Bundling in Cable Television: A Pedagogical Note With a Policy Option

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Bundling can be a pricing mechanism by which monopolists capture economic surplus from consumers. We suggest that given the cost structure of media markets, channel bundling in the cable and satellite market could also emerge in a competitive environment. A la carte channel pricing on cable television may or may not increase consumer welfare and could decrease total welfare. Because bundling may create other problems, policymakers may consider allowing cable and satellite networks to sell packages of channel space to viewers at a given price, allowing viewers to choose which channels they want in their packages. We term this option quasi-bundling.

Speaking before Congress on issues relating to indecency in broadcasting, Commissioner Kevin Martin (*Protecting Children,* 2004) of the Federal Communications Commission stated that perhaps "cable and DBS operators could offer programming in a more a la carte manner. For example, they could permit parents to request not to receive certain channels and reduce the package price accordingly."[1] Concurring, Senator John McCain, Chairman of the Commerce Committee, noted that an "a la carte suggestion sounds ... more persuasive than ever in providing parents control over their television sets."[2]

Although the views of Commissioner Martin and Senator McCain are more expansive and comprehensive that what we have quoted here, their comments point to an interesting and important policy question relating to bundling of channels on cable television. *Bundling* refers to the grouping of a collection of products together in a single package that is then sold to final consumers. Thus, rather than selecting a few of the products offered on an individual or a la carte basis, the consumer has the choice of buying the bundle or nothing. With the exception of some channels, most consumers of cable must buy their programming in bundles.[3]

In this article, we employ a simple analytical structure and explore two related questions. First, why do domestic cable and satellite television services offer many channels only in bundles, and second, what are the implications of this bundling for consumers and policymakers? As we suggest, the results of our analysis are somewhat counterintuitive and imply that certain types of bundling can be a competitive response by cable providers that is welfare enhancing for consumers.

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Economic Rationale for Channel Bundling

As Spence and Owen (1977) first observed, cable channels are differentiated products with high fixed costs and constant marginal costs.[4] Certain individual channels that attract strong interest from a small group of viewers[5] and face high fixed costs would not be produced in a pay television regime despite the fact that the total consumer surplus produced by these channels outweighs their fixed cost of production.[6]

Using some simple examples, we show how bundling helps solve this problem when viewers place divergent values on channels. Essentially, as Stigler (1963) pointed out, bundling acts as a price discrimination mechanism.[7] Price discrimination at least partially solves the aforementioned problem posed by Spence and Owen (1977) because it allows the seller to capture a larger fraction of a channel's surplus. Our final example, however, will illustrate a case in which bundling increases consumer economic welfare, decreases producer economic welfare, and increases total economic welfare.

As we suggest, a monopolist would not engage in the type of bundling that we illustrate in our final example, and thus, this type of bundling logically must be a consequence of actual or potential competition (which satel-

lite providers or cable overbuilders might provide, respectively). This finding runs counter to the common intuition that bundling acts as a monopolist's mechanism for extracting surplus from consumers. However, the industry's desire to avoid a la carte pricing requirements may indicate that this latter type of bundling is not currently taking place on a large scale.

In the examples that follow, we use two channels and two viewers to illustrate our logic. This simplification, like many simplifications and assumptions used in economic modeling, clearly illustrates and isolates an idea that enables the reader to understand a world with many channels and many different viewers, abstracting away from other important details.[8] As we show, bundling may well have important implications for consumers and public policy.

Example 1

Assume there are two viewers, Moe and Lisa, and two channels, Itchy and Scratchy. Moe and Lisa value the programming as shown in Table 1. The fixed cost of producing either of the programs, Itchy or Scratchy, equals $11.

Without bundling and absent, first-degree price discrimination, neither program would be produced. To see this, suppose that the operator priced the Scratchy channel and the Itchy channel independently.

Looking only at the Scratchy channel, we observe that Lisa and Moe are willing to pay $10 and $2, respectively, whereas the fixed cost of producing the Scratchy channel is $11. Lisa would be willing to pay $10 for the Scratchy channel, so the provider could price the Scratchy channel at $10, reach one subscriber, and obtain $10, which would not cover the Scratchy channel's fixed cost of $11.

Moe is willing to pay $2 for the Scratchy channel, so the provider could sell the Scratchy channel to Lisa and Moe at $2 each, obtaining a total revenue of $4 (i.e., $2 from Moe and $2 from Lisa). However, once again, the total revenue ($4) does not cover the Scratchy channel's fixed cost of $11.

As is seen from Table 1, the same analysis would hold for the Itchy channel (only the names Lisa and Moe would be reversed). Neither show will be produced independently. Under what conditions might they be produced?

