Chapter 5

Customers as Gambles

> **Gam-ble 1:** To play a game for money or property. **2:** To bet on an uncertain outcome. **3:** To stake something on a contingency: take a chance.[1]

The goal of this chapter is to provide a mathematical approach for conceptualizing, measuring and influencing value to the customer (VTC), as well as the value of the customer (VOC). We will build on concepts of VTC and VOC first described in Chapter 2, develop them in a fair level of mathematical detail, and then apply them to some of the key ideas generated in Chapters 3 and 4 to demonstrate how the analysis could be used to help a manager in making meaningful marketing decisions.

While the central idea of this chapter is mathematical modeling, we would like to emphasize that our objective in this chapter is not to drown the reader in a swamp of unintelligible mathematical mumbo-jumbo. Instead, what we would like to achieve is to be able to give the reader some very clear intuition behind the mathematics. In particular, we would like the reader to be able to

(1) Understand the parameters of the customer management problem they are facing.
(2) Structure the problem using very simple mathematical tools.
(3) Work out the logic by which the problem could be solved.

[1] Gamble. Def. 1–3. *Merriam-Webster Online Dictionary*, 2009.

Once the manager is able to achieve these three, he could simply outsource the actual mathematics/analytics to any of the large number of bright undergraduate students of science or mathematics. The trick in making any customer analytics work well for the manager is not in the spreadsheets or the actual mathematics (which can be conveniently outsourced to an analyst whom we shall refer to as Mike the Mathematician), it is in the manager's ability to structure the problem effectively and to supply the analyst with the logic and intuition needed to analyze the problem. This chapter does precisely that, and so while the material appears superficially dense and complicated to read, we encourage the reader to stay with us through these pages and guarantee that you will have a very different way of thinking about marketing analytics by the end of this chapter.

I. Modeling Customer Value: The Building Blocks of Gamble Analysis

We start our discussion on the modeling of customer value (both VTC and VOC) by offering two building blocks for our analytical treatment.

(1) *The Retailer Metaphor*

The first building block was introduced in Chapter 2, and illustrated in Figure 2.3. All customer-related activity can be decomposed into two distinct phases. The first set of activities, acquisition, refers to everything that the firm does in order to attract the business of the customer. In the case of a retailer like Zara, all traffic building activity that gets the customer to visit the store for the first time can be grouped under the acquisition umbrella. Everything that happens after the customer is in the store falls into the value of customer umbrella. In ongoing discussion, we will refer to this building block as the "retailer metaphor."

(2) *The Stochastic Model*

The second building block is a seemingly unusual, yet a very intuitive metaphor. Any visitor to the casinos of Macau and Las Vegas will know what gambling is all about. It is about inserting a token worth, say $1, into a slot machine, pulling a handle, and hoping that the player hits jackpot and wins, say, a thousand dollars. Likewise, any reader of quantum physics will know that when a thin sheet of metal is bombarded with energetic photons, the photon is absorbed with some probability and the atom transitions from a lower energy level to a higher energy level. Indeed, a simple stochastic model in which a given action results in a particular outcome with a probability p that is less than one is a very simple model to represent a very large number of real world phenomena both in the natural sciences as well as in business administration. Quantum transition probabilities, the likelihood of finding oil on drilling in a field, many aspects of financial markets, and all forms of gambles have been successfully modeled using standard and simple stochastic models.

We model customers as gambles. Much like an individual inserting a $1 token into a slot machine and hoping for some reward in exchange, or a scientist firing a photon into an atom hoping to move it to a higher energy level; we think about firms as initiating a marketing intervention targeted at a particular individual with the hope of moving that individual from one stage in their value chain to the next stage. Moving people from any one stage to the next stage is like playing a gamble; the firm decides to introduce a particular intervention that, with a certain probability, moves the customer

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Think about every marketing intervention as playing a gamble. With some probability of success p, the customer moves from one stage of the value chain to another stage. The expected value of the gamble represents the net value of the marketing intervention. Your goals are to (a) identify interventions that maximize the probability of success, yet (b) result in high net value!

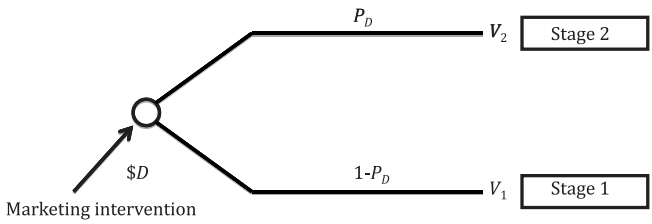

Figure 5.1 Customers as gambles.

up the value chain to the next stage. The game can then be played again till the customer goes up the value chain successively over time.

