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Conference Paper

Triple play as a separate market? Empirical findings and consequences to broadband market definition

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**Triple play as a separate market?
Empirical findings and consequences to broadband market definition**

Abstract

Double and triple play bundled offers are common phenomena in many national communication markets. However the overall market context, technological background of provision, the level of facility based platform competition and strategic role of the bundled offers seems to be different in national markets. There is clear challenge to the current European regulatory approach to broadband markets, which is treated as a separate market on its own. If there was a separate market for the bundled product, the whole market analysis and remedy system had to be adapted to this market reality. Testing the (triple play) bundle the market hypothesis is the logical and necessary first step to address this issue.

We designed and conducted an empirical study supported by the Hungarian Competition Authority in order to address these questions. A special, situation adaptive questionnaire design was applied in order to get the possibly best informed and adequate stated preference reactions to a 10% price change. We used the critical loss test for market definition, testing whether there is a separate market for triple play bundles.

Results indicates that the market definition question whether bundle has to or could be considered as a separate relevant market can be answered using well designed survey techniques. Many clues support the hypothesis that the triple play bundle in 2010 indeed was a separate relevant market.

JEL codes

Keywords: triple play, double play, multi-play, bundle, market definition, SSNIP test, consumer survey, stated preference approach, critical loss

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Increasing take-up of multiplay bundles throughout Europe is a striking development on the communications market, and one of the most exciting and challenging issue from strategic, marketing or regulatory point of view. However multiplay is a concept without strict definition, therefore is not a well identifiable object for scientific study. It is an umbrella concept, meaning different types of service bundles combining two or more different electronic communication services. In case of triple play, the standard usage of the term normally refers to a bundled telephony, television and internet package, but still is a notion which is not differentiated according to the exact parameters of these services. On the market a wide range of combination of options exist by the different characteristics of composing services: subscription and call prices for the telephony; number and composition of channels for television, speed characteristics of the broadband part of the bundle, etc. For the convenience of the study if we use the term *n-play*, it also just refers the number of the services comprising the bundle, and if we consider the exact designation of the services we use the *xy 2-play* expression for example. In this study 3-play always refers exactly to a bundle of telephony, TV and broadband internet, but without taking care of the technology behind, or whether it is provided technically on the same communication media or not¹.

According to the market realities usually there is the option of buying the services separately, from different providers or in many cases from the same provider even though that is not the most popular option. That means that from commercial point of view mixed bundling is the normal characteristic of the market. However there are incentives² to provide as well as to buy bundled services.

On the supply side there is an incentive to exploit the gains from economies of scope. There are no strong complementarities in the production of the individual services of a typical multiplay bundle. Economies of scope may be present though presumably not strongly in the production of the bundled services. But the gains from joint marketing, billing and customer care can be significant. It is more economic to sell more services to the same customer, and binding her than acquire a new one. It is the case with selling “new services” by established providers of a popular service like cable TV. It is an additional service and additional sale to sell broadband and telephony to their customers.

Beside these cost efficiencies, there are obvious strategic reasons of bundling. The bundle offer can be attractive if it is the first on the market, so newcomers use this for attracting more subscribers and gaining scale faster. Because customer loyalty is very important, and having a bundle makes switching more painful and difficult (i.e. switching cost is higher) even if there is mixed bundling, incumbent telecom companies introduce bundles in order to delay quick erosion of their fixed telephony subscriber base. Of course it is a necessary step in order to take up the gauntlet thrown in by the challengers.

Bundle can be attractive for many consumers too. If part of the savings resulting from lower cost of providing services in bundle passed to the customers, many of them will prefer to buy the services in the form of a bundle. One-stop-shopping has some transaction cost advantages too. Nevertheless committing to a bundle may increase the cost of switching. Though according to the current market practices, there is no need for entering into too long (more than 2 years) commitment by the customers to get the discounts. If the market has not reached a mature stage yet and there is competition in the retail market (i.e. more than one player is capable of providing bundled services) the lock-in effect via bundling is not too strong. If

¹ In a 3-play package can be provided via xDSL, coaxial cable, fiber, wireless. Referring to a bundle as 3-play package it is indifferent whether the TV is analog, DVB-C, DVB-S or IPTV for example.

² See Pernet (2006) and Crampes and Hollander (2006) for analyzing the different efficiency and competitive strategic incentives for bundling.

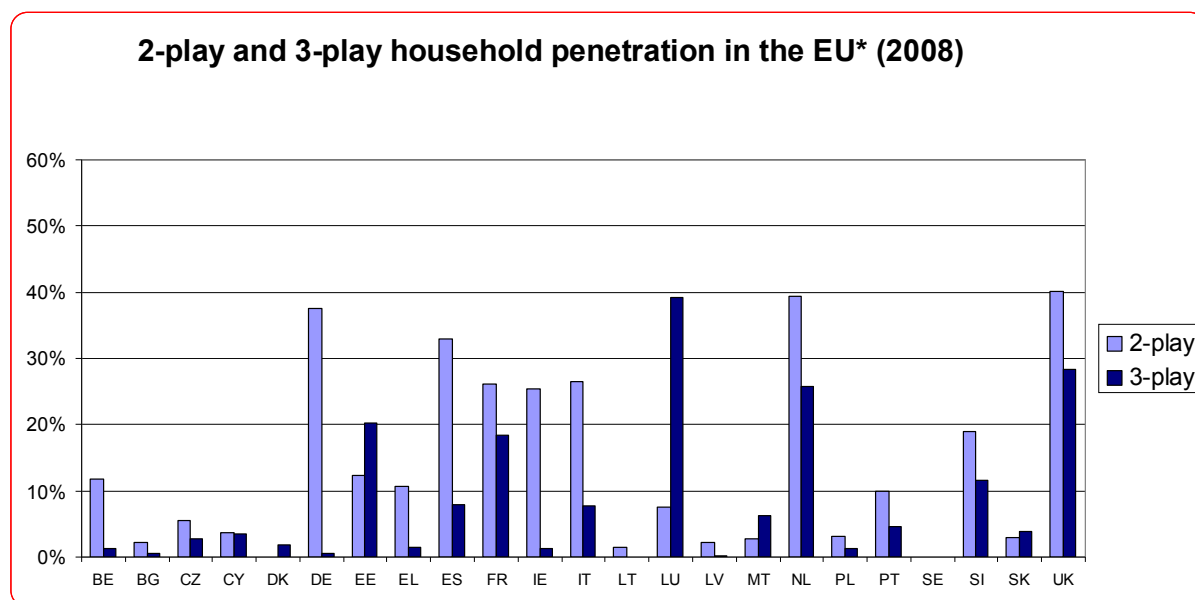
there are only few who are switching, positive brand loyalty or customers' inertia, may be a more plausible explanation of that behavior than lock-in. In case of competitive bundle markets the players compete with a range of bundle offers, where each bundle is a combination of the same elements with different technical, quantity or quality terms and price. Each competitor sells a basic package and there are above some bigger, faster, better offers usually with quantity discounts, and at the top of the list there might be a premium package as well. Therefore a customer who is loyal to the brand can switch to another package in house from the menu, and do not have to switch to another provider if she wants to change the price/quantity/quality terms. It is now the everyday characteristic of the electronic communication market and very significant in countries where cable is the main competitor beside telecom incumbents.

