OPTA

05

THE BUNDLE THE MARKET ?

REGULATORY POLICY NOTE

Onafhankelijke Post en Telecommunicatie Autoriteit

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Explanatory note

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.

In terms of market conditions, market structure and regulatory framework, telecommunications and postal markets present a continuously changing landscape. In this environment, OPTA has committed itself to improving the economic reasoning on which strategic choices are made in such a way that market parties can contribute to and have a clear understanding of the development of OPTA-policies, 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. To stimulate discussion EAT organises roundtables. With its products and activities the Economic Analysis Team expects to add value to the economic debate in Dutch telecoms and post.

Often, lessons can be drawn from past cases. Policy Notes will try to benefit from analysing such cases. These Notes, however, are aimed at contributing to the development of future OPTA policies and are focused on providing sound economic reasoning to that effect. For the purpose of these Notes it is not necessary to take into account other considerations, either of a factual or of a policy nature that may have played a role in these past cases. These Notes, e.g., do not set out to identify or evaluate short term benefits service providers may offer to end consumers but primarily aim to look into long term benefits of competition between service providers. As a consequence, discussion of these cases should not be considered or construed as an attempt to revise or evaluate these cases. Furthermore, Policy Notes are not aimed at reviewing past policies or expressing future policies. They are solely intended to stimulate discussion and critical comment within as well as outside of OPTA, thus laying a basis for the development of future policies.

The analyses and conclusions expressed in Economic and Regulatory Policy Notes of the Economic Analysis Team (EAT) do not necessarily reflect the opinions of the Commission of OPTA. As such, the opinions of EAT, in whatever shape or form, do not have a legal status. Quotes from and references to these Notes can be made freely, provided that such quotes and references sufficiently express the preliminary character and purpose of the Notes.

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Executive Summary

In the current markets for electronic communications networks and services, bundling is becoming an increasingly prominent phenomenon. This paper addresses the question under what circumstances a bundle of electronic communications services can be considered to establish a separate relevant market.

Bundling is the situation in which two or more products or services are offered together as one package (the bundle). The most relevant type of bundling in the context of this paper is mixed bundling, which refers to the situation when the relevant products are both offered separately and as part of a bundle. Bundling can have advantages on the supply and on the demand side (economies of scope and transactional complementarities respectively).

The problem of defining markets in the presence of multi-product firms supplying bundles of products is recognised in competition policy. In the United States the idea of “cluster markets” has been developed to capture the idea that a bundle of products jointly consumed by customers may define a relevant market. A cluster market may exist if transactional complementarities are such that consumers do not consider “unbundling” a suitable alternative to purchase of the bundled (or clustered) products.

The question when a bundle is a market on its own can also be framed in terms of the hypothetical monopolist test. If a hypothetical monopolist supplier of a bundle would not be able to raise its price because of substitution to the separate products comprising the bundle, this does not necessarily imply that a single market exists that contains the bundle and all individual components. In fact, the bundle can be part of more than one relevant market for the components of the bundle. This non-uniqueness of market definition is not a defect of the hypothetical monopolist test but rather a reflection of the way competition works. Nevertheless, substitution from the bundle to one of the separate components may be conditional on the availability of the other separate component(s). Such conditionality could indicate that there is a separate market for the bundle.

We are currently in the early stages of (so far non-symmetric) convergence. Households are increasingly able to choose a single infrastructure for all their fixed electronic communications services. Once a sufficient number of households has chosen for one infrastructure or the other, a separate service on one infrastructure may no longer be a stand-alone substitute for the same service on the other infrastructures. However, at the bundle level the two infrastructures may remain substitutes for each other. Once the separate services over different infrastructures become weaker substitutes while a bundle of those services over different infrastructures become or remain strong substitutes, this provides a strong indication of a separate relevant market for the bundle.

1 Introduction

Telecommunications was traditionally characterized by distinct infrastructures, owned by distinct companies, providing distinct services to customers. However, the capabilities of infrastructures are increasing (OECD 2006). Cable companies are capable of providing broadband and telephony services in addition to their traditional television service. Traditional telephone companies are, in addition to providing telephony, increasingly providing broadband services as well and are now introducing their television services. Also mobile operators are now introducing broadband and tv. These market developments are usually discussed under the heading of convergence. These phenomena are also a pushing factor behind the emergence of bundling. Very often, suppliers introduce a new service as part of a bundle. So cable companies, which supplied television services for many years, are offering add-on services such as broadband and (IP) telephony. Also KPN, traditionally a fixed telephony supplier, is offering broadband and recently introduced its television service. So gradually a situation is arising where, in addition to the traditional separate product markets of fixed telephony, mobile telephony, broadband and television, bundled markets will be created, which in the long term may even incorporate the single product markets.

For OPTA this development gives rise to the question whether, when and how these bundles become separate relevant markets in their own right, or incorporate the single product markets. The EC defined markets which NRA's have to analyse. Until now only single product markets have been listed by the EC. According to European Commission staff: "there is [currently] little evidence to consider triple or quadruple plays as a bundle that should be analysed as a single market" (see Box 1) However, since bundling and multi-play strategies are becoming increasingly prominent in the electronic communications markets in the Netherlands, there may be a moment in the near future that bundled multiple product markets will have to be defined as relevant market in competitive assessments.

This paper addresses the question under what circumstances a bundle of electronic communications services can be considered to establish a separate relevant market. It brings the bundling issues addressed in EPN04 to the practical level of performing market analysis. EPN04 dealt with anti-competitive and competitive effects of a bundle. In this paper the influence of such effects is investigated in market analysis issues. The first step in every market analysis is defining the relevant market. Dominant firms may use bundling strategies to obtain or enhance such a position, and by doing so influence the way the market is defined. Because the issue of market definition can be complicated when bundles arise, this paper aims to shed more light on the issues involved.

2 Background

In the current markets for electronic communications networks and services, bundling is becoming an increasingly prominent phenomenon. Cable companies have entered the markets for telephony and broadband internet access while traditional telephony companies have entered the markets for broadband internet access and television. Increasingly these companies offer multi-play bundles. The issue of bundling was previously addressed by EAT in its EPN 04, "Bundling, the economic theory and a framework for ex-ante regulatory assessment", September 2004[1]. This paper presented a framework for assessment of the competitive effects of bundling strategies.
The fact that companies are increasingly offering multi-play bundles also raises the question about the implications of bundling for market definition. This paper will address the following question: under what circumstances can a bundle of electronic communications services be considered to establish a separate relevant market?

"Bundling

Communications companies provide a multitude of services to their customers, which are often sold as a bundle or a cluster. In most cases the individual services in a cluster are not good substitutes for each other yet can be considered to be part of the same relevant market.[2] In the future converged offerings between mobile and fixed services may emerge but this is not expected to be a widespread phenomenon during the life of the revised Recommendation. Such clusters are often sold as such due to economies of scope in the supply function. Some of these economies of scope are related to the marketing and billing functions and are, as such, independent of the context. Others relate to the actual technology used where a given network can be configured to provide a large range of services.
On the demand side, consumers may have a preference for a bundle/cluster if there are significant transactional costs. In this case, consumer preferences may be such that the vast majority prefer to purchase the whole bundle from a single supplier and hence the bundle may become the relevant product market.
Whilst certain bundles are well established (voice and SMS on mobile), others are at a much earlier stage of development. In many circumstances such bundling is to the advantage of consumers without impacting negatively on competition.
As yet, there is little evidence to consider triple or quadruple plays as a bundle that should be analysed as a single market. An important part of this is that the consumer is able to "unpick" the bundle and obtain a particular service from another provider if they so desire. For the same reason, access and calls markets in the fixed arena would still be viewed as separate markets"

Box 1: Text on bundling in the draft explanatory memorandum to the draft Recommendation on relevant markets[3]

[1] available at http://www.opta.nl/asp/nieuwsenpublicaties/onderzoeken/document.asp?id=1634.
[2] This is interpreted in this paper to refer to clusters such as fixed telephony access and fixed call origination, mobile telephony acces, origination and SMS services, etc.
[3] Draft Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation (Second edition), available at: http://europa.eu.int/information_society/policy/ecomm/doc/info_centre/public_consult/review/recommendation_final.pdf

2.1 Types of bundles

Bundling is the situation in which two or more products or services are offered together as one package (the bundle). Bundling is a widespread business practice in the electronic communications sector. The most important forms of bundling are pure bundling and mixed bundling. In legal cases a third type of bundling is often introduced: tying. This paper uses the following definitions of bundling:

- *Pure bundling:* two goods, A and B, are sold only together. They are not available for individual purchase. Furthermore the goods A and B are offered in a fixed proportion. (A simple example of complements are left and right shoes. These are mostly sold in the fixed proportion of 1 to 1 and generally not available separately.)
- *Mixed bundling:* in addition to being sold individually, goods A and B are sold as an A-B package for less than the combined price of A and B. If no discount were given, and consumers obtain no significant benefit from purchasing the products as part of a bundle, then the strategy of mixed bundling would be of limited attraction to consumers since they could buy both goods A and B separately.
- *Tying:* a customer, who wants to buy A, also must buy B. It is possible to buy B without A which explains why this is a tie and not a (pure) bundle. Thus, the items for sale are B alone or an A-B package. In this situation B is the tied product; A is the tying product. For example, if buying a new pair of shoes, laces are typically included. (Though the consumer may choose to leave the included laces with the salesperson, a discount is unlikely to be obtained). Shoelaces are also available separately. Shoes are the tying and shoelaces the tied product.

