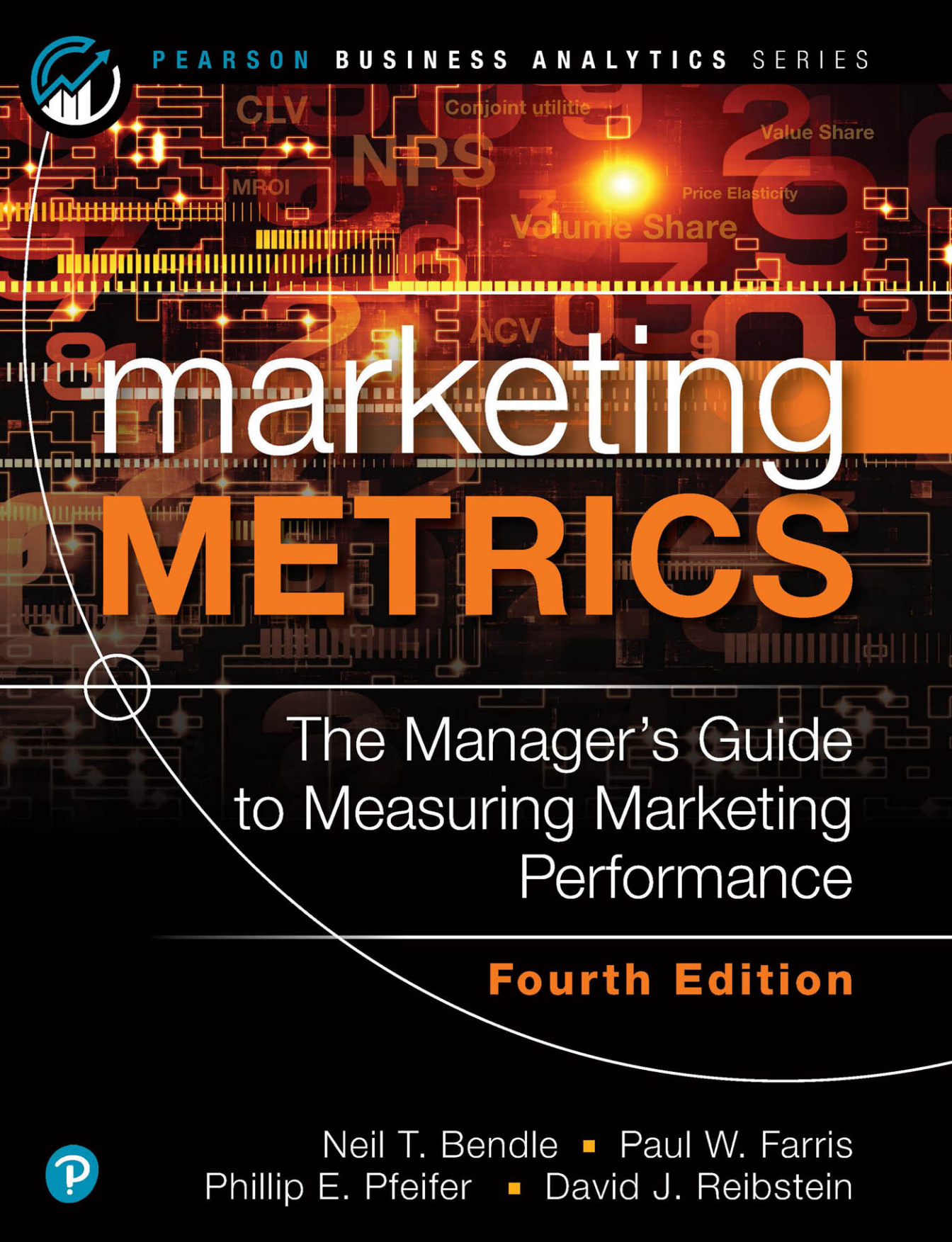
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MARKETING METRICS

FOURTH EDITION

$$\text{Value in Future Period} = \text{Value in Year 0} * (1 + \text{Growth Rate}) \wedge \text{Number of Years}$$
$$= \$100 * (100\% + 10\%) \wedge 3$$
$$= \$100 * 133.1\% = \$133.10$$

Compound Annual Growth Rate (CAGR): *A constant year-on-year growth rate applied over a period of time. Given starting and ending values and the length of the period involved, it can be calculated as follows:*

$$\text{CAGR (\%)} = \{[\text{Ending Value (\$, \#)}/\text{Starting Value (\$, \#)}] \wedge 1/\text{Number of Periods (\#)}\} - 1$$

EXAMPLE: Let's assume we have the results of the compounding growth observed in the previous example, but we don't know what the growth rate was. We know that the starting value was $100, the ending value was $133.10, and the number of years was 3. We can simply enter these numbers into the CAGR formula to derive the CAGR.

$$\text{CAGR} = [(\text{Ending Value}/\text{Starting Value}) \wedge (1/\text{Number of Years})] - 1$$
$$= [(\$133.10/\$100) \wedge 1/3] - 1$$
$$= [1.331(\text{The Increase}) \wedge 1/3(\text{Cube Root})] - 1 = 1.1 - 1 = 10\%$$

Thus, we determine that the growth rate was 10%.