In this case, the provider can produce and bundle both programs profitably, because Lisa and Moe have the "right" type of preferences. Referring back to Table 1, we recall that Moe is willing to pay $10 for the Itchy Channel and $2 for the Scratchy Channel, whereas Lisa is willing to pay $2 for the Itchy Channel and $10 for the Scratchy Channel. This means that Lisa and Moe's valuations move opposite one another because the channel that Lisa strongly prefers is the channel that Moe only weakly prefers and vice versa.[9]

Therefore, a cable operator could profitably produce both the Scratchy channel and the Itchy channel by producing both and selling the bundle for a price of $12. Because Lisa is willing to pay $10 for the Scratchy channel and $2 for the Itchy channel, Lisa is willing to pay $12 for the two bundled channels. Similarly, because Moe is willing to pay $10 for the Itchy channel and $2 for the Scratchy channel, Moe is also willing to pay $12 for the two bundled channels. In this case, Lisa and Moe obtain a consumer surplus of 0, and the seller makes a profit of $2.

Note that under a perfectly contestable market in which the monopolist faces the threat of immediate entry at any moment, the seller would bundle the two channels and price the bundle at $11.[10] Then, Lisa and Moe would each receive $1 of consumer surplus for a total consumer surplus of $2, and the seller would receive 0 economic profits. However, in both cases, bundling increases total economic welfare from 0 to 2. The split between consumer and producer surplus depends on the competitiveness of the market.

Example 2

Bundling can also reduce consumer surplus, increase producer surplus, and increase total economic welfare (as the standard economic analysis of price discrimination implies). We still employ Lisa and Moe and the Itchy and Scratchy channels; however, we modify the valuations from the original example to those shown on Table 2. As before, the fixed cost of producing either of the programs equals $11.

Table 1. Consumer Valuations of Programing, Example One

Valuation	*Itchy*	*Scratchy*
Moe	$10	$2
Lisa	$2	$10
Total	$10 + $2 = $12	$2 + $10 = $12
Maximum Combined Price, Each Channel	$2 + $2 = $4	$2 + $2 = $4

Table 2. New Consumer Valuations

Valuation	*Itchy*	*Scratchy*
Moe	$10	$7
Lisa	$5	$10
Total	$10 + $5 = $15	$7 + $10 = $17
Maximum Combined Price, Each Channel	$5 + $5 = $10	$7 + $7 = $14

In this case, the Itchy channel would not be produced on its own. The provider could either sell the Itchy channel to (Moe) for $10 or to two consumers (Moe and Lisa) for $5 each. In either case, the total revenue from the Itchy channel would be $10—clearly not enough to cover the fixed costs of $11.

The cable provider can, however, sell the Scratchy channel by itself. The cable provider can sell the Scratchy channel to Moe and Lisa at $7 each, generating $14 in total revenue, enough to cover the $11 fixed cost and make a profit of $3. Lisa also obtains $3 in consumer surplus because she pays $7 for a channel for which she would be willing to pay $10. Moe obtains no consumer surplus because he pays his exact valuation of $7. The total surplus is $6: $3 in producer surplus and $3 in consumer surplus.

However, the cable provider could make an even larger profit by bundling the two channels and selling the bundle for $15. In this case, both Moe and Lisa buy the bundle, so the cable company makes $30 in revenue while incurring fixed costs of $22 (the total cost of producing both the Scratchy and the Itchy channel).

Moe gains $2 in consumer surplus because he pays $15 for a bundle that he values at $17. Lisa gains no consumer surplus because she pays $15 for a bundle that she values at exactly $15. The total surplus is $10, higher than the total surplus of $6 under a la carte pricing. Consumer surplus, however, is lower: $2 instead of $3. Profits are higher: $8 instead of $3.

Essentially, in this example, bundling allowed the cable provider to capture more of the value from programming, which led them to produce the economically efficient amount of programming. However, because the provider captures more of the value from the programming, consumers are slightly worse off. The monopolist, however, is much better off. Consumers lose $1 of surplus, whereas the provider gains $5, for a total gain in economic welfare of $4. We summarize these results in Table 3.

It may seem that we have reached a final conclusion: Bundling likely increases total economic welfare but may leave consumers worse off mainly because it acts as a price discrimination mechanism, which tends to increase total economic welfare,[11] decrease consumer welfare, and increase producer welfare. As we show in the next example, this need not be the case.

Example 3

We employ one last example to illustrate a case in which bundling can increase consumer welfare, decrease producer welfare, and increase total welfare. As before, we employ Lisa and Moe and the Itchy and Scratchy channels, with new valuations for the channels. As before, the fixed cost of producing either of the programs equals $11.

As in the previous example, the provider could sell the Scratchy channel to both Lisa and Moe for $7 each, making a profit of $3 and generating a consumer surplus of $3.