2.2 Relevance of types of bundles for market definition

Mixed bundling

The most relevant type of bundling in the context of this paper is mixed bundling. In this situation the relevant products are both offered separately and as part of a bundle. In this situation the question to which market the bundled supply belongs becomes relevant. With respect to electronic communications examples of mixed bundling are Voice over Broadband with broadband internet access (since both the fixed telephony services and the internet access services are available separately), fixed telephony access and call origination (call origination being available separately from e.g. CPS providers) and mobile telephony access, call origination and SMS.

Pure bundling

If products are only offered as part of one and the same pure bundle, for instance all suppliers on the market offer left shoes together with right shoes as a pair of shoes, the issue of market definition is quite straightforward. In that situation the products form a “system” of complements which is most likely to be a market in it’s own right; in this case a pair of shoes.

If one or more suppliers of a certain product offer that product in a pure bundle while other suppliers offer the products separate of each other, the resulting market situation will be no different than a situation of mixed bundling. The only difference lies in who is supplying what, but that should not affect the market definition.

Tying

In case of tying the main question on market definition is whether the tying product and the tied product are part of the same relevant market. Methodologically this raises the same questions as in the mixed bundling case, only the number of possible substitutes for the bundled supply is lower.

2.3 Economic reasons behind bundling

The economic rationale behind bundling is discussed extensively in EPN 04. In it, the following four efficiency reasons behind bundling are presented.

2.3.1 Cost reductions achieved by suppliers

Bundling can lead to a reduction of costs of producing and distributing products through the achievement of economies of scope. Bundling is a way to achieve cost savings within the product portfolio of the firm. For example, it is cheaper for a firm to distribute their software packages on one single CD than to distribute all software separately. Cost reductions derived from bundling are welfare enhancing as they lead to either more supplier surplus (in case of higher profits), consumer surplus (in case of lower prices) or both. In ex ante regulatory assessment of the effects of bundling on competition and welfare, it is important for the regulator to assess whether the cost savings are directly attributable to the fact that the products are bundled.

2.3.2 Bundling to reduce transaction costs incurred by consumers

Bundling can reduce the transaction costs incurred by consumers. Transaction costs are the costs of trading with others above and beyond the price, such as cost of writing and enforcing contracts. For consumers, transaction costs are mostly search costs, for example the time it takes to find the right product; the costs to go to a store; the time it takes to download the site of a web store or learning how to use the product. It is straightforward to see how bundling could reduce transaction costs. By offering two or more products together, consumers have to spend less time searching for the right offer or making the two products work together properly. If the purchase of certain goods from a single firm significantly reduces the consumers transaction costs, these goods are called: “transactional complements”.

2.3.3 Bundling to reduce pricing inefficiencies

Bundling can be used as a means of reducing inefficiencies in pricing. If different “types” of consumers value a product differently (i.e. their willingness to pay for a certain product differs), there is not a single price which will optimise profits, and therefore pricing inefficiencies exist. The solution to this problem is charging each individual consumer exactly what he or she is willing to pay. This perfect price discrimination leads to optimal social welfare. The ability to price discriminate between consumers is limited in reality. Implementation of price discrimination requires the ability to distinguish between different consumers, the ability to limit resale and control over prices. If selecting different

(groups of) consumers on the bases of their willingness to pay is difficult, bundling can help by making heterogeneous consumer valuations more homogeneous. This discrimination allows the seller to increase profits by extracting greater revenue from those buyers who are most willing and able to pay. Perfect price discrimination can be welfare enhancing as it can lead to a higher output decision by the producer which reduces deadweight losses under imperfect competition. Note that such welfare gains go mostly to the producer.

2.3.4 Bundling to improve quality or quality control

A final reason for a producer to offer a pure bundle or a tied product is to increase the (perceived) quality of a product or to maintain the reputation/brand of the provider. A producer might find it crucial to secure the use of separate products together for quality reasons. For instance, by bundling a radio or CD-player together with the car, the operation of the radio can be integrated in the dashboard or steering wheel. In total, this adds value over a non-bundled product that would need a separate radio/CD-player.

Quality justifications are more plausible for pure bundling or tying. It is not so likely that a mixed bundle could really offer quality improvements. Since the products are produced separately as well, the production process does not leave much room for quality improvement as a result of the bundle unless a separate process is designed for the bundle (this is costly and is not likely to lead to cost reductions). Bundling for quality reasons/quality control is a generally accepted argument. Therefore it is often used in competition cases in defence for bundling, for instance in situations where a secondary product in an aftermarket is tied to a primary product. The argument should be considered carefully because. as Nalebuff (2003, p. 21) notes, "*safety and quality may be the last refuge of a scoundrel.*"

2.4 Consumers' motives for buying bundles: the case of telecoms

OPTA is monitoring the development of bundled supply in the electronic communications markets in The Netherlands. Figure 1 (below) shows the uptake of different types of dual and triple play bundles by consumers in the years 2004, 2005 and 2006.

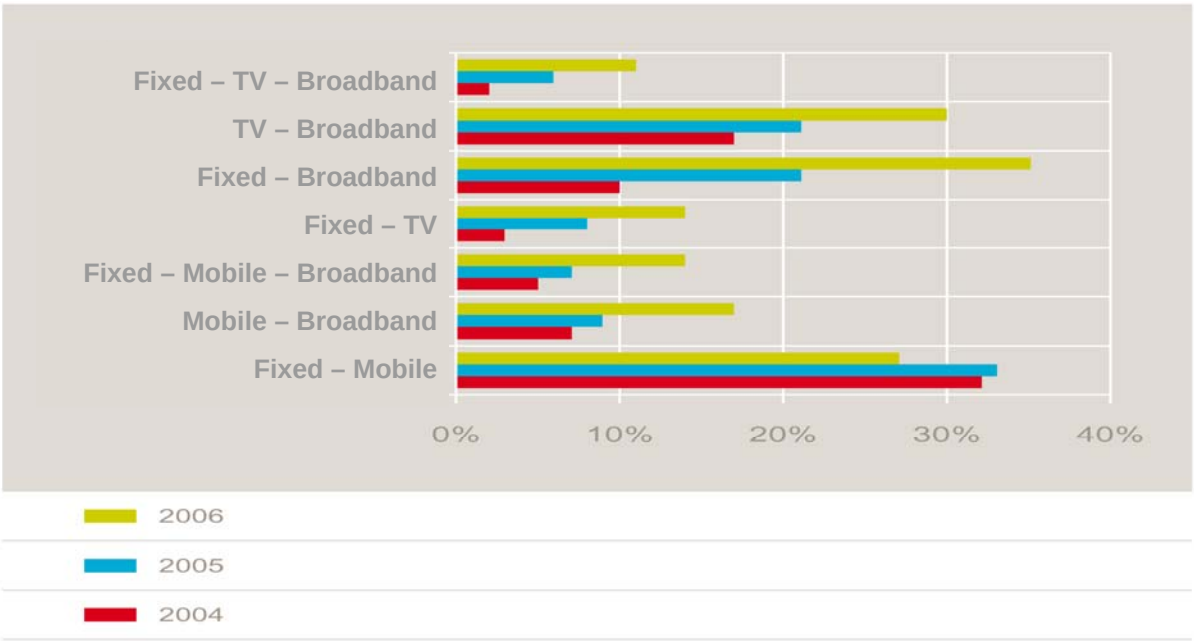


Figure 1: Uptake of bundles in The Netherlands[4]

The number of users of all types of bundles shown above, except the fixed telephony - mobile telephony bundle, have increased over the past three years.

As shown in Figure 2 (below), the consumers' motives for using bundles have changed somewhat over the past three years. The factor convenience has always been the most important, and the discount factor has apparently gained importance in 2006.

