Price Discrimination Reading

Tirole, 1988, Ch. 3

Varian, 1989

Belleflamme and Peitz, 2010, Ch. 11.1

- Bundling model presented in Cowan, 2022 assumes that a consumer's valuation for the bundle is equal to the sum of his valuations for each of the separate goods. This assumption of strict additivity is plausible for independently valued goods, which are neither complements nor substitutes. When the separate goods are complements, a consumer's valuation of the bundle is greater than the sum of his valuations for each of the separate goods. The reverse is true when the separate goods are substitutes.
- Consumers with relatively high valuations for both goods are better off when the goods are bundled, while those who have a high valuation for one good and a low valuation for the other are worse off.
  - Consumers who are better off are those who (1) have high valuations for each good and buy both goods under either pricing model, and enjoy a discount under bundling, (2) have intermediate valuations for each good and buy neither good under separate pricing but both goods when bundled, or (3) have high valuations for one good and intermediate valuations for the other and buy one good under separate pricing but both goods when bundled.
  - Consumers who are worse off are those who (1) have high valuations for one good and low valuations for the other and buy an additional good in the bundle but enjoy lower surplus, or (2) have intermediate valuations for both goods and buy one good when priced separately but not when bundled.
  - It can be shown that consumer surplus increases under pure bundling in the model presented by Cowan, 2022.
- Monopolist profits increase under mixed bundling. Under mixed bundling, the bundle is more expensive than under pure bundling, and the separate goods are more expensive than under separate selling. Since some of the consumers who buy one of the separate goods and are alienated by a price increase would instead consume the bundle, the monopolist has greater incentive to increase the price of separate goods when the bundle is available (under mixed bundling) than otherwise (under separate selling). Similarly, since some of the consumers alienated by a higher bundle price choose to instead buy one of the goods separately, the monopolist has greater incentive to increase the price of the bundle when the goods are also available separately (under mixed bundling) than otherwise (under pure bundling).
- Under the given model, consumer surplus is greatest under pure bundling, intermediate under mixed bundling, and lowest under separate selling.
  - Consumer surplus and total welfare are greatest under pure bundling than under mixed bundling if the products are independently valued, consumers' valuations for the two products are independently and uniformly distributed, and marginal cost is zero.
  - If marginal cost were non-zero, then under pure bundling, consumers may be induced to buy an additional product in the discounted bundle even though their valuation for that product is below marginal cost. Under mixed bundling, such consumers would be more likely to buy only one product (for which valuation exceeds price which exceeds marginal cost).
- When the monopolist sells complementary products, the value consumers attach to the bundle is larger than the sum of the values they attach to the component products, and conversely for substitutable products. To model this, let us write the gross valuation for the bundle as $\theta AB = (1 + \gamma)(\theta A + \theta B)$, where $\gamma > 0$ for complements, $\gamma < 0$ for substitutes and $\gamma = 0$ for independently valued products.
  - It can be shown that the advantage that pure bundling has over separate selling tends to decrease as the synergies between the two products become stronger.
  - As complementarity increases, consumers enjoy smaller surplus from consuming a single good (relative to consuming both goods), hence there are more consumers who would prefer either both goods or neither goods and fewer consumers who would prefer a single good. The difference to consumers and to the firm between separate selling and bundling narrows. In the extreme, where no consumers demand only one of the two goods, separate selling and bundling are equivalent.
- Correlation between Valuation
  - Pure bundling leaves profit unchanged when valuations are perfectly correlated since under separate selling, no consumer buys only one of the two goods, therefore all and only the consumers who buy both goods under separate selling also buy both goods under pure bundling, bundling does not expand demand.

    - Pure bundling doubles profit when valuations are perfectly inversely correlated since bundling dramatically increases demand. Under separate selling, all consumers buy exactly one good. Under bundling, all consumers buy the bundle.
    - Profits are higher under pure bundling than under separate selling if and only if the correlation between the values for the two products is negative, or sufficiently weak if positive.
    - There is high variance in the valuation for a single good, such that a marginal decrease in price captures only a small number of additional consumers. Bundling of goods with uncorrelated valuations decreases the variance in the valuation of the bundle (relative to separate good valuations) such that a marginal decrease in the price of the bundle captures a greater number of additional consumers. If the valuations of the goods are highly positively correlated, bundling fails to have this effect, and thus fails to have a positive effect on profit.
- Larger Number of Products
    - As the number of products in a bundle increase, by the law of large numbers, the variance in the distribution of the bundle valuation (assuming goods are independently valued) decreases, hence the demand curve becomes flatter for a larger set of quantities (since demand function is given by the cumulative distribution function of the bundle valuation) the monopolist captures more of consumer surplus, sells a greater quantity, hence deadweight loss decreases.
    - This result holds only if marginal costs are sufficiently close to zero. Otherwise, it can be shown diagrammatically that the increase in marginal cost could outweigh the above effect. This result is more realistic for software or information goods.

Varian, 1985

- Varian validates Schmalensee's (1981) result that third-degree price discrimination increases welfare only if it results in an increase in output, and establishes several further (apparently unexaminable, technical) results.

Aguirre et al., 2010

- Aguirre et al. find sufficient conditions under which third-degree price discrimination increases welfare, which are related to the convexity of sub-market demand functions.

Motta, 2004, Ch. 7.4

Bulow, 1982

- Durable-goods monopolists face special problems because the sale of their products creates a secondhand market not controlled by the monopolist. To the extent the monopolist is able to rent his product rather than sell it, or to make binding promises about his future production, such problems are ameliorated.
    - Otherwise, durable goods monopolists have incentive to produce less durable goods, hence to under-invest.

Katz, 1987

- This paper examines third-degree price discrimination by an intermediate good monopolist selling to downstream firms that differ in their abilities to integrate backward into supply of the input. It is shown that discrimination may lead to all buyers facing higher prices, and conditions under which discrimination reduces welfare by lowering total output are presented. It is shown that discrimination may raise welfare in some cases by preventing socially inefficient backward integration.

Shiller and Waldfogel, 2011

- [Notes in Case Studies, Data file]

Adams and Yellen, 1976

Stole, 2007