However, if the cable provider bundles the two channels, the provider can sell the bundle for $12 to each Moe and Lisa. This generates revenues of $24. Given the fixed cost of $11 for each channel, this generates a profit of $24 − [2 × ($11)] = $2. Moe is willing to pay $17 for the bundle but pays only $12, receiving $5 in consumer surplus. Lisa is willing to pay $12 for the bundle and pays $12, receiving no consumer surplus. Therefore, bundling increases total consumer surplus from $3 to $5, decreases producer surplus from $3 to $2, and increases total welfare from $6 to $7 (see Table 4 and Table 5).

However, as Adams and Yellen (1976) demonstrated, the provider can increase their profits by engaging in mixed bundling, which consists of combining bundling with a la carte pricing. Let us say the provider prices the bundle at $17 and sells the Scratchy channel on an a la carte basis for $10. Moe purchases the bundle for $17 and Lisa buys only the Scratchy channel for $10. The provider gains a surplus of $27 − $22 = $5. Moe and Lisa both realize a zero consumer surplus. Total economic welfare is less than either underunbundling or under pure bundling, as is seen from Table 5.

Thus, pure bundling can increase consumer welfare and decrease producer welfare, whereas mixed bundling can increase producer welfare while reducing both con-

Table 3. Unbundled Versus Bundled Surplus

Surplus	*Unbundled*	*Bundled*
Moe	$0	$2
Lisa	$3	$0
Producer	$3	$8
Total	$6	$10

Table 4. New Consumer Valuations for Programming

Valuation	*Itchy*	*Scratchy*
Moe	$10	$7
Lisa	$2	$10
Total	$10 + $2 = $12	$7 + $10 = $17
Maximum Combined Price, Each Channel	$2 + $2 = $4	$7 + $7 = $14

Table 5. New Unbundled Versus Bundled Surplus

Surplus	*Unbundled*	*Bundled*	*Mixed Bundle*
Moe Surplus	$0	$5	$0
Lisa Surplus	$3	$0	$0
Producer	$3	$2	$5
Total	$6	$7	$5

sumer welfare and total economic welfare. Essentially, mixed bundling allows the monopolist to price the bundle very high, to capture the consumers with a high total valuation of all the channels, and still capture some consumers with a very high valuation of particular channels. Clearly, we would only expect to see welfare-enhancing pure bundling as a result of competition in the market because a monopolist could make higher profits by not bundling, and absent competition would therefore not have the incentive to bundle. When we observe the industry's apparent eagerness and willingness to incur costs to avoid unbundling rules, it seems unlikely that this competitive type of bundling currently takes place on a significant scale because requiring unbundling would then increase providers' profits.

However, our mixed bundling result does generate a somewhat counterintuitive insight. If the market is not sufficiently competitive, then an economic welfare-maximizing regulator may wish to consider forbidding a la carte pricing if the regulator also allows bundling. Conversely, the regulator may wish to forbid bundling. The combination, however, of bundling and a la carte pricing (termed mixed bundling) may be welfare reducing.

The Problem With Bundling

Even though bundling may confer welfare-increasing benefits on producers and even (under certain conditions) consumers, the current industry bundling practice may still have drawbacks beyond the possible reduction of consumer welfare through price discrimination. Recent work by Nalebuff (2004) raises the possibility that bundling may be a tool that incumbents use to foreclose entry. Although the Chicago School demonstrated that bundling could not be used to leverage monopoly power into a perfectly competitive market, a monopolist could use bundling to leverage monopoly power into an imperfectly competitive market. Thus, bundling has some very undesirable properties, and some of these properties arguably could contravene flow of programming to final viewers.

One Possible Solution

Can this problem be resolved? One might prefer a regulatory rule that preserves many of the efficiency enhancing price discrimination characteristics of bundling whereas eliminating many of the undesirable entry-blocking characteristics of bundling. One possibility emerges: Allow the cable operators to sell bundled packages of channel space to consumers at a given price, and then allow consumers to choose which channels they put on that space. For example, cable operators could sell a package of 25 channels for $30 and a package of 50 channels for $55, but consumers would then choose what those 25 or 50 channels would be. Consumers would then self-select in such a way so that the final equilibrium would be identical to the price discrimination bundling equilibrium. Looking back at a few of our examples, one can see how such an arrangement would work. In Example 1, a cable operator could simply offer any 2 channels for $12, and Moe and Lisa would then select their preferred channels. As was shown, Moe and Lisa would each select both the Itchy and Scratchy channels. In Example 2, a cable operator would offer any two channels for $15, whereas Moe and Lisa would each select Itchy and Scratchy. In Example 3, the outcome depends on the level of competition. A provider with sufficient market power would simply not carry the Itchy channel and sell only one channel (the Scratchy channel) for $7. If the regulator also permitted a la carte programming, the provider with sufficient market power would sell the bundle for $17 and the Scratchy channel for $10, which, as Table 5 demonstrates, would lower both consumer welfare and total economic welfare. Thus, allowing a la carte pricing may lower economic welfare under this quasi-bundling scheme. In a competitive market, a provider would offer a package of any two channels at $11, and Moe and Lisa would choose the Itchy and Scratchy channels.

