

Pricing information goods

Nowadays, information is an economic good of large importance. Due to their special features special pricing forms have developed. Windowing, versioning and bundling will be introduced as strategies of price discrimination of information goods.

I. The significance and special features of information goods

Information plays an ever more important roll in our modern economic life. Its share of the economic output has been increasing for many years and the term "production factor information" has already established itself. If one wants to trade information on markets, one speaks about information goods, which is understood as "a definable quantity of data, which the economic subjects attach a benefit to" (Linde 2008, p. 7). Such information goods which are, in the meantime predominantly dealt with digitally, are e.g. news, music, pictures or any kind of software.

It is to be noted that as a customer one is frequently offered these goods very favorably or even free of charge. Amongst these information goods are e.g. the e-mail account at GMX, the ubiquitous PDF-Software Adobe Acrobat or series on the new internet TV RTLnow. From an economic point of view you'd think the corporations would "cut the ground from under their own feet" with such offers. But, far from it, the information goods feature some characteristics which make it advisable to quickly make large quantities marketable and to saturate the market. In order to achieve this aim, many information providers make use of differentiated pricing, in which favorable or offers free of charge have a fixed place besides charged offers.

Information goods feature some economic special features. As a first point they are liable to distinctive unit cost reduction. Whereas initial creation of the contents for a master copy, e.g. a film costs many millions, the additional costs for duplication and distribution are extremely low, particularly on the internet. With information goods it is often not possible to accurately appraise the quality of the product. This means there is an information asymmetry: Whether the film is really as exciting as it is described on the back of the DVD, can only really be judged after viewing. And ultimately one must always ask oneself the question with information goods, whether one decides in favor of an offer that many already use, or, for one which most likely fulfils ones own particular requirements. Is it better to install Windows or Linux, purchase Fifa or Pro Evolution Soccer, watch "Wetten, dass...?" or Shreck, chat with friends via MSN, ICQ or Skype. The economist is speaking about network effects which lead to goods becoming more valuable for the user, the more widespread they are.

II. Pricing information goods

Information providers usually have a special interest in a wide circulation of their products. Due to the cumbersome fixed costs it is obvious to set prices which generate high sales volumes and therefore to create the desired unit cost degression. If the supplier also wants the network effects to be effective, it is advisable to apply base prices which allow rapid circulation. Also, information asymmetries can be successfully negotiated when the price presents no obstacle to the purchase. Everything points in the same direction: Prices shouldn't be cost orientated but must be market orientated. Thereto must either the customers willingness to pay be ascertained via (online-) market research or the customers must at least partially, on purchasing, be given the opportunity to disclose how their asking prices turn out. The instrument of price discrimination offers, particularly for information providers a whole arsenal of possibilities.

III. Types of price discrimination

The basic idea of price discrimination is in principle, to sell the same product to every customer at a different price (cf. e.g. Diller 2000, p. 286). With the help of differentiated prices, customers (groups) with a different willingness to pay can be appealed to. In comparison with an offer with a standard price the sales can thereby be increased. Of course, price discrimination only makes sense when on the customers' side there are actual existing different user values and therewith also a different willingness to pay for the goods on offer.

