Harvard Business School

N2-525-014
JULY 3, 2024

SUNIL GUPTA

Quantitative Analysis in Marketing (Abridged)

The goal of marketing is to grow a business by providing value to customers. To achieve this objective, a firm makes various decisions such as identifying market opportunities, selecting target segments, launching new products, offering price promotions, choosing channel partners, and advertising its products. These decisions are based on both qualitative and quantitative assessment. In this note, we highlight several important marketing decisions, key issues that you should consider, and quantitative analysis that may help you arrive at a well-informed choice.

Market Size

Whether you are launching a new product, a new business, or evaluating growth options for an existing business, you should consider the following issues:

- How big is the market and how fast is it growing? This is the *total addressable market*.
- What is the size and growth rate of various segments in this market; how good is your product-market fit within each segment; and what is the best target market for your product? This is the *total available market* for your product.
- What *market share* do you expect to achieve in the market that is available to you? This depends on various factors such as the competitive advantage of your product and its price.

Market size depends on how you define the market. For example, if you are launching a solar panel company in the U.S., you might see your market potential as 72 gigawatts of solar power generated in the U.S. in 2019, or 720 gigawatts of renewable energy, or over 4,000 gigawatts of electricity from all sources.[1] The choice of market definition depends on your strategy and where you intend to compete. There are two broad methods to estimate market size: top-down and bottom-up.

Top-Down Approach

In this approach, you typically use industry estimates of comparable products that you intend to compete with. Airbnb and Careem, a ride hailing company in the Middle East, used this approach.

Airbnb When Brian Chesky, Nathan Blecharczyk, and Joe Gebbia, started AirBed&Breakfast (later named Airbnb), a competitor site, Couchsurfing.com already had 630,000 users. However, the

[1] https://www.eia.gov/tools/faqs/faq.php?id=427&t=3, accessed June 2022.

Professor Sunil Gupta prepared this note as the basis for class discussion.

Copyright © 2024 President and Fellows of Harvard College. To order copies or request permission to reproduce materials, call 1-800-545-7685, write Harvard Business School Publishing, Boston, MA 02163, or go to www.hbsp.harvard.edu. This publication may not be digitized, photocopied, or otherwise reproduced, posted, or transmitted, without the permission of Harvard Business School.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

cofounders knew the market potential was much bigger than 630,000 users. Using data from all hotel and bed and breakfast bookings, they estimated the total global market to be over 1.9 billion trips. However, they realized that Airbnb would compete only in the budget and online market, which resulted in the available market size of 532 million trips. They expected Airbnb to get about 2% of this market, or about 10.6 million trips. To estimate Airbnb's revenue potential, they assumed users would spend 3 nights per trip at an average cost of $70 per night and Airbnb would charge a 10% commission on it, or $20 average fee per trip. Combining this with 10.6 million trips gave them an estimated annual revenue of $200 million.[2]

Careem In July 2012, Mudassir Sheikha and Magnus Olsson launched Careem, a ride hailing company, in Dubai. As part of their fundraising, they highlighted the potential market size of over $4 billion. Although Careem started in Dubai, the two co-founders had plans to expand their business to the six Gulf Cooperation Council (GCC) countries that includes Saudi Arabia, Kuwait, UAE, Qatar, Bahrain and Oman. Based on this market definition, they estimated the market size as follows:

- Dubai taxis did 90m trips in 2011.
- 5.5% of these trips were for AED 40 (about USD $11), remaining trips were for AED 20 (~$5.50).
- Therefore, the estimated size of Dubai taxi market is about $500m - $525m.
- Also, about 2,000 limos in Dubai did about $50,000 per year of business, i.e., total of $100m.
- Dubai was estimated to be about 50% of the UAE market, which was 30% of the GCC market.
- Therefore, the total market opportunity was estimated to be over $4 billion.[3]

By 2019, Careem expanded its operations beyond the Middle East to North Africa, Pakistan and Turkey. In 2019, Uber acquired Careem for $3.1 billion.[4]

Notice the market definition in these two examples. While Careem defined its market as GCC countries, Airbnb expected to be a global player. In addition, Careem expected to compete with all taxi and limo businesses, whereas Airbnb defined its target segment as budget and online users only. In other words, the choice of market is a strategic decision that guides the estimation of market size.

Bottom-Up Approach

In this approach, you "build up" the market size by breaking it down into various components and estimating each component. For example, a human resource software company that plans to sell its software on a per month per employee basis, could estimate its market size as (number of firms in its target market) * (average number of employees per firm) * (average revenue per employee). Mint, the personal financial management service, provides an example of this approach.

[2] Pitch-Deck Library: The pitch decks that helped hot startups raise millions, Business Insider, Jan 10, 2020. https://www.businessinsider.com/pitch-decks-that-helped-hot-startups-raise-millions-2019-4, accessed March 16, 2020.

[3] Pitch-Deck Library.

