

## Price discrimination



INDEPENDENT POST AND TELECOMMUNICATIONS AUTHORITY

## PRICE DISCRIMINATION

**This OPTA Economic Policy Note is a translation of (academic) economic literature into insights that are understandable to non-economists. An Economic Policy Note (EPN) contains implications for regulation policy.**

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## Abstract

Charging different prices to different consumers for the same product or service is a widespread commercial practice, within the telecommunications sector as well as outside this industry. Economists refer to this practice as 'price discrimination'. However, price discrimination is a 'neutral' term.

There are circumstances in which price discrimination is desirable and increases social welfare and there are also circumstances in which it is undesirable. If the total sold quantity of a service, for all companies on a market together, increases, price discrimination is in principle desirable. However, price discrimination can also have a strategic effect. If it leads to a critical decrease in volume among competitors – with the final result being that the offering of services is no longer commercially feasible for them – competition decreases. This is at the expense of consumers in the longer term. Aside from these potential anti-competitive effects, price discrimination by means of selective discounts must be regarded as a permissible competitive response from an existing firm to increased competitive pressure.

There may be explicit policy objectives that rise above a purely economic consideration. An example is the policy objective to stimulate entry – this may lead to a situation in which price discrimination is forbidden even though it is desirable from an economic point of view. The reason would then be to protect entrants from the aggressive responses of existing companies by prohibiting price discrimination and thus stimulating entry.

## 1 Introduction

Charging different prices to different consumers for the same product or service is a widespread commercial practice, within the telecommunications sector as well as outside this industry.. Economists refer to this practice as 'price discrimination'. Price discrimination is a 'neutral' term<sup>1</sup>. As we will see there are circumstances in which price discrimination is desirable and increases social welfare and there are also circumstances in which it is undesirable. This will have to be examined from case to case – the most important goal of this paper is to provide guidelines for this evaluation.

### 1.1 Demarcation

The economic literature about price discrimination is sizeable and the areas in which price discrimination has economic effects are extensive. For these reasons, this EPN makes the following demarcation:

- The EPN concentrates on price discrimination as possible misuse of a dominant market position. The question that occupies centre stage is under which circumstances price discrimination by a dominant firm is desirable and undesirable from an economic perspective. The possibility of price discrimination also has consequences for market definition (price discrimination could lead to a narrower market definition), but this will not be discussed in this EPN.
- The EPN also concentrates on price discrimination in markets for end-user services. This focus was chosen consciously in order to be able to zoom in fully on the isolated effects of price discrimination. Besides the effects of discrimination, other motives and effects may also play a role in price discrimination in 'wholesale' services. Examples include 'vertical foreclosure' or 'margin squeeze' practices, such that price discrimination may have 'exclusionary' effects in the markets for end-user services at the wholesale level.<sup>2</sup>
- A final field demarcation concerns the following. Compared with uniform prices, some consumers benefit from price discrimination (price discrimination leads to lower prices for them), while other consumers lose out (price discrimination leads to higher prices for them). From the point of view of competition regulation, there are various ways of evaluating these prices. The higher prices charged to some consumers due to price discrimination may be evaluated as possible 'excessive' (too high) prices. The lower prices can be regarded as potential 'predatory' prices (too low prices). In the first instance, the EPN scrutinises the use of differences in prices, not whether excessively high or excessively low prices are employed with these differences (although the aspect of predatory prices will be dealt with in the paper).

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<sup>1</sup> Non-economists sometimes make a distinction between 'price differentiation', which is not considered undesirable from a social welfare point of view, and 'price discrimination', which is considered to have a negative connotation and to be undesirable from a social perspective. The source of this negative connotation is unclear.

<sup>2</sup> This EPN will also discuss possible exclusionary effects, but then from the 'horizontal' perspective (i.e. possible exclusionary effects as a result of the strategy of one player on other players within the same layer in the sector).

## 1.2 Structure

The remainder of this EPN is organised as follows:

- **Chapter 2** provides a definition and covers various types of price discrimination.
- **Chapter 3** presents a number of examples of price discrimination in the telecommunications sector.
- **Chapter 4** describes the most important insights from the economic theory in price discrimination literature. A distinction is made between:
  - Price discrimination by a monopolist;
  - Price discrimination in a competitive environment;
  - Non-linear prices.
- **Chapter 5** introduces a number of specific policy implications, outlining the most important steps in the evaluation of price differences.

## 2 Definition and types of price discrimination

### 2.1 Definition

There are various definitions of price discrimination in the economic literature. The following, practicable definition is provided by the Office of Fair Trading (OFT) in the United Kingdom, in the guidelines about the prohibition of the abuse of dominant market positions:

“the charging of different prices to different customers, or categories of customers, for the same product – where the differences in prices do not reflect the quantity, quality or any other characteristics of the items supplied<sup>3</sup>.”