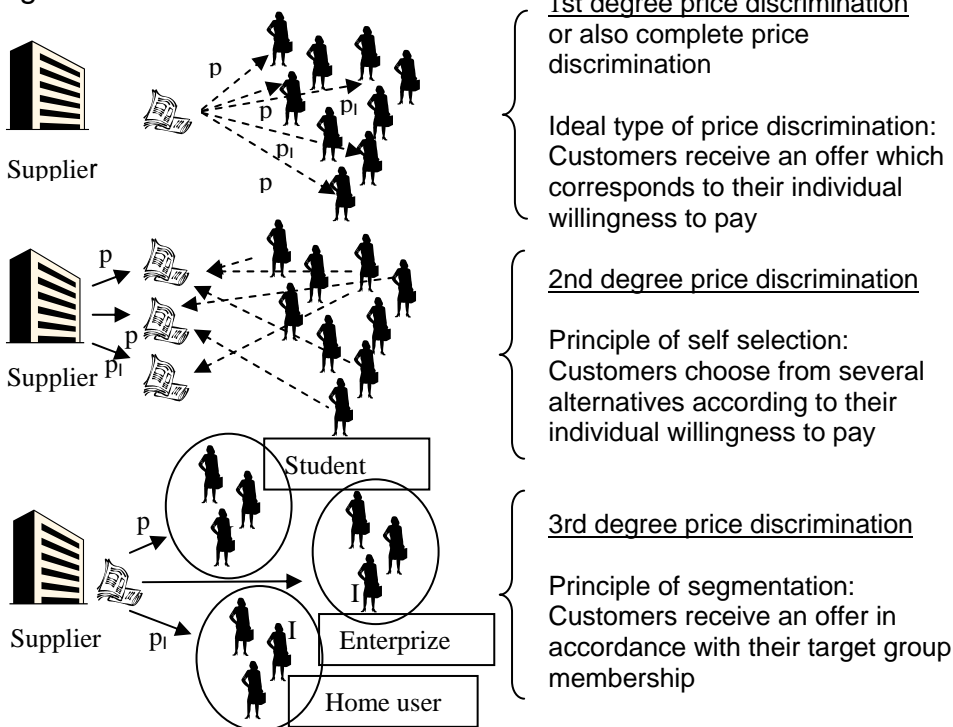


Illustration 1: Types of price discrimination. (According to Schumann/Hess 2006, p. 70)

There are three basic forms of price discrimination. They differ subsequently, by who sets the price and how the purchasing groups are separated:

To evaluate the various types of price discrimination Adams and Yellen have (1976, p. 481) compiled three optimality conditions:

- Customers whose willingness to pay lies below the marginal costs should remain excluded from a purchase (Exclusion),
- Customers whose willingness to pay is above the marginal costs should purchase (Inclusion) and
- On purchasing no consumer surplus (willingness to pay minus price) should result (for Complete Extraction).

The better these conditions are met, the closer one comes to the ideal complete price discrimination for the vendor.

IV. 2nd degree price discrimination with information goods

In connection with information goods three varying types of 2nd degree price discrimination play a special roll. All three are based on the fact that the supplier doesn't make a fixed offer to the different customer groups (segmentation), but instead, offers corporation services so differentiated, that the customer can choose which price he/she wants to pay (self-selection). Thereby, it is up to him/her to decide in which price performance combination he/she wants to purchase the product.

1. Windowing

So called windowing is, to bring a finished information good like a film or a book in different forms, at varying times on to the market. Based on one and the same first-copy, the master, customers are offered various conveyance forms or media carriers over a specific period of time. Films like "Star Wars" are not only offered at the movies, but also - delayed - as purchasable or rentable video, on pay-TV and on free-TV. The offers satisfy different needs, therefore, customers are prepared to pay different price levels. Customers who want to watch the film at the movie theatre are willing to pay more than those who want to watch the film later as a rentable video or on free-TV. The temporal aspect is in the foreground of this type of price discrimination. The information providers attempt to create various "profit Windows" (cf. Zerdick et al. 2001, p. 70 et seq.) or utilization windows (therefore also: Windowing) to tap the full potential as optimally as possible. If they didn't graduate their offers, cannibalization effects would occur. Many customers would no longer go to the movies, but would rent a DVD forthwith. However, if the customer has to wait a long time for the attractively priced DVD, then he/she will

also be prepared to pay the admission charge for a movie showing. Therefore, a considerable interval lies between the individual windows. This can be recognized well in illustration 2. The free-TV offers are ordered right at the end of the exploitation chain, because here are the customers with the least willingness to pay. They must however, wait the longest for the cost-free broadcasting which is financed by advertising. The higher the risk of cannibalization, the more distinctly the utilization windows have to be separated from each other and must be planned without temporal overlapping.