Figure 5.1 shows the simplest possible stochastic representation of the gamble metaphor. Consider a manager trying to move a customer from one stage to another, where the value in the first stage is V_1 and the value in the second stage is V_2. Let us assume that the manager spends $\$D$ to try and engineer this upgrade, and at that level of spending, the probability of success is p_D. Using the basic principles from probability and decision trees, the net expected value of this gamble can be written as

$$\text{EV (customer gamble)} = p_D * (V_2 - V_1) - D$$

II. Customer Gambles

(1) *The Gamble is Merely a Mathematical Metaphor*

A few discussion points are in order here. First, the term gamble as it is used colloquially in the English language has two connotations; it is often used in the context of either fun or danger, and it suggests that the probability of the desired outcome happening is beyond the control of the gambler (that said, a number of successful gamblers at casinos and the race tracks would argue otherwise). When used in the context of customers, though, we abstract ourselves from any

emotional content of gambling and focus purely on the ability of the gamble to give us a mathematical crutch for modeling value. Moreover, we do not believe that the act of playing a gamble for a customer is a passive one in which the manager simply sends out a marketing intervention and sits back and "hopes" for a customer to move up a value chain. In fact, nothing could be further from the truth. When seen in the gamble analogy, however, marketing interventions take on a different conceptual definition. We can now define the goal of any marketing intervention as optimizing the value of each gamble. One manner of achieving this is to improve the probability of success, the probability with which the customer moves up along the value chain. As we will see later, however, optimizing the value of a customer gamble does not necessarily mean that p should be extremely high. That said, if the manager has access to data on what the probabilities of success of various marketing interventions are as a function of how much is spent on that interventions, he will be able to develop a decision support tool to help determine which intervention to select.

(2) *Customer Gamble and Relevant Costs*

Second, what is a marketing intervention and what costs should be modeled when trying to study customers as gambles? In our conceptualization, an intervention refers to a single, or multiple activities that are designed to stimulate a move along the value chain. These could include, but are not restricted to advertising, direct mail, sampling, couponing, mail-in rebates, catalogue promotions, phone sales, financing plans — absolutely anything designed to elicit a specific action. Note that an intervention could comprise of a combination of two or more individual actions as well. For instance, a retailing firm might choose to convert prospects to customers via a combination of sampling and low introductory prices. In real practice, however, there is never crisp and clear demarcation between different marketing activities and their consequences. If a

potential customer responded to a direct mail solicitation, one might conclude that it was the direct mail that moved the customer from being a prospect to making their first purchase. However, other marketing actions might have also played a part. It could have been possible that, undetected to the firm, the customer also saw some advertisement and heard some good word of mouth about the firm. Therefore, the advertising and word of mouth would have also contributed to moving the customer up the value chain. Similarly, the direct mailing might have effects beyond simply triggering the first purchase. If the mailing was attractive, or had some utility (e.g., included a wall calendar), it might also serve as a reminder and trigger repeat purchasing. Table 5.1 shows a number of different marketing activities as well as possible behavioural outcomes arising from them.

Our approach addresses this imperfect association between action and outcome in a number of specific ways.

(a) *Apply the models in controlled environments*

There are a large number of situations in which a firm decides to introduce only one marketing activity at a time, especially at the level of a geographic or demographic segment, and for different products. In such instances, the likelihood of contamination is low especially if the activities are done in a manner in which each segment is sufficiently distinct. For instance, a conversation with the operating officer of a large retail bank suggested that this bank sent electronic messages to the younger segment, phone calls to the older segment, and direct mail that differed in geographic reach for different product lines. When they analyzed the effectiveness of their marketing vehicles, they would treat each vehicle independently after verifying through some simple market research that the customers had not received any other communication and their decision to act was based on the specific marketing activity that had been targeted to them. In such instances, the schematic in Figure 5.1 does a fine job of modeling the effectiveness of the marketing activity.

Table 5.1 Marketing activities and behavioural outcomes.

