Managing Customer Dynamics II
Customer Lifetime Value

Dr. Ashutosh Singh

Customer Lifetime Value (CLV)

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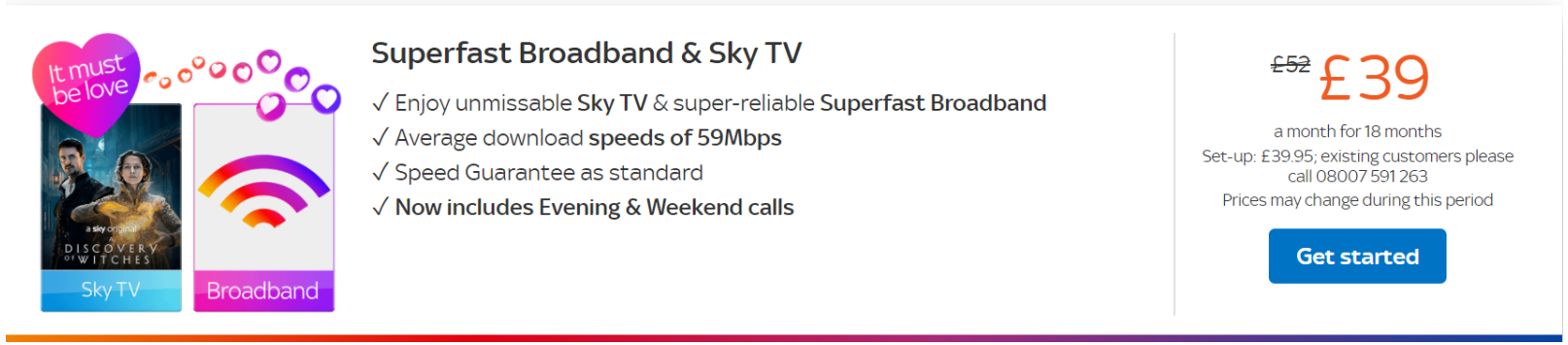

- **In many banking initiatives only 1 in 3 “customers” remain after incentive ends**
- **Are all customers worth acquiring or retaining?**

CLV

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- **Resources are scarce and not all customers are profitable**

CLV

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- **What is the profitability of the customer in the long run?**
  - CLV = present value of all future profits obtained from customers over their relationship with a firm
  - Calculation across customers, per segment, or per customer

- **CLV a key analysis tool for making Acquisition-Expansion-Retention (AER) decisions**
  - It captures “true” contribution of each customer at any stage
  - Because CLV ranks customers on the basis of profitability, it can target marketing campaigns toward the most high value customers.
  - It evaluates a firm’s profit as the sum of each customer’s lifetime discounted cash flows

CLV

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- Australia and New Zealand CMO Survey
  - Survey conducted on 255 CMOs and marketing directors in Australia and New Zealand
  - Those who “always measure the lifetime value of each customer” achieved a 16% average increase in their annual marketing budget as compared to 0% for those who do not measure it.
  - 75% of the marketers are engaged in some level of CLV effort within the organization

How CLV works

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- **CLV is the dollar value of a customer relationship, according to both its present value and the projected future cash flows from the relationship.**

- **The calculation process consists of three steps:**

  (1) estimating the remaining customer lifetime, or number of years over which a customer is likely to maintain a relationship with the firm, normally according to retention rates,

  (2) forecasting net profits from the customer over the predicted lifetime, and

  (3) calculating the net present value of the future amounts.

