Effect?
- Interaction with other Marketing Actions?

Measures of Advertising

- **Advertising to Sales Ratio**
 - Advertising to Sales Ratio = Advertising Spending / Sales
 - Most Popular Measure
 - Rule of thumb to simply advertising decision: advertising decision are complex and involve multiple trade-offs in dynamic and turbulent business environments.
 - Mirrors how companies allocate budgets on advertising in practice.
 - Costless to replicate
 - Enables normalization: companies vary in sizes.
- **Share of Voice**

- Advertising Spending / Total Advertising Spending in an industry (or a brand category).
- This measure captures a company's advertising relative to that of its competitors.
- Advertising expenditures differ dramatically across industries.
 - More comparable across different industries
 - More useful and managerially relevant.
- *"How are we doing relative to our competitors?"*
- Not fully under managers' control
- In practice, more relevant to brand level than firm level. How much is it relevant?
- What is the theory behind share of voice?
- It is also applied to social media contexts (i.e., social share of voice).
- **Relevance of Advertising Share of Voice (ASOV): Financial Analysts**
"Wanted to understand how your share of voice has changed" – Societe Generale Analyst (Diageo 2016)
"It seems like your market shares aren't impacted at all by the pullback and maybe it's like a share of voice issue." – Deutsche Bank Analyst (Colgate Palmolive 2015)
- **Relevance of Advertising Share of Voice: Senior Managers**
"We are putting more dollars into marketing just to make sure that our share of voice is strong" – Marvin Ellison, CEO (JC Penney 2016).
"Our share of voice continues to increase in the pizza category in the US" – Jeff Lawrence, CFO (Domino Pizza 2017).
- Goal of Advertising → Target Audience
 - Aware of the brand, product, or service
 - Induce consumer behavior (e.g., trial, purchase or conversation).
- Having high share of voice can lead to increase in brand awareness and increase sales.
- Consumer Theory: this measure is more consistent with the way consumers process advertisements.



- **Log of Advertising Spending.**
 - Log of advertising allows to measure advertising elasticity.
 - Beta 1% of sales increase if 1% of advertising spending increases.

Other Issues in Modeling Advertising – Potential Challenges?

- There are **many** media vehicles companies are using.
- 18 different media vehicles.
- There are **other metrics** related with the quantity of advertising such as impression, gross rating point (GRP) etc.
 - Different metrics capture different aspects of advertising (e.g., budget or frequency).

Linear Relationship? – Advertising and Sales

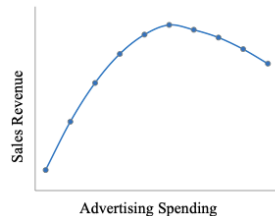
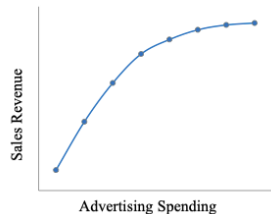
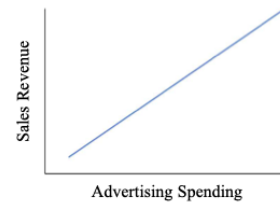
- A Linear Positive Effect on Sales.
- What does this linear relationship suggest?

- Advertising spending or frequency → improves sales, brand equity.

Advertising and Diminishing Returns

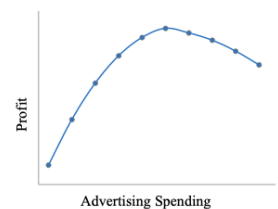
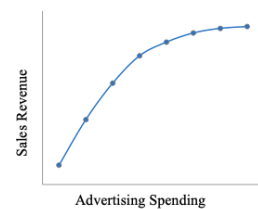
Advertising and Sales

- How would be the relationship between advertising (frequency) and sales?



Why? – Economic Perspective

- Saturation of consumer demand.
- E.g., brand A has a dominant market share.
- Diseconomies of scale when buying media.
- May differ in case of sales and profit.



Psychological Mechanism

Point of Saturation:

- Theory of Repetition.
- Saturation point and decline: Consumer response to repetitive exposure of a brand.
- Wear-in & Wear-out.