### 2.2 Conditions for price discrimination

A number of conditions must be satisfied for a firm to be able to discriminate on price:

- *Control over prices.* The provider of a service must, to a certain extent, be able to influence the price – otherwise it would not have the possibility of employing different prices. Economic market power is required in order to discriminate on price (and following on from this, that the practice of price discrimination is in itself a strong indication of economic market power). From an economic point of view, however, this goes much too far. Price discrimination also occurs in sectors that are clearly competitive on a large number of indicators.<sup>4</sup> The fact is that a certain degree of control over prices already occurs if not all the conditions of the extreme model of ‘perfect competition’ are satisfied in practice (in other words, when a provider is not a ‘price taker’).
- *Distinguishing between different consumers.* A provider must be able to distinguish between different groups of consumers who are asked to pay different prices. This also applies to schemes that are based on ‘self-selection’, i.e. in the case of schemes where consumers state their preference for a particular price proposition from a number of alternatives. But with these schemes, a provider must also be able to make some assessment of how many consumers will choose particular proposals.

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<sup>3</sup> OFT Guidelines on The Chapter II Prohibition, Competition Act 1998, p10

<sup>4</sup> See Levine (2002), “Price discrimination without market power”, Harvard Law School working paper

- *Limited resale possibilities.* A final condition for price discrimination is that consumers (or specialised parallel traders) do not conduct business between themselves to take advantage of price differences (for example, by buying products in low-price locations and selling them in high-price locations). A provider must be able to prevent or limit this resale possibility.

### 2.3 Incentive for price discrimination

An important observation is that if the three above-mentioned conditions are present and regulatory bodies do not forbid it, a firm always wants to apply price discrimination. Price discrimination leads to at least as much profit as under uniform prices – after all, uniform prices can always be chosen under price discrimination, but this is not possible the other way around. In other words, the requirement of uniform prices forms an additional restriction in the case of profit maximisation by a firm and can therefore only lead to less profit.

### 2.4 Types of price discrimination

Traditionally, economic literature distinguishes the following three categories of price discrimination:

- *First-degree price discrimination:* this is so-called ‘perfect’ price discrimination, such that every consumer is charged their exact reservation price (the maximum price that the particular consumer is prepared to pay). First-degree price discrimination seldom or never occurs in practice. It is used more often as an economic benchmark – social welfare is optimal in the case of perfect price discrimination (but nevertheless only consists of producers’ surplus, or profit). This EPN will not examine first-degree price discrimination any further.
- *Second-degree price discrimination:* with this type of price discrimination, the price per unit depends on the number of units purchased. This is also referred to as ‘non-linear’ prices. A firm generally offers various discount schemes and consumers are eligible for specific discounts on account of their purchasing patterns (self-selection). Examples of second-degree price discrimination are quantity or volume discounts, loyalty discounts and discounts on bundles.
- *Third-degree price discrimination:* with this type, consumers are divided into different categories on the basis of externally observable characteristics and are subsequently charged different unit prices for the same commodity. Different consumers may, for example, live in different geographical areas or belong to different age groups. This category also includes the charging of different prices on the basis of business or non-business use.

Within these three basic types, a number of specific examples can also be given:

- *Bundling:* the bundling of several services, which are then offered at a discount, is a means of implementing price discrimination. This is also referred to as ‘mixed bundling’ if the services in the bundle are also offered separately (if not, this is referred to as ‘pure bundling’). This is a type of second-degree price discrimination.
- *Intertemporal price discrimination:* intertemporal price discrimination exists if different prices are charged for the same service at two different moments in time. Examples include clearance sale prices or peak and off-peak calling tariffs. This is a type of third-degree price discrimination.
- *Price discrimination on the basis of ‘buying history’:* price discrimination can also take place on the basis of the buying history of individual consumers. The second-degree price discrimination category includes, for example, loyalty discounts (campaigns focusing on retaining existing customers) and ‘customer poaching’ (campaigns focusing on enticing customers away from competitors).
- *‘Meeting competition’:* price discrimination can also be a response to competitors. If, for example



competitors enter a specific market segment the incumbent might lower its price in this segment. Such a reaction can be a “normal” competitive response. However, it can also be an anti-competitive reaction and a form of predatory pricing. This is a more strategic type of price discrimination. In this respect, ‘strategic’ means that in the short term it is not immediately in the interest of the provider to ask such a low price for a segment of consumers. In the longer term, however, it enables the operator to weaken competition and subsequently raise prices without inducing entry. On balance profits can ultimately be increased. Strategic price discrimination can be second-degree or third-degree.