[4] https://reut.rs/2HE5XkF, accessed March 16, 2020.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

Mint In 2007, Aaron Patzer wanted to raise funds for his startup Mint, which would help consumers manage all their finances in one place. He estimated the market size for Mint as follows:

- 49 million people are in the 22-35 years of age group (Mint's target population).
- 64% of them use online banking.
- Therefore, Mint has a market of 31 million prospective users.
- Patzer expected to generate revenue from two sources by leveraging his user base: lead generation or referrals (to banks, credit cards, etc.) and advertising on his site/app.
- The revenue estimate from each source was further built with detailed breakdown. For example, Patzer estimated that 0.5% of Mint users would potentially enroll for a credit card advertised on Mint, and the credit card company would pay $50 for each lead. He estimated similar numbers for bank accounts, cell phones, Internet, and other potential corporate sponsors. By combining these estimates, he arrived at annual revenue per user of $8 from referral. Similarly, he estimated annual advertising per user as $4.50.
- Combining the number of prospective users (31m) with per user annual revenue from referral ($8) and advertising ($4.50), Patzer estimated Mint's market potential as $388 million.[5]

Both top-down and bottom-up approaches are useful to estimate market potential. While the top-down approach is quick as it relies on published industry reports, the bottom-up approach provides more information to investors/senior managers by clearly articulating the assumptions.

Customer Value

Market size gives you an estimate of the potential market, but how much share of this market you would get depends on how customers view your product. Why should a customer buy your product? Put differently, what value do you provide to your target customers and how is this value better than that offered by competing products? Often this value is hard to quantify. For example, Amazon started with a value proposition of convenience, variety and lower price. Except for price, it is hard to put a dollar value on the value of convenience and variety. However, in some cases it is possible to quantify these benefits in terms of the total economic value to the customer (TEV).

Consider the example of LED bulbs. In 2013, the price of a 60-watt incandescent lightbulb in the U.S. was $1.25, while an LED bulb that emitted equivalent light was sold at about $36.00 (by 2022, this price came down to less than $3). How could a firm convince customers that it was worth buying LED bulbs? **Table 1** shows that even though the price of an LED bulb was almost 28 times that of an incandescent bulb, it saved consumers money due to its longer life and energy efficiency. In other words, *the total cost of ownership* for an LED bulb is less than the equivalent cost for an incandescent bulb. In this example, the TEV of an LED bulb is $352.50 - $85.95 = $266.55, because it provides 50,000 hours of use for $85.95, while its incandescent bulb competitor provides the same hours of use for $352.50. In general, TEV of a new product is the difference in the total value of ownership of new and old products, where the total cost of ownership includes the initial purchase price as well as usage and maintenance costs.

[5] For details see, https://www.slideshare.net/hnshah/mintcom-prelaunch-pitch-deck/4-Market_Size_US_49_Million.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

Table 1 Total Cost of Ownership of Lightbulbs, 2013

	LED Bulb	Incandescent Bulb
Expected lifespan of the bulb	50,000 hours	1,200 hours
Watts per bulb (60-watts equiv.)	10	60
Cost per lightbulb	$35.95	$1.25
Electricity (kWh) used over 50,000 hours	500	3,000
Cost of electricity ($0.10 per kWh)	$50.00	$300.00
Bulbs needed for 50,000 hours of use	1	42
Cost of bulbs for 50,000 hours of use	$35.95	$52.50
Total cost for 50,000 hours	$85.95	$352.50

Source: Adapted from Sunil Gupta, "Creating Customer Value," *Harvard Business Publishing*, 2020.

The total cost of ownership and the total value of ownership (TEV) are often used in a business-to-business (B2B) settings. For example, SKF, one of the largest producers of bearings, develops technically superior bearings that are more durable and reliable and are sold at a price premium of 10% to 50% over competitive products. When SKF customers questioned if the superior quality of SKF bearings was worth the price premium, the company developed a computer-based sales tool, called Documented Solutions Program (DSP), to quantify the value of SKF bearings. Using customers' data, SKF showed that its bearings reduced equipment failure and downtime that was worth thousands of dollars.[6]

Quantifying value is a good first step, but it may not be enough to convince customers to buy your product. Customers may be skeptical about your assumptions (does an LED bulb really last for 50,000 hours?), unwilling to pay a high upfront price ($36 for a LED versus $1.25 for an incandescent bulb), or may worry about other qualitative factors (e.g., the quality of light from LED bulb).

Demand Generation and Customer Acquisition

A good product does not sell on its own. You still need to communicate its value to customers. This may involve promotions (e.g., price discounts), digital marketing (e.g., Facebook ads), or other actions to generate demand and acquire customers. How do you assess if these actions are profitable ways to grow your business? The following examples illustrate typical analysis to address this question.

Price Promotion and Breakeven Analysis

Domino's sells a medium pizza for $5.99 and the owner of one of its franchisees is considering offering a promotion of "buy one get one free" for a month. Is it a good promotion?

To address this question, we need to know the fixed and variable costs for this promotion. Assume the fixed cost of promoting this offer for the franchisee is $5,000 and the variable cost per pizza is $1.99. With this information, we can calculate the *breakeven volume,* or the sales needed to cover the fixed cost of the promotion. The breakeven volume (BEV) can be calculated by:

$$\text{BEV} = \text{fixed cost}/\text{contribution margin per unit} \quad (1)$$

[6] Kamran Kashani and Aimee DuBrule, "Value Selling at SKF Service (A)," *IMD Case 5-0751*, November, 2010.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

- Contribution margin per pizza = $5.99 - $1.99 = $4.00
- Margin per order (buy one get one free) = $4.00 - $1.99 (cost of free pizza) = $2.01, or about $2
- Fixed cost of promotion = $5,000
- Breakeven volume = $5,000/$2 = 2,500 orders

This analysis suggests that the franchisee has to get an additional 2,500 orders to breakeven. How do we know if this is achievable? There are two ways to make this judgment. If the franchisee has run similar promotions in the past, they might have some idea if they can expect this incremental volume (sometimes companies run small experiments to test this). Alternatively, we can assess the percentage increase in sales needed for breakeven and make a judgment if this is achievable. For example, if the pizza store gets 5,000 orders per month, then the incremental sale of 2,500 orders represents 50% of monthly sales, which seems quite high and perhaps hard to achieve. However, if the store gets 50,000 orders per month, then an increase of 2,500 orders (or 5%) may seem reasonable.