	Traffic	Purchase	Multiple purchase	Repeat purchase	Loyalty to brand	Create referrals	Increase frequency of shopping
Samples		X	X			X	
Guerilla marketing	X	X				X	
Word-of-mouth advertising	X	X				X	
Loss leader							
Point-of-sale display	X	X					
Phone sales	X	X			X		
Direct mail	X						
Company Web site	X					X	
Mail-in rebates		X	X				X
Premium promotion		X	X				
Personal sales		X		X	X	X	
Financing plans		X					
Buy-one-get-one-free promotion			X				
Price promotion based on volume			X				
Price promotions (discounts)		X	X	X			
Catalogue promotions coupons		X	X				
Reward programs					X	X	X
Customer relationship management systems					X	X	X
Loyalty programs					X	X	X
Refer-a-friend promotion						X	

(b) *Apply the models at the margin*

A second approach to applying the approach is to use it "at the margin." We illustrate what we mean with a specific example. Suppose a manager at a spa salon has decided on a two-pronged strategy to acquire new customers — initially a long running advertising campaign to increase awareness and liking, followed by a series of more specific programs (e.g., couponing to one group of prospects, sampling to another, a buy-one-get-second-free offer to a third group). It is obvious that the advertising will influence a prospect's decision to try the new service for all these groups of customers. Hence, each customer could be influenced by two different marketing activities, and a clean application of the gamble framework would not be possible. However, the manager could choose to analyze this by considering the entire campaign (advertising, couponing, sampling, and the offer) as the universe. In this universe, advertising could be considered as a fixed cost — and indeed a sunk cost when it comes time to spend money on the more specific programs. In this case, the manager could treat each of the three specific programs as a gamble at the margin, and noting that now — at the margin — the three programs are independent, use the framework from Figure 5.1 to analyze their effectiveness and value.

(c) *Apply the models at a broader level of analysis*

Sometimes, the manager might choose to use marketing activities in conjunction with each other, and the assumption of independence between different marketing actions might not hold true. For instance, a firm might choose to use direct mail program in conjunction with a sampling program for the very same target segment, and with the very same value chain objective (e.g., converting a prospect into an entry-level customer). In this case, our approach would be to broaden the level of analysis and treat the combined marketing activities as the unit of analysis. The manager then might not be able to reach a nuance conclusion on the effectiveness

of direct mail vis-à-vis sampling, but would be able to analyze what happens when both are used in conjunction with each other.

(d) *Allocate costs*

In some cases where the manager expects contamination across two marketing activities, he might be able to estimate (either using syndicated data or custom market research) the degree of contamination. For instance, suppose it is known that 10% of all customers received both direct mail and sampling, while 45% received only one of the two. In this case, the manager will be able to treat this program as comprising of three different marketing activities: (a) sampling, (b) direct mail, and (c) direct mail and sampling. The manager can allocate costs appropriately across these three, and apply the gamble model suitably.

(3) *Using Portfolio Approaches to Manage Customers*

The third discussion point is metaphorical, yet very meaningful. Now that we have conceptualized customers as gambles, we can think about the firm as an entity that manages a portfolio of gambles. Any student of finance knows that this is exactly what a portfolio manager in a financial institution — or a wealth manager looking after your assets — does. The portfolio manager wants the portfolio to be diversified and balanced in a manner that is consistent with the client's goals. Likewise, the firm should seek to maintain a balanced portfolio of customers. This activity requires an ongoing audit, acquisition, investing in, and letting go of customers. The customer portfolio grid presented in Chapter 2 is one way to think about how to manage customers. But there are other ways, notably a risk versus reward approach to categorizing customers and segments. We will discuss some of the tools needed to approach these decisions later in this chapter.

(4) *Customer Gambles and Accuracy*

Fourth, we could like to comment on the accuracy of the analysis that will emerge from our framework. We will be the first ones to admit that the numbers that arise from the Customer Gambles will not be accurate. It is easy to question the assumption of independence in many cases, and in the event that the manager decides that independence is not valid and that costs need to be allocated suitably across different activities, the manner in which allocation is done could also be questioned. Whenever analytics like the customer gamble model, or VOC and VTC calculations are presented in class, the first set of responses always tend to focus on challenging the underlying assumptions and hence the accuracy of the calculations.

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The goal of using customer gamble analysis is not accuracy. It is to help the manager make choices between marketing interventions, different levels of spending, and different stages in the value chain to target. Don't get too hung up about accuracy, but do ensure that the analysis is forward looking and diagnostic!

We reiterate that the models presented here might not necessarily yield accurate answers. However, we also make the counter claim that accuracy is NOT the goal of any of our models. In many cases, we estimate customer gamble models and VTC/VOC models in order to forecast the worth of a customer, or to decide on which marketing activity to choose. By definition, forecasts cannot be accurate. While we do not necessarily aim to be inaccurate, our goals in conducting the analytics are twofold: first, we would like to give the manager some direction in terms of how to make decisions like which marketing action to employ, which part of the value chain to focus on, how much to spend on trying to upgrade a customer and so on. Note that traditional approaches to marketing do not give managers any quantitative guidelines. In fact, when we surveyed managers and asked how they made such decisions, the overwhelming majority responded with "intuition," "seeing what the competition