[4] Source: OPTA, Annual Report 2006. Note that certain categories are subsets of other categories, e.g. "tv – broadband" is also counted in "fixed – tv – broadband"

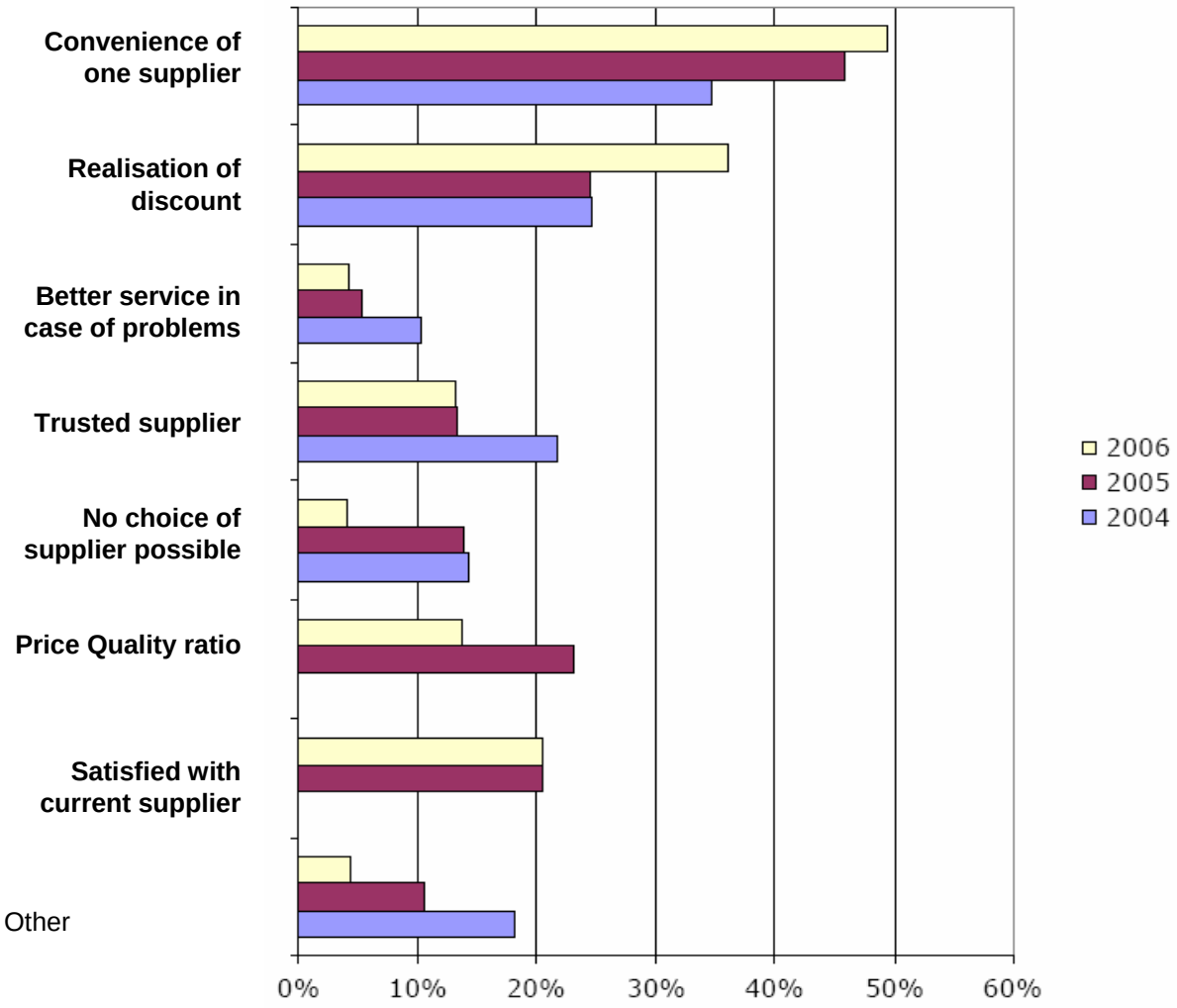


Figure 2: Motives for a conscious choice of a bundled offer[5] (more than one answer possible)[6]

The next chapter provides a brief recap of standard market definition technique and discusses its usefulness in the case of bundles.

[5] The number of households that mentions a certain motive as percentage of the total number of households that made of conscious choice for a bundled offer.

[6] Source: Consumer survey of bundled consumption of communication services in the Netherlands, third survey, 8 March 2007.

3 Market definition

This chapter will give a short overview of the standard market definition technique using the SSNIP test and discusses the usefulness of this technique in answering the research question of the paper.

3.1 Principles of market definition

The purpose of market definition is to define which products are included in a relevant market.[7] The European Commission (1997) uses the following definition of relevant product market:

> *"A relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use."*

In the Guidelines on market analysis and the assessment of significant market power the Commission makes the following observations regarding the definition of the relevant market.

> *"The extent to which the supply of a product or the provision of a service in a given geographical area constitutes the relevant market depends on the existence of competitive constraints on the price-setting behaviour of the producer(s) or service provider(s) concerned. There are two main competitive constraints to consider in assessing the behaviour of undertakings on the market, (i) demand-side; and (ii) supply-side substitution.*
>
> *A third source of competitive constraint on an operator's behaviour exists, namely potential competition. The difference between potential competition and supply-substitution lies in the fact that supply-side substitution responds promptly to a price increase whereas potential entrants may need more time before starting to supply the market. Supply substitution involves no additional significant costs whereas potential entry occurs at significant sunk costs. The existence of potential competition should thus be examined for the purpose of assessing whether a market is effectively competitive within the meaning of the framework Directive, that is whether there exist undertakings with SMP.*
>
> *Demand-side substitutability is used to measure the extent to which consumers are prepared to substitute other services or products for the service or product in question (25), whereas supply-side substitutability indicates whether suppliers other than those offering the product or services in question would switch in the immediate to short term their line of production or offer the relevant products or services without incurring significant additional costs."*

[7] Market definition also concerns which geographical boundaries exist to a product market. This issue is not analysed in the paper.

The example below provides an example of supply side substitution.

For example, a hypothetical monopoly supplier of plastic knives and forks is unlikely to be constrained from raising prices by the possibility of customers switching their purchases to plastic plates (i.e. plastic plates are not demand-side substitutes for plastic cutlery). Nonetheless, it may be that the assets of the plastic plate maker, such as the injection moulding equipment and distribution systems, could easily be used to make plastic knives and forks at short notice and without the need to make any significant new investments or incur any significant new risks. In this example therefore, even though there is no demand side substitution, there is supply side substitution which means that plastic cutlery and plastic plates can belong to the same relevant market.

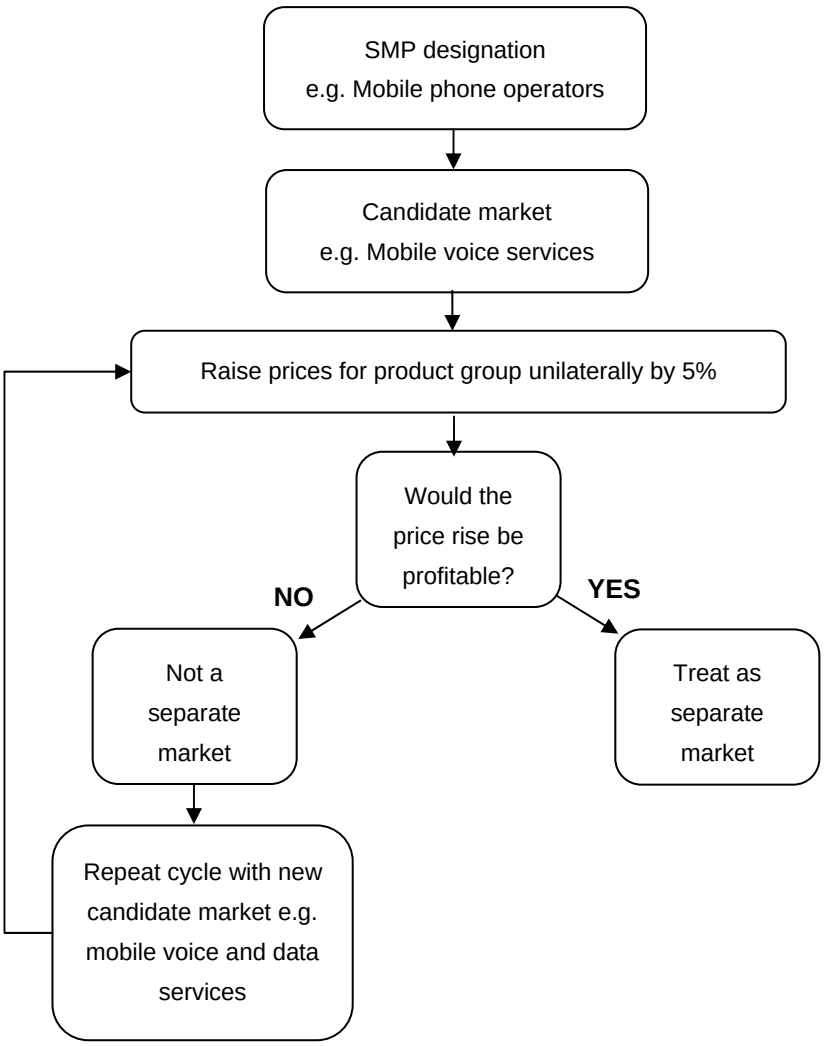
Box 2: An example of supply side substitution

3.2 The hypothetical monopolist test

An often-used approach to analyse demand and supply side substitutability is the so called hypothetical monopolist test or SSNIP test. This method constitutes a thought experiment in which one asks the question whether a hypothetical monopolist supplying a certain product would be able to realize a SSNIP (small but significant non transitory increase in the price) of this product, starting from a competitive price. If the hypothetical monopolist increases its price, this will generally result in a higher profit margin on the sales, but in lower sales. If the hypothetical monopolist can increase the price of a product profitably by 5 to 10%, it means that other products and other (potential) suppliers are not exercising strong competitive constraints on the hypothetical monopolist. This means that market is confined to the product investigated. If the hypothetical monopolist cannot increase the price profitably, because the loss in sales outweighs the increase in profit margin, then these other products to which some consumers switch establish a competitive constraint on the pricing behaviour of the hypothetical monopolist and are therefore part of the relevant market. A flow chart of the SSNIP test is presented in Figure 3 (below).