Digital Marketing

Away, a direct to consumer (DTC) luggage brand, has been advertising on Facebook to acquire new customers. Should it continue Facebook advertising?

Before diving into any quantitative analysis, think of the information you need to make this decision. Broadly speaking, we need to know the cost of advertising and the profit generated from it. Breaking it down further, we would need the following information:

- How much money has *Away* spent on Facebook advertising in a particular period? Assume it spent $15,000 per month.
- What does *Away* get for the money it spends on Facebook? Typically, Facebook and other media companies offer advertising *impressions* (or views) at a certain rate. For example, Facebook may charge $15 per thousand advertising impressions, often referred to as CPM (cost per mille or the cost per thousand views).[7]
- Some percentage of consumers who see this ad clicked on it, called the *clickthrough rate* or CTR, and are directed to *Away's* website. Let's say CTR for *Away's* ad is 1%.
- A small proportion of consumers who click on the ad and land on *Away's* website eventually buy its product. Assume this *conversion rate* to be 2%.
- We now need to know the average order size of consumers who decide to buy. Assume the average spend of consumers who buy is $250.
- To assess the contribution margin, we need to know *Away's* variable cost. Let's say it is $100 per order on average.

With this information we can now assess the effectiveness of Away's advertising as follows:

- Ad budget = $15,000 per month

[7] CPM rates vary depending on product category. In 2020, the average CPM rate on Facebook was about $7. Facebook and Google also sell ads based on clickthrough rate or CTR. In 2020, the average cost on Facebook was $1 per click (see webfx.com/social-media/how-much-does-facebook-advertising-cost.html).

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

- CPM rate (cost per thousand impressions) = $15
- Ad impressions per month = ($15,000/$15)*1,000 = 1 million
- Number of clicks per month = Ad impressions * CTR = 1 million * 1% = 10,000
- Number of orders = # Clicks * conversion rate = 10,000 * 2% = 200
- Margin per order = Average order size – Cost per order = $250 - $100 = $150
- Total gross profit per month = # orders * margin per order = 200 * $150 = $30,000
- Net profitability of Facebook advertising = $30,000 - $15,000 = $15,000

It is common for companies to use three metrics to evaluate their ad effectiveness.

- *Customer Acquisition Cost* (CAC). In our example, *Away* spent $15,000 to acquire 200 customers, so its CAC, the average cost to acquire one customer, is $75. Companies often compare CAC across different media channels to decide on the size of their total ad budget and its allocation across media channels.

- *Return on Ad Spend* (ROAS). This is simply the additional *revenue* generated per dollar spent on ads. In our example, *Away* generated an incremental (200 orders) * ($250 order size) = $50,000 by spending $15,000 on ads. Therefore, its ROAS is $50,000/$15,000 or 3.33. While it varies by media channel and brand, a typical range for ROAS is between 2 and 4.[8] This metric is often used by ad agencies who may not have the contribution margin information for their clients handy.

- *Return on Investment* (ROI). While CAC and ROAS are useful metrics, they do not consider the profitability of the ad campaign. ROI is defined as:

  ROI = (incremental gross profit – Ad Spend)/Ad Spend (2)

  In our example, *Away* generated $30,000 in incremental gross profit by spending $15,000 on Facebook ads, so its ROI is ($30,000 - $15,000)/$15,000 = 1 or 100%.

Note three things. First, some products, especially new brands, may want to advertise to acquire customers even if they lose money. Second, in our analysis we have implicitly assumed that Facebook advertising is solely responsible for 200 consumers buying from *Away*. In general, these consumers may also be exposed to other advertising from the brand, for example on Google. In other words, we should not attribute all the benefit of sales to Facebook. To address this *attribution* problem, companies often resort to experimentation or sophisticated modeling. Third, we ignored the possibility that consumers who bought on *Away* may buy again in the future. This issue is especially important for subscription services, such as Netflix, where a customer generates a stream of revenues in the future. In the next section, we address this issue by introducing the concept of *customer lifetime value* (LTV).

Customer Lifetime Value (LTV)

In November 2019, Disney launched its new streaming service *Disney+* for $6.99 per month or $69.99 per year. By April 2020, it had attracted 50 million global subscribers, many of whom were fans of

[8] https://bit.ly/3vkcgkD, accessed June 24, 2022.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

Disney and perhaps did not need any advertising to sign up. These customers would generate revenue over several months or years, so here we can't ignore future revenue.

Assume that after the initial burst of subscribers, Disney ran several ad campaigns to acquire new subscribers. Using an approach similar to the one we described for *Away* luggage, Disney estimates its CAC as \$150,[9] and average annual revenue of \$60, net of discounts and promotional offers. These customers would provide recurring revenue but not all of them would stay with the company in the future. In other words, the *retention rate* for Disney+ will be less than 100%. Let's assume that based on its own data as well as data from Hulu and ESPN+, Disney estimates its annual retention rate to be 80%.[10]. Is it profitable to acquire customers at a cost of \$150?

To address this question, we need to estimate customer lifetime value or LTV. One simple way to estimate LTV that we will use in the RC Marketing course is:

$$LTV = m * LT \tag{3}$$

Where m is a customer's annual contribution margin, and

LT is the expected life (in years) of a customer with the firm.