### 3 Price discrimination in telecommunications services

In practice it is sometimes difficult to classify specific price propositions in one of the three basic types described above. Sometimes there are also hybrid types that fit within several basic types. The following section shows a number of examples of price discrimination that KPN applies in practice or has proposed to apply:

- ‘Block of Time’ tariffs: these are volume discounts for customers who purchase a certain number of minutes and who also choose this in advance (it is therefore not the case that a discount is effective for everyone who reaches a particular number of minutes). BOT tariffs are, for example, employed by internet dial-up services (e.g. BOT retention tariffs) and particular voice services (e.g. ‘BelZakelijkxxx’, ‘BelPlus 200’ and ‘Flat Fee Weekend’ proposals). BOT tariffs are a type of second-degree price discrimination – in essence these are *ex-ante* volume discounts that consumers can choose from a menu of different alternatives from KPN.
- Volume discounts: KPN also employs volume discounts that are determined *ex-post*, depending on the actual number of calling minutes. An example of this is ‘Worldline’, where a graduated discount per service is given above a particular turnover. In practice this arrangement only applies for business users.  
A volume discount is a type of second-degree price discrimination. Different tariffs for business and non-business users are a type of third-degree price discrimination.

## 4 Insights from economic literature

### 4.1 Price discrimination by a monopolist

#### 4.1.1 Background

At the beginning of the nineteen eighties, two important publications, by Schmalensee (1981) and Varian (1985), appeared in the field of third-degree price discrimination by a monopolist. As already explained, third-degree price discrimination involves the use of different prices for different groups of consumers who can be distinguished on the basis of externally observable characteristics. Examples of these characteristics are age, residential area, business/non-business use, time of calling, national/international destination of a telephone call. These publications focussed on price discrimination by a monopolist, in order to exclude possible strategic or competitive effects in an oligopoly. In both publications, the direct effects of price discrimination on consumers (not on competitors) therefore occupy centre stage. The insights from this section of the economic literature apply to those markets and segments in which KPN has a very large market share, and where price discrimination by KPN appears in the first instance to be intended for its own customers, and not to

entice customers away from competitors or to prevent them from running off to competitors. Two cases are distinguished below: one where no account is taken of the recovery of fixed costs and one where this is the case.

### 4.1.2 Static analysis – no fixed costs

One important result in Schmalensee (1981) and later on more generally in Varian (1985) is the following: in order to increase social welfare, the total quantity of sold services must increase under price discrimination, compared with uniform prices.<sup>5</sup> Output increase is an essential, but not sufficient condition for an increase in welfare. Formulated differently, if the quantity demanded by consumers decreases as a result of price discrimination, this reduces social welfare. This can be explained as follows. Under price discrimination, a monopolist will set a higher price in a demand segment with low price elasticity (low price sensitivity), and a lower price in a segment with high price elasticity. This therefore leads to the use of two different prices. In principle, social welfare is not optimised if consumers do not all have the same marginal benefit/price ratio – unutilised exchange possibilities then still remain open between consumers, which can increase social welfare. This negative effect on social welfare can only be countered if price discrimination leads to more output. The decrease in demand as a result of the higher price in the price-insensitive segment is then smaller than the increase in the demand as a result of the lower price in the price-sensitive segment. The sum of consumers' and producers' surplus (social welfare) can only increase if total output increases.

Finally, it should be pointed out that there is a special category of cases of smaller and more price sensitive markets that are served ('opened') by price discrimination, which would not be served under uniform prices (because it would put too much pressure on the price level in other markets). This opening of new markets is a type of output increase that generally increases social welfare.

### 4.1.3 Dynamic analysis – recovery of fixed costs

The analyses in Schmalensee and Varian are static in the sense that they do not explicitly take into account the fact that a firm must recover its fixed costs. In the longer term, a dynamic analysis must take account of the necessity of recovering fixed costs. If this is not the case, a sector is not in balance in the long term and there is no incentive to invest in fixed costs. When a fixed amount of money must be recovered from various groups of consumers this can best be achieved by ensuring that groups with an inelastic demand contribute more than groups with an elastic demand. This is also referred to as 'Ramsey pricing'.

As indicated above, under third-degree price discrimination a monopolist also fixes prices in accordance with the price elasticity of demand of different groups of consumers. Third-degree price discrimination is a type of Ramsey pricing and thus desirable from a social point of view subject to the condition that this does not lead to excessive profits, but to a profit that is just sufficient to recover fixed costs. This insight is important for the telecommunications sector. KPN's fixed network is a fixed cost and can be used to provide various services. In order to recover the fixed costs by means of various services and from various groups of consumers, it is socially desirable to employ price discrimination.