A relevant market is the smallest group of products such that a (hypothetical) single supplier would be able to introduce a small but significant non transitory increase of price profitably. If the hypothetical single supplier cannot increase the price profitably, then the products are part of a wider relevant market.

Figure 3: The SSNIP test flow chart[8]

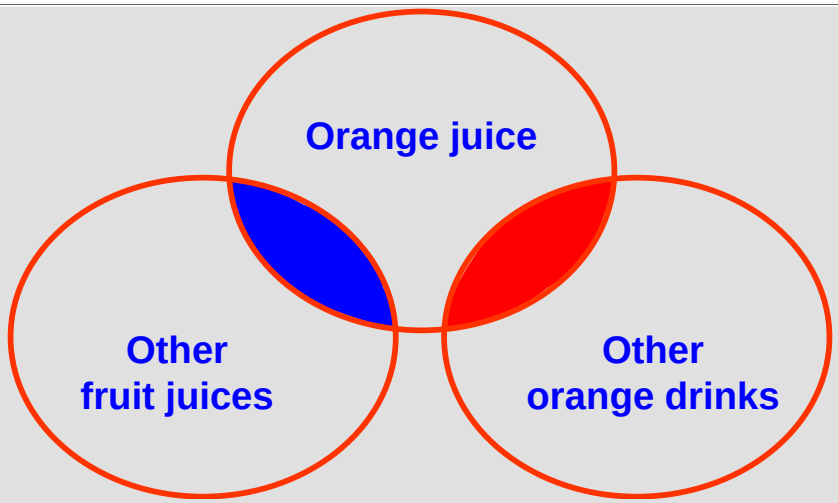


3.3 The use of standard market definition techniques on bundles

A critical issue in the application of the market definition techniques is the definition of the starting point for the hypothetical monopolist test because it can influence the outcome of the test. This is explained in the box below.

Suppose one were looking at the supply of fresh orange juice and trying to define the appropriate market. Further, suppose that of those currently drinking fresh orange juice, a large percentage of customers would switch to other beverages in the event of a price rise. Of those who would switch, half would purchase other fresh fruit juices (e.g. grapefruit juice) and half would purchase other types of orange flavoured drink (e.g. carbonated orangeade).

[8] Source: NERA, Market Definition and significant market Power assessment, A Handbook for OPTA, Volume I, February 2002.



It may not be profitable for a hypothetical monopoly supplier of fresh orange juice permanently to raise prices. Yet it is possible that a profitable price increase might be achieved either by acquiring control of those firms which produced other fruit juices or by acquiring control of a firm which produced other orange flavoured drinks. It may therefore be valid to define the market as either fresh fruit juices or orange-flavoured drinks. Both could meet the market definition test as the smallest group of products whose prices could be increased by a hypothetical monopolist.

The market definition that will be relevant will depend on the context of the analysis. If an orange juice manufacturer is acquiring a grapefruit juice manufacturer, then the relevant market might well be fresh fruit juices. If instead the firm to be acquired was in the business of making carbonated orangeade, the relevant market might well be orange-flavoured drinks.

Box 3: The non uniqueness of market definitions[9]

The choice of the starting point is crucial in situations where asymmetric substitution between products exists. If the suppliers of product A are unable to raise price due to a loss of sale to product B, but the pricing of product B is not constrained by a loss of sales to product A, this may be the effect of asymmetric substitution. This arises where for a high proportion of A's customers, product B is a close substitute but product A is a close substitute for only a small proportion of customers of product B. When the hypothetical monopolist test is applied, this means that whilst product B is in product A's market, product A is not in product B's market. Even though such situations are not common they do arise, particularly in markets where technological innovation leads to the replacement of a product by another (newer) product over time. If customers tend to "trade-up" but are reluctant to "trade-down" then asymmetric substitution can arise. The convergence trend which pushed bundled supply of products may also cause asymmetric substitution from individual components to the bundle.

Furthermore, analysis of substitution between bundles and their components can also lead to non – unique market definitions. This will be demonstrated in the next chapter. This chapter will present an economic approach to the definition of relevant markets in the context of bundles.

[9] ibidem

4 In what circumstances is the bundle the market?

4.1 Introduction

The problem of defining markets in the presence of multi-product firms supplying bundles of products is recognized in competition policy. In competition law practice there are several examples where markets are defined that comprise a collection of products which are no substitutes for each other. The most famous example of a market definition that comprises a bundle of products is the retail supply of daily consumer goods through supermarkets (see Box 4).

A clear example of a situation where a bundle is a relevant market in itself are supermarkets. In merger cases notified to the European Commission the relevant market is usually defined as: "the provision of a basket of fresh and dry food-stuffs and non-food household consumables sold in a supermarket environment."[10] One of the main reasons for this is the "one stop shopping" principle of supermarkets. Through purchasing the listed grocery items in one shop in one go consumers can realize a significant reduction in search costs.
Search costs for groceries can be seen as significant in two ways. First, individual grocery items tend to have a low price or value, which suggests that search costs will be high in relation to the price or value of individual items. Second, grocery demand is usually expressed in terms of demand for a bundle of products, rather than individual items. As bundles of products are more difficult to compare than individual items, search costs are likely to be high for this reason as well. These characteristics differentiate grocery retailing from other retail markets where comparison of alternative products is much more feasible and worthwhile.[11]
The lower search costs of shopping in a supermarket compared to purchasing the daily consumer goods in different specialized stores causes a price (or quality) difference between the bundle supplied in the supermarket and the individual products supplied in specialized grocery stores.

Box 4: The basket of daily consumers goods.

The following example illustrates the same considerations concerning electronic communications services.

Paragraphs 119 to 122 of OPTA's market analyses concerning mobile access and call origination (14 November 2005) discuss the issue of whether mobile (data) services such as mobile internet, SMS, WAP, MMS, etc belong to the same relevant market as mobile access and call origination. Even though these services can not be seen as strong substitutes for the access and call origination services, the market analyses nevertheless finds that these services belong to the same relevant market. The reasons are that these services are virtually always included in the bundle of services of the various service providers and competition between the service providers exists between the bundles, not the individually identifiable services. This issue is closely linked to the concept of "cluster markets" as discussed in the next paragraph.

Box 5: Market analysis of mobile access and call origination

[10] See for instance: European Commission, Case No IV/M.784 - Kesko/Tuko, COMMISSION DECISION of 20 November 1996, http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexplus!prod!CELEXnumdoc&lg=en&numdoc=31997D0277

[11] Competition Commission, Supermarkets: A report on the supply of groceries from multiple stores in the United Kingdom, 2000, http://www.competition-commission.org.uk/rep_pub/reports/2000/446super.htm

4.2 Cluster markets

In the United States the idea of a cluster market has been developed to capture the idea that a bundle of products jointly consumed by customers may define a relevant market. This approach was first used in 1964 by the Supreme Court in United States v. Philadelphia National bank and has subsequently been applied in antitrust cases concerning banking and hospital care services.[12] This approach is discussed below.

A cluster market is a market where competition revolves around the joint supply by one firm of economically distinct but complementary products. The complementarity between the products can be the result of economies of scope of producing the products jointly (see paragraph 2.3.1) and consumer convenience in acquiring the products jointly (see paragraph 2.3.2).[13] The degree of transactional complementarity and economies of scope of joint production determine whether the products constitute a cluster.

The concept of transactional complements is sometimes called a demand side analogy to economies of scope, in which the economic benefits accrue to the consumer instead of the producer.[14] Importantly however, the mere existence of economies of scope in the production of a group of different products is not sufficient to group these products into a relevant cluster market. The logic behind this is that joint production does not generally necessitate joint sale while the realisation of transactional complementarities always necessitate joint purchase. However, economies of scope can have an effect on the pricing of the bundle. For instance, when a dual or triple play bundle is offered over a single connection (e.g. copper line or coax) the infrastructure is a so-called “common input” to the several products in the bundle. It is the existence of such common inputs that create economies of scope in the production of a bundle. In a competitive market (or when demand in sufficiently elastic), these savings may not only accrue to the producer but also for a significant part to the consumer in the form of a lower price for the bundled product.

4.2.1 Cluster markets of services

In the special case of services, the general framework sketched above is somewhat more complex. By definition a service is produced and consumed simultaneously. When applying the concept of bundling or cluster markets to service markets this implies that the economies of scope on the supply side can only be realised when there is simultaneous joint consumption. Therefore, in the special case of services (instead of products), joint production necessitates joint sale. Economies of scope linked to joint production can hence be an important element in the rationale for the bundling of services (i.e. joint sale[15]).