Multiplay in the EU

Though there are some publicly available data on multiplay penetration from almost all EU member states in the 14th and 15th Reports³, the data collection methodology is not transparent and country reporting is rather ambiguous. Even triple play was interpreted differently by data providing authorities⁴. Therefore the data in the figures we found in the reports do not seem to be comparable, so we have to consider them only as indicative of the market situation.

The next figures show the market situation in 2008 and 2009, with each and every caveats described in the notes you find in the Reports⁵. For better comparability we calculated the household penetration of the services as a substitute for number of bundle subscriptions by 100 inhabitants.

Figure1. Household penetration of multi-play services in the EU, 2008



* See notes in the original reports

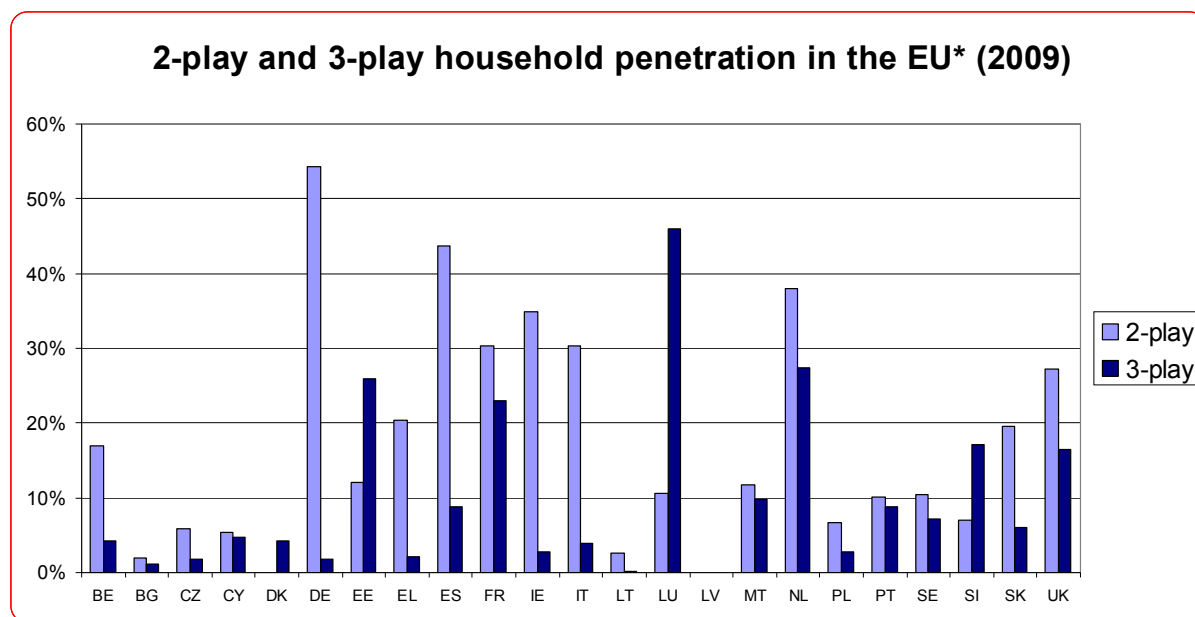
Household penetration is calculated using 14th Report data,

³ See the 14th and 15th Report.

⁴ Notes attached to the figures say almost everybody interpreted the meaning of bundle offers on its own way. For example Luxembourg interpreted triple play as fixed telephony + broadband + mobile, there are missing data of some or all multiplay bundles, etc.

⁵ 14th and 15th Report.

Figure2. Household penetration of multi-play services in the EU, 2009



* See notes in the original reports

Household penetration is calculated using 15th Report data,

In spite of the obvious data incoherence problems, some general conclusions about some tendencies may be drawn. The comparison of the 14th and 15th report data shows that the growing market significance and increasing penetration of the multiplay bundles is straightforward. The average growth of multiplay from 2008 to 2009 in countries reported is more than 50%.

A quick correlation analysis shows that by using the data from the EU 15th Report, multiplay penetration normally tend to be higher in countries with higher GDP per capita and higher broadband penetration. The first correlation is strong and the latter is no news in itself, but behind that there is also the positive correlation between broadband penetration and the triple play penetration, but not with double play.