A customer's expected lifetime can be estimated as:

$$LT = \frac{1}{(1-r)} = \frac{1}{churn\ rate} \tag{4}$$

Where r is the annual retention rate, and (1 - r) is equal to the annual churn rate. For example, if 50% of a firm's customers churn every year, the average lifetime of its customers is 2 years. Similarly, if 25% of its customers churn every year, the average lifetime of its customers is 4 years.

For Disney, an 80% retention rate or a 20% churn rate implies that the expected life of a customer is 5 years. Since the marginal cost of an additional customer for a digital service is close to zero, the annual margin per customer is almost the same as the average annual revenue of \$60. Therefore, LTV for Disney+ is (\$60/year) * (5 years of life) = \$300.

Some companies, particularly software-as-a-service (SaaS) companies, collect revenues from customers on a monthly basis, rather than annually, which means that customers can fail to renew their subscription each month. In this type of business model, churn rates and retention rates are measured in monthly terms, rather than annually. In this case, the LTV formula should be calculated using the monthly retention rate and the monthly contribution margin, rather than the annual numbers. What's important is that the time period for all metrics in the equation match.

While this analysis is simple, it ignores time value of money stemming from future profits. Strictly speaking, LTV is the *present value* of all future stream of profits expected from a customer, considering the possibility that a customer may leave the firm sometime in the future. If we would like to include the time value of future profits (a concept that you will learn later this semester in your RC Finance

[9] Some reports estimate that Netflix CAC for domestic (U.S.) customers in 2018 was \$140.

[10] Annual retention rate of 80% (or *churn rate* of 20%) implies that if Disney acquires 100 customers, 80 of them will continue with its service at the end of the year. Typically, this analysis is done for a *cohort*, i.e., for a group of customers acquired in the same period.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

course, we need to include a term *i* to account for the discount rate or the cost of capital. For a discussion of this more sophisticated formula, please see **Exhibit 1**.

Note a few things from our basic LTV formula noted in equation (3):

- We can improve LTV by either increasing margin (e.g., by raising our prices, lowering our costs to serve a customer, increasing the frequency or quantity of purchases, upselling or cross-selling, etc.), or by reducing churn or increasing retention (e.g., through better service, superior customer experience, etc.).
- LTV = margin/churn or margin * expected lifetime, as indicated in equations (3) and (4).
- By subtracting our cost of customer acquisition (CAC) from LTV, i.e., LTV – CAC, we can derive the net value of a customer to the firm over their lifetime.
- The LTV – CAC formula shows us the three levers of marketing in action. Marketers strive to acquire customers efficiently (keeping CAC low), retain them for a long time (keeping *r* high), and maximize the amount of profit the company earns from customers during each period (maximizing *m*).

We can also assess the return on investment (ROI) on customer acquisition as follows:

$$ROI = \frac{(LTV - CAC)}{CAC} = \frac{LTV}{CAC} - 1 \quad (5)$$

Here, CAC is the investment in acquiring a customer, and (LTV – CAC) is the net profit of that investment over the life of that customer. Companies and venture capitalists (VCs) often track the LTV/CAC ratio, and this ratio needs to be greater than 1 for ROI to be positive. Often, in companies that rely on recurring revenue, such as software-as-a-service (SaaS) firms where customers are charged monthly, startups and VCs look for a LTV/CAC ratio of greater than 3 as a rule of thumb, which generally provides enough of a financial cushion to bootstrap the company's growth.

For Disney+, using a margin of $60 per year and an annual retention rate of 80%, we get[11]

$$LTV = \frac{60}{(1 - 0.8)} = \$300$$

Given a CAC of $150, this ad campaign yields profitable customers with LTV – CAC = $300 - $150 = $150. Disney's LTV/CAC ratio is 2 and ROI is 1. Note the impact of retention rate on LTV. If Disney can improve its retention rate to 90%, its LTV increases to $600, or a 100% increase. Retention can be improved through better customer experience, and this analysis also provides a way to assess how much to invest in improving customer experience.

Go-to-Market Strategy

Should you distribute your product directly to consumers or partner with retailers? While direct-to-consumer e-commerce and company owned stores eliminate the need to pay a retailer margin, the costs of selling through retailers need to be balanced against the customer acquisition costs and potentially higher shipping and logistics costs that companies will incur selling through a direct model.

[11] Here we are using annual time period, but this analysis can also be done at monthly level.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

Apart from economics, there are other strategic considerations – for example, many DTC brands are finding that it is important to partner with retailers to scale their business.

If you choose to use a retail channel, you need to decide on the retailer margin you will pay your retailer partner and the other incentives you will need to offer retailers to support your product. Imagine that *Allbirds,* a DTC shoe company, decides to expand its business through retailers, and finds that even it needs to offer a 30% retail margin to its retailer partners and a 20% wholesale margin to the wholesaler partners who service the retailers . Is this worth it?

To understand this dilemma, let's understand channel economics.

Channel Economics

Before we get into the specifics of the Allbirds example, let's understand some of the basics of channel economics. **Figure 1** shows a typical channel structure where a manufacturer sells its products to wholesalers, who in turn sell it to retailers, who then sell it to consumers.

Figure 1 Channel Economics for Allbirds

Source: Author.