[12] Case associates, Banking Mergers, Transaction costs and market definition, Casenote May 1999, http://www.casecon.com/data/pdfs/casenote18.pdf

[13] Telecommunications Authority Guidelines on Mergers and Acquisitions in Hong Kong Telecommunications Markets, 2004, http://www.ofta.gov.hk/zh/report-paper-guide/guidance-notes/gn_20040503.pdf

[14] ibidem

[15] Joint sale in the case of telecommunications services does not necessarily require that the “purchase moment” of the consumer occurs at the same point in time. E.g. a consumer may decide to purchase telephone services at one point in time and to purchase broadband services from the same provider at a later point in time (while still consuming the telephone service).

In the case of telecommunications, the joint production of several services using the same infrastructure leads to economies of scope. Part of these economies of scope (the costs connected to the last mile, i.e. the customer specific infrastructure[16]) can only be realised if the consumer is enticed to jointly consume the services, i.e. consume a bundle of telecommunications services. The realised economies of scope may either be used in a discount (consumer surplus) or additional profit (producer surplus) which may be expected to depend on the level of competition on the bundle.

4.2.2 Existence of unbundling costs

Substantial[17] unbundling costs can indicate the existence of a cluster market. Such costs of unbundling can have several causes. When a consumer switches from bundled to unbundled purchase:

- the cost advantages of joint supply (the economies of scope) are no longer realised[18],
- the fixed transaction costs are no longer spread over several products . This means that transactional complementarities are not realised anymore,
- there may be switching costs as a result of technical incompatibility of the devices used to consume the services (modems etc).

Regarding the relative magnitude, the relevant question is how the costs of unbundling can be measured. A first indication of these costs can be found by measuring the relative price differences between bundled and unbundled purchase. This can be done on the basis of actually observed prices. Measuring the level of transactional complementarity will be more difficult. Essentially this implies a valuation of the higher utility consumers attach to bundled purchase compared to unbundled purchase of the separate components. A way to assess this may be through the use of consumer research. Switching costs due to technical (in)compatibility can be measured by assessing the actual costs to be made when switching from one platform delivering a bundled service to multiple platforms delivering separate components.

A cluster market may exist if transactional complementarities are such that consumers do not consider “unbundling” a suitable alternative to purchase of the bundled (or clustered) products. The level of unbundling costs depends on the cost advantages of joint supply (or the cost disadvantages of separate supply), the level of the fixed transaction costs and whether these can be spread over several products, and the level of the switching costs.

[16] The costs involved in higher level (i.e. non-customer specific) infrastructure also qualify as economies of scope in the production of several services but these economies can also be realised in absence of joint consumption.

[17] The costs can be regarded as “substantial” if they are not outweighed by the SSNIP.

[18] In the case of telecommunication services, unbundling could imply reverting from an “all services over one infrastructure” bundle to an unbundled situation with some services over one infrastructure and some over another infrastructure. In that case, the economies of scope of the same infrastructure as common input for all services are no longer realised.

4.3 Applying the SSNIP test to bundles

This paragraph will demonstrate how the issues discussed in the previous paragraphs can also be put in the context of the SSNIP test. Three situations will be discussed: 1) the existence of a market for the bundle, 2) the existence of markets for individual components in which the bundle competes, and 3) the coexistence of bundled markets and components markets.[19]

4.3.1 The bundle is the market

The question when a bundle is a market on its own can also be framed in terms of the hypothetical monopolist test. In this context the substitutability between bundled and unbundled supply should be assessed. This exercise starts with the determination of the bundle and its components. If consumers have the choice between buying the components A and B as a bundle AB, a separate relevant market for the bundle may exist if the relative price of the bundle is lower than the price for buying the components A and B separately. This relative price difference may exist for the following reasons:[20]

- Firstly, if the actual price for the bundle AB is significantly less than the price for buying the components A and B separately.
- Secondly, if consumers attach a premium to the convenience of buying as a bundle, e.g. due to lower transaction costs (transactional complementarities).[21]

In both cases, the market can be defined by applying the hypothetical monopolist test. When there is a significant relative price difference between the bundle and the sum of the prices of the individual components or there are sufficiently large transactional complementarities, it is possible that consumers of a bundle would hardly switch to purchasing the individual components in case of a SSNIP of the bundle. In that situation a hypothetical monopolist supplying the bundle X would not be constrained by the prices of the individual components A and B. A separate relevant market for the supply of the bundle would then be found.

It should be noted that the existence of a bundled market does not preclude the existence of separate markets for one or more of the components of a bundle. This can be the result of strong differences in consumer preferences. In the situation that a significant group of customers consider the components of the bundle to be transactional complements, a market definition comprising the bundle may be appropriate. Such a market definition should in principle exclude suppliers of separate components of the bundle. These suppliers cannot compete with suppliers of the bundle because the consumers of the bundle have a strong preference for bundled supply based on transactional complementarity. By definition these consumers are not interested in purchasing separate components. This does, however, not exclude that there may be another significant group of customers that do not consider the components of the bundle to be transactional complements and therefore have a preference for purchasing separate components.

[19] In response to a SSNIP of the bundle, consumers may decide to switch to one of the individual components only, in which case there would be a relevant market consisting of the bundle and one of the individual components.

[20] Europe Economics, *Market Definition in the Media Sector – Economic Issues*, report for the European Commission, DG Competition, November 2002.

[21] If the price of the bundle would equal the sum of the prices of separate components, transactional complementarities would create a higher utility for the bundle compared to the separate components. A consumer of the bundle therefore pays a lower price per unit of utility.

A bundle can be a relevant market on its own if consumers would not switch to purchasing the separte components of the bundle in reaction to a relative price increase of the bundle. If consumer preferences are sufficiently differentiated a relevant market for the bundle and a market for one of the components of the bundle can coexist.

4.3.2 The bundle is part of one or more wider markets

Alternatively, if the relative prices of bundled and unbundled purchase, adjusted for any advantages of buying as a bundle, are such that a hypothetical monopolist of the bundle would be constrained from increasing price by the threat of substitution to the individual products the market would be wider than the bundle. In such a situation the bundle is not a market on its own but is part of one or more wider market(s). The question would then be which products are part of the market and which are not.

If a hypothetical monopolist supplier of the bundle A+B would not be able to raise its price because of substitution to products A and B, this does not necessarily imply that a single market exists that contains the bundle A+B and (both) the individual components A and B.[22] This can be explained by the sequential nature of the application of the SSNIP-test in practice.

The first step after a finding that the hypothetical monopolist of the bundle is constrained is the inclusion of one of the individual products in the market of the hypothetical monopolist. The question would then be whether a hypothetical monopolist supplying the bundle AB and individual product A would be constrained by the individual product B. If we assume that A and B are not substitutes[23] it seems logical to conclude that the hypothetical monopolist of bundle AB and product A is not constrained by the individual product B. The relevant market would then be the market for the supply of bundle AB and the individual product A. Conversely, when one starts with the inclusion of individual product B in the market, the conclusion might be that the relevant market consists of the market for the supply of bundle AB and individual product B. The end result of the application of the SSNIP test will be that there are two possibilities for possible market definitions:

- a market which contains the bundle AB and the individual component A; or
- a market which contains the bundle of AB and the individual component B.

Because these two definitions can coexist at the same moment, the bundle AB can be part of two relevant markets at the same time.

This example thus shows that in the context of bundling, market definitions are dependent on the specific situation of the case, the starting point and the sequence of application of the SSNIP test. This is not a defect of the hypothetical monopolist test but rather a reflection of the way competition works.[24]

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[22] Europe Economics, *Market Definition in the Media Sector – Economic Issues*, report for the European Commission, DG Competition, November 2002.

[23] If A and B would be substitutes A and B would be part of the same market.

[24] For a further discussion on this see: Europe Economics, *Market Definition in the Media Sector – Economic Issues*, report for the European Commission, DG Competition, November 2002, Appendix 1.

If a monopolist supplier of a bundle is constrained in its pricing of the bundle by the threat of substitution to the separate components, the bundle can be part of one ore more relevant markets for the components of the bundle.

However, there may be instances of bundling whereby most consumers generally will want to consume all products in that bundle, regardless of whether these products are available in a bundle or separately. When determining the relevant market in such cases, by performing the analysis systematically one may find a separate relevant market for AB and A and a separate relevant market for AB and B, as described above. Nevertheless, demand for individual product A in the relevant market AB and A may well be conditional on the availability of individual product B. Similarly, the relevant market for AB and B may only exist conditional on the availability of separate product A. If this is the case, consumers can be thought of as creating their own “virtual” bundle in order to replace the actual bundle.
A slight modification of the analysis would therefore be justified: when determining the relevant market with a bundle as the starting point, one needs to determine the conditionality of demand for a separate component on the availability of (all) the other separate component(s) of the bundle.