### 4.1.4 Proposed rule of thumb

Although an increase in the quantity sold is strictly speaking only an essential and not an adequate condition for an increase in welfare (the static result), this EPN nevertheless proposes the use of the following rule as the general rule of thumb for the evaluation of price discrimination: if a particular

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<sup>5</sup> Strictly speaking, this result from Varian (1985) is not confined to monopoly but is more generally applicable.

practice is likely to lead to the increased purchase (e.g. minutes) of a particular service by users, then this practice will probably increase the welfare (apart from any strategic effects that may reduce the welfare – this is discussed in more detail later on in this document). The considerations underlying this proposal are that a clear rule provides a more substantial frame of reference in the case of a practical evaluation (which is already difficult enough) and that the literature clearly points in this direction, certainly if dynamic considerations are included. The following section shows that this rule of thumb remains valid in the case of third-degree price discrimination in an oligopoly.

## 4.2 Price discrimination in an oligopoly

### 4.2.1 Background

At the end of the nineteen eighties and in the nineteen nineties, the focus in economic literature shifted to the analysis of third-degree price discrimination in a competitive environment (instead of by a monopolist). The results from this literature apply to the situation in which KPN does have a large market share but where strategic competitive interaction with other established telecommunications providers is clearly present. An initial comment concerns the strong analogy between third-degree price discrimination by a monopolist and an oligopolist. If, in the case of an oligopolist, the prices of rivals are assumed to remain unchanged (i.e. rivals are assumed not to respond to price changes of the oligopolist in question), we then return in principle to the scenario of a monopolist as described above.

### 4.2.2 Cross price elasticity

In an oligopoly, however, it is unlikely that rivals will not respond to price changes or that a firm will not attempt to assess the responses of rivals when determining its prices. In terms of the price elasticity of demand, not only the firm's own price elasticity, but also the cross price elasticity plays a role where the monopoly is concerned. Cross elasticity is defined as the percentage increase of the quantity of player 1 as a result of a percentage increase in the price of player 2. A monopolist puts its margin on top of the marginal costs as a function of its own price elasticity – the consideration is that sufficient consumers will buy. If the price is too high, too many consumers are excluded from the market, which is not in the monopolist's interest. Moreover, an oligopolist takes account of the effect of the increase of its own prices on the quantity of its rivals (cross elasticities). The consideration once again is that sufficient consumers buy and that not too many are excluded from the market, but now also that consumers buy from him and not from his rivals.

### 4.2.3 Effects of price discrimination

What are the consequences of this additional effect on price setting in a competitive environment? Firstly, prices will be lower in both segments (price sensitive and price insensitive segment) – both in the case of uniform prices and under price discrimination. The reason is that the additional consideration that consumers must be discouraged from buying from rivals puts extra pressure on prices. This is on top of the consideration that consumers must be prevented from being excluded from the market. Secondly, the welfare effects of price discrimination are not easy to point out because both uniform and discriminative prices will decrease (and in the case of the effects of price discrimination, the relevant issue is the difference between uniform and discriminative prices). In particular, two articles in the economic literature deal with the welfare effects in more detail.

- *Holmes (1989)*: in this duopoly model two groups of consumers are distinguished with so-called symmetric preferences. Symmetric preferences means that for both providers one group of consumers is the 'strong' (price insensitive) market and the other group is the 'weak' (price

sensitive) market. Holmes shows that in this case the results from the 'monopoly' literature are repeated: the uniform price lies between both discriminating prices; and increase of output (for the two providers combined) is an essential, but not adequate condition for welfare increase through price discrimination. The same conclusion about the importance of an increase in the quantity of services thus remains valid.<sup>6</sup>

- *Corts (1998)*: this article shows that in the case of non-symmetric preferences, price discrimination can lead to prices that are below the uniform price for both groups of consumers. Here, asymmetric preferences means that a 'strong' group of consumers for one provider is a 'weak' group of consumers for another provider, and vice versa. The intuition underlying this result is as follows. The 'weak' group for the one provider is served with relatively low prices by that provider. However, this is the 'strong' group for the other provider, which responds to the relatively low prices of the other by also employing lower prices (otherwise it will lose too many consumers to the other provider). The end result under price discrimination is that the prices for both groups will end up lower than under uniform prices.<sup>7</sup>

In summary, price discrimination in an oligopoly is not fundamentally different from price discrimination by a monopolist. Although strategic considerations will play a role, the generally proposed rule of thumb remains valid that price discrimination is desirable as long as the total quantity of services increases (e.g. in minutes).

### 4.3 Non-linear prices

Non-linear prices is a general name for types of second-degree price discrimination such that the turnover (price × quantity) does not increase proportionately with the quantity. In other words, the price per unit product depends on the quantity that a consumer purchases (normally speaking, the price per unit product decreases in quantity). This may, for example, be the result of volume discounts, loyalty discounts, 'two-part tariffs', and discounts on bundles. The effects of a number of non-linear prices are explained in more detail below.