Retailer margins follow the same formula as gross margin (or contribution margin) for a manufacturer. The retailer's margin is a function of the price at which the retailer sells the product to its consumer, (the retail selling price or RSP) and the cost that the retailer incurs to purchase the item from the wholesaler (the wholesale selling price WSP), such that:

$$\text{Retailer Margin \%} = \frac{\text{Retail Selling Price} - \text{Wholesale Selling Price}}{\text{Retail Selling Price}} \quad (6)$$

And, the wholesaler calculates their margin in the same way, which is a function of the price at which the wholesaler sells the product to its customer, the retailer (the wholesale selling price or WSP) and the cost that the wholesaler incurs to purchase the item from the manufacturer (the manufacturer selling price or MSP), such that:

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

$$\text{Wholesaler Margin \%} = \frac{\text{Wholesale Selling Price} - \text{Manufacturer Selling Price}}{\text{Wholesale Selling Price}} \quad (7)$$

Finally, the manufacturer's gross margin or contribution margin is a function of the price at which the manufacturer sells the product to its customer, the wholesaler, (the manufacturer selling price or MSP) and the cost the manufacturer incurs to produce the product (the cost of goods sold or variable cost).

$$\text{Gross Margin \%} = \frac{\text{Manufacturer Selling Price} - \text{Cost of Goods Sold}}{\text{Manufacturer Selling Price}} \quad (8)$$

$$\text{Contribution Margin \%} = \frac{\text{Manufacturer Selling Price} - \text{Variable Cost}}{\text{Manufacturer Selling Price}} \quad (9)$$

In this figure, the retail selling price of the Allbirds shoes to consumers is $100 and retailer gets a 30% margin, or $30 per unit (note a channel partner or retailer margin is calculated using the selling price as the denominator, not the cost incurred to purchase the goods from a channel partner). The retailer receives the product from the wholesaler at $100 - $30 = $70, which is the wholesale selling price, or the price at which the wholesaler sells the product to retailer. The wholesaler earns a 20% margin on $70, or $14. Therefore, their cost of goods, which is the price at which manufacturer sells the product to the wholesaler is $70 - $14 = $56. If the cost of goods for the manufacturer is $36, its gross margin per unit is $20. Thus, Allbirds makes $20 in gross margin (for a 36% gross margin %) every time a retailer sells a pair of its shoes.

Now, consider the economics of Allbirds' DTC channel sale. When Allbirds sells directly to consumers via its own e-commerce website or its own stores (cutting out the wholesaler and the retailer middlemen), it receives the full retail selling price, $100, as revenue and incurs its cost of goods of $36 for a gross margin of $64 (a 64% gross margin %). Why wouldn't Allbirds want to grab a bigger slice of the profits from the sale of its products?

Now think about what else has to happen for Allbirds to sell its products directly to consumers. First, it must attract customers to its website or its stores. It must spend money on advertising to generate demand for its brand and products, incurring CAC. When Allbirds sells its product through retailers, the retailer, not Allbirds, incurs the costs associated with generating demand by offering a steady flow of eager customers in their own stores. In the retailer model, Allbirds's CAC is much reduced. Second, when selling directly, Allbirds must service and fulfill the demand for its products, which requires paying for the logistics of maintaining inventory, warehousing its products, picking and packing orders, shipping, handling returns, and managing customer questions, complaints, and service requests during and after the sale. In the retailer model, the retailer partner takes on all of these costs for Allbirds. Chances are that the costs associated with demand generation, demand fulfillment, and after sales service that Allbirds will need to take on when selling direct may exceed the cost of the margin it has to pay retailers to take on those costs. Why? Because retailers are able to amortize these costs across a full assortment of brands and products that they sell. Each customer that comes into a retailer's store has the opportunity to buy a basket of brands and products, generating greater volume and profits that can be used to generate and fulfill demand. Conversely, Allbirds is only selling its own products and will likely be much less efficient as a result.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

In this example, Allbirds needs to calculate the total costs associated with its own demand generation, demand fulfillment, and after sales service expenses. Imagine that Allbirds needs to spend $30 in CAC to attract a customer to its website and that customers buy only one pair of Allbirds over their lifetime. And, that shipping a pair of shoes to the customer costs $15 in fulfillment expenses (to hold inventory, pick, pack, and ship the shoes, and to account for some percentage of shoes that are returned and have to be handled and scrapped). Now, for the $100 in revenue, Allbirds receives the following in profit:

$100 - $36 COGS = $64 gross margin - $34 CAC - $15 fulfillment expense = $15 in profit

Under this cost scenario, Allbirds makes more money when it sells through retailers than it does selling its product itself. While its gross margin is higher when it sells direct, its operating profit is lower because Allbirds incurs higher demand generation and demand fulfillment expenses that fall below the line and hit operating margin.

Trade Promotions

Firms often provide incentives to retailers in the form of trade promotions. For example, in order to encourage retailers to promote its product, Coca-Cola may decide to offer them $1 off per case of 24 cans of Coke for the next four weeks. As independent businesses, retailers can choose to pass on this discount to consumers, called *pass through,* or simply buy discounted cases and sell them at the regular price. In other words, retailers can pocket the discount instead of passing it on to consumers - clearly something that Coca-Cola does not want. As Coca-Cola, you want to assess what retailers might do in the following scenario:

- Assume a retail selling price of a case of Coke = $8.00
- Assume an average retail margin per case = 30%
- Assume a trade promotion discount to retailers = $1 per case

Without the trade promotion, the retailer's margin is $8.00 * 30% or $2.40 and its cost of goods (the manufacturer's selling price) is $8.00 - $2.40 = $5.60 per case. If Coke offers $1 off per case, the retailer's COGS goes down to $5.60 - $1.00 = $4.60 per case. Now, the retailer has two choices:

- They can pass on the $1 discount to consumers and price the case at $7.00 for a price reduction of $1/$8 or 12.5%, and still make $2.40 in margin, or
- They can pocket the discount, keep the retail selling price at $8.00, and increase their retailer margin by $1 to $3.40 and increase their retailer margin from 30% to 42.5%, a $1/$2.40 = 42% increase.[12]

In other words, the retailer would be inclined to pass on the discount to consumers only if Coke sales are likely to go up at least 42% as a result of a 12.5% retail price discount. Using past data and judgment, the retailer can decide the profit maximizing course of action.