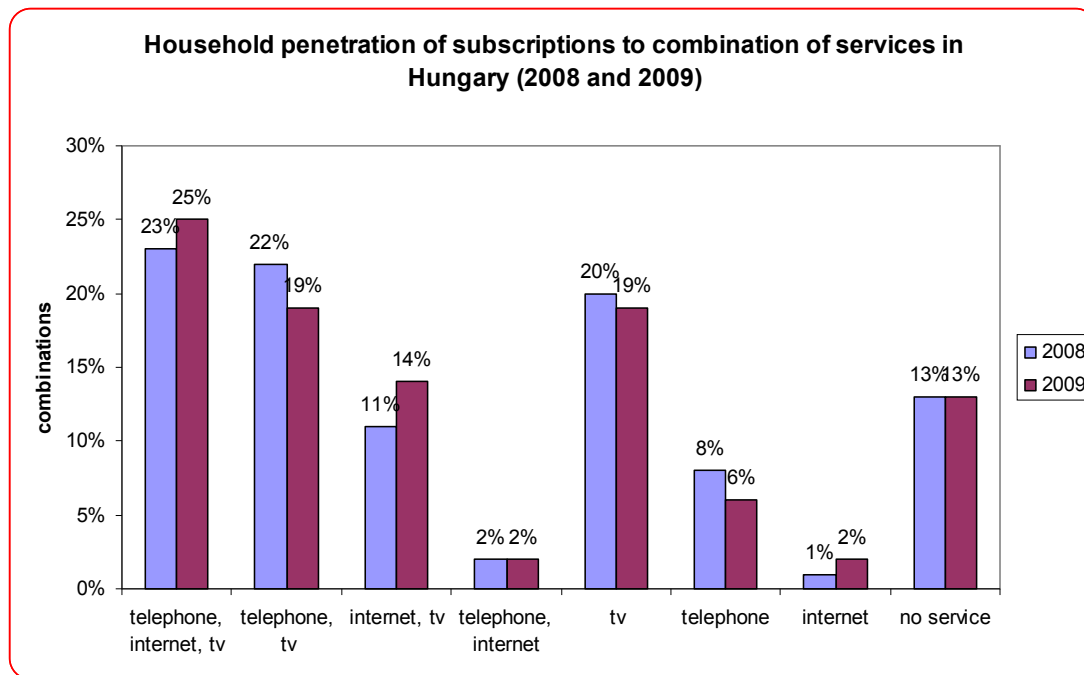
Comparing the penetration of double and triple element packages the rate of triple play is somewhat higher in countries with significant cable broadband but this is far from being a universal phenomena. The country experience is very mixed and it is hard to find any patterns which may be a good proxy to guess.

Based on the available data we did not find any strong connection between penetration of broadband, fix telephony, the dominant means of TV delivery and multiplay package penetration. After this bird's eye view of Europe we turn to the market specialties of Hungary.

Multiplay in Hungary

Though the 15th Report does not contain data on Hungary, there is some information available from the surveys commissioned by National Communication Authority of Hungary in 2008 and 2009. These public data are sufficient to show the basic characteristics of the market for multiplay services.

Figure3. Household penetration of subscriptions to service combinations

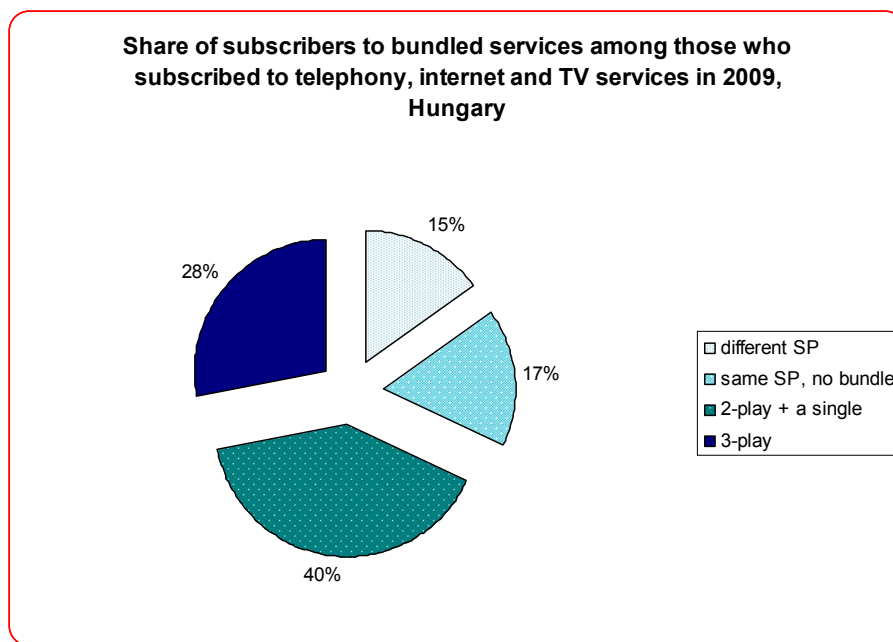


Source: NHH Working Plan 2010

The published data from yearly large sample surveys show only the service combinations of subscriptions. In order to read it properly we have to know that a combination does not necessarily mean that it is a bundle. The services can be combinations of single services, even from different providers, but might also be a bundle. Consuming more than two services is increasing, but penetration of some combinations like single telephone and single TV service and the combination of these are significantly decreasing, mostly because of the declining popularity of fixed telephony, and partly because of increase of buying three services. Internet service is on the rise in single and every other combination as well.

We have partial information about real bundles, because public data about the composition of the population of those who subscribed to at least two services is not available, though we know the composition of the group who subscribed telephone, internet and pay television services. As the figure shows 68% of them consuming at least 2 services in bundle, and only 28% who is a real triple play customer. This means in 2009 there were about 7% of the households who really subscribed to triple play.

Figure4. Share of the bundled and only combined consumption of the three services together



Source: NHH Working Plan 2010

The regulatory problem

In spite of the noise, available data clearly shows that subscribing to more than two services is becoming common today, and consuming them in service bundles is on the rise, however still far from dominant in Hungary. Mixed bundling is an everyday phenomena, and its presence makes the analysis of service markets more complicating especially in cases when some regulatory surveillance may be appropriate or what is more, required. Telephony and broadband access is regulated nationally but strictly according to the European telecom regulatory framework, and periodic regulatory review of some markets is required. Though the European approach is focusing on the regulation of upstream, the periodic market analysis starts with the retail markets. Without bundles and complementarities, the market analysis would be easier. With bundles widely present, the analysis of individual service markets, as if they were really unconnected, may result in wrong definition of the market and therefore misguided analysis after. Even if the individual service market hypothesis might be the right one, existence of bundles makes the application and interpretation of the SSNIP test more difficult, because there may be only a single bundle price, therefore there might be a need for using imputed prices for bundle elements. And even in this case it is worth to note that costumers' switching decisions may rightly be influenced by the presence of bundle. Theory does not tell us, how:

The regulator always has to cope with the methodological challenge of identifying the relevant market in a way that diminishes the error of defining too wide or too narrow the markets in the product dimension. Too wide market definition may lead to missing the target of identification the market power, which is real on the market. The other side, defining the market boundaries too narrowly, leads to the problem of overregulation. The strong presence of bundles provokes the question whether the bundle is a separate relevant market, or part of the larger relevant market where single services compete with bundles. In case there is no separate bundle market there would be need to take care on bundles only technically in the market definition phase. However bundles may cause problems on the market if they can

serve to distort competition via leverage by a player who has unmatched advantage in providing bundles which hardly replicated by its rivals. In such a case initial competition problem may evolve to a separation of the market by detaching the segment penetrated by bundles from the original set of close substitute services. If only one firm were able to provide bundles, this practically resulted in the monopolization of that market. It is trivially a problem however we do not have to think so much afar. It is enough to understand that the question, whether any set of the different bundles constitute a separate market is a relevant question for regulators to ask if they really want to understand the situation on the market, and if problems arise, address them.