#### 4.3.1 'Two-part tariffs'

'Two-part tariffs' means that both a fixed one-off fee ('entry fee') and a variable fee, dependent on the intensity of use, are required for the purchase of a service. One of the first papers on 'two-part tariffs' was by Oi (1971), who wondered which pricing strategy would be better for Disney parks: a fixed price for admission and then all attractions free-of-charge, or free admission and payment for each attraction. Bear in mind that a pricing strategy that employs a fixed fee (e.g. a telephone subscription) is a type of non-linear pricing because it ensures that the price per unit decreases with the number of units. The economic literature concludes that two-part tariffs are generally favourable for social welfare. Intuition says that such tariffs can better reflect the underlying cost structure of providing a service. If the provision of a particular service is accompanied, for example, by high fixed costs and low variable costs, it is better to employ a fixed fee and a lower variable use tariff. The variable users' tariffs then more closely reflect the lower variable costs, so that the economic benchmark for optimum welfare, where

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<sup>6</sup> A more technical comment is that Holmes demonstrates that output only increases if the ratio between the own elasticities of both segments is greater than the ratio of crosswise elasticities. In other words, differences between consumers in the tendency not to buy weigh more heavily than differences to switch to alternative providers.

<sup>7</sup> A practical translation would be that KPN has a preference for a particular group of consumers and competitors of KPN for another group. An example of this is that an entrant mainly focuses on a particular specific market 'niche' in which KPN has much less interest.

prices are the same as marginal costs, is more closely approximated.

A possible unfavourable effect of two-part tariffs is that certain consumers might be deterred from consuming the service because of the upfront fixed fee. For people with limited consumption, a fixed fee might lead to no consumption at all.

### 4.3.2 Menu of price propositions

Another type of non-linear prices is the offering of a menu of alternative price propositions from which a consumer can choose his or her preferred alternative. A menu may, for example, consist of various combinations of subscriptions and minute prices. According to the economic literature, the use of menus is in principle desirable from the point of view of social welfare. The most important reason for this is that different price propositions fit in better with the diversity of consumers – consumers have different preferences and serving them with one proposition produces less ‘benefit’ for consumers than different propositions (‘something for everybody’). As a result, it is also likely that the total requested quantity and thus the consumers’ surplus will increase.

Apart from these direct effects on consumers, the competitive effects on competing providers must also be examined. Depending on the extent to which a menu of prices ensures that output is higher than without that menu, and given the fact that prices are higher than marginal costs, the menu can ensure that additional contributions are made to the recovery of fixed costs. In addition to the advantages of output increase for consumers, output increase is therefore also advantageous for the recovery of fixed costs. The drawback, however, is that an increase in output from the one provider generally leads to a decrease in output from the other providers. And taking away volume from rivals may have the effect that these rivals do not secure the volume that is required for a commercially feasible activity. There is then a risk of foreclosure. This risk may be particularly relevant in sectors where fixed costs are high. Having said that, the basic situation is that if competitors can also offer a menu of alternative price propositions, there is no competitive risk of foreclosure. Competition between companies simply assumes the form of competition between price menus. This qualification holds less if a competitor is handicapped in retail competition due to the fact that no suitable inputs, or inputs against suitable prices are available.

### 4.3.3 Volume discounts

In the case of quantity or volume discounts consumers receive discounts in proportion to the quantity of services purchased. These discounts are often introduced in a graduated form. The discounts may apply to volume ranges (e.g. 5% discount on 100 minutes between 400 and 500 minutes) or the discounts may be cumulative (‘roll-back’) (e.g. 5% discount on all previous minutes if 500 minutes are attained).

Direct and competitive effects can also be distinguished in the case of volume discounts. Where the direct effects on customers are concerned, two courses can be followed:

- Suppose that two groups of consumers can be distinguished – one group with consumers that purchase a large quantity and another group that purchases a small quantity. A volume discount can then be regarded as a type of price discrimination between these two groups. Volume discounts are then nothing more than third-degree price discrimination, as already described in detail.
- Another way of regarding volume discounts is to assume that only one price applies in the first instance, i.e. a price without a discount. A certain quantity of services is purchased at this price. From this perspective, discounts subsequently lead to an increase in the quantity sold, and are thus desirable from a social point of view.

In addition to these direct effects, volume discounts can also have competitive effects, which may be

undesirable under certain circumstances:

- There is a potential risk of foreclosure as a result of two effects:
  - Firstly, consumers are less inclined to 'multi-source', i.e. buy services from several providers at the same time. After all, in the case of volume discounts, a consumer will pay a lower price if he or she buys from one provider. As a result, entrants have less chance of attracting customers (although they can also give volume discounts).
  - Secondly, consumers are less inclined to switch to alternative providers once they have started buying from one provider and volume discounts become likely. A competing provider will then have to offer lower prices in order to attract consumers.