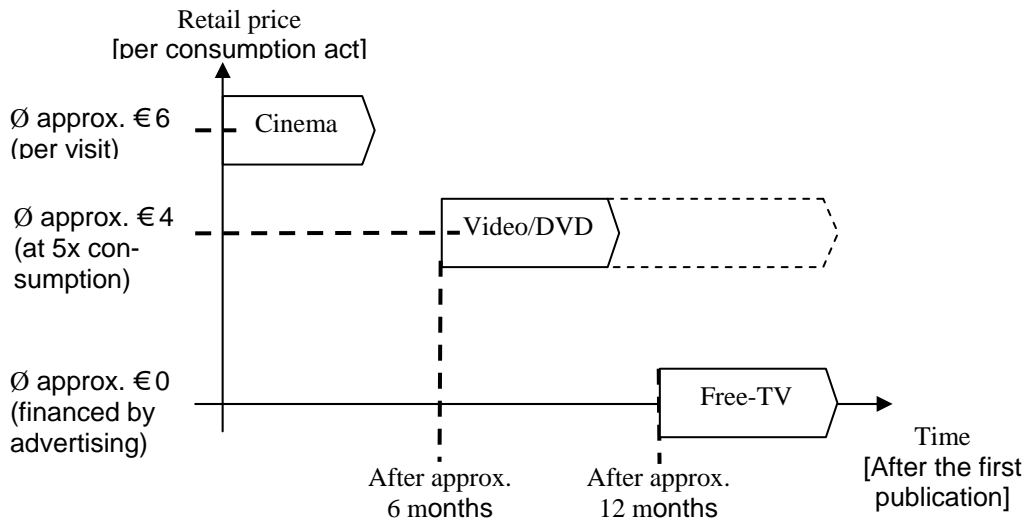


Illustration 2: Willingness to pay for different types of offers for a film. (According to Schumann/Hess 2006, p. 74)

2. Versioning

With versioning the corporation offers its product in various versions and leaves it up to the customer to select the suitable one for him/herself (cf. Shapiro/Varian 1999, p. 61). The aim for the corporation is to design its offers incurring as little expense as possible, so that on the one hand, the customer requirements are fulfilled as precisely as possible and on the other hand that the requested price matches the customer's willingness to pay. What is the best way to proceed for a supplier of information goods?

For information providers, producing various versions is fundamentally very simple, when the product, e.g. a mail program, a company data base or a communications portal, is established, it's very easy to produce "slimmed down" versions at low cost.

How many versions should one's customers be offered? Theoretically, one could produce an individual version at a negligible versioning cost for each customer, with which one would achieve the price strategic ideal case for complete price discrimination. Too many product versions only lead to confusion for the customers and are therefore not advisable. The market must be able to clearly recognize the performance differences

in order to make their purchasing decisions. If the difference isn't sufficiently perceptible, the hazards are that the higher-value offers are not recognized as such by the customer and are thus not purchased. There are several empirical studies, according to which at least three versions should generally be offered (cf. Stahl 2005, p 190). At least three versions, as customers tend towards the middle, avoiding extremes. If customers only have a choice of two offers, they frequently decide in favor of the more reasonably priced one. On the other hand, if there is an extra High-end-, Gold-, Maxi- or Premium-Version this promotes the purchase of the middle one - erstwhile the most expensive version. With the introduction of a third, high-quality version it's not necessarily about selling these in large quantities, this however, changes the perception of the customers regarding the more favorable versions and encourages low-end buyers to decide in favor of the higher-value (medium) product. Thereby, the products in the middle attain acceptability. Indeed, many information offers are found in exactly three versions, e.g. with tax programs, such as, Lexware with Basis, deluxe and Home&Business or, also with Adobe-products with the differentiation of Standard, Professional and 3D.

Versioning can be performed in various cost-effective ways which are depicted in the following illustration.

Possible types of Versioning	Characteristics of Versioning	Practical examples
Up-to-dateness	Immediate access or delayed	Onvista: Stock exchange information real-time or with time delay (www.onvista.de) Eco-Test: Price according to age of test (www.oekotest.de)
Availability of the information	Unimedial or Multimedial Access options	Falk: Routes and maps as a printout or as an e-mail (www.falk.de) Lexis-Nexis Databases: On-Screen or also as a download (www.lexisnexis.de) Database access On-campus or also Off-campus
Scope of work	Few or many functionalities	Adobe Photo Shop CS3 or CS3 extended with many additional functionalities (www.adobe.de) OpenBC/Xing: Comprehensive research possibilities in the Premium-Version (www.Xing.com) Dialogue web vs. DataStar with a different content of background

	Information content	information (www.dialog.com) Abstract. vs. Fulltext of market research
Perception-friendliness	Low or high resolution	Fotolia: Price grading depending on the pixel size (de.fotolia.com)
Processing speed	Low or high speed	Mathematica: Design of the symbolic, graphic and numerical operations in different calculation speeds (www.wolfram.com)

Illustration 3: Types of versioning.

