

you take their feedback for granted. They never sue or threaten to sue. And, because they feel committed to you and see value in emotional terms, they will pay more for what they get from you...because they're convinced it is worth it.

Issuing funny hats and face paint to customers or teaching them the company fight song won't yield the enthusiastic fervor that you witness at the stadium, in the stands, or on the tube. Customers are not attracted by the cosmetics of customer love. But include customers, connect with them, teach them, trust them, reassure them, wow them, and care for them, and they will passionately reward you with their devotion, their advocacy, and their funds.

THE STRATEGY OF BUNDLING

Barry Nalebuff

One of the distinguishing features of our modern economy is the competitive success achieved by product bundles. There are many reasons why bundling is an extremely effective strategy. Yet, the advantages of bundling are not well understood. This chapter provides some of the intuition for how bundling works—and when it doesn't.

The advantage of bundling was first recognized by Augustin Cournot.¹ Further advances were discovered by Stigler;²

¹ Cournot, Augustin. (1838). *Recherches sur les principes mathématiques de la théorie des richesses*. Paris: Hachette. English translation: (N. Bacon, trans.), *Research into the Mathematical Principles of the Theory of Wealth*. Mountain Center, CA: James and Gordon, 1995.

² Stigler, George. (1968). "A Note on Block Booking." In G. J. Stigler (Ed.), *The Organization of Industries*. Homewood, IL: Irwin.

The Many Facets of Leadership, edited by M. Goldsmith, V. Govindarajan, B. Kaye, and A. Vicere. Upper Saddle River, NJ: FT Prentice Hall, 2003.

McAfee, McMillan, and Whinston;³ and Nalebuff.^{4,5} Only recently has the theory moved from the academic journals to the public policy arena. Its debut was dramatic. In 2000, the \$45 billion proposed merger between General Electric and Honeywell was blocked by the European Union Merger Task Force. A primary reason for their objection to this combination was a concern over bundling.

It will help to define bundling right at the outset. Many items are sold as a package. A car is a bundle of seats, wheels, engine, transmission, gas pedal, cup holders, and much more. An obvious explanation for these types of bundles is that the company can integrate the products better and cheaper than the customers can. While cost savings and product improvements offer powerful motivation to offer a bundle, it is not the focus of this chapter.

For our purpose, a *bundling* is a combination of products that is sold at a discount relative to the individual items.⁶ We imagine that the customer can put the items together as well as the seller. Thus, we are interested in exploring bundling as

³ McAfee, R. Preston, John McMillan, and Michael Whinston. (1989, May). "Multiproduct Monopoly, Commodity Bundling, and Correlation of Values." *Quarterly Journal of Economics* 104, 371-84.

⁴ Nalebuff, Barry. (1999). "Bundling." Working paper. [Online]. Social Science Research Network Available: <http://papers.ssrn.com>.

Nalebuff, Barry. (2000). "Competing Against Bundles." In P. Hammond and G.D. Myles (Eds.), *Incentives, Organization, and Public Economics*. Oxford University Press: London.

Nalebuff, Barry. (2001). "A Bundle of Trouble: Bundling and the GE-Honeywell Merger." Yale SOM working paper.

Stigler, George. (1968). "A Note on Block Booking." In G. J. Stigler (Ed.), *The Organization of Industries*. Homewood, IL: Irwin.

⁵ Stigler and McAfee, McMillan, and Whinston show how bundling reduces customer heterogeneity and thereby allows a firm to do a better job at pricing. Nalebuff (1999) shows how a multiproduct incumbent can use bundling to deter the entry of a single product rival. Nalebuff (2000, 2001) emphasizes bundling complements, the theme of this chapter.

⁶ We assume that the items are sold individually as well as in the bundle. This case is typically called mixed bundling. If the items are sold only as part of a bundle, this is called pure bundling.

a pricing strategy. If the package is simply priced at the sum of its component prices, we do not call this bundling, as there is no strategic impact of the bundle pricing.

Microsoft Office is our motivating example of a bundling strategy. The 2001 list price for Office XP Professional was \$547. You could buy the components separately, but you wouldn't. Word, Excel, PowerPoint, and Access each cost \$339, and Outlook is a bargain of \$109. The total adds up to \$1,465. The software package came at a 60 percent discount compared to the individual items. This made it very hard for someone with just one product to compete, and indeed Microsoft has come to dominate most of these product categories.