The market definition issue is more exciting if the answer is not trivial. New market developments may change the landscape but it is better to keep the pace with the market than simply react when it becomes overdue.

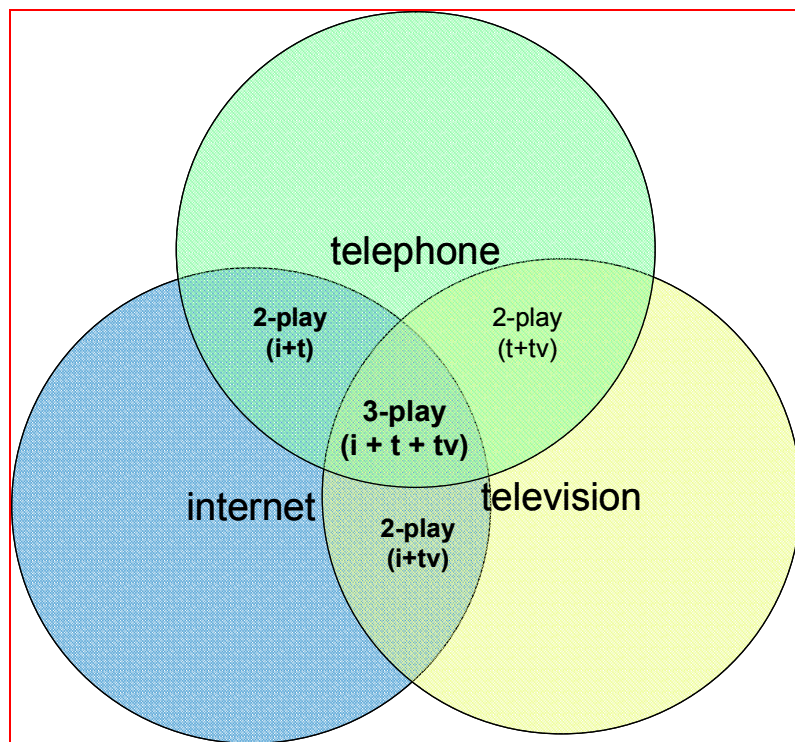
The standard SSNIP process starts with an initial product and tests whether the hypothetical monopoly provider of that product lost profits after a small but significant (5% or 10%) non transitory price increase above the competitive price. If he would loose (i.e. the test fails), that shows that there are substitutes to the product, so it cannot be a separate relevant market. Then the set has to be expanded by incorporating the closest substitute, and the test must be repeated, until it will not fail. Then we have reached the smallest set of products which belong to the same market. This process of finding demand substitutes is easy to understand, but needs more care to manage, because of the mere fact that it is path dependent. That means the market we identify as the relevant market depends on where we had started. It is not a big issue if we have clear preference what market we want to test, and consequently from where to start the process. Traditionally regulated markets can be good starting points. Under the European regulatory framework, it is on the national regulators' normal agenda to investigate some prescribed markets regularly, and beside that to start an investigation if they surmise that there is some real competition problem on any other markets. In a specific case they should now where to start the investigation, and how to perform the test.

Aim of the research

In our case the question is whether the retail broadband internet as a whole is the relevant market or single offers and bundles constitute separate markets. The research task stems from this question is to construct and test a research methodology which is capable of giving an answer at least some indicative one, helping the regulators in handling potential or real problems on the broadband market.

A careful analysis starts with the identification of the choice options from the single service to the more complicated bundles.

Figure5. Possible consumption combinations of telephony, internet and television services



If we use the notation a little bit differently than the traditional use of Venn diagrams, “internet” set in the figure is restricted to single an internet offer which is disjunctive set from the other different bundles. Consequently the two 2-play sets containing the internet are disjunctive to the 3-play. The product market definition question starts from the single internet point of view is that the product market is a single broadband internet service or a union of some of these disjunctive sets or all of them⁶. From this start the relevant market options are the following:

1. single {i},
2. or {i} & {i+t},
3. or {i} & {i+tv},
4. or {i} & {i+t+tv},
5. or {i} & {i+t} & {i+tv}
6. or {i} & {i+t} & {i+t+tv}
7. or {i} & {i+tv} & {i+t+tv}
8. or {i} & {i+t} & {i+tv} & {i+t+tv}

At first sight this task seems to be a complicated one. But this is not the case. For regulators from product market definition point of view it is not particularly important to judge whether bundles can be effective substitutes of a single broadband service, because there is no potential or actual competition problem from the mere fact that they are on the same market now, except the case when the market is on the way to be split. In this extreme the problem would be that as a result the bundle will be a separate market. This hypothesis cannot be judged from the results.

⁶ We do not discuss the issue of different quality levels of the internet services; here we assume that they are linked through chain substitution.

But the opposite question of whether any set of bundles constitute a separate market, if the tests starts with a defined bundle, is more relevant. If bundle can be a separate relevant market, bundled offers can compete only with bundled ones, and the presumably smaller number of firms on the market increases the chance of finding one with market power, or there could be higher chance of some form of collusion between the players. In this case the regulator has to analyze both the single and the bundle markets separately.

As the research paper on this issue of the Dutch regulator⁷ rightly states, that the substitution can be asymmetric, i.e. working in one direction, but not in the other, starting from single offer we might find that the market contains bundles as well, but starting from a triple play bundle the SSNIP test may conclude that even the 2-play and single broadband offers together cannot be so effective substitutes to make the 10% price rise unprofitable for the hypothetical monopolist of the triple play bundle. That is why the starting point is important. Therefore we define the main research question as the test of bundle as a separate market hypothesis. In the next section we discuss the methodological considerations and main elements of our research design.