Data Sources, Complications, and Cautions

Percentage growth is a useful measure as part of a package of metrics. It can be deceiving, however, if not adjusted for the addition of such factors as stores, salespeople, or products or for expansion into new markets. "Same store" sales and similar adjustments for other factors tell us how effectively a company uses comparable resources. These adjustments, however, are limited by their deliberate omission of factors that weren't in operation for the full period under study. Adjusted figures must be reviewed in tandem with measures of total growth.

Be careful about the difference between percentage changes and changes in percentage points. Consider a firm that grew 10% last year. This year, a marketer might say that the rate of growth increased by 10%. This means that the growth was 10% more than last year, so 10% * (1 + 10%) means growth was 11%. If growth increased by 10 *percentage points*, growth would now be 20%. It had increased from 10% and added 10 more percentage points. This is dramatically different.

You may also hear about basis points, a related term. *Basis points* are simply percentage points divided by 100, so 50 basis points equal 0.5%. Basis points are often used in finance because fractional percentage point differences can make very significant differences in outcomes, and it is easier to speak of basis points than fractions of a percentage point.

Related Metrics and Concepts

Life Cycle: *Marketers view products as passing through four stages of development:*

- **Introductory:** *Small markets not yet growing fast*
- **Growth:** *Larger markets with faster growth rates*
- **Mature:** *Largest markets but little or no growth*
- **Decline:** *Variable size markets with negative growth rates*

This is a rough classification. No generally accepted rules exist for making these classifications.

4.3 Cannibalization Rates and Fair Share Draw

Cannibalization is the reduction in sales (units or dollars) of a firm's existing products due to the introduction of a new product. The cannibalization rate is generally calculated as the percentage of a new product's sales that represents a loss of sales (attributable to the introduction of the new entrant) of a specific existing product or products.

$$\text{Cannibalization Rate (\%)} = \frac{\text{Sales Lost from Existing Products (\#, \$)}}{\text{Sales of New Product (\#, \$)}}$$

Cannibalization rates represent an important factor in the assessment of new product strategies.

Fair share draw constitutes an assumption or expectation that a new product will capture sales (in unit or dollar terms) from existing products in proportion to the market shares of those existing products.

Cannibalization is a familiar business dynamic. A company with a successful product that has strong market share faces two conflicting ideas. The first is that it wants to maximize profits on its existing product line, concentrating on the current strengths that promise success in the short term. The second idea is that this company—or its competitors—may identify opportunities for new products that better fit the needs of

certain segments. If the company introduces a new product in this field, however, it may "cannibalize" the sales of its existing products. That is, it may weaken the sales of its proven, already successful product line. If the company declines to introduce the new product, however, it leaves itself vulnerable to competitors launching such a product and thereby capturing sales and market share from the company. Often, when new segments are emerging and there are advantages to being early to market, the key factor becomes timing. If a company launches its new product too early, it may lose too much income on its existing line; if it launches too late, it may miss the new opportunity altogether.

> **Cannibalization:** *A market phenomenon in which sales of one product are achieved at the expense of some of a firm's other products.*

The cannibalization rate is the percentage of sales of a new product that comes from a specific set of existing products.

$$\text{Cannibalization Rate (\%)} = \frac{\text{Sales Lost from Existing Products (\#, \$)}}{\text{Sales of New Product (\#, \$)}}$$

EXAMPLE: A company has a single product that sold 10 units in the previous period. The company plans to introduce a new product that will sell 5 units with a cannibalization rate of 40%. Thus, 40% of the sales of the new product (40% * 5 units = 2 units) comes at the expense of the old product. Therefore, after cannibalization, the company can expect to sell 8 units of the old product and 5 of the new product, or 13 units in total.

Any company considering introducing a new product should confront the potential for cannibalization. A firm would do well to ensure that the amount of cannibalization is estimated beforehand to provide an idea of how the product line's contribution as a whole will change. If performed properly, this analysis will tell a company whether overall profits can be expected to increase or decrease with the introduction of the new product line.

EXAMPLE: Lois sells umbrellas on a small beach, where she is the only provider. Her financials for last month were as follows:

Umbrella Sales Price:	$20
Variable Cost per Umbrella:	$10
Umbrella Contribution per Unit:	$10
Total Unit Sales per Month:	100
Total Monthly Contribution:	**$1,000**

Next month, Lois plans to introduce a bigger, lighter-weight umbrella called the "Big Block." Projected financials for the Big Block are as follows:

Big Block Sales Price:	$30
Variable Cost per Big Block:	$15
Big Block Contribution per Unit:	$15
Total Unit Sales per Month (Big Block):	50
Total Monthly Contribution (Big Block):	**$750**

If there is no cannibalization, Lois thus expects her total monthly contribution will be $1,000 + $750 = $1,750. Upon reflection, however, Lois thinks that the unit cannibalization rate for Big Block will be 60%. Her projected financials after accounting for cannibalization are therefore as follows:

Big Block Unit Sales:	50
Cannibalization Rate:	60%
Regular Umbrella Sales Lost:	50 * 60% = 30
New Regular Umbrella Sales:	100 – 30 = 70
New Total Contribution (Regular):	70 Units * $10 Contribution per Unit = $700
Big Block Total Contribution:	50 Units * $15 Contribution per Unit = $750
Lois's Total Monthly Contribution:	**$1,450**

Under these projections, total umbrella sales will increase from 100 to 120, and total contribution will increase from $1,000 to $1,450. Lois will replace 30 regular sales with 30 Big Block sales and gain an extra $5 unit contribution on each. She will also sell 20 more umbrellas than she sold last month and gain $15 unit contribution on each.