Rule of Three:

- Too many messages and claim.
- Less persuasive.
- The optimal number of claims to persuade consumers.

How Do We Model Non-Linear Effects? - Lagged Advertising Effects

Assumption: Advertising increases the current sales. What do you think of this assumption?

Advertising may have lagged effects on sales. Advertising in the current period (e.g., the current year) may not necessarily generate the current sales.

$$Sales_{i,t} = \beta_0 + \beta_1 Price_{i,t} + \beta_2 Advertising_{i,t-1} + \varepsilon_{i,t}$$

for firm i at time t and $t-1$

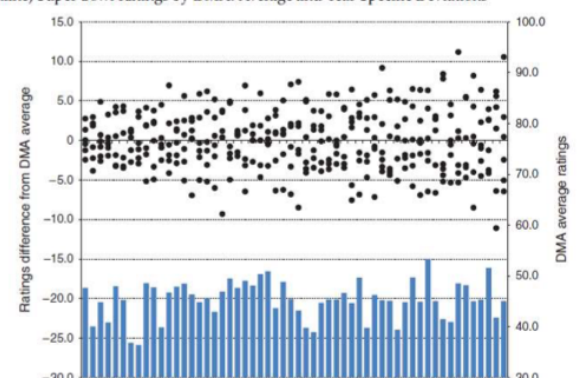
Media Advertising – Measuring Media Advertising

Media Advertising Metrics

- **Impression**
 - The number of times a specific advertisement is available to be seen or otherwise exposed to media audience.
 - Impression = Reach x Average Frequency
 - Reach = Number of unique individuals exposed to certain ads.

Example

(Color online) Super Bowl Ratings by DMA: Average and Year-Specific Deviations



- Frequency = the average number of times each such individual is exposed.
- **Gross Rating Points (GRP)**
 - The sum of all rating points delivered by the media vehicles carrying an advertisement or campaign.
 - $\text{Gross Rating Points} = \sum [\text{Rating Points} \times \text{Frequency}]$
 - Rating Points (% of Reach) = % of unique individuals exposed to certain ads in a defined population.
 - Average Frequency = the average number of times each such individual is exposed.
- **Frequency Response Functions**
 - Expected relationship between advertising frequency
 - Linear Response
 - Learning Curve Response
 - Threshold Response
- **Wear-in**
 - The frequency required before a given advertisement or campaign achieves a minimum level of effectiveness.
- **Wear-out**
 - The frequency at which a given advertisement or campaign begins to lose effectiveness or even yield a negative effect.

Measuring Media Advertising

Firms are spending a lot on advertising. There are 18 different media vehicles. It is almost impossible for firms to measure advertising responses accurately across 18 advertising vehicles and their combinations (how many combinations?) Manager's challenge: how can the effectively allocate advertising budgets across media vehicles?

The Broad Goal of Media Advertising:

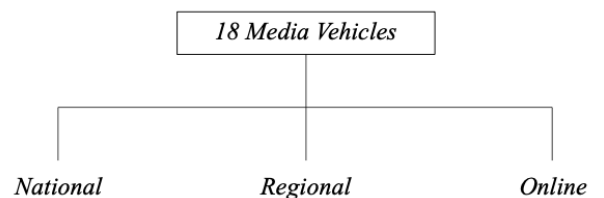
- To reach a sufficiently large audience
- To reach a high-quality audience
- With the appropriate type of advertising message.

Classifying media vehicle choices into:

- Smaller
- Manageable subset of choices

Using the following criteria:

- **Quantity of the Reach**, the count of the captive audience (e.g., viewers, listeners, readers) that the firm obtains through an advertising spot.
- **Quality of the Reach**, the degree to which the media channel's reach is customized to fit the advertiser's specific target market in terms of future buying potential.
- **Product Message**, the way the advertiser aims to build in product differentiation by demonstrating a favorable comparison of key product attributes over a competitor.