How CLV works

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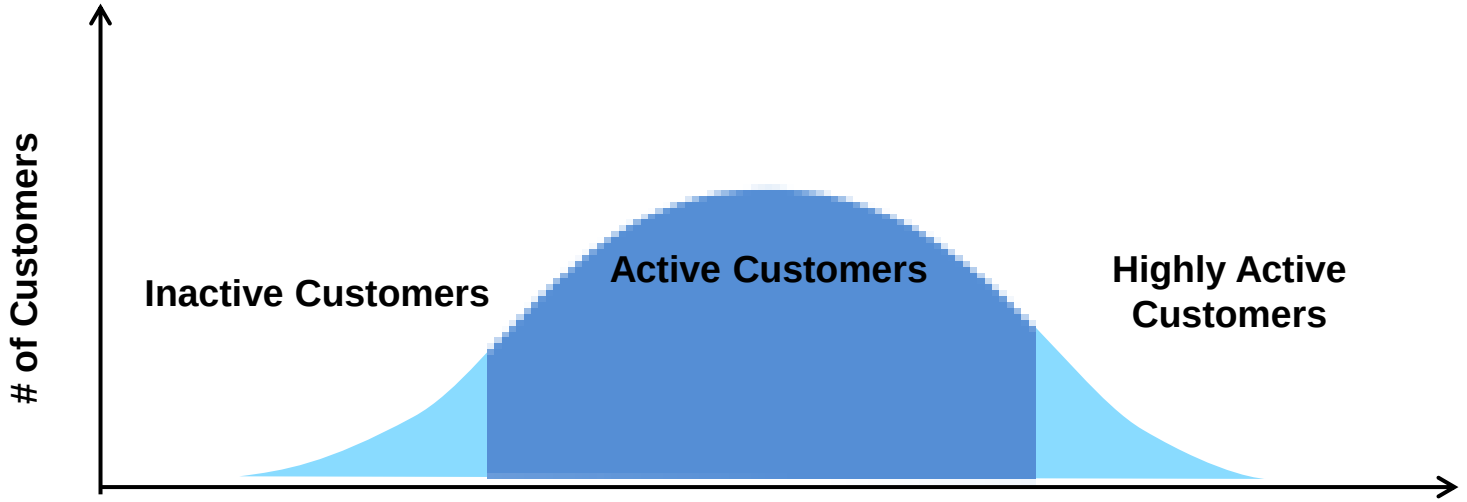
- **Both current and potential customers can be segmented according to expected long-term profits or CLV.**
- **The graph below plots the CLV distribution of firm**
  - inactive customers (low to negative CLV)
  - active customers (positive CLV), and
  - highly active customers (very high CLV)
- **Firms can use such a graph to identify and target the most profitable customers for marketing retention campaigns.**



How CLV works

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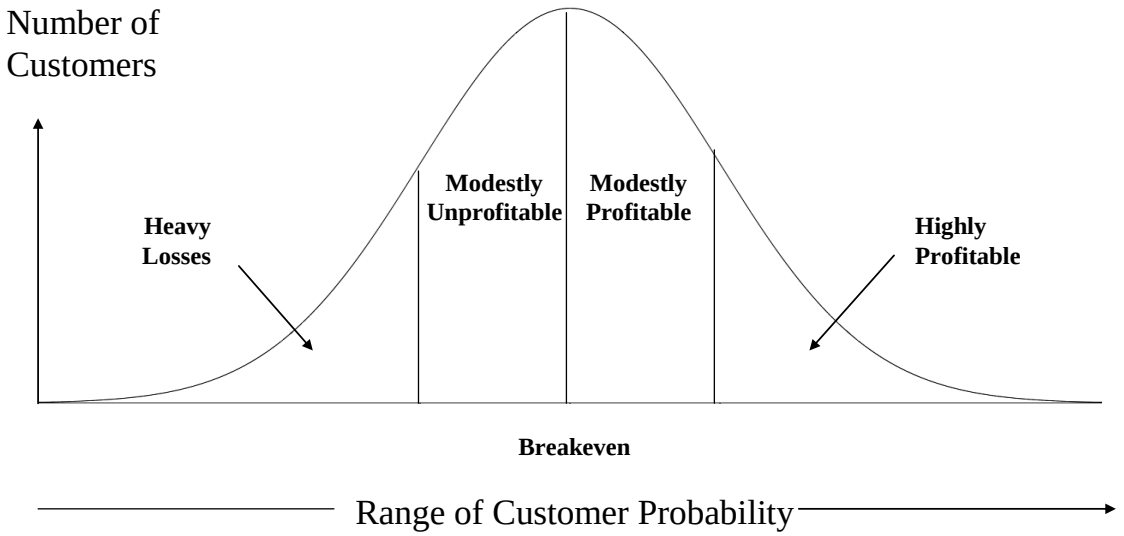
- **CLV Accounts for Varying Profits Across Customers**
  - Beyond 80/20 rule: firms earn 150% of their profits from 30% of their customers
  - CLV captures these difference in your existing customers so you can acquire, expand, and retain the “best customers”