All of this leads to consumers sticking to the providers that they have already chosen and that entrants face a greater obstacle upon entry. Competition between operators takes the form of competition to acquire consumers (in stead of competition to acquire quantities). For entrants the possibilities to acquire consumers at the time they make their decision for a certain operator, are of crucial importance<sup>8</sup>. If insufficient consumers are available and the 'stickiness' effect actually does lead to fewer entrants or to existing companies having so many difficulties in gaining customers that they are forced to exit, which subsequently enables the remaining companies to curtail the volume discounts without inducing re-entry, there will then be a reduction in competition and a decrease in social welfare.

#### 4.3.4 Bundles of services

Bundling several services and then offering these at a discount (a discount compared with purchasing the services separately), is one way of implementing price discrimination. In the case of 'mixed bundling', the services are also offered separately in addition to the bundle; with 'pure bundling' this is not the case and only the bundled products is offered. An example of 'mixed bundling' is elaborated below. The table shows the maximum willingness to pay (also referred to as reservation price) of two types of consumers, type 1 and 2, for two services, A and B.

Table 1

	<i>Type 1 consumers</i>	<i>Type 2 consumers</i>
<i>Willingness to pay for service A</i>	EUR 9,000	EUR 2,000
<i>Willingness to pay for service B</i>	EUR 3,000	EUR 10,000
<i>Willingness to pay for services A and B</i>	<i>EUR 12,000</i>	<i>EUR 12,000</i>

The following observations can be made with reference to this table:

- If the provider of service A wants to sell to both types of consumers, the maximum price can be EUR 2,000 (the limit for type 2). In this case, the maximum price for service B can be EUR 3,000 (the limit for type 1). Per consumer, the provider will then be able to ask EUR 5,000 to sell services A and B – together EUR 10,000.
- In this case, more profit would be gained by the provider if it only sells service A to type 1 consumers (for EUR 9,000) and service B only to type 2 consumers (for EUR 10,000). Its income would then be EUR 19,000, which is more than if it would sell to both types of consumers.
- Bundling strategy. There is, however, one possibility for the provider to generate even more income. It can do this by also selling service A and B as a bundle for, for example, EUR 11,000.

<sup>8</sup> Consumers with large volumes are of special interest for entrants. With larger volumes the risk of entry can be greatly reduced. It is no wonder that competitive battles are predominantly for this group of large consumers



In this case, type 1 and type 2 consumers will buy both services (the combined price remains below the sum of their reserve prices) – unlike the case without bundling. The income is then EUR 22,000 – more than the first two cases.

Bundling services actually enables the provider to apply price discrimination for individual services. The quantity sold can thus increase (as is the case in the example), which is desirable from the social welfare perspective. Bundling services can also have competitive effects. It goes too far to deal with this in more detail in this EPN (there is sufficient material for a separate EPN about bundling – for a summary see Nalebuff 2003). It will suffice here to say that bundling may be anti-competitive in certain circumstances. It may, for example, be a way of ‘leveraging’ market power from one market to another, or to raise extra barriers against entrants (which must enter two markets instead of one).

### 4.3.5 Loyalty discounts

Loyalty discounts reward consumers who buy a certain part of their purchases from a specific provider and not from others. Because these kinds of discounts do not appear to occur in the telecommunications sector, this EPN will not go into them in further detail (see OECD 2003 for a comprehensive summary). As with volume discounts, loyalty discounts are accompanied by a potential risk of foreclosure. There is less space in the market for entrants to build up volume, and it is also more expensive to do this. In addition to loyalty discounts that are directed towards retaining existing customers, the economic literature also distinguishes discounts that are specially intended to ‘poach’ customers from rivals.<sup>9</sup>

## 4.4 ‘Meeting competition’

The last type of price discrimination concerns the selective reduction of prices to particular consumers as a response to competition. This initially relates to the strategic effects on rivals, and less to the direct effects on consumers. Strategic price discrimination may assume the form of third-degree price discrimination (if, for example, a particular group of consumers is targeted) or of second-degree price discrimination (if, for example, certain discounts are intended to take volume away from rivals).

### 4.4.1 Encouraging entry as policy objective

A first consideration with strategic price discrimination is the following (Armstrong and Vickers 1993). Suppose that an existing firm is prohibited from responding selectively to entry. This firm is then faced with the following choice: either not responding and thus accommodating entry; or responding by reducing prices – not selectively for those customers which the entrant focuses on, but for all customers. Both choices reduce the firm’s profit – by accommodating entry it may lose a group of customers and with a general price reduction its income from all its customers decreases.

By permitting price discrimination, which does facilitate a selective response, an existing firm can reduce prices for its group of customers that are under fire from the entrant. In this case there are no consequences for the prices that it can charge its customers that are not under fire.<sup>10</sup>

By prohibiting selective price responses, there is less chance that existing companies respond very

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<sup>9</sup> An example of this is the ‘poaching’ model of Fudenberg and Tirole (2000) which distinguishes two periods: in the first period it is clear which of the two providers are preferred by consumers – in the second period companies can then launch specific campaigns to acquire customers from the competitor. The most important finding in the model is that companies with smaller market shares give greater discounts.