Methodology and research design

The typical research method of investigating aggregate effects of individual consumer choices when no historical data is available is the stated preference method. This technique often also builds upon the consumer choice approach proposed by Lancaster that the demand is not for the good in itself but rather the many characteristics of the good which are providing utility to the consumer. This approach has the consequence of a more effective analysis of demand for goods that are closer or farther substitutes, but it can also be used as a base to construct a research setting in which demand and attitudes toward still non existent goods can be tested against their existing counterparts. A research technique, conjoint analysis emerged as a method for testing attitudes toward a wide range of good characteristics with surveys. The method is based on the idea that if there are too many combinations to be tested, (if we have N products with M characteristics each, N^M potential products are possible), the number of options to test can be significantly reduced if some assumptions are made, making the test empirically feasible. For example the orthogonal design assumes that the main effects are independent. However, in this case lack of independence may lead biased results.

A special variant of the stated preference method is the choice experiment⁸. In this experiment participants are asked to choose from a limited set of products with variable characteristics. Prediction of the choice is calculated directly from the data without estimating individual utility functions. Statistical methods (for example multinomial logit model) are used for estimating the effects of different factors. The advantage of this method is that the respondents face less complex and more real choice situations. The flip side is that the modeling task is more challenging.

Using choice experiment was an option at the beginning of our research study, because n-play bundles have different characteristics in each element's quantity, quality and price dimension. Unfortunately the possible choice combinations are numerous even in the real market situation. Research cost and feasibility constraints induced us to find such a solution which keeps the reliability of the results and do not put too heavy burden on respondents considering the time and complexity of the answers to the questionnaire. We know that respondents had made their choice and already chosen they most preferred option from the available set. It seems logical that in case of a 10% price increase induces them to really consider those

⁷ See OPTA (2007)

⁸ Louvière and Timmermans (1990).

options which are real substitutes to their current one. Truly artificial options may induce fuzzy answers and decrease the reliability of the results.

The combination of revealed preference and stated preference methods⁹ can be a good solution to our problem. This approach can handle the choice had been made - and takes them as if they were optimal in the previous decision setting. In the hypothetical situation of the price increased by an amount which is exactly 10% of the price, one option of course is to keep with the status quo and pay the higher price. Dropping the service must and degrade it may also be in the available choice set.

The problem with this approach is that the alternatives generated are not fully independent of the former choice and somehow restrict the choice set. Having kept our research goal in mind this bias was not a big concern, since not the estimation of the demand function was at stake but the test whether the respondents state that they were switching away or remain with their former choice as a reaction to the price change. However, another problem is the issue that a respondent typically overestimates his reactions: he says that he will take an action compared to his actual future behavior more often than the effect in the opposite direction: that he will not change to any of the options but in the reality he would.

Survey design

When we are using surveys for supporting competition or regulatory decisions we can use the same methods as in commercial cases, but with some special focus because of the aim of the research is different. Our team tested some techniques in the past some years to adapt to and develop survey design elements for regulatory purposes, identifying and measuring switching cost¹⁰ and consumer reactions to SSNIP like price changes on different markets¹¹.

In this research our aim was to test consumers' reactions to relative price changes in a real market setting, and their attitudes toward bundled offers. At the first sight it is evident that the choice situation is different according to the consumption situation of each respondent, namely what type of service or package he is currently using. The first thing is to identify this situation because it determines the choice set they face in the investigated hypothetical situation. This was the starting point in the survey design.

The key points were the followings:

- Which dimensions are relevant for (consumer) respondent segmentation/grouping?
- Which offers are considered relevant for each group?
- What kind of changes shall be tested against the initial real situation?
- What kind of motives have to be tested in each choice situation?

The first bloc of the questionnaire identifies the characteristics of the status quo situation. The results are used to create the groups with different situations. Key differentiating characteristics are:

- What kind of services the respondent currently consumes?
- Who is the provider or are the providers of service(es) and/or the bundle he subscribes to?
- If he consumes more than one services, how many and which services are provided by the same seller?

⁹ See Meyer (2007).

¹⁰ Lőrincz and Nagy (2010).

¹¹ Lőrincz and Nagy (2010); Édes, Bölcskei, Lőrincz, Nagy, Pápai (2010).

- If he consumes more than one service which one of them is bought in the form of a bundle?

These answers were necessary to define the main groups having different service consumption and subscription profiles. Having used the answers we have created a three level ordering, on the basis of:

- number of services consumed (0-3)
- of which from the same provider (0-3)
- of which are in a bundle (0-3)

These subscription characteristics served as the main dimensions for grouping, though there was a need to use some more in the questionnaire.

Beside these characteristics, the first section of the questionnaire collected information about the main technical and technological and consuming characteristics of the services they were subscribing: fixed telephony (technology), internet (technology, speed), television (technology), mobile telephony (number of subscriptions in the household, private or company) and mobile (the same as in mobile telephony). We registered the name of the service providers. For each potential element of triple play package (fixed telephony, internet and pay television) we asked the monthly cost, for telephony we asked the subscription and usage fee. Though the preferred source of the price information was the monthly bill, smaller part of the respondents used that, mostly they reported their perception. For the later part of the questionnaire this “recalled” personal price information were considered and taken as real and were used for calculating later offers, and for calculation of direct amounts when we asked about 10 or 20 % price changes.

The strong need for segmentation, and the need for personalized calculation of changes and generating offers applicable to the respondents’ real situations, led us to conclude, that we needed a survey supported by laptop. A little computing support behind saved us a lot, giving the opportunity to streamline the questionnaire and tailor to the types of respondents, and we could drop all time consuming questions for those for whom it was irrelevant. This choice was also useful for choosing from real market offers even if there were more than 30 service providers on the list with many offers. By using direct laptop supported questioning, we could target the questions according to the respondents identified choice situation and type.

The second bloc was the main part of the questionnaire. Two types of questions we asked. First we tested consumer reactions to actual market situation, if they had been more informed than they were, showing them real market offers without changing the price. Then we asked their reaction if they had to face a hypothetical long term price change of their current type of service. We also asked that in another state of the world if they had got an offer which is cheaper with 10 or 20% then the current market price would have change their mind and switched to that bundle or individual service in question. We asked them about the reasons or attitudes behind their original choice and if it was relevant behind changing their mind.

If handling of many subgroups somewhat differently was easily manageable with laptop support, what sets the limit to this segmentation? Targeting questioning to the situation is good for getting more into the details but at a cost of decreasing respondent numbers, that is representativeness. How can we avoid sacrificing too much representativeness for getting more detailed knowledge? We tried to optimize by limiting the focus and standardizing the questions as much as possible. The advantage of this was the possibility to re-aggregate the responses, or to group respondents differently, so we could almost always have larger groups at the end.