How CLV works

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- **CLV Accounts for the Time Varying Profits of Customers**
  - On average, annual earnings typically increase over a customer's life due to cross/up-selling
  - But, some customers are more costly to acquire or retain (lowering prices, high service levels)

	Profit per Customer (in dollars) by Year of Relationship				
Industry	1	2	3	4	5
Credit Card Issuance and Servicing	(21)*	42	44	49	55
Industrial Laundry	144	166	192	222	256
Industrial Distribution	45	99	121	144	168
Auto Servicing	25	35	70	88	88

* Figures in parentheses denote losses.

Expected Value Concept

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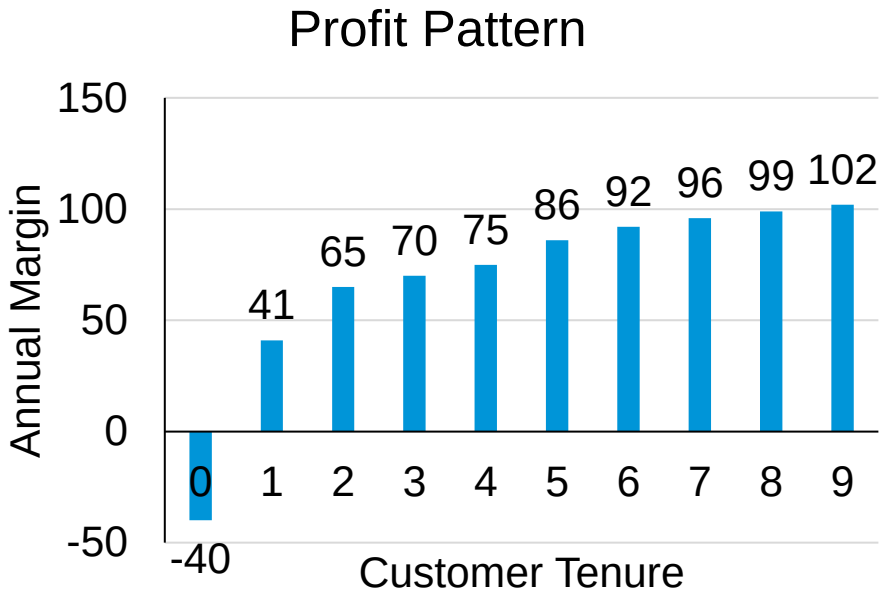
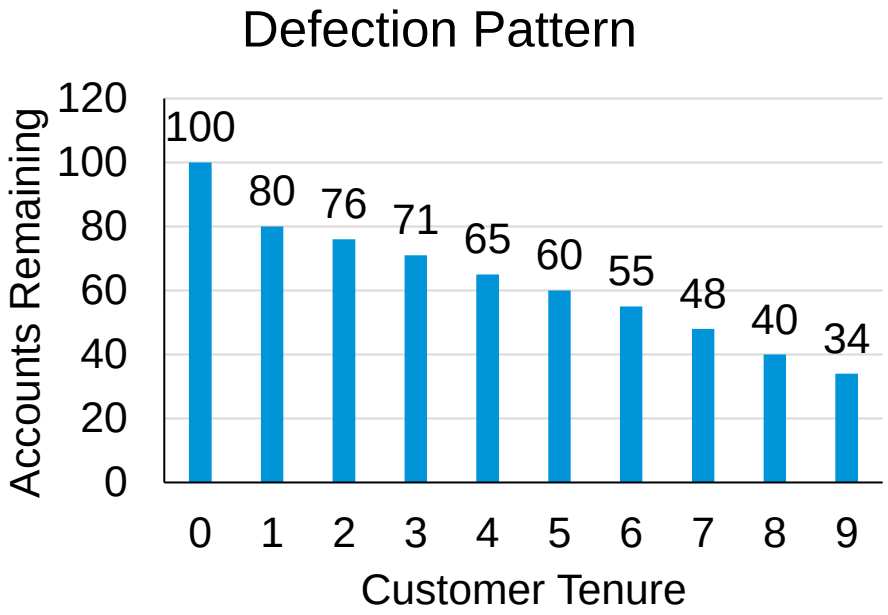
Result	Payout	Probability	Expected Value
Heads	$50	50%	$25
Tails	($40)	50%	($20)
Expected Return			**$5**
Annualized Return			**5%**