When determining the relevant market from the perspective of a bundle, extra care should be taken to include the possibility of conditionality of demand for a separate component on the availability of (all) the other separate component(s) of the bundle. Such conditionality could indicate that there is a separate market for the bundle.

The possible conditionality described above may depend on the actual demand patterns for the individual products that a bundle consists of. The next section describes two methods to assess the underlying demand patterns for products in bundles.

4.4 Assessing demand patterns

As discussed earlier in this paper the concepts of “cluster markets” and “transactional complementarities” have been used in several antitrust cases in the United States and in practice in Europe and Hong Kong.[25] From this practice a number of questions can be identified which can help in the assessment whether a cluster (or bundled) market exists in a particular situation. These questions are discussed below. An example of the practical application of this approach is provided in box 6.

[25] Telecommunications Authority Guidelines on Mergers and Acquisitions in Hong Kong Telecommunications Markets, 2004, http://www.ofta.gov.hk/zh/report-paper-guide/guidance-notes/gn_20040503.pdf

4.4.1 Demand correlation

The correlation of demand for components in the bundle can be assessed in order to determine whether the components belong together in a market for the bundle or belong to separate relevant markets. This can be investigated by determining the willingness to pay for the separate components of the bundle. If there would be no large differences between consumers as regards their willingness to pay for components of the bundle, this would suggest that predominantly a relevant market for the bundled product exists.
If on the other hand there may be differences between groups of consumers in willingness to pay for different components of the bundle, separate relevant markets for the components may be found. In such a case the differences in willingness to pay for the separate components can be exploited by suppliers by engaging in bundling in order to achieve price discrimination (as described in paragraph 2.3.3). However, if bundling for price discrimination is the main motive for bundling, then in response to a SSNIP of the bundle, different groups of consumers may switch to the individual component they prefer most in the bundle. Therefore, this second situation points in the direction of the existence of a separate relevant market for the bundle with one of the individual components and the relevant market of the bundle with the other individual component.

Strong correlation of demand for the components of a bundle indicates that there is a separate relevant market for the bundle. Weak correlation on the other hand suggests that the relevant market consists of the bundle plus one of the separate components.

4.4.2 Component market share dynamics

Another question that can be of interest is what happens to the market shares of the separate components as a result of a price change of the bundle. This criterion is only applicable in case of mixed bundles, i.e. when the components are also available separately.
If a supplier's market share for one component of the bundle responds in the same way as the market share for another component of the bundle in response to a relative price rise of the bundle, this indicates the existence of a separate relevant market for the bundle. In this situation consumers react to a price change by switching their purchase to all the components of the bundle available elsewhere[26]. What matters in this context is the symmetry of substitution to the separate components. If, in contrast, consumers switch more to one individual component of a bundle than another (assuming no price change for the components) this would be an indication that a relevant market for the bundle plus one of the individual components exists.

A symmetric response of market shares to a price change of the bundle indicates that there is a separate relevant market for the bundle. Asymmetric response of component market shares on the other hand suggests that the relevant market consists of the bundle plus one of the separate components.

[26] The alternatives could be a similar bundle from another supplier or separate components from separate suppliers, in which case the consumers create a “virtual” bundle to replace the actual bundle.

The concept of "cluster" markets was used by the Telecommunications Authority (TA) in his Statement of 1 June 2002 on the Application by PCCW-HKT Telephone Limited for Declaration of Non-Dominance in the Market for External Bandwidth Services. The issue was whether the market for external bandwidth services should be considered a "cluster" market that included local connectivity to customer premises in Hong Kong, or whether they should be considered to be separate markets.

In forming the view that it was not a "cluster" market, the TA took into account the following factors:

- *PCCW was offering a "mixed" bundle where there is a choice between taking the bundle or taking the component of external connectivity only (or even deciding to not take the bundle or the component);*
- *the two services were offered to corporate businesses where it was considered that the costs of unbundling them was likely to be relatively small compared to their total outlays for telecommunications and there were incentives to "shop-around" for the separate components if the price of the bundle is not "right"; and*
- *the core component of external bandwidth services is obviously the external circuit. Business customers were essentially demanding this component, with local connectivity being a necessary but secondary consideration after the external core. Accordingly, demand and hence competition were considered to be focused more around the external component than the local component.*

Box 6: Application of the cluster market concept by the Telecommunications Authority in Hong Kong[27]

[27] Source: see footnote 25.

5 Policy implications

The previous chapters investigated the implications of bundling for market analysis, which is relevant for OPTA due to the increasing tendency of the market to offer bundled electronic communications services. This chapter will focus on the actual state of play of the various relevant service markets and discuss the implications of the previous chapters with respect to the current situation.

5.1 Convergence

To sketch the right context, the following section looks at the development of the various electronic communication services / markets over roughly the past decade and on into the future. The developments are stylized in order to illustrate the developments clearly.

Around the mid-nineties nearly every household made use of fixed telephony services over what for the sake of simplicity we will call the copper infrastructure and tv services over what we will call cable infrastructure. The development of mobile telephony is left out of the picture sketched below in order to focus on the two fixed infrastructures, copper and cable.
Figure 4 below shows the market structure in terms of sets. The copper infrastructure set (green) envelops all 7 million Dutch households as does the cable infrastructure set (blue). The grey set represents the total number of Dutch households.

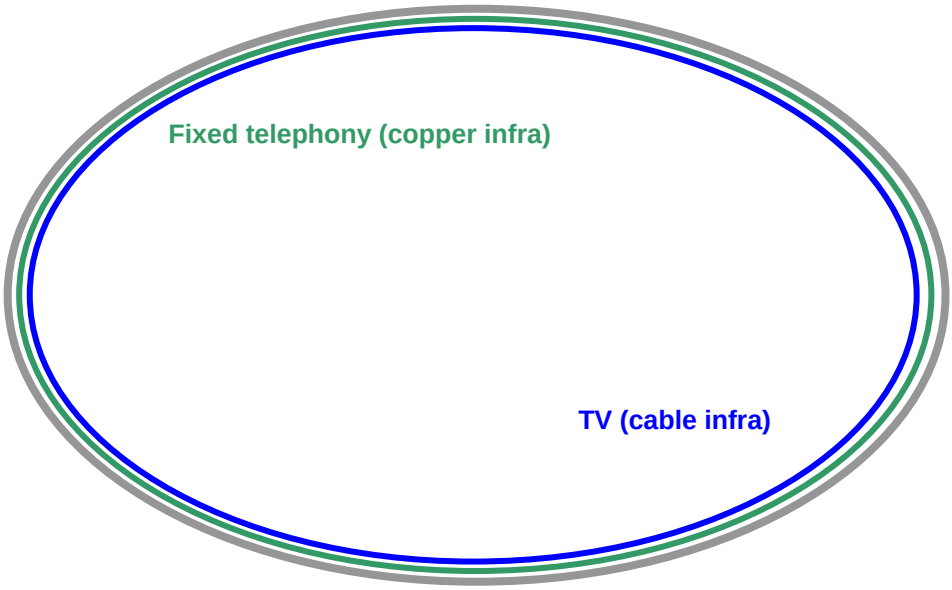

Figure 4: 1995 Dutch market structure.

The set of TV customers (on cable infrastructure) in 1995 was roughly equal to the set of fixed telephony customers (on copper infrastructure). There were therefore roughly twice as many fixed infrastructure connections as households: one for fixed telephony and one for tv.
Due to convergence, eventually (in the future) both infrastructures may have fully replicated the capabilities of the other. This will allow households to choose whether they want all their services over

one infrastructure or over the other. All households are assumed to make this choice eventually since it saves connection costs to use only one infrastructure instead of two. Therefore, in the future the market structure as depicted by Figure 5 may emerge:

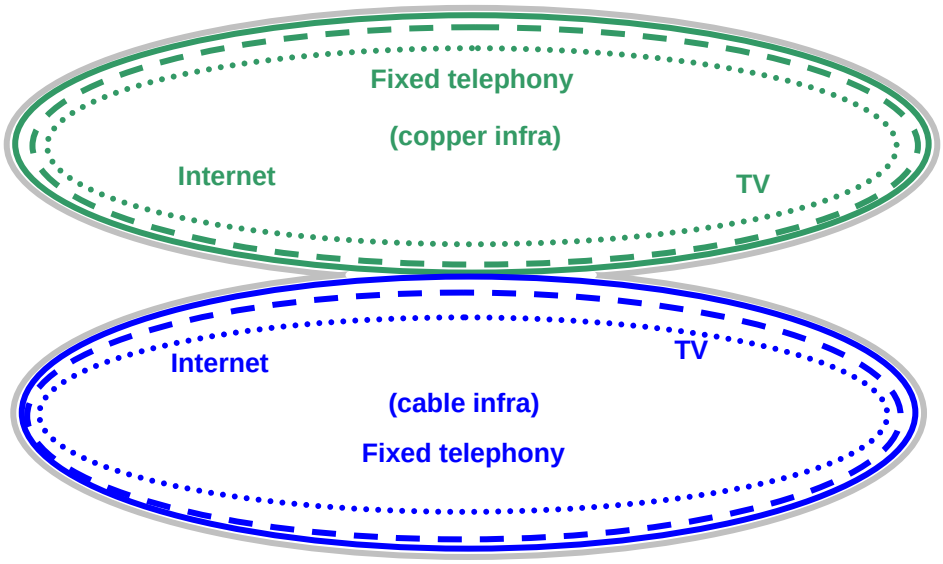

Figure 5: Full symmetric convergence (hypothetical future): all households choose either one or the other infrastructure for all electronic communications services.