Expanding Product Line and Business Scope

Expanding the product line and entering adjacent businesses is an often used approach for growth. BMW expanded its product line by introducing the BMW one series. Tiffany started offering low-end

[12] In practice, retailers can pass a portion of the promotional offer. There may also be legally binding constraints.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

silver jewelry to attract younger consumers. Apple launched Apple Music to reduce reliance on its devices. High-end luxury brands often launch less expensive versions to grow their customer base. How should we evaluate these decisions? There are several pros and cons of this approach.

On the positive side, the new product line could attract new users and generate additional sales. These users might also upgrade in the future to the more expensive products of the firm. Adjacent businesses, such as Apple Music, could create stickiness for the firm. On the negative side, a new product line might cannibalize existing products and reduce overall profitability. The introduction of low-end products could also dilute the equity of the brand that could result in long-term negative impact. While it is hard to quantify the impact of all these factors, especially in advance, it is advisable to identify the most critical factors and estimate their impact through historical data, experiments or managerial judgment.

Consider the case of the *Economist* magazine that offers annual subscription for $189 for print and $95 for their digital version. While print and digital may appeal to different segments, it is quite possible that print subscribers may switch to digital version at half the annual price. Should the *Economist* be concerned?

Let's start by thinking through what information we need to evaluate this decision. First, we need to know costs – the marginal production and distribution cost for a new digital subscriber is close to zero, while the marginal cost of a print subscriber is the additional cost of print/paper and distribution (for our example, assume it is 20% of the price). Therefore,

- Profit margin per print subscriber = $189 * (100%-20%) = $151.20
- Profit margin per digital subscriber = $95

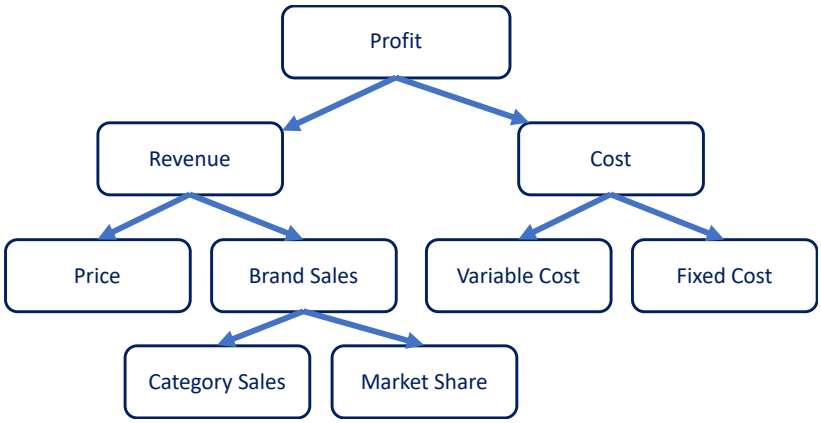
This suggests that cannibalization of print by digital would be detrimental. However, this may not be the complete story. What if the retention rates of print and digital subscribers are 60% and 90% respectively? Using the simplified LTV formula described earlier, it is easy to see that in this scenario, the LTV for a print subscriber = $151.20/(1 - .60) = $378.00 compared to the LTV of $95/(1 - .90) = $950.00 for a digital subscriber. Therefore, cannibalization from digital should not be a concern for the *Economist.* You can further include customer acquisition cost, which might also differ for print and digital subscribers.

Sales and Market Share

As markets mature, sales growth slows down and the battle for market share intensifies. What are the appropriate actions for a brand in such a situation? **Figure 2** shows the drivers of profit. An often used strategy by companies in mature markets is to focus on cost reduction. However, there are limits to reducing costs, so eventually the firm has to find ways to improve revenues, either by increasing sales or price. In this section we focus on sales, in the next section we will discuss pricing.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

Figure 2 Drivers of Profit



Source: Author.

One option to increase sales is to grow the product category by generating primary demand. This strategy is especially useful for market leaders. An often used approach for category growth is to find new uses for the product. For example, cereal brands started encouraging consumers to eat cereal as a healthy option throughout the day, not just at breakfast time. Snickers advertised itself as "hunger bars" that could satisfy hunger at break times. In India, Knorr promoted its soups as a healthy snack for children after school and before dinner, which led to a significant growth of the category in a market that had a very low consumption of soups.

A second option to grow sales is to gain market share from competitors by building secondary demand. Before taking any action, it is useful to understand why your brand share is low. For this diagnosis, it is helpful to breakdown market share into three components:

$$\text{Market share} = (\%\ \text{Awareness}) * (\%\ \text{Trial}) * (\%\ \text{Repeat rate}) \quad (10)$$

- *Awareness:* What percent of target consumers are aware of your brand? If awareness is low, then brand advertising may be the appropriate action.
- *Trial:* What percent of target market has tried your product? If consumers are aware but have not tried your brand, then free samples may be appropriate. Many digital products offer freemium pricing and free trials for this reason.
- *Repeat rate:* What percent of consumers who have tried your brand are buying it again? If consumers are not repeat buying your brand, then you may need to re-examine your product. Low repeat rate may be due to low usage of the brand or due to lack of loyalty.