Source: Morningstar.

The CLV formula





$$\text{Expected margin} = \$41 \times 0.80 + \$65 \times 0.76^2 + \ldots$$

$$\text{Present value of the expected margin} = \frac{\$41 \times 0.80}{(1+0.1)} + \frac{\$65 \times 0.76^2}{(1+0.1)^2} + \ldots$$

The CLV formula

$$CLV = \sum_{t=0}^{T} \frac{(p_t - c_t)\, r^t}{(1+i)^t} - AC$$

Net present value of profit in period *t*

Acquisition cost

Summed over *T* periods

- p_t= price paid by the consumer at time *t*
- c_t= direct cost of servicing the consumer at time *t*
- p_t–c_t= profit margin of the consumer at time *t*

- r= retention rate (probability of the consumer repeat buying)
- $(1+i)^t$ = Discounting the profit in period *t* (i is the discount rate)

Simplified CLV Analysis

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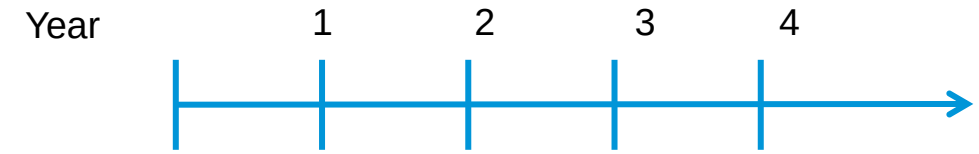
- **Assuming that**
  - T → infinity
  - Contribution margin m = p – c, does not vary over time

- **the CLV formula can be more simplified:**

$$CLV = \sum_{t=0}^{\infty} \frac{m \times r^t}{(1+i)^t} - AC = \frac{m \times r}{1+i} + \frac{m \times r^2}{(1+i)^2} + \cdots - AC = \boldsymbol{m\left(\frac{r}{1+i-r}\right) - AC}$$

  - Constant annual margin m
  - Constant annual retention rate r
  - Discount rate i
  - Acquisition cost AC

Simplified CLV Analysis (a bit of math)



Retention Rate	r	r^2	r^3
Expected margin	mr	mr^2	mr^3
Discounted expected margin	$\frac{mr}{1+i}$	$\frac{mr^2}{(1+i)^2}$	$\frac{mr^3}{(1+i)^3}$

$$CLV = \frac{mr}{1+i} + \frac{mr^2}{(1+i)^2} + \frac{mr^3}{(1+i)^3} + \ldots - AC$$

$$= \frac{mr}{1+i}\left[1 + \frac{r}{1+i} + \frac{r^2}{(1+i)^2} + \ldots\right] - AC$$