Figure 5 (above) shows that hypothetically (in the future) convergence can separate households into two sets: those that have all their electronic communications services over the copper infrastructure and those that have all their services over the cable infrastructure. Disregarding the change in the absolute number of households between 1995 and the sketched hypothetical future, the result of full convergence is that the total number of fixed infrastructure connections is halved. It should also be noted however, that the number of services provided per connection (and thus assumedly revenues per connection) has increased, which may well fully counter the effects of decreasing number of fixed connections per infrastructure.

The next paragraphs describe the transition from the 1995 situation depicted by Figure 4 to the hypothetical future depicted by Figure 5.

Between 1995 and today several relevant developments occurred. Around the turn of the century, the broadband internet service became available through both the copper and the cable infrastructure. Simultaneously, mobile telephony grew strongly and as a result some fixed-mobile substitution occurred. In the 21st century, the most important development so far is convergence. Initially, convergence has been asymmetric: fixed telephony services became available over cable infrastructure. This has allowed a number of households to choose the cable infrastructure for all their services (tv and/or internet and/or fixed telephony), allowing these households to disconnect their copper connection. The situation is depicted in Figure 6 below, and corresponds roughly to the actual situation in the Netherlands at the time of writing:

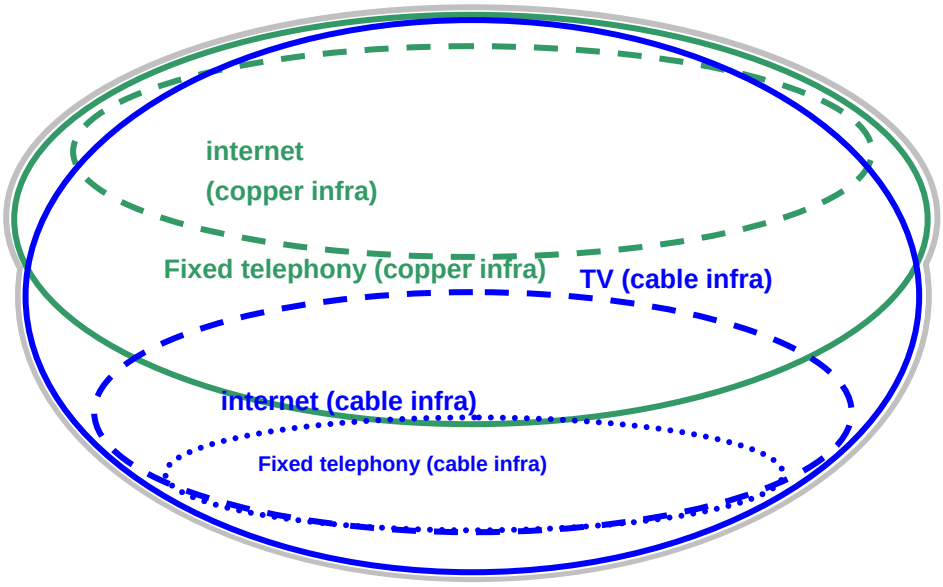

Figure 6: Initial convergence: cable infrastructure replicating copper infrastructure telephony service.

Figure 6 (above) shows the results of the (asymmetric) convergence of cable infrastructure that is now able to replicate the traditional copper infrastructure service of fixed telephony. In other words, some asymmetric substitution from fixed (copper) telephony to fixed (cable) telephony has occurred. As a result, the copper infrastructure set envelops significantly less than the total number of Dutch households, whereas the cable infrastructure set still envelops roughly all households.[28] The total number of fixed infrastructure connections has therefore decreased compared to the 1995 situation, but the number of services (and thus revenue generated per connection) has increased.

The next step could be symmetric convergence – where the copper infrastructure becomes capable of replicating the cable infrastructure tv service.[29] In other words, asymmetric substitution from fixed (copper) telephony to fixed (cable) telephony and from tv (cable) to tv (copper) would occur. Eventually symmetric convergence may lead to a situation whereby all households will choose either one infrastructure or the other for all services.[30] This would lead to the market structure as depicted by Figure 5 (p. 21), wherein there is no more overlap between the two infrastructures in terms of connected households. Each household is connected either to the copper or to the cable infrastructure and has all the relevant services provided over that infrastructure. In this situation of theoretical full symmetric convergence, the total number of fixed infrastructure connections has shrunk to equal the total number of Dutch households. Compared to the initial situation depicted in Figure 4 (p. 20), the total number of fixed connections has halved.

[28] The figure actually shows that not all households have a fixed cable connection any more. This can be assumed to correspond to some households switching to e.g. DVB-T services. The households that are depicted as having neither fixed telephony over copper nor over cable can be assumed to represent mobile-only households.

[29] This is in fact already (partially) the case: both the incumbent and a third party DSL operator offer a tv product over copper. The incumbent has however not yet started to market its product widely. The announced All-IP investments by the incumbent could mark the real beginning of symmetric convergence between the two infrastructures.

[30] It should be emphasised that this is a purely theoretical situation and does not consider the possible effects of e.g. the emergence of fibre optic networks.

5.2 Implications for market definition with bundling

The identified trend first and foremost implies that initially the copper infrastructure and eventually both infrastructures are going to be losing connections (households). Initially both infrastructures serviced virtually every household whereas in the theoretical end structure each may serve only half the total number of households. In this sense, the total "market for end-user connections" is shrinking (from initially double the total number of households to eventually exactly the total number of households). This may seem to imply that the infrastructure providers will be losing revenues, but it should be noted that the number of services per connection increases, which may fully counter the effects of a decreasing number of connections in terms of revenues per connection.[31]

One observation is that from the outset, the internet service was sold in a bundle with either fixed telephony or tv. However, since (initially at least) every household had an active connection through both infrastructures, this bundled availability did not create separate markets (a hypothetical SSNIP for internet over copper can cause sufficient substitution to internet over cable for the two services to belong to the same relevant market). For this logic to hold, a sufficiently large set of households must have an active connection on both infrastructures. (This is the conditionality of demand as referred to at the end of section 4.3.2, p. 16.)
This implies that segregation between households (in terms of type of infrastructure used) increases the average switching costs from a service on one infrastructure to the same service on the other infrastructure. The increased switching cost occurs because when a household has only one infrastructure connection active (i.e. the household has chosen for all services over copper or all services over cable), the costs of active connection[32] to the other infrastructure must be incurred before a substitutable service over that infrastructure becomes available. Note that at present, it would appear as though the costs of active connection to the copper infrastructure are generally integrated with the costs of the telephone service, while the costs of active connection to the cable infrastructure are generally integrated with the costs of a tv subscription. The above concept is illustrated with the following example.

Example: Consumers Tom and Sue
Tom and Sue are two consumers who are very similar in that they generally prefer to be able to make calls and be called on a landline number, to watch tv at home and to have access to the internet at home. However, Tom has never bothered about his connections / subscriptions and is currently a customer of KTN (copper) for his fixed landline, a customer of UTC (cable) for his tv, and he decided to use cable to get connected to the internet some years ago, consequently internet over the cable infrastructure. Sue on the other hand has followed electronic communications developments closely and as soon as it became possible she decided to get all three services from UTC (cable), so she has telephony, internet and tv over the cable infrastructure.
Now imagine the following change: due to unexplained market forces the price of internet over cable increases by a small amount. Both Tom and Sue notice the price increase and both start wondering if they're getting the best deal on their internet subscription. Tom checks internet to compare price plans and quickly discovers that he can get a cheaper but similar internet subscription over his KTN copper connection (and promptly decides to switch). Sue also finds the copper internet offer, but then

[31] Increasing revenue per connection is achieved by selling more than one type of service over the connection. However, selling more than one type of service is actually the cause of the decreasing number of fixed connections (i.e. a self-enforcing trend).
[32] These costs can be both the one-time connection fee and the monthly subscription fee.

discovers that she can only get a copper internet connection if she already has a KTN copper telephony subscription. After some calculation she decides to stay with her current provider, since the alternative of switching both telephony and internet to KTN copper and only keeping her tv with UTC cable is more expensive than her current total monthly costs.
In terms of finding the relevant market, the results depend on how many “type Tom” households there are compared to how many “type Sue” households there are. If there are sufficient “type Tom” households, their switching to copper internet as a result of a small price increase (SSNIP) of cable internet will render the price increase unprofitable and therefore imply that cable and copper internet are part of the same relevant market. However, if there are more “type Sue” households the substitution effect may not be strong enough to counter increased profits from the price increase, in which case the result would be a separate relevant market for cable internet.