3. Bundling

An additional type of price discrimination is Bundling. Two or more goods are combined to create one single offer and are sold as a package or set for an all round price (cf. e.g. B. Diller 2000, p 306). Adams and Yellen (1976) have comprehensively examined this strategy of pricing for the first time. The central concern of bundling is to reduce the valuation and thus reduce the consumers' willingness to pay for an item in comparison with the retail sale. Especially for digital information goods is bundling a worthwhile variant of the price discrimination, as the marginal costs for the addition of further goods to a bundle are of negligible value. On the other hand, it has been empirically shown, that with increasing marginal costs, e.g. with information offers via data carriers such as video cassettes or DVD's, but also for physical goods, that bundling becomes less attractive (cf. Bakos/Brynjolfsson 1999, p 1626). Various kinds of bundling can be differentiated:

- With pure bundling there are only product packages with several components. This is e.g. the usual procedure with newspapers and magazines, as it is not possible to purchase individual articles but only the entire issue.
- The counter-example which strictly speaking isn't bundling at all, but unbundling. Here, the goods are only sold individually. This approach is however interesting because in the meantime individual goods are frequently offered, which were formerly, solely available in a package. The download offers for individual music titles (formerly only entire cassettes, LPs, CDs) or individual press articles should be particularly mentioned here.
- With mixed bundling both variants are at the customers' disposal. It is possible to purchase both the package and the individual offer. Mixed bundling can frequently be found by software when, as in the case of Microsoft Office, the individual programs are offered separately and also, as sets for private customers, professional users or corporations.

By means of an example it is well demonstrated just how bundling is able to benefit from

the consumers' willingness to pay. This works the better, the closer one gets to the complete price discrimination (1st degree). In order to evaluate this, the optimality conditions, presented above from Adams and Yellen should be consulted.

3 a) Bundling without marginal costs

Lets take two software programs Word and Excel and look at a customer whose willingness to pay is 40 € for Excel and 140 € for Word. Let us further assume that for the sale of both products each the price charged is 110 €. With purely unit prices, the customer would only purchase Word, because, for example, he is a journalist, however, not Excel, as he could carry on invoicing at the said price by text processing. Without variable costs the supplier achieves a contribution (to fix costs) of 110 €. Two of the above mentioned conditions are thereby breached, as the customer doesn't buy Excel, although his willingness to pay lies above the marginal costs (Inclusion) and he realizes 30 € consumer surplus with the purchase of Word (Extraction), as he is prepared to spend 140 €.

What would happen if the corporation changes its pricing strategy and offers a package for 180 €? It has to be said that the bundle price is not simply the result of the addition of the unit prices, but from an independent optimizing process based on the willingness to pay (cf. Olderog/Skiera 2000, p. 140 et seq.). In our case the sum of the customer's willingness to pay corresponds exactly to the price for the bundle and the optimality conditions are completely fulfilled. It is easy to recognize how, due to the package offer the transfer of consumer surplus comes into being (cf. Wirtz/Olderog 2001, p. 203 et seq.): The customer intellectually transfers the consumer surplus existing for Word in comparison with the unit price to the lower estimated Excel. For the supplier there are contributions of 180 € and there is no existing consumer surplus remaining.

If the supplier doesn't exactly meet the sum of the willingness to pay with his price, as in this example, the customer either won't buy (sum of the willingness to pay < package price) or he realizes a consumer surplus (sum of the willingness to pay > package price). Even if the latter isn't ideal from the supplier's point of view, because the extraction condition isn't satisfied, he can at least acquire the customers' consumer surplus transferred from one product to the other and only has to abstain from the excess part.

3 b) Bundling with marginal costs

What happens now, when variable costs occur, both products, for example, are offered in lavish packaging with a user guide, and the price offered can not be increased due to the market? Recurrent variable costs immediately reduce the supplier's contributions. This becomes problematic with bundling when the marginal costs are higher than the customer's willingness to pay for one of the products in the package (illus. 4). The exclusion condition is then violated, i.e. there are customers who buy products although

their willingness to pay is lower than the marginal costs. For this reason, the supplier makes losses related to the individual product. He can only acquire the excess consumer surplus for the higher valued product when the marginal costs for the lower valued product are lower than the accompanying willingness to pay. Otherwise, he must use them for the "cross-subsidization" of the exclusion infringement, in order to compensate for the difference between the willingness to pay and marginal costs. He can stay the course as long as there is sufficient excess consumer surplus. If this difference by the lower valued product is larger than the compensated consumer surplus, then the contributions are affected. This is the case in illustration 4: The excess consumer surplus for Word doesn't suffice to compensate for the missing willingness to pay for Excel.