In this scenario, Lois is in the enviable position of being able to cannibalize a lower-margin product with a higher-margin one. Sometimes, however, new products carry unit contributions lower than those of existing products. In such instances, cannibalization reduces overall profits for the firm.

An alternative way to account for cannibalization is to use a weighted contribution margin. In the previous example, the weighted contribution margin would be the unit margin Lois receives for Big Block after accounting for cannibalization. Because each Big Block contributes $15 directly and cannibalizes the $10 contribution generated by regular umbrellas at a 60% rate, Big Block's weighted contribution margin is $15 – (0.6 * $10), or $9 per unit. Because Lois expects to sell 50 Big Blocks, her total contribution is projected to increase by 50 * $9, or $450. This is consistent with our previous calculations.

If the introduction of Big Block requires some fixed marketing expenditure, then the $9 weighted margin can be used to find the break-even number of Big Block sales required to justify that expenditure. For example, if the launch of Big Block requires $360 in one-time marketing costs, then Lois needs to sell $360/$9, or 40 Big Blocks to break even on that expenditure.

If a new product has a margin lower than that of the existing product that it cannibalizes, and if its cannibalization rate is high enough, then its weighted contribution margin might be negative. In that case, company earnings will decrease with each unit of the new product sold.

Cannibalization refers to a dynamic in which one product of a firm takes share from one or more other products of *the same firm*. When a product takes sales from a competitor's product, that is not cannibalization, although managers sometimes incorrectly state that their new products are "cannibalizing" sales of a competitor's goods. You can only cannibalize your own sales; taking sales from rivals is not considered cannibalization.

Though it is not cannibalization, the impact of a new product on the sales of competing goods is an important consideration in a product launch. One simple assumption about how the introduction of a new product might affect the sales of existing products is called *fair share draw*.

> **Fair Share Draw:** *The assumption that a new product will capture sales (in unit or dollar terms) from existing products in direct proportion to the market shares held by those existing products.*

EXAMPLE: Three rivals compete in the youth fashion market in a small town. Their sales and market shares for last year appear in the following table:

Firm	Sales	Share
Threadbare	$500,000	50%
Too Cool for School	$300,000	30%
Tommy Hitchhiker	$200,000	20%
Total	$1,000,000	100%

A new entrant is expected to enter the market in the coming year and to generate $300,000 in sales. Two-thirds of those sales are expected to come at the expense of the three established competitors. Under an assumption of fair share draw, how much will each firm sell next year?

If the new firm takes two-thirds of its sales from existing competitors, then this "capture" of sales will total (2/3) * $300,000, or $200,000. Under fair share draw, the breakdown of

that $200,000 will be proportional to the shares of the current competitors. Thus, 50% of the $200,000 will come from Threadbare, 30% from Too Cool, and 20% from Tommy. The following table shows the projected sales and market shares next year of the four competitors under the fair share draw assumption:

Firm	Sales	Share
Threadbare	$400,000	36.36%
Too Cool for School	$240,000	21.82%
Tommy Hitchhiker	$160,000	14.55%
New Entrant	$300,000	27.27%
Total	$1,100,000	100%

Notice that the new entrant expands the market by $100,000, an amount equal to the sales of the new entrant that *do not* come at the expense of existing competitors. Notice also that under fair share draw, the relative shares of the existing competitors remain unchanged. For example, Threadbare's share, relative to the total of the original three competitors, is 36.36/(36.36 + 21.82 + 14.55), or 50%—equal to its share before the entry of the new competitor.

The opposite of cannibalization is incremental sales. This is when the introduction of a new product may boost sales for a complementary product—one that naturally goes with the product.

Data Sources, Complications, and Cautions

As noted previously, with cannibalization, one of a firm's products takes sales from one or more of *that* firm's other products. Sales taken from the products of competitors are not "cannibalized" sales, although some managers label them as such.

Cannibalization rates depend on how the features, pricing, promotion, and distribution of the new product compare to those of a firm's existing products. The greater the similarity of their respective marketing strategies, the higher the cannibalization rate is likely to be.

Although cannibalization is always an issue when a firm launches a new product that competes with its established line, this dynamic is particularly damaging to the firm's profitability when a low-margin entrant captures sales from the firm's higher-margin offerings. In such cases, the new product's weighted contribution margin can be negative. Even when cannibalization rates are significant, however, and even if the net effect on the bottom line is negative, it may be wise for a firm to proceed with a new product if management believes that the original line is losing its competitive strength. The following example is illustrative.