We posed relatively few types of questions, but asked them from many groups, tailored to their situation. Beside the main dimension, i.e. the number and type of services consumed, we used for segmentation the dimension of the respondent's relation to subscribe to a bundle. So we differentiated according to whether he or she:

- already had a bundle
- could have got a bundle without switching (more than one services, but at the same provider)
- could only have got a bundle with switching (subscribing to more than one services but different providers)
- could have got a bundle by buying new element (subscribing to only one service)

We combined the service dimensions with the bundle related dimensions getting 24 groups potentially. The logical skeleton of the questioning based on the above "relation to bundles" dimension was the following:

Group: respondents with bundle:

- Why did he/she choose the bundle?
- How much he/she saves with the bundle?
- What did he/she do if he/she could save 10% (the exact amount) leaving the bundle?
- What did he/she do if the price of his current bundle increased by 10% (the exact amount)?

Group: respondents, who could have a bundle with or without switching

- Why did not he/she choose a bundle?
- Would he/she subscribe to a bundle on the market which grants 10% discount to the sum of individual services?
- If not, would do it with 20% discount?
- If did not subscribe to triple play, would he/she choose a double?

Group: respondents, who could only have a bundle with buying additional services

- Would he/she subscribe to an additional service (on market price)?
- Would he/she subscribe to an additional service bundled with his current one (on less than 10% than the sum of the prices of individual product)?

We asked "why" questions in order to get information about the motives or rationalization of the choice.

"Market offers" were real or calculated on the basis of real offers in case of defining a bundle with 10% less the price of the given pure element's offer prices. For those who did not subscribe to a service, let's say the internet we offered the basic version of that service on market price and 10% less of the total if it was offered in bundle. If someone did not take the 10% bundle offer, we offered it for 20% less, in order to test whether the price is the issue or some other motive is working behind the refutation. If they declined this offer, we asked, why.

Questions were also differentiated according to the dimension of the number of services used and from the same provider or not. We report the relevant responses in the result section. The questionnaire contained many other questions about the context of consuming electronic communication services, and the usual individual and household socio-demographic variables.

Sample

The research made by Infrapont Ltd. was supported by a grant from the Hungarian Competition Office. The population was the 18+ population of Hungary, and the 1000 member of the sample were chosen by stratified sampling, and were representative by age, gender, and strata. The survey was conducted in April-May 2010 with laptop supported face-to-face questionnaire by Ipsos Hungary.

In order to correct sampling errors, a four dimensional individual weight was used based on age, gender, place of residence and social status.

Results¹²

First we show the technology divisions of telephone, internet and television subscriptions by technology.

Table1. Service share by technology for telephony, internet and television

telephone	N=1000	internet	N=1000	television	N=1000
PSTN/ISDN	37,4%	Cable	20,5%	Cable	56,1%
Cable	5,9%	ADSL	16,2%	Analog terrestrial or free satellite	19,0%
VOIP	0,2%	Mobile internet	4,2%	Paid Satellite	15,4%
		Micro, Wifi	2,3%	IPTV	3,5%
		ISDN	0,5%	Digital terrestrial	4,0%
		Other	2,8%	Other	2,0%
No	56,5%	No	53,5%		
Total:	100%	Total:	100%	Total:	100%

The data is in line with other market studies and shows the distinctive characteristic of the Hungarian market compared to EU mainstream or average¹³, namely:

- high penetration of cable as a television media, together with significant paid satellite, and the remaining more than one fifth share of those who are watching free analog or digital channels only
- cable is almost dominant share in broadband,
- relatively low penetration of fixed telephony, and significant share of cable.

¹² A very detailed report on the study is available on Hungarian as Infrapont (2010).

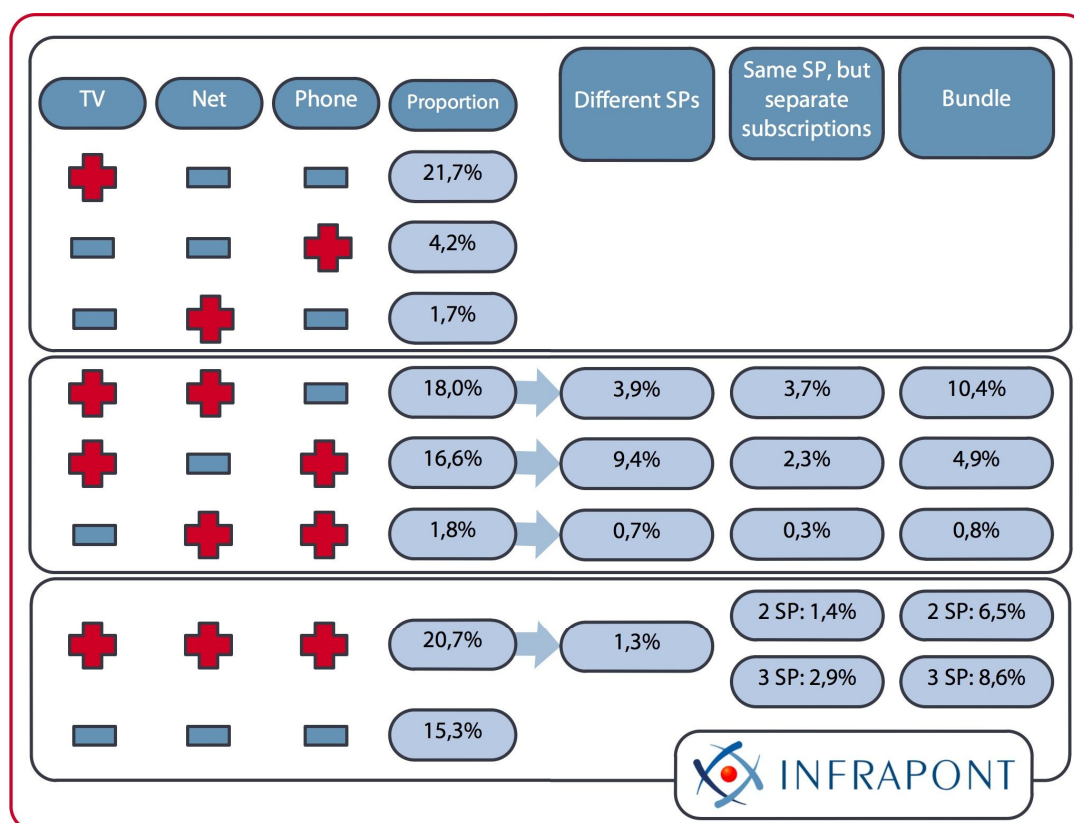
¹³ To learn more about these distinctive features and their regulatory consequences see Banhidi and Papai (2010).