Media Type	Quantity of Reach	Quality of Reach	Product Message
National	Large mass audience	Low relevance	Simple product message and concept for brand building
Regional	Low quantity of audience (e.g., up to 60 local radio stations)	Highly relevant	More product/ promotion information contents
Online	Limited by the volume of website visits	Superior to offline media (tracking available)	Both simple and promotional information

Interactive Effects on Performance? – Positive or Negative?

Positive Interaction

- There would be superadditive benefits.

- The marginal effect of spending in one of the media type would be enhanced by spending in the other.

Memory Reinforcement

- Consumers forget the advertisement.
- Consumers see frequent advertisement.

Negative Interaction

- There would be superadditive benefits
- The marginal effect of spending in one of the media type would be mitigated by spending in the other.

Inherently Different Purposes

- National advertising: brand building
- Regional and Online advertising: promotional information

Different types of media possibly generate conflicting messages and confuse consumers when used jointly.

Marketing and Interaction Effects – Positive or Negative?

In marketing, we have many options for marketing actions. Each marketing action can be independent, but there may be different types of interaction effects. What is the interaction effect?

In regression models, we include the product terms.

$PERF_{it} = \alpha_{0i} + \alpha_1 NATIONAL_{it} + \alpha_2 REGIONAL_{it}$	National advertising	.278 (1.77)	.254 (1.25)	.458* (2.17)	.299 (1.86)
$+ \alpha_3 ONLINE_{it} + \alpha_4 NATIONAL_{it}$	Regional advertising	1.285*** (6.84)	1.187*** (5.81)	2.124*** (12.07)	2.046*** (12.38)
$\times REGIONAL_{it} + \alpha_5 NATIONAL_{it}$	Online advertising	.867* (2.02)	.590 (1.34)	.823 (1.80)	.985* (2.23)
$\times ONLINE_{it} + \alpha_6 REGIONAL_{it}$	National advertising $\times$ Regional advertising	-.638* (-2.23)	-.358 (-1.18)	-.602 (-1.93)	-.864** (-2.93)
$\times ONLINE_{it} + u_{it}$	National advertising $\times$ Online advertising	-1.548* (-2.37)	-1.379* (-2.06)	-1.867** (-2.69)	-2.012** (-2.98)
	Regional advertising $\times$ Online advertising	-1.701* (-2.11)	-1.860* (-2.28)	-2.050* (-2.42)	-1.831* (-2.19)

Session 8 – Analyzing Customer Profitability

Importance of Customers - Marketing

Creating value through acquiring and retaining customers.

Customers are import assets for companies. Companies try to satisfy customers by providing superior customer value → higher customer satisfaction. **However, maximizing customer satisfaction comes at cost.**

- How much should a company invest in customers? Should a firm spend \$10 million to increase its customer satisfaction from 8 to 9 (out of 10)? Or maybe \$100 million?
- The classic case of Hoover, a sales promotion: free airline tickets within Europe as a reward of buying \$100 worth of a product.
- Significantly positive response and additional promotion of free airline tickets between UK and US as a reward of buying \$250 worth of a product.
- The promotion was successful: generated additional sales, helped Hoover acquire customers, resulted in higher market shares.
- What about the profit and cost?
 - Cost: almost \$50 million
 - Profit declined
 - The executives in the UK division were fired!

What is the problem? And How should we manage this?

Source of
Revenue

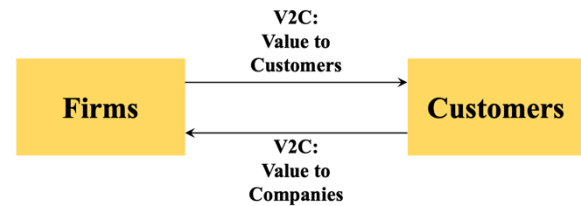
Source of
Competitive
Advantage

Customers are important assets, but... Acquiring and retaining customers requires costs. It is important for companies to manage customers **profitably**. **Probably, not all customers are valuable.**

Two Sides of Customer Value

“Marketing is to **create value** through **customer acquisition and retention**”.

