Probability Models for Customer Lifetime Value Analysis

Computer Lab Exercise — Part 2

Required files: Blue Apron case
`Blue_Apron_case_data.xlsx`

The objective of this exercise is to give you hands-on experience with computing CLV in a contractual setting using simple probability models for customer lifetimes.

Question 1

- Using the BG model from Part 1 and the financial data given on p. 8 of the case (and the logic as covered in the lecture), what is the expected value of an as-yet-to-be-acquired Blue Apron customer? [Check: Why is the monthly WACC not $20/12 = 1.67\%$?]

Question 2

- According to the case (Exhibit 9), the expected value of an as-yet-to-be-acquired Blue Apron customer is \$133.60. How do you reconcile this with the number you have computed above?

[Optional] Question 3

It is important to realise that, in most situations, no single customer has a realised value of $E(CLV)$. We should therefore consider the distribution of CLV. First read

> Fader, Peter S. and Bruce G.S. Hardie (2017), "Exploring the Distribution of Customer Lifetime Value (in Contractual Settings)." (`http://brucehardie.com/notes/035/`)

- Compute the distribution of CLV (where CLV is computed to the nearest cent). What is the mean and variance of this distribution?
- Assuming a CAC of \$100, what is the probability that Blue Apron loses money on a newly acquired customer?
- Suppose Blue Apron acquires 10,000 new customers (with a CAC of \$100). What is the expected value of this cohort of customers? What is the associated 95% interval?
- Repeat for 1,000 new customers. How do you explain the difference in the relative ranges of the 95% intervals?