For example, the market share of a brand with 80% awareness, 40% trial and 20% repeat rate would be (80%) * (40%) * (20%) = 6.4%. Note, two brands may have the same market share but different percent of awareness, trial and repeat rates, and will therefore require different actions.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

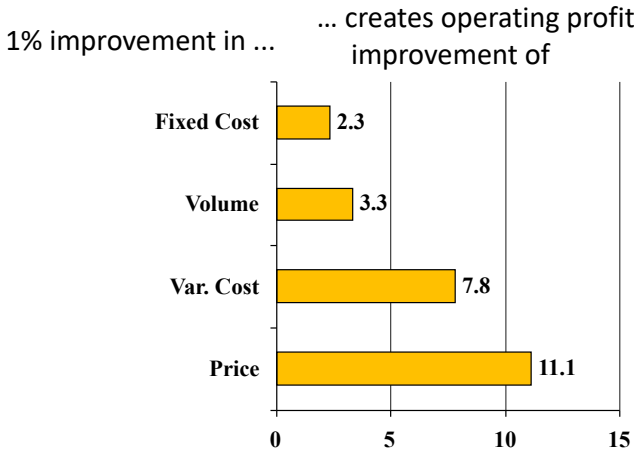
Pricing Strategy

Pricing is a critical factor in capturing value. As products mature and become less differentiated, price competition intensifies and margin erodes. It may be necessary to reduce price to stay competitive in the marketplace and maintain market share, but you should also consider the impact of pricing decisions on profitability.

Impact of Price on Profits

Figure 3 shows the impact of various levers on profits based on a McKinsey study of about 2,500 global companies. These results suggest that, given the business models of these companies, a 1% price reduction, with no change in volume, would, on average, decrease profits by 11.1%. Conversely, a 1% price increase would, on average, increase profits by 11%, *ceteris paribus*. Of course, individual results would vary by company depending upon how sensitive demand for the company's products and services are to changes in price. In most situations, we expect volume to go up with price reduction. Figure 3 shows that a 1% increase in volume improves profit by 3.3%. Even if volume increases by 3%, resulting in a 9.9% increase in profit, it won't compensate for a 11.1% profit decline from a 1% price cut. In other words, unless the *price elasticity* (the percent change in volume associated with a 1% change in price) is more than 3, on average, it is not profitable to cut price.[13]

Figure 3 Comparison of Profit Levers



Source: Michael V. Marn and Robert L. Rosiello, "Managing Price, Gaining Profit," *Harvard Business Review*, Sep-Oct 1992.

Table 2 highlights the impact of price change on profits in a slightly different way. It presents a scenario of a firm whose product is currently priced at $100, and its variable cost is $60. Therefore, for every unit the firm sells, it generates a margin of $40. Now, consider what happens if the firm cuts its price by 10% or 20%, or increases its price by 10% or 20%. In all scenarios we assume that variable cost remains the same, i.e., there are no economies of scale. Under these different pricing options, the unit margin is simply $20-$60 as shown in the table.

[13] Price elasticity is defined as the percent change in volume for 1% change in price. It is typically negative (volume increases with price cut), but in our discussion we refer to its absolute value.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

Table 2 Impact of Price Change on Breakeven Volume

	20% Price Reduction	10% Price Reduction	Current Price	10% Price Increase	20% Price Increase
Price	$80	$90	$100	$110	$120
Variable Cost	$60	$60	$60	$60	$60
Margin	$20	$30	$40	$50	$60
Breakeven Volume	2	1.33	1	0.8	0.67

Source: Adapted from Robert J. Dolan and Hermann Simon, *Power Pricing: How Managing Price Transforms the Bottom Line*, The Free Press 1997.

The interesting part is to note the breakeven volume, or the volume needed to make the same contribution margin as the firm makes under its current price. Table 2 shows the following:

- A 10% price cut requires a 33% increase in volume to breakeven, while a 20% price cut requires a 100% increase in volume – showing a much steeper curve as you make deeper price cuts.
- Conversely, a 10% increase in price requires only holding onto 80% of current volume to breakeven, and a 20% price increase requires holding onto 67% of current volume – a much shallower curve.
- Finally, imagine if the variable cost is $70 instead of $60, i.e., a lower margin per unit that is typical in commodity markets. In this case, a 20% price cut would require three times the current volume to breakeven. Ironically, firms in commodity markets resort to price wars when significant volume gains are extremely hard.

Price Elasticity

As the previous discussion illustrates, an informed pricing decision requires a good understanding of how sensitive a product's demand is to changes in its price – or its *price elasticity*.

Price elasticity = Percentage change in volume demanded/Percentage change in price (11)

There are several ways to estimate it.

Historical Data Price elasticity can be estimated by building models, such as regressions, on past data of volume sales and prices. Based on meta-analysis of 81 studies and 1,851 price elasticities, one study estimated the average price elasticity for consumer packaged goods brands as -2.62.[14] For a 1% increase in price, we would expect these brands to lose 2.62% in volume.