Thus, even our suggested bundling of channel space may lead to the loss of some worthwhile channels,[12] at least in a less competitive environment. A worthwhile channel could get dropped if it possesses all of the following features:

1. These channels would generate strong preference from a relatively small group of viewers and weak preference from the vast majority of viewers, that is, the demand for the channel would be convex.
2. The viewers who strongly preferred these channels would less strongly prefer another channel, and that other channel would attract relatively strong interest from all viewers, that is, the demand for the other channel is concave.

This possible channel loss, however, would not be as large and as severe as the channel loss that would occur under complete unbundling. In addition, any channels lost might be restored in a more competitive environment unlike under complete unbundling.

Cost is another important issue. In this article, we do not address the technical costs of either unbundling or the selling of channel space, but we do point out that cable systems in Canada offer a la carte channels and packages of channel space in which the viewer can purchase any 5,10, and so forth channels for a given price. There-

fore, we know that it is technically feasible for at least some systems to offer unbundled channels and/or packages of channel space to consumers, although we still do not necessarily know the cost of doing so and thus do not make any final policy recommendations in this article.

Conclusion

The issue of bundling in cable channels does not yield a clear answer. In this article, we clarify some of these issues using simple and accessible models and manage to generate another option for policymakers, the idea of selling bundled channel space in which viewers have to buy packages of channel space, but they choose which channels go in their package. This quasi-bundle approach, along with a la carte pricing, may also deal with policymakers' concern about so-called indecent material and how to allow consumers to avoid unwanted indecent material.[13] The quasi-bundling approach has the advantage of allowing consumers to opt out of viewing or paying for indecent material and avoid some of the disadvantages of pure a la carte pricing illustrated in this article. We also note that this quasi-bundling approach may benefit consumers the most when the regulator actually forbids a la carte pricing.

We stress, however, that we cannot (yet) determine which policy approach toward channel bundling is "correct" because that would require knowledge that we do not yet have. If a la carte pricing and/or quasi-bundling would be particularly costly for cable operators to implement, then the status quo may be the economic welfare-maximizing policy choice. If policymakers weight consumer welfare more heavily than producer welfare and believe that the industry is not competitive and will not be competitive in the near future, it then becomes possible that a la carte channel pricing maximizes the relevant economic welfare. If policymakers weight consumer and producer economic welfare more equally and/or believe that the industry is or is becoming fiercely competitive, then the quasi-bundling approach that we explore here may maximize economic welfare. In this article, we point out, however, using Adams and Yellen's (1976) mixed bundling example, that requiring a la carte pricing and allowing flexible bundling may actually lower both consumer and total economic welfare relative to requiring a la carte pricing and not permitting bundling or requiring flexible bundling and not permitting a la carte pricing. Because of the interaction between the a la carte price and the price of the bundle, policymakers should remember that more contractual flexibility is not necessarily better in the context of cable bundling.

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Endnotes

1. "Protecting Children From Violent and Indecent Programming," Wednesday, February 11, 2004, 9:30 a.m. The testimony of Honorable Kevin J. Martin, Commissioner, Federal Communications Commission, before the Committee on Commerce, Science and Transportation, United States Senate.
2. "Protecting Children From Violent and Indecent Programming," Wednesday, February 11, 2004, 9:30 a.m. The testimony of Honorable Senator John McCain before the Committee on Commerce, Science and Transportation, United States Senate.
3. In cable and satellite markets, these different bundles are commonly referred to as "tiers."
4. With no loss of generality, we can assume marginal costs are zero.
5. Spence and Owen (1977) demonstrated that convexity of the demand curve lowers the percentage of a channel's surplus that a single-price provider can capture.
6. Waldfogel (2003) expressed a similar idea using the concept of "preference externalities." Because many media products face high fixed costs and low, constant, marginal costs, an individual media consumer is made better off by other media consumers with similar preferences—hence, the term preference externalities.
7. Stigler (1963) also exploded the oft-repeated but incorrect cliché that "bundling makes people pay for products they don't want."
8. One important abstraction is to keep subscriber fees, an important source of revenue for cable providers, constant. It is

possible that unbundling might have an impact on the number of subscribers a cable operator can attract.

9. Moe's and Lisa's channel valuations are negatively correlated.
10. We abstract from the issue of the new entrant's effect on programming costs because the new entrant and incumbent could now share the fixed costs of programming.
11. Except possibly in the case of so-called hurdle price discrimination.
12. By "worthwhile," we mean those channels whose total consumer valuation is higher than their fixed cost of production.
13. For that matter, a la carte pricing and quasi-bundling may allow other viewers to avoid unwanted decent material.

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