<sup>10</sup> In more technical terms, price discrimination only permits the reduction of prices for marginal consumers, while in the case of a demand for uniform prices, prices for both marginal and infra-marginal consumers must be reduced.

aggressively and this increases the chance of entry. If an explicit policy objective is to encourage entry (as an aim in itself, without an additional demand that entry must be efficient), this could be achieved by prohibiting or discouraging strategic price discrimination. This could lead to inefficient entry and therefore to so called productive inefficiencies, whereby output is produced too costly. However, allocative efficiency might improve, because the existing firm is pressured to reduce (excessive) prices.

#### 4.4.2 Competitive and anti-competitive selective discounts

If there is no such policy objective, each case must be examined in pure economic terms to determine whether a selective price response is permissible or not. Where does the distinction lie? A price response is too aggressive if it leads to ‘predatory pricing’. In the case of predatory pricing, a provider sets the price below the average variable costs (and thus accumulates a loss on each unit that it sells), with the intention of scaring off an entrant or forcing an existing firm out of the market<sup>11</sup>. Once this has happened resulting in less competition and re-entry is improbable, it can change its loss-making price structure and introduce higher prices. Because a strategy of predatory prices can only be profitable with higher prices in the longer term to compensate for initial losses, the offering of services below average variable costs is a strong indication of anti-competitive behaviour<sup>12</sup>. In principle, fixed costs in the telecommunications sector are relatively high and variable costs are relatively low – the lower limit for evaluating predatory prices is thus relatively low (and it would be more difficult for a regulatory body to substantiate a predatory price case). However, if wholesale and retail services are considered separately, then wholesale tariffs represent a variable input cost for providers of retail services – and are thus part of the lower limit.<sup>13</sup>

A price response may also be too aggressive if prices lie above variable costs, but still have the effect of removing volume that is essential for entrants to survive (e.g. because volume is necessary to achieve crucial economies of scale). In this case the effect of the price response is the same as with predatory prices, i.e. reducing competition. The difference is that the sole intention with predatory prices can only be the exclusion of competitors, while with prices that remove critical volume from competitors, exclusion can only be an effect (perhaps unintended).

## 5 Policy implications

### 5.1 Translation from the literature into specific directions

#### *Two important effects*

Although specific considerations and effects depend on the specific type of price discrimination, in general two effects can be distinguished that determine the desirability or undesirability of price discrimination:

- Direct effects: what are the consequences for the *consumers* of the firm that applies price discrimination?

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<sup>11</sup> Competition law uses the “average variable cost” test. A better test from an economic point of view would be to identify potential predatory prices by average avoidable costs. Prices below this level do not contribute to higher profits or lower losses.

<sup>12</sup> It should still be verified if there are pro-competitive motives for these low prices (f.e. a price below average variable costs can be used temporarily to stimulate demand – think of network externalities where more users lead to an increased utility for all users).

<sup>13</sup> This perspective is also chosen in OPTA’s price squeeze tests.



- Competitive effects: what are the consequences, in the short and longer term, for *competitors* of the price discriminating firm?

In each specific case, the emphasis should lie on assessing these two effects.

### *Direct effects*

Where the direct effects are concerned, the rule of thumb that can be used is that if the quantity of a service or services purchased by consumers increases as a result of the price discrimination, then the price discrimination is desirable on the basis of social welfare considerations<sup>14</sup>. The intuition behind this rule of thumb is as follows: Compared with uniform prices or prices without discounts (linear prices), price discrimination may turn out positive (lower price) for some groups of consumers and negative (higher price) for other groups of consumers. It is then difficult to determine what the net result is. If, however, more consumers are served, or if existing consumers buy more, then the net result is positive. One could argue that this rule of thumb is fairly strict in the case of telecommunications services. In sectors in which fixed costs are relatively high and variable costs low (such as in telecommunications), a type of price discrimination, i.e. Ramsey price-setting, is optimal from a social point of view in order to recover fixed costs. From this perspective, price discrimination could be desirable, even if the quantity of services would not increase as a result.

### *Strategic effects*

In addition to a way of generating more income (apart from the behaviour of consumers), price discrimination can also be a response to competitors. An existing firm can reduce prices selectively for a specific group of consumers that are approached by entrants. An existing firm can also modify the tariff structure with discount schemes in order to discourage its own customers from switching. These are examples where the strategic effects of price discrimination are important. Where strategic effects are concerned, a distinction must be made between responses from an existing firm to competitors that ultimately restrict the competition on the one hand, and competitive responses that are permissible on the other hand. Where does the border lie between the permissible and impermissible responses of competitors?