Microsoft Office's success was achieved in spite of the fact that prior to its arrival, there were successful firms each selling individual software applications, such as WordPerfect, Quattro or Lotus, Adobe PageMill, and Harvard Graphics. While no single factor explains Microsoft's success, one advantage gained via a bundle discount strategy can be found in the writings of Cournot.⁷

Cournot considered a market in which consumers are interested in buying a collection of several complementary products. Modern examples include hardware and software, ski rentals and lift tickets, and aircraft engines and avionics. When determining whether or not to purchase a bundle, the consumer takes into account the aggregate cost. Thus, a computer user examines the cost of hardware and software; a skier considers the price of lodging, transportation, lift tickets, equipment, and lessons; an airline looks at the total cost of equipping a plane. In Cournot's words:⁸

⁷ Other explanations for the success of MS Office include the delay by Novell and others in updating their products to be compatible with Windows in its migration from DOS.

⁸ Cournot, Augustin. (1838). *Recherches sur les principes mathématiques de la théorie des richesses*. Paris: Hachette. English translation: (N. Bacon, trans.), *Research into the Mathematical Principles of the Theory of Wealth*. Mountain Center, CA: James and Gordon, 1995.

We imagine two commodities, (a) and (b), which have no other use beyond that of being jointly consumed in the production of the composite commodity (ab). ...Simply for convenience of expression we can take for examples copper, zinc, and brass under the fictitious hypothesis that copper and zinc have no other use than that of being jointly used to form brass by their alloy.

Cournot considered the case where each component that goes into the bundle is produced by a monopoly. His key insight is that if the two monopolists get together, they will make more money by pricing the bundle of their goods *lower* than if they acted individually.

While it is not surprising that coordinated pricing leads to higher profits, what is surprising is that coordinated pricing leads to a *reduction* in prices. Both consumers and firms are better off. The reason is that the two firms are complementary—each firm's product makes the other's more valuable. Thus, when one firm lowers its price, the other firm's sales increase, an externality that is not taken into account with uncoordinated pricing. There is an advantage to bundling when two firms each have market power, but each is missing one of the complementary products.

Here, we take the next step. We examine what happens when there is competition between the component products that go into the bundle. Our objective is to better understand what happens when a player in the market aggregates a collection of complements and sells them as a bundle, while the competition remains independent or uncoordinated.

Following the intuition of Cournot, it will not be surprising that the bundler does better than the collection of independent competitors. But the scale of the advantage is remarkable. Table 26.1 gives some numbers based on a linear demand specification.⁹ Firm A sells all the items as a bundle, while the Firm B acts in an uncoordinated fashion. Once there are four or

⁹ The full model can be found in Nalebuff (2000). For simplicity, the total market is fixed at size 1 and Firm A offers its goods only as part of a pure bundle. Allowing for market expansion and mixed bundling only increase the incentive to bundle.

TABLE 26.1 Bundler vs. Independent Competitors

NUMBER OF GOODS	FIRM A'S BUNDLE PRICE	FIRM B'S COMPO-NENT PRICE	FIRM A'S MARKET SHARE	FIRM A'S PROFIT	FIRM B'S PROFIT	COMBINED FIRM B PROFITS
2	1.45	0.86	0.63	0.91	0.32	0.64
3	2.09	0.88	0.70	1.47	0.26	0.78
4	2.84	0.92	0.76	2.15	0.22	0.88
5	3.63	0.94	0.79	2.88	0.19	0.95
6	4.48	0.96	0.82	3.69	0.17	1.02
7	5.40	0.99	0.84	4.56	0.15	1.08
8	6.36	1.02	0.86	5.48	0.14	1.12

more items to the bundle, the bundle aggregator has captured 75 percent of the market and 71 percent of total profits.¹⁰ By the time there are eight items in the bundle, Firm A has 86 percent market share and 83 percent of the industry profits.

This suggests that a firm that creates or simply aggregates a bundle of complementary products would have a substantial pricing advantage over its rivals and thereby achieve a leadership position in the market. This is especially true as the bundle grows in scale.

Moreover, the advantage is long lasting. The rivals do not have an incentive to emulate this strategy, as this would lead to even more ferocious competition. The resulting competition of bundle against bundle would leave the independent sellers even worse off than they are in their present disadvantaged position. Thus, it might seem that the first firm to bundle has a large sustainable advantage over its rivals.¹¹

¹⁰ Firm A's profits are slightly lower than its market share due to the bundle discounting. Bundling leads to essentially equal profits for Firm A compared to non-bundling with three items; with more than three goods in the bundle, bundling leads to higher profits.

¹¹ This, of course, doesn't take into account that forming a competing bundle would also destroy the rival firm's profits. Misery loves company. Or, more to the point, firms may prefer not to be in such an asymmetric position relative to a rival when there are issues of research and development financing or similar dynamic issues in long-term competition.

However, like all results, the advantage of bundling depends on some key assumptions. A crucial assumption required for this result is that the *sellers charge a single price to all consumers in the market*. This is a quite reasonable assumption for a typical consumer good, such as Microsoft Office. But it is not a reasonable assumption for most commercial products, where the two parties typically engage in extensive negotiation as part of the sale process.