Table2. Service combinations according to how many services someone is subscribing to

Service combinations	N=1000
Single service	27,7%
television + internet	18,0%
television + telephone	16,5%
telephone + internet	1,8%
telephone + internet + television	20,7%
no subscription	15,3%
Total:	100%

Fifty-seven per cent of the households are subscribing more than one services and fifth of the population pays for telephone, internet and multichannel television together, though not all of them consumes these services in bundle. Therefore it is important to prepare a well differentiated table to see the patterns whether subscriptions are at the same service provider or not and the share of those subscribing to the services separately or in a bundle.

Figure6. Customer subgroups according to the subscribed services, same or different providers, and whether they have a bundle

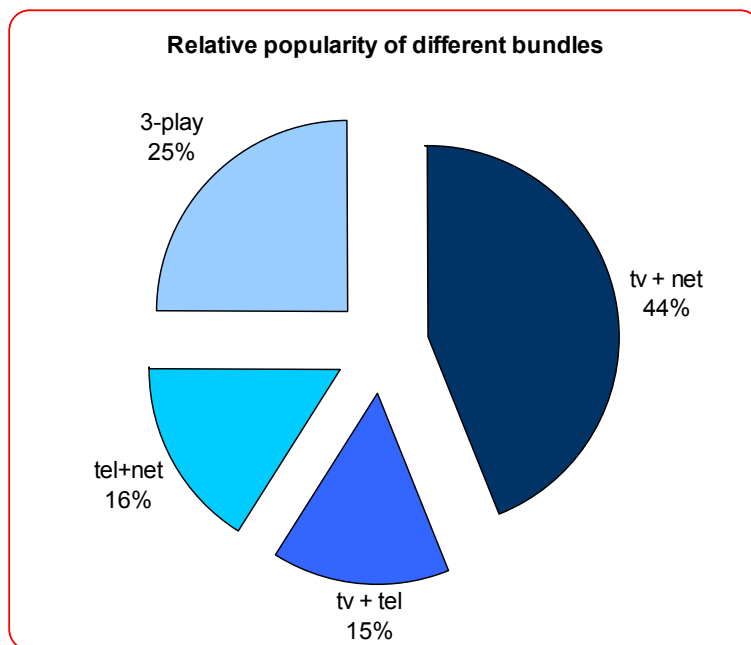


It is interesting to see that among those who subscribed to at least two services, a little bit above 40% consuming all of them in bundle. Though in the subgroup of subscribers to three services, the (2 or 3 elements) bundle share is 73%, but the proportion of real 3-play

consumers among them is only 41 %. The overall 3-play penetration is 8,6% and any combination of 2-play penetration is 22,6%

The most popular 2 service combination is television and internet, and this is the most widely used 2-play bundle too. The second 2 service combination with slightly less popularity is telephone and television but they are rather consumed separately. Telephone and internet combination is much less significant than television and net combination and the same as television and phone. This shows not only the diminishing popularity of fixed telephony but the effect of the strong presence of cable television networks on bundle availability and matching the supply options with consumers' preference.

Figure7. Share of each bundle type in the total bundles in the sample



Twenty-five per cent of the total bundles are 3-play. The relative popularity of different 2-play bundles shows that internet is rather bundled with television and almost 2/3 less chance with telephony.

An important input to our study was the price respondent's household pays for the services. The reported monthly bill data which is seen on the next table is in line with the observed offers on the market.

Table3. Household monthly spending on combinations of telephone, internet and paid television services

	telephone	internet	television	net+tv	tel + tv	tel+net	3-play
	258	164	495	143	49	41	93
1-1999 HUF	8,7 %	2,8 %	9,6 %	1,1 %	1,2 %	0 %	0 %
2000-3999 HUF	32,8 %	33,8 %	60,3 %	2,5 %	15,9 %	8,4 %	3,9 %
4000-5999 HUF	40,2 %	44,5 %	24,8 %	19,2 %	40,9 %	15,1 %	3,8 %
6000-7999 HUF	9,1 %	16,3 %	4,9 %	42,1 %	32,3 %	20,9 %	20 %
8000- 9999 HUF	3,3 %	2,6 %	0,4 %	22,3 %	7,2 %	14,5 %	13,7 %
10000-15000 HUF	4,9 %	0 %	0 %	12,3 %	0 %	31,9 %	46,2 %
15000-20000 HUF	0,4 %	0 %	0 %	0,5 %	2,5 %	6,9 %	12,4 %
20000 HUF or more	0,6 %	0 %	0 %	0 %	0 %	2,3 %	0 %
average	2543	4507	3423	7265	5662	8726	10241
standard deviation	1304	1547	1309	2244	2620	4740	3414
Total	100 %	100 %	100 %	100 %	100 %	100 %	100 %

Notes: Respondents' estimates. Mode and average are highlighted. The nominal exchange rate was ~275 HUF = 1EUR). The number of respondents is 852, but one person may have more than one separate subscriptions so the sum of subscriptions is higher.

We used the individual payment data for calculating the 100 HUF rounded amount of 10% or 20% price changes.

