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# Bundling and Competition on the Internet

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## Abstract

The Internet has significantly reduced the marginal cost of producing and distributing digital information goods. It also coincides with the emergence of new competitive strategies such as large-scale bundling. In this paper, we show that bundling can create “economies of aggregation” for information goods if their marginal costs are very low, even in the absence of network externalities or economies of scale or scope.

We extend the Bakos-Brynjolfsson bundling model (1999) to settings with several different types of competition, including both upstream and downstream, as well as competition between a bundler and single good and competition between two bundlers. Our key results are based on the “predictive value of bundling,” the fact that it is easier for a seller to predict how a consumer will value a collection of goods than it is to value any good individually. Using a model with fully rational and informed consumers, we use the Law of Large Numbers to show that this will be true as long as the goods are not perfectly correlated and do not affect each other’s valuations significantly. As a result, a seller typically can extract more value from each information good when it is part of a bundle than when it is sold separately. Moreover, at the optimal price, more consumers will find the bundle worth buying than would have bought the same goods sold separately. Because of the predictive value of bundling, large aggregators will often be more profitable than small aggregators, including sellers of single goods.

We find that these economies of aggregation have several important competitive implications:

1. When competing for upstream content, larger bundlers are able to outbid smaller ones, all else being equal. This is because the predictive value of bundling enables bundlers to extract more value from any given good.

2. When competing for downstream consumers, the act of bundling information goods makes an incumbent seem “tougher” to single-product competitors selling similar goods. The resulting equilibrium is less profitable for potential entrants and can discourage entry in the bundler’s markets, even when the entrants have a superior cost structure or quality.

3. Conversely, by simply adding an information good to an existing bundle, a bundler may be able to profitably enter a new market and dislodge an incumbent who does not bundle, capturing most of the market share from the incumbent firm and even driving the incumbent out of business.

4. Because a bundler can potentially capture a large share of profits in new markets, single-product firms may have lower incentives to innovate and create such markets. At the same time, bundlers may have higher incentives to innovate.

For most physical goods, which have nontrivial marginal costs, the potential impact of large-scale aggregation is limited. However, we find that these effects can be decisive for the success or failure of information goods. Our results have particular empirical relevance to the markets for software and Internet content and suggest that aggregation strategies may take on particular relevance in these markets.

*(Bundling; Internet; Pricing; Information Goods; Software; Competition; Digital Goods)*