When price negotiation is possible—the firm can charge different prices to different customers—then it is no longer clear that the Cournot effect will be present. (This is the heart of the argument for why bundling is neither empirically or theoretically relevant to the aviation and aerospace industry.) The ability to negotiate differently with different customers depends on information quality. In a world in which vendors know their customers' valuations and charge differential prices, there is no gain from bundling, either in profits or in market share.

Consider the case of three firms, one A and two B firms. (As will be clear, the results apply to any number of firms and any number of products.) Firm A can sell its products individually or as a bundle or both ways, a mixed bundle. The B firms can only sell their products individually. Marginal costs are symmetric at c .

These firms are selling to a customer whose preferences are known. For example, consider the competition for the customer who has a strong preference for A on good 1 and a weak preference for A on good 2. Imagine that the customer would pay an extra \$6 for Firm A's version of good 1 and an extra \$2 for Firm A's version of good 2. In this case, A should win both competitions. The customer has a preference for both its products. Before the B firms will concede defeat, they would be willing to price down to marginal cost, c , on each component. That means that A can charge up to $c + 6$ for the first component and $c + 2$ for the second and still make the sale. Firm A can also charge $2c + 8$ for the bundle and make the sale.

Profits of the A and B firms are exactly the same when A bundles as when it does not. In each case, the B firms earn

zero (which is the efficient outcome, as their products are inferior in this case) and the A firm earns 8. *The results are exactly the same when firms compete on a component-by-component basis. The option to bundle has no effect on prices, market share, or profits.* Thus, firms have no incentive to offer bundle discounts and consumers have no incentive to demand them.

When the customer valuation is known, there are no positive effects of bundling. However, bundling can be costly on two accounts. First, including inferior products in the bundle diminishes the product offering. Second, there is a reduction in product differentiation and thus increased competition in the market.

Firms make profits only to the extent that their products are differentiated. Profits exist to the extent that the firm has an advantage with the customer. When a firm bundles two good products or bad products together, the advantages (or disadvantages) sum up, and there is no impact. However, when a firm mixes good and bad products together and only sells a bundle, this mitigates the advantage, and profits fall accordingly. With mixed bundling, no one would buy the bundle and so there would be no effect at all.

Bundling is a powerful tool when applied in the right context. The advantage of bundling applies when the seller sets a single price in the market for all buyers. In some environments, every customer will pay a different price, while in other environments a firm will charge one price to all customers. There are three general situations under which a firm will set one price in the market to all of its customers.

The first case is one of necessity. If customers are numerous and small, no firm has the time to set a price to each customer—the costs of negotiation would outweigh any possible benefit. This would be the typical case for consumer goods. Most retailers, from movie theaters to corner stores to superstores such as Wal-Mart, use posted prices. Customers accept the price as fixed. There is no one to negotiate with.

The second case is when a firm is ignorant as to the customer's valuation. If the vendor doesn't know the customer's valuation, then there is no basis upon which to charge one

customer more than another. A cell phone provider might like to charge a different price based on whether the call is being used to discuss a business deal or a date, but without any way of knowing, it must price based on the number of minutes and not the value of the call.

The third case is when firms are contractually required to give each customer the best price given to any customer, what is sometimes called a most-favored customer clause. Firms commit themselves to a one-price rule through a contract.

There is a second concern that a firm should explore before pursuing a bundling strategy. Due to the risks involved, we should consider more carefully the nature of the competitive response before advising that a firm embark on this path. *Whatever advantages may exist, they quickly disappear if the rival firms coordinate and offer a competing bundle.* While the rivals do not have an incentive to offer a competing bundle, there are two factors that suggest that a bundle competing against uncoordinated components would not be a stable outcome in this market.

First, customers would stand to gain a great deal if they could create a bundle-against-bundle competition. To the extent that customers are not passive in this market, it is in their interest to induce the creation of rival bundles.

Second, rivals stand to lose very little by offering a competing bundle. The big loss comes out of the incumbent bundler. If firms are worried that the bundler will use its profit advantage to better position itself in research and development, then they will want to lower the incumbent's profits.

Any advantage of bundling assumes that other firms will not match. However, buyers are put in the best position of all if they can pit one bundle against another. Thus, firms should be concerned that rival firms will be induced to form competing bundles. Sometimes this is a greater threat than other times, depending on the coordination required (technical and strategic) and even whether all the components exist to form a rival bundle.

CONCLUSIONS

Bundling can help a firm significantly increase its profits and market share. It is best used when a firm must set a single price in the market and faces heterogeneity in customer valuations. Even here, it is not without risk if competitors are able to form a competing bundle. Bundling is less valuable when firms negotiate prices with each customer. When the risks are understood and if used in the right environment, bundling is one of the most powerful and least appreciated strategy tools.