Conjoint Analysis For new products that lack historical data or the ability to do experiments, techniques such as conjoint analysis can be used, where a consumer is asked to choose from a series of options that carefully vary various product attributes including price. Consumer choices reveal how they tradeoff various product features with price.[15]

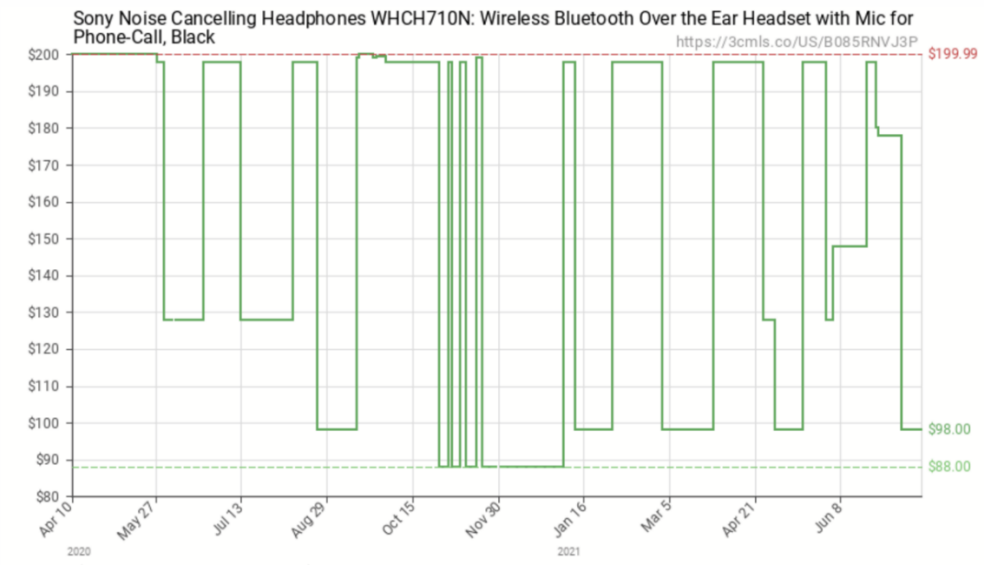
[14] Dominique Hanssens, *Empirical Generalizations about Marketing Impact,* Marketing Science Institute, Sep 2015.

[15] For additional information, see Elie Ofek and Olivier Toubia, "Conjoint Analysis: A Do it Yourself Guide," *HBS Note*, 515-024, August 4, 2014.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

Experiments In the digital era, it is relatively easy to do experiments where a firm can vary prices and observe shifts in demand. Amazon conducts hundreds of pricing experiments daily to assess consumers' price elasticity. **Figure 4** shows price variation for Sony noise cancelling headphones over a year.

Figure 4 Amazon's price for Sony Noise Canceling Headphones, July 23, 2020- July 23, 2021.



Source: camelcamelcamel.com, accessed July 23, 2021.

Conclusion

Marketing is a combination of art and science. It requires both qualitative and quantitative assessment of various factors to arrive at effective decisions. It is best to start with qualitative evaluation and wherever possible support your arguments with quantitative analysis. For example, if you argue that a firm should enter a particular market segment because it is large, you may want to show the size of the market segment by estimating TAM. You may not always have the relevant information to do quantitative analysis, and may need to make suitable assumptions. However, whenever possible, you should always attempt to add the rigor of quantitative analysis. But quantitative analysis for the sake of analysis is not useful unless it helps in decision making. Therefore, it is important to ask the "so what" question after you have crunched the numbers. In general, a sequence of qualitative-quantitative-qualitative analysis is the best way to proceed.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.

Exhibit 1 Calculating LTV to account for the time value of money

In the RC Marketing course, we'll simplify the LTV calculation by assuming that the firm's discount rate or cost of capital is equal to zero (given that you will not learn about the time value of money until later in the semester in your Finance course). However, in the real world, a firm's discount rate or cost of capital is greater than zero, which requires us to use a more complicated formula to measure LTV that takes this metric into account.

We can construct a year-by-year spreadsheet of the expected margins we expect to receive from customers given the annual retention rate (and discount it back to its present value using *i* as the discount rate) to calculate LTV if the annual margin (*m*) or annual retention rate (*r)* is changing over time, or if we assume a constant annual margin (*m*) and a constant annual retention rate (*r*) over time, then LTV can be written as:

$$LTV = 0 + \frac{m}{(1+i)} + \frac{m * r}{(1+i)^2} + \frac{m * r^2}{(1+i)^3} + \cdots \quad (12)$$

This formulation assumes the following:

- The firm acquires the customer at time 0, and the customer starts paying at time 1 and continues to generate a margin *m* for the company from that period on.
- To account for time value of money, we discount the margin of period 1 by $1/(1+i)$, where *i* is the discount rate or the cost of capital.
- At each period, customers have a probability r of staying with the firm, or (1-*r*) probability of churning. Therefore, at the end of period 2, "r" percent (e.g., 80%) of customers stay with the firm, at the end of period 3, r^2 (e.g., 80%*80%=64%) customers stay with the firm, and so on.

Equation (12) is a geometric series that can be simplified and rewritten as[16]:

$$LTV = \frac{m}{(1-r+i)} = \frac{annual\ margin}{annual\ churn + annual\ discount\ rate} \quad (13)$$

Source: Case writer

[16] For details about CLV under different assumption, see Sunil Gupta and Donald R. Lehmann, *Managing Customers as Investments,* 2005.

This document is authorized for use only in Professor Avery's Marketing Fall 2025 at Harvard Business School from Jul 2025 to Sep 2026.