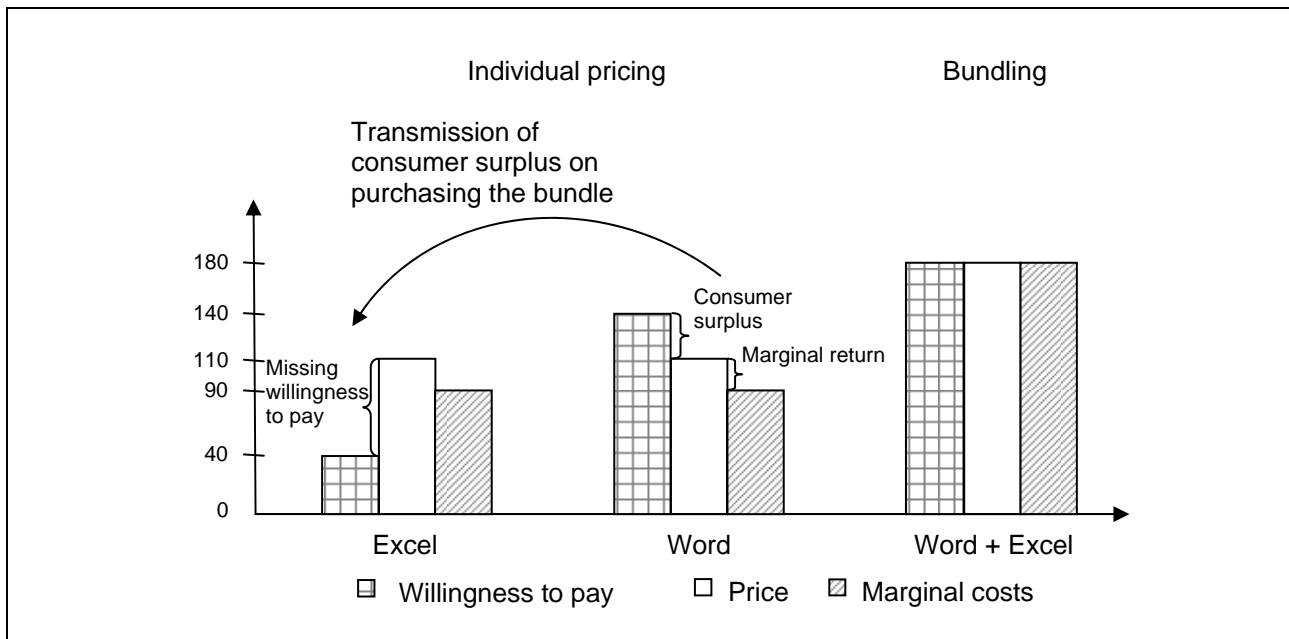


Illustration 4: Transfer of consumer surplus (according to Wirtz/Olderog 2001, p. 204).

It can nevertheless make sense to offer with a loss, e.g. when it concerns the establishing of a network. When Sony offers its Play station 3 below marginal costs, the positive contributions from the offered games would be used for cross-subsidization. The same applies to cell phone companies who mainly offer cell phones low priced only in a package with a two year contract period. The suppliers aim is to compensate for actual losses with future profits. However, it becomes obvious, that the higher the marginal costs, the more limitation for the supplier's margin. This applies to the cross-subsidization within the bundle but also for possible bundle discounts.

3 c) Alternative bundling strategies

So, which price strategy is the most advantageous: The unbundling, pure bundling or a combination of the two mixed bundling? It can generally be assumed that mixed bundling depicts the optimum price strategy.