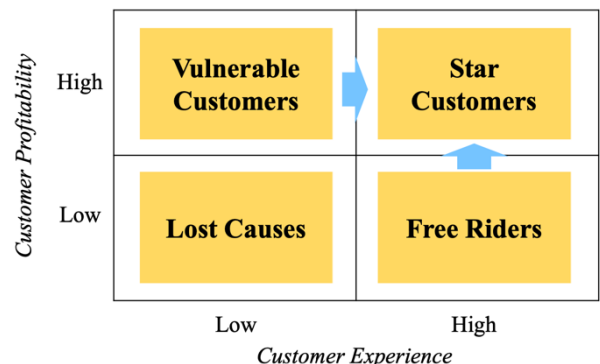
It is important to provide superior value to customers. Then, what about the other side of value?



- The Hoover case suggests it focused on the one side of customer value, but ignore the other side, i.e., it gets value from customers.
- The challenge → Balancing between the two sides of customer value.

Which customers are worth keeping on both dimensions?

- **Star Customers**
 - Most desirable customers
 - Loyal and satisfied customers who deliver long-term profits
- **Lost Causes**
 - They cost more than they worth
 - Frequently complain or return products, spread negative word-of-mouth.



What can companies do for those customers in this case?

- **Free Riders**
 - Hoover case
 - Companies may be providing more than customers pay for.

What can companies do to improve profitability?

- Charge higher prices to get more value from the customers (Vodafone MM4M).
- Reduce services to the customers (Vodafone limitations on hotspotters).
- **Vulnerable Customers**
 - They are valuable but vulnerable for switching brand.
 - They might stay due to the lack of alternatives or high switching costs.
 - But competitors could identify and attract these customers.
 - US Airways in 1990's
 - 41% of market share – Baltimore – Washington
 - High price for poor service
 - The market share significantly dropped (i.e., 6%) after Southwest airlines entered the market.

How to Identify Valuable Customers?

Valuing Customers

- **Customer Lifetime Value (CLV)**
- **Customer Referral Value (CRV)**
- **RFM Analysis (Recency, Frequency and Monetary Value)**

Which Customer is the most valuable?

Customer A - Annual Revenue: <u>\$2,000</u> - Product Costs: \$500 - Customer Service Costs: \$100 - Annual Retention Rate: <u>80%</u> - Acquisition Costs: \$1,000	Customer B - Annual Revenue: <u>\$3,000</u> - Product Costs: \$500 - Customer Service Costs: \$200 - Annual Retention Rate: <u>60%</u> - Acquisition Costs: \$1,000
Customer C - Annual Revenue: <u>\$4,000</u> - Product Costs: \$500 - Customer Service Costs: \$300 - Annual Retention Rate: <u>50%</u> - Acquisition Costs: \$1,000	Customer D - Annual Revenue: <u>\$5,000</u> - Product Costs: \$500 - Customer Service Costs: \$100 - Annual Retention Rate: <u>20%</u> - Acquisition Costs: \$1,000

Customer Lifetime Value (CLV)

The **net present value** of all future streams of cash flows that a customer generates **in the life** of the business relationship with the company.

- CLV is based on **profits**, not revenue, taking into account costs.
- CLV is a measure of **long-term profitability**.
- CLV helps identify valuable customers.

$$CLV = M \times \frac{r}{(1+i-r)} - AC$$

Calculating CLV. The simplified form of CLV is:

M = profit or contribution margin

Assumptions of the simplified CLV:

- Customers have a constant profit margin **M** over time.
- Customers have a constant retention rate **r** over time.
- The discount rate is constant over time.
- Value is estimated over an infinite horizon.

r = retention rate

i = constant discount rate

AC = acquisition cost

These assumptions are reasonable and can be modified.

$$CLV = M \times \frac{r}{(1+i-r)} - AC$$

The margin multiple

Margins = Annual Revenue – Product and Service Costs

What is the implication of the Margin Multiple?

What determines CLV (i.e., important factors)?