A strong indication of undesirable strategic price discrimination is if a selective price reduction for a group of consumers only makes sense (i.e. is profitable) for an existing firm if this leads to the withdrawal of competitors (or prevents entry). The most probable reason for such a response is to increase prices again in the longer term once competitors have been forced off the market. An example: if prices for a selective group of consumers are below the average variable costs, this is a strong indication that the strategy is directed towards forcing competitors off the market in order to increase prices later (after all, such a pricing structure must lead to losses in the short term).<sup>15</sup>

Undesirable price discrimination may also occur if it is likely that it is no longer commercially tenable for competitors to continue offering services due to a reduction in the quantity of services sold as a result of the price discrimination by the existing firm. Although the effect of reduced volumes does not necessarily have to be directed towards the elimination of competitors, price discrimination may very well have this effect and is probably anti-competitive (unless the service is a natural monopoly, in which case one

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<sup>14</sup> Economic literature suggests a stricter test, stipulating that an increase in output is a necessary but not sufficient condition for welfare to increase.

<sup>15</sup> In these cases it still should be considered if there are pro-competitive reasons for this kind of pricing.

provider is optimal). There is a possibility that a reduction in volume critically threatens the commercial feasibility, particularly if economies of scale in a market are important.

Aside from these potential anti-competitive effects that restrict the competition, price discrimination by means of selective discounts must be regarded as a permissible competitive response from an existing firm to increasing competition.

## 5.2 Specific steps in the evaluation of price discrimination

The following questions should be asked in specific cases of price discrimination (inspired by economic price discrimination literature):

- *Does the firm that applies the price discrimination hold a dominant market position?*  
If there is no question of a dominant market position, it is unlikely that price discrimination can be undesirable from a social welfare perspective. In this case the firm is quite simply unable to significantly influence the market.  
Without mitigating circumstances (such as lower entry barriers, purchasing power, a dynamic competitive environment or bidding market properties), a share on the relevant market in excess of 50-60% is often regarded as an indication of market power.
- *Can differences in prices be explained by differences in variable costs?*  
If price differences are based on variable costs or on specific costs for serving groups of consumers, there is no question of price discrimination and the practice should be permitted.
- *Does the price discrimination lead to an increase of output on the market?*  
If the sold quantity of a service, for all companies on a market together, increases, price discrimination is in principle desirable. However, it must still be determined whether strategic effects lead to a reduction of competition in the longer term (see following question).
- *Does the price discrimination lead to a critical decrease in volume among competitors – with the final result being that the offering of services is no longer commercially feasible for them?*  
If it is likely that a decrease in volume is disastrous for a competitor, and also that this competitor will not re-enter the market when prices are higher again, price discrimination can lead to a reduction in competition, which is at the expense of consumers in the longer term. A strong indication of the intention to restrict competition in the longer term is the offering of services below the variable costs in the short term.

The steps outlined above are part of a purely economic evaluation of price discrimination in practice. It should be mentioned that there may be explicit policy objectives that rise above a purely economic consideration. An example is the policy objective to stimulate entry – this may lead to a situation in which price discrimination is forbidden even if it is not undesirable in principle from an economic point of view. The reason would then be to protect entrants from the aggressive responses of existing companies by prohibiting price discrimination and thus stimulating entry.

In general regulation of a firm can be regarded in the following perspective. There is a trade-off between productive efficiency and allocative efficiency. Not allowing price discrimination can lead to productive inefficiencies because less cost efficient operators might enter the market. However, this market entry can increase allocative efficiencies, because pressure on prices of the existing firms is increased and thereby decreases the risk of excessive prices by existing firms. Promoting entry by prohibiting price discrimination in the form of selective discounts, can be recommended in circumstances where excessive prices are likely and (other) forms of price regulation are not effective.

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## Economic Analysis Team

The **Dutch Independent Post and Telecommunications Authority (OPTA)** regulates the postal and telecommunication markets in The Netherlands. OPTA is an independent executive body that commenced its activities on 1 August 1997. OPTA's mission is to stimulate sustained competition in the telecommunications and post markets. In the event of insufficient choice OPTA protects end-users. OPTA regulates compliance with the legislation and regulations on these markets.

OPTA has committed itself to improving the economic reasoning on which strategic choices are made so that market parties have a clear understanding of what to expect from OPTA now and in the future. In 2003 the OPTA bureau was complemented with the **Economic Analysis Team (EAT)** headed by the Chief Economist. EAT is responsible for developing economic reasoning and stimulating discussion on key issues within the telecommunications and postal markets. To achieve this, EAT produces two kinds of policy notes – short discussion papers. *Economic Policy Notes* focus on economic issues and principles. *Regulatory Policy Notes* focus on strategic economic issues in specific regulatory fields.

With its products and activities the Economic Analysis Team expects to add value to the economic debate in Dutch telecoms and post. For further information visit [www.opta.nl](http://www.opta.nl) from where you can download EAT publications.

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