If we once again look at illustration 4, this statement can easily be understood. For the sake of clearness, let's assume that the marginal costs for each product are very high - 90 €. The supplier sets unit prices at 110 € each and only sells Word to the customers (willingness to pay 140 €) and only realizes marginal costs of 90 € each, with a contribution of 20 €. With pure bundling at a package price of 180 € the customer receives both products, but there are no contributions for the supplier. He has to expend both, the transferred consumer surplus (30 €) – compared to unit prices – as well as his contributions (40 €), in order to compensate for the lack of willingness to pay for Excel (70 €). He turns out to be worse off than when he had only sold one product. If the supplier takes the mixed bundling and offers in addition to the unit price e.g. a package price of 200 €, then due to the self selection possibilities he can increase his profits further. The implied customer would now decide against the bundle and only choose Word. Other customers with a willingness to pay of over 200 € would purchase the bundle.

The three researched types of price discrimination are depicted and summarized in illustration 5.

Type the price discrimination (Pd)	Information content (Roof ridge Copy)		Medium	
	identical	varying	identical	changing
Pd 2nd degree				
Windowing	unchanged original product		changing between the different profit windows if necessary	
Versioning		different versions of the same original product	media choice as a type of versioning (availability of information)	
Bundling	package offer with unchanged original products		the same medium	

Illustration 5: Types of 2nd degree price discrimination with information goods.

V. Summary

Due to their special characteristics the various types of 2nd degree price discrimination can be applied particularly well to information goods. First and foremost on account of having very low marginal costs. This makes it attractive to offer them both, individually or in a package in the context of mixed bundling. It benefits windowing that the information contents can be very easily transferred to different formats. Also, versioning can be easily executed, as the cost of changing the original version is also low in comparison with the development costs. Vital here is the self selection mechanism with the help of which the consumer discloses his/her willingness to pay through his/her product choice. Versioning like bundling supports the speedy circulation of information goods and therewith the emergence of network effects. Low priced or free introduction versions (individual or in a package with additional offers) make it easy for the customers to at least decide for a trial. At the same time, information asymmetries vanish and the user can gather his experience with the product.

It now becomes obvious why information providers frequently offer, in context with price discrimination, low price and often free goods. With very low priced offers they are trying to persuade customers with a low willingness to pay to make a purchase. However, completely free offers which should appeal to customers without willingness to pay, work on a slightly different logic. They are an inherent part of windowing and also frequently versioning. If, by windowing, films are broadcasted in the last profit window, e.g. films shown on free TV, then the customers' consumer surplus is entirely forgone and is replaced by revenues from advertisements in combination with the film. Also with versioning, the offer of free information goods goes hand in hand with forgoing consumer surplus. The supplier then also connects these with advertising or assumes that the user will get used to the product expecting that he will purchase a high quality version at a later date.

Literature recommendations:

- Adams, W.J./Yellen, J.L.: Commodity Bundling and the Burden of Monopoly. In: Quarterly Journal of Economics, Vol. 90 (1976), No. 3, pp. 475-498.
- Bakos, Y./Brynjolfsson, E.: Bundling information Goods. Pricing, Profits and Efficiency. In: Management Science, Vol. 45 (1999), No. 12, pp. 1613-1630.
- Diller, H.: Preispolitik. 3. Revised Ed., Stuttgart, Berlin 2000.
- Linde, F.: Ökonomie der Information, Göttingen 2008.
- Olderog, T./Skiera, B. (2000): The Benefits of Bundling Strategies. In: Schmalenbach Business Review, Vol. 52 (2000), No. 2, pp. 137-159.
- Schumann, M./Hess, T.: Grundfragen der Medienwirtschaft. Eine betriebswirtschaftliche Einführung. 3., Updated and Revised Ed., Berlin 2006.
- Shapiro, C./Varian, H.R.: Information rules. A Strategic Guide to the Network Economy. Boston 1999.
- Stahl, F.: Paid Content. Strategien zur Preisgestaltung beim elektronischen Handel mit digitalen Inhalten, Wiesbaden 2005.
- Wirtz, B.W./Olderog, T.: E Pricing: Die neue Herausforderung für das Preismanagement. In: Hutter, M. (Ed.): e-conomy 2.0. Management und Ökonomie in digitalen Kontexten. Wittener Jahrbuch für ökonomische Literatur, Vol. 6, Marburg 2001, pp. 187-219.
- Zerdick, A. et al. (Eds.): Die Internet-Ökonomie. Strategien für die digitale Wirtschaft. 3. Extended and Revised Ed., Berlin 2001.