	CLV	Annual Revenue	Product Costs	Service Costs	Annual Retention Rate	Acquisition Costs
Customer A	4600	\$2,000	\$500	\$100	80%	\$1,000
Customer B	2450	\$3,000	\$500	\$200	60%	\$1,000
Customer C	2200	\$4,000	\$500	\$300	50%	\$1,000
Customer D	25	\$5,000	\$500	\$400	20%	\$1,000

Calculating CLV: Netflix Case

Suppose the following:

- The monthly retention rate for premium: 80%
- The monthly discount rate is given: 1%
- The average monthly revenue for a premium customer: 17.99\$
- Variable monthly costs for each premium customer: 1.50\$
- Acquisition cost: 30\$
- Acquisition cost is incurred at month 0 and the revenue is generated at month 1.

What is CLV? (Assume the discount rate is zero (0.01)) \$32.82.

How does CLV help make decisions on customer management?

- Helps set **the limit of acquisition cost**.
- Provides **a template for customer segmentation** (e.g., high vs low profitability customers).
- Helps companies understand **the driver of customer profitability**.
- Helps marketing managers invest in customers (e.g., linking customer satisfaction to retention rate).
- Provides an estimate of customer equity.

Managing Customer Value: Drivers of Customer Profitability



- Many companies realize not all customers are valuable.
- Bargain Hunters in Best Buy Stores.
- Sprint cancelled contracts with customers who were costly to serve.
- However, firing customers should be done carefully.



- Does customer retention matter? Yes. Let's go back to the calculation of CLV: it is the function of retention rate.
- Increasing retention rate suggests a company gain margins for the longer periods → Customer retention is the main driver of CLV.
- A small increase in retention rate result in larger increase in CLV.
- One study finds 5% increase in retention rate could increase CLV by 35% to 85%.
- It costs 5 times as much to attract a new customer than to keep an existing one.



- Once customers are acquired and retained, a company needs to put effort in developing the customer relationship → Increasing customer margins.
 - Increasing share of wallets.
 - Cross-selling and upselling
 - Cross-selling: selling other products of the company to the existing customers (e.g., Apple, Telecom subscription plans).
 - Upselling: selling the premium products to the customers who buy non-premium products → increasing margins (e.g., Netflix, Spotify, Telecom companies).

CLV and Customer Equity



- Is CLV enough and relevant for senior executives such as CEO and CFO?
- CLV is applicable to the individual customer only.
- We can calculate Customer Equity, i.e., the sum of all CLVs across all existing and potential customers.

- Customer Equity (CE) is a good proxy for firm value.
- CE suggests the long-term value of an organization.

Customer Referral Value

- Who is the most valuable customer in terms of CLV?
- Who are you going to invite as your customer given the following additional information?



(A) CLV: \$2,000



(B) CLV: \$3,000



(C) CLV: \$5,000



(D) CLV: \$1,000

	(A) The Beauty	(B) The Beast	(C) Iron Man	(D) Harry Potter
CLV	\$2,000	\$3,000	\$5,500	\$1,000
Additional Costs	\$1,000	\$1,500	\$2,500	\$0
The number of close friends	5	3	2	10

- What are potential drawbacks of CLV?
 - **Customer Acquisition**, we can take into account the effect of customer acquisition better.
 - **Social Interaction Effect**, word-of-mouth and social media, etc. Customer referrals are crucial.
 - **Valuable Free Customers**, CLV focuses exclusively on paying customers and ignores nonpaying ones.

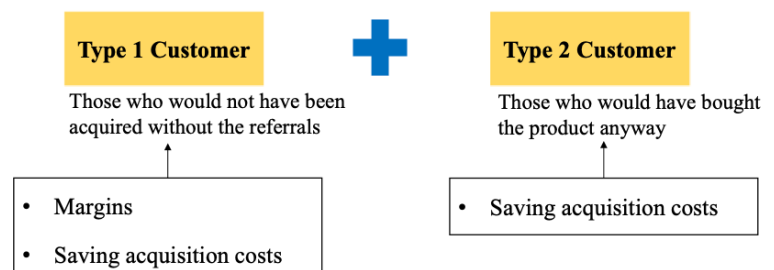
Reality and Challenges?

- What have companies been doing? Most firms use consumer willingness to make referrals.
- Most good intentions may not necessarily be related with the action.
 - One financial service firm > **68% of customers** expressed their intention to refer the company to other people, but only **33%** did.
 - One telecom firm: **81% of customers** expressed the intention to recommend the company, but only **30%** did.