Box 7: Example of substitutability of services under partial convergence.

The above example illustrates the fact that depending on the state of the market (in terms of connections per household), the boundary of the relevant markets for the services may differ. As convergence causes more households to choose for one infrastructure for all the electronic communication services, the effect can be that the separate services over the two infrastructures become weaker substitutes for each other (with the possible result that the two types of infrastructures do not belong to the same relevant market anymore). The next example shows that this result does not imply the same (separate relevant markets) at the bundle level.

Example 2: Tom and Sue revisited
Sue ponders her situation a little longer. She sees that she gets the best deal by subscribing to all three services over one infrastructure (which is why she had all three services over cable to begin with). Even though only cable internet has increased in price, she now looks at the effect differently: she wonders if she can get a better deal by switching to all three services over copper. After looking around on the internet she discovers that if she were to switch fully to copper, she can save some money per month on her total subscription bill. She promptly switches all three services from cable to copper.

Box 8: Example of substitutability of services continued.

In this second example, the same effect as described in the first example leads to switching at the bundled level. Therefore, given the appropriate structure of the market, it is possible that a single service (e.g. internet) over one infrastructure is no longer a strong enough substitute for the same service over the other infrastructure, but the bundle of services over one infrastructure may nevertheless be a sufficiently strong substitute for the bundle of services over the other infrastructure.

Once this stage is reached, there may very clearly be a separate market for a bundle of services, provided by several infrastructures. This bundle would then represent a cluster market in the sense of section 4.2 (p. 13). So even though e.g. internet over copper may no longer be a strong enough substitute for internet over cable, the bundle of internet/telephony/tv over copper may be a strong substitute for internet/telephony/tv over cable.

5.3 Implications today

As noted at Figure 6 (p. 22) we are currently in the early stages of (so far non-symmetric) convergence. The cable infrastructure has converged to replicate the capabilities of the copper infrastructure and has facilitated asymmetric substitution away from the copper infrastructure (i.e. the total number of copper household connections is shrinking). At the other side, copper has not fully converged to replicate the capabilities of cable infrastructure yet.

There are, at the time of writing, copper tv products available from the incumbent and a third party DSL company. However, the incumbent is yet to start actively marketing its DSL tv product whilst the efforts of the third party DSL company haven't yet had a measurable impact on the number of households connected to cable tv services. In other words, the total number of cable households is stable (it may be starting to shrink slightly, but whether this is a trend that will hold is really "too soon to tell"). Once households begin to substitute copper tv services for cable tv services, the market will be moving towards the symmetric type of convergence which may eventually lead to the situation depicted in Figure 5 (p. 21).

A relevant result from the above approach concerns telephony and internet. As noted earlier, internet has *de facto* always been a bundled service, either with telephony over copper or with tv over cable. Due to convergence, copper and cable are now more or less symmetrical in terms of their capabilities with respect to these two services. Nevertheless, the situation is not symmetrical. To see why, recall Figure 6 (p. 22), which shows that more or less all households have an active cable infrastructure connection, whereas not all households have an active copper infrastructure connection anymore. Therefore, if the price of copper internet were to increase slightly (a SSNIP), nearly all households that currently have internet over copper could choose to simply switch to internet over cable (since they have an active cable connection for their tv services anyway). In other words, cable internet could be a strong substitute for copper internet. The opposite need not be the case though. If cable internet were to become slightly more expensive, not all households that have cable internet can simply switch their internet services to copper, since not all households have an active copper connection. In order to switch, they would first need to (re)activate their copper connection. The additional costs or effort involved may inhibit substitution. In other words, copper internet may be becoming a weaker substitute for cable internet. At the bundle level this asymmetry currently holds: the bundle of internet and telephony over cable may be a stronger substitute for the same bundle over copper than vice versa, since not all households have a copper connection whereas nearly all households have a cable connection.

The implications of the current situation are that, in determining the relevant markets, the question needs to be asked whether the currently available separate services are strong enough substitutes for the same services provided in a bundle for a sufficiently large set of Dutch households. This appears to depend on the question whether enough households still have active connections on both infrastructures. If not, a separate market for the bundle may have emerged.

6 Conclusion

In the current markets for electronic communications networks and services, bundling is becoming an increasingly prominent phenomenon. Cable companies have entered the markets for telephony and broadband internet access while traditional telephony companies have entered the markets for broadband internet access and television. Increasingly these companies offer multi-play bundles. The fact that companies are increasingly offering multi-play bundles raises the question about the implications of bundling for market definition. This paper therefore addressed the question under what circumstances a bundle of electronic communications services can be considered to establish a separate relevant market.

Bundling is the situation in which two or more products or services are offered together as one package (the bundle). Bundling is a widespread business practice in the electronic communications sector. The most relevant type of bundling in the context of this paper is mixed bundling, which refers to the situation when the relevant products are both offered separately and as part of a bundle. In this situation the question to which market the bundled supply belongs becomes relevant.

Bundling can have advantages on the supply and on the demand side. On the supply side bundling can lead to a reduction of costs of producing and distributing products through the achievement of "economies of scope". On the demand side bundling can reduce the transaction costs and/or price incurred by consumers: so-called: "transactional complementarities".

The problem of defining markets in the presence of multi-product firms supplying bundles of products is recognised in competition policy. In competition law practice there are several examples where markets are defined that comprise a collection of products which are no substitutes for each other. The most famous example of a market definition that comprises a bundle of products is the retail supply of daily consumer goods through supermarkets.

In the United States the idea of "cluster markets" has been developed to capture the idea that a bundle of products jointly consumed by customers may define a relevant market. A cluster market is a market where competition revolves around the joint supply of economically distinct but complementary products. The complementarity between the products can be the result of economies of scope and transactional complementarities.[33] The degree of transactional complementarity and economies of scope of joint production determine whether the products constitute a cluster.

A separate cluster market may exist if transactional complementarities are such that consumers do not consider "unbundling" a suitable alternative to purchase of the bundled (or clustered) products. The level of unbundling costs depends on the cost advantages of joint supply (or the cost disadvantages of separate supply), the level of the fixed transaction costs and whether these can be spread over several products, and the level of the switching costs.

The question when a bundle is a market on its own can also be framed in terms of the hypothetical monopolist test. In this context the substitutability between bundled and unbundled supply should be

[33] Telecommunications Authority Guidelines on Mergers and Acquisitions in Hong Kong Telecommunications Markets, 2004, http://www.ofta.gov.hk/zh/report-paper-guide/guidance-notes/gn_20040503.pdf

assessed. A bundle can be a relevant market on its own if consumers would not switch to purchasing the separate components of the bundle in reaction to a relative price increase of the bundle.

If a hypothetical monopolist supplier of a bundle would not be able to raise its price because of substitution to the separate component products, this does not necessarily imply that a single market exists that contains both the bundle and (both) the individual components. If a monopolist supplier of a bundle is constrained in its pricing of the bundle by the threat of substitution to the separate components, the bundle can be part of more than one relevant market for the components of the bundle. This non-uniqueness of market definition is not a defect of the hypothetical monopolist test but rather a reflection of the way competition works.

Nevertheless, substitution from the bundle to one of the separate components may be conditional on the availability of the other separate component(s). If this is the case, there may be separate relevant markets for the bundle and one separate component as well as the bundle and the other separate component, but these separate markets may only exist because of the availability of the other separate product. If this is the case, there is conditionality of demand for a separate component on the availability of the other separate component. When determining the relevant market from the perspective of a bundle, extra care should be taken to include the possibility of conditionality of demand for a separate component on the availability of (all) the other separate component(s) of the bundle. Such conditionality could indicate that there is a separate market for the bundle.

In order to gain more insight into the actual nature of demand for the components of the bundle, one can look at actual demand patterns for the (components of) bundles. Two questions can be assessed: whether demand for the components in the bundle is correlated among consumers and how the market shares of separately available components respond to a price change of the bundle. Strong correlation of demand and the symmetric response of market shares to a price change of the bundle both indicate that there is a separate relevant market for the bundle. Weak correlation and asymmetric response of component market shares on the other hand suggest that the relevant market consists of the bundle plus one of the separate components.

We are currently in the early stages of (so far non-symmetric) convergence. If the currently available set of separate services does not provide a sufficiently strong substitute to the bundle of services as offered to a (growing) subset of households, a separate market for the bundle may be emerging. In some sense, the total market for fixed end-user connections is shrinking (though this does not mean that revenues per connection are shrinking). Once a sufficient number of households has chosen for one infrastructure or the other, a separate service on one infrastructure may no longer be a stand-alone substitute for the same service on the other infrastructures. Therefore, switching costs between services over different infrastructures may increase as a result of convergence. However, at the bundle level the two infrastructures may remain substitutes for each other. Once the separate services over different infrastructures become weaker substitutes while a bundle of those services over different infrastructures become or remain strong substitutes, this provides a strong indication of a separate market for the bundle.

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