Let $k = \frac{r}{1+i}$

$$= mk\underbrace{[1 + k + k^2 + k^3 + \ldots]}_{\frac{1}{1-k}} - AC$$

$$= \frac{mk}{1-k} - AC$$

$$= \mathrm{m}\frac{r}{1+i-r} - AC$$

Exercise

- **A manager of a broadband company wants to determine if it is strategic to acquire the Brett family, by estimating their household-level CLV. The manager estimates that it will cost the company $65 (AC) to get the Bretts' to switch, and the Bretts' will generate $100 revenue (p) each year, with a $10 annual marketing cost (c) to retain them. The estimated retention rate (r) is 65%, and the current discount rate (i) is 5%.**

- **From the CLV formula, is it profitable to acquire the Brett's?**

Exercise

$$CLV = \boldsymbol{m(100-10)\left(\frac{r(0.65)}{1+i(0.05)-r(0.65)}\right)-AC(65)}$$

Margin Multiple (Constant Margins)

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- CLV = Profit Margin * Margin Multiple
- Margin Multiple $\dfrac{r}{1+i-r}$

Margin Multiple		Discount Rate			
		10%	12%	14%	16%
Retention Rate	60%	1.20	1.15	1.11	1.07
	70%	1.75	1.67	1.59	1.52
	80%	2.67	2.50	2.35	2.22
	90%	4.50	4.09	3.75	3.46

$$\frac{0.90}{1+0.16-0.90}$$

Example: Royal Bank of Canada (RBC)

- Identified medical students as high CLV customers
- Implemented a program to satisfy their needs early during the progression of their careers: products such as credit cards, help with student loans, and loans to set up new practices.
- In the first year, RBC's market share in this segment increased from 2% to 18% and average sales were four times higher than average customers. These customers were also very loyal.

RBC Royal Bank

Application: Customer Acquisition

- 140 customer accounts of a company use 2,285 units per month
- Price is £12.50 and variable cost is £4.25
- Retention rate = 0.9, discount rate = 12%

- What is the maximum the company should be willing to spend to acquire a new account?
- What is the maximum that company should spend on each customer per year to increase retention rate to 0.95?

Application: Customer Acquisition

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- **Annual margin per customer (m) = £1617**
  - 140 customers → 2285 units/month
  - 2285 *12 / 140 = 196 units/year/customer
  - margin/unit = £12.50 – £4.25 = £8.25
  - m = 196 * 8.25 = £1617

- **Margin multiple = 4.09**
  - Retention rate = 0.9
  - Discount rate = 12%

- **CLV = 1617 * 4.09 = £6613.53**
- **Maximum acquisition cost = £6613.53**

Application: Customer Acquisition

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Retention rate	0.9	0.95
Margin multiple	4.09	5.588
Margin	m	m* = m - c

$$m \times 4.09 = m^* \times 5.588$$

$$m^* = \frac{m \times 4.09}{5.588} = \frac{1617 \times 4.09}{5.588}$$

$$m^* = 1183.52$$

$$c = m - 1183.52 = 1617 - 1183.52 = £433 \; per \; year \; per \; customer$$

Increasing Customer Value: Strategies

- **Customer acquisition**
- **Customer expansion**
- **Customer retention**

$$CLV = m\left(\frac{r}{1+i-r}\right) - AC$$

CLV Example

Takeaways

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- Customer lifetime value (CLV) seeks to capture the true contribution of each customer over time.
- This approach beneficially provides guidance for making trade-offs and resource allocation decisions among different AER stages.
- It also can change a firm's culture, such that the focus is on profits as the sum of each customer's lifetime value, rather than the sum of a product line's profits.
- Understand the importance of CLV and Choice modelling in dynamic segmentation

Module Mid Review (To be done during Lecture)

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Marketing Analytics (LUBS 5403M)

Mid Module Review