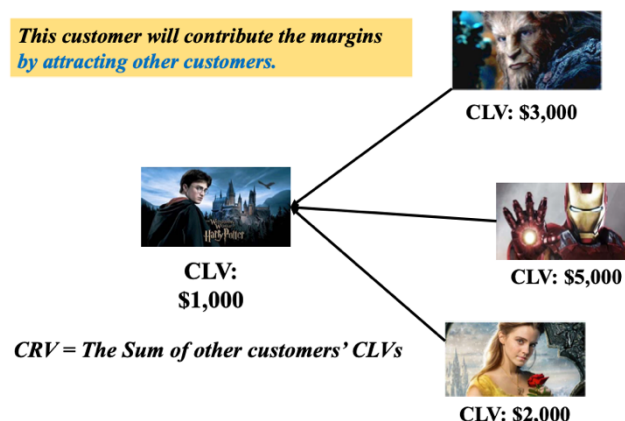
Any Alternatives?

Customer Referral Value (CRV): A sum of the values of all customers acquired by the referred customer.

It is important to distinct two types of acquired customers!



Customer Referral Value as an Alternative Metric



Combining CLV and CRV

Surprisingly, CLV is not necessarily related with CRV. The most loyal customers are not necessarily good marketers.

	Customer Lifetime Value	Customer Referral Value
1	\$1,933	\$40
2	\$1,067	\$52
3	\$633	\$90
4	\$360	\$750
5	\$313	\$930
6	\$230	\$1,020
7	\$190	\$870
8	\$160	\$96
9	\$137	\$65
10	\$120	\$46

Telecommunication company (# of customers = 9,900)			
		Low	High
CLV	High	Affluents 29% CLV : \$1,219 CRV: \$49	21% Champions CLV: \$370 CRV: \$590
	Low	Misers 21% CLV: \$130 CRV: \$64	29% Advocates CLV: \$180 CRV: \$670

Implications of Affluents, Advocates and Misers

- Overlooking the importance of social interaction might underestimate customer profitability.
- Customers with high CLV are not necessarily the same customers with high CRV.
- The customers in each cell should be evaluated differently. To migrate the customers in each cell, the company needs different marketing programs.

Misers

- Low CLV and Low CRV
- Need to improve both
- At least the company may migrate them to one of the other three cells.

Affluents

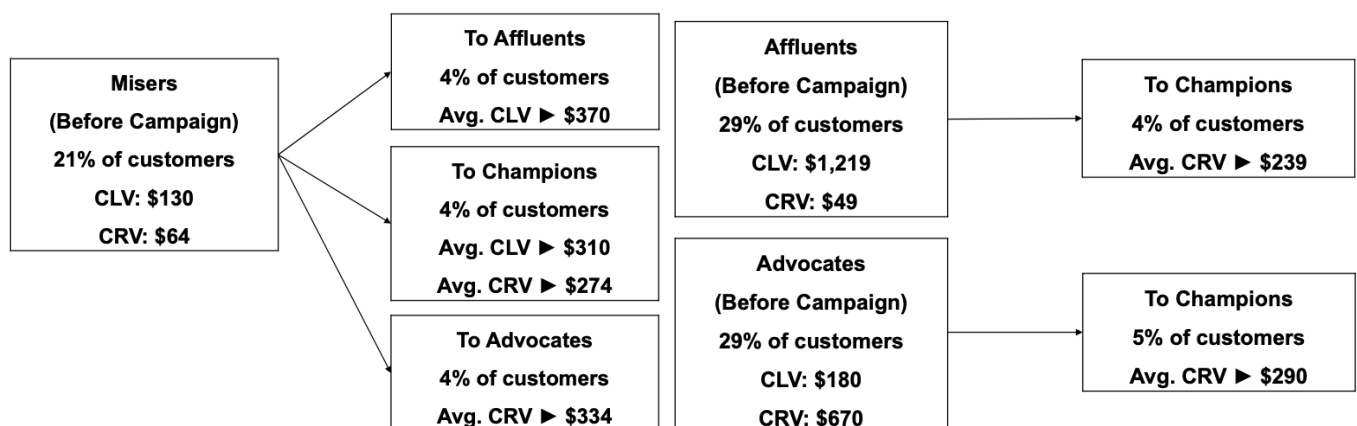
- High CLV and Low CRV
- Need to encourage these customers to refer new customers using referral incentives.

Advocates

- Low CLV and High CRV
- Need to encourage these customers to spend more.

What would be the goal of marketing campaigns for each group of customers?

Marketing Campaign – Results of the campaign



Marketing Campaign ROI

To evaluate whether the marketing campaign was successful, we need to compute the ROI (Return On Investment).

- The results seem to be successful, but we don't know the cost and profit implications.
- Total marketing costs: \$31,500 for 7,821 customers (\$4 per customer).
- Overall profit: \$486,090
- ROI: 15.5

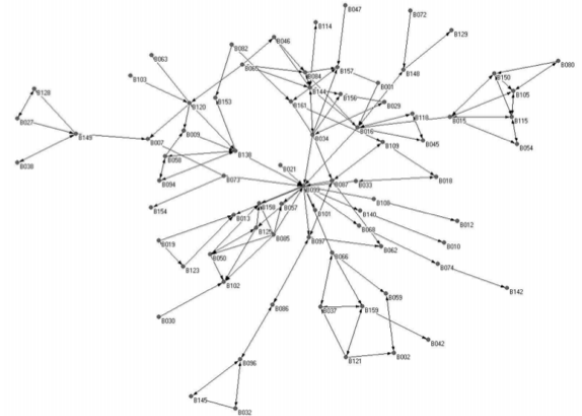
Example of Consumer Network

How do you evaluate the marketing campaign?

Social Influence

CRV approach allows managers to take into account social influence in valuing customers.

- Friends influence our purchase behavior.
- This effect is stronger in the age of online social media and social network.
- Social influence affects not only **customer acquisition** but also **retention**.
 - Customer acquisition likelihood increases by 9 times to 15 times if somebody in the consumer network already adopted the product.
 - A customer's risk of cancellation increased by 80% if one friend canceled.



RFM Analysis

Recency – How recently did the customer purchase?

- A measure for the time elapsed since a customer last placed an order with the company.

Frequency – How often do the customer purchase?

- A measure of how often a customer orders from the company in a certain time period.

Monetary value – How much do the customer spend?

- A measure of the amount that a customer spends on an average transaction.

71% of the firms use RFM in their direct marketing efforts.

Computing RFM Score

- Compute each variable, R,F,M.
- Determine the relative weight.
 - Directly determined by managers.
 - Or by using simple regression techniques.

Example: Bocconi café wants to select the best customer to invest its marketing budgets. The customer with the highest RFM score will be selected.

Euro Amount Spent by Each Customer

Customer	Jan	Feb	Mar	Apr	May
A	200	50	80	100	200
B	300	200	0	25	45

Relative weight for R, F, M = 50%, 20% and 30% respectively.

Purchase Frequency

Customer	Jan	Feb	Mar	Apr	May
A	3	1	2	1	1
B	2	1	0	1	2

RFM score for each customer?

What does the score mean?

Customer A: 41.2

Customer B: 38.2

Calculating RFM Score

Variable	Weight	Points
Recency	50%	20 points if purchased within the past month
		10 points if purchased 2 months ago
		3 points if purchased 3 or 4 month ago (count only once)
		2 points if purchased 5 or more month ago
Frequency	20%	3 points for each purchase within the past six month
Monetary value	30%	10% of \$ volume of purchase within the past six month

Discussion on Different Metrics – What are the differences?

RFM

- Incorporate some aspects of customer buying behaviors
- Backward looking measure
- Does not provide the key information such as profits
- Relative measure
- Depending on relative weights.

CLV

- Forward looking measure
- Provides the information about customer profitability, it has the elements of revenue, cost, and customer behavior.

CRV

- Forward looking measure
- Provides the information about customer profitability
- Incorporates the impact of social interaction.