Consumer's reactions in different subgroups

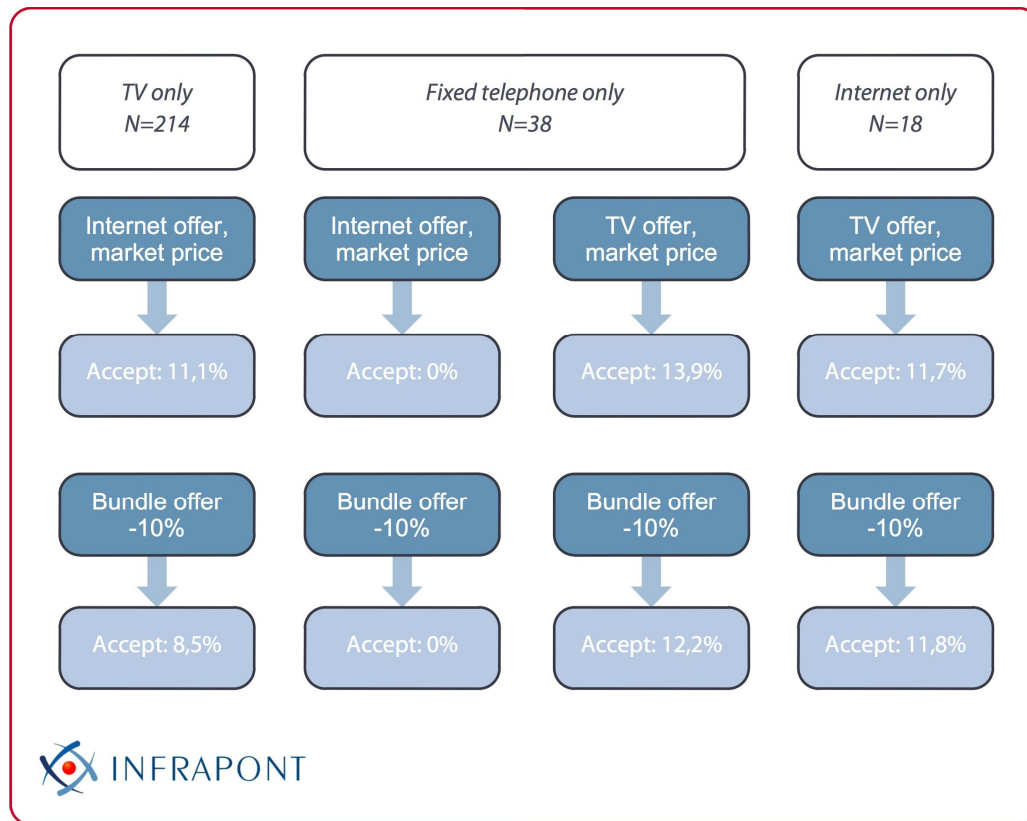
The next figures and tables show the reactions of respondents in different groups. Respondent expressed their stated preference toward hypothetical price changes and after that they had to give some reasoning concerning their former choice (revealed preference) and their current decision (change or not).

For reading the figures correctly it is necessary to know that:

- respondents always answered to closed questions
- data in the table is always for the same subgroup and N is always constant in a column
- arrows are not indicating causality, only the order of the questions
- "market offer" is a common offer on the market, something which is usually existent in the portfolio of main players (with average technical and quality terms)
- "bundle offer" is always dependent on the context. It is a 2- or 3-play offer which is available to the customer, with or without switching provider, and priced with 10% discount to the sum of the price of the elements. This option involves a one year commitment, which is typical on the market.
- 20% discount "bundle offer" is the same as above except the price

First we present the results regarding single service consumers.

Figure8. Reactions to a bundle offer with 10% discount; Group: households subscribing to only one service

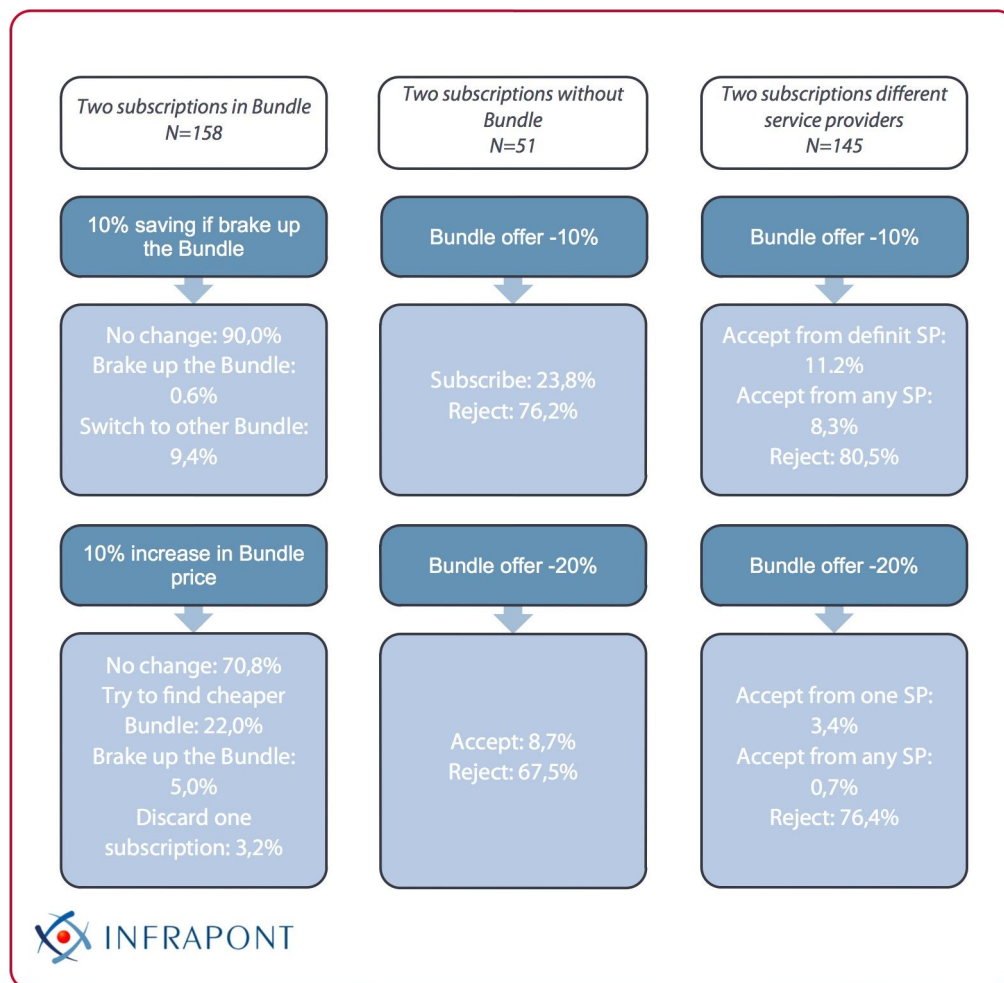


11% of the households with television service only would accept a market offer with internet and but only 8,5% would take it in bundle. Telephone only households seem to be absolutely uninterested in subscribing to internet. Television offer to households both with telephone or internet only is more popular, since a little bit more than 10% accept the market offer and almost all of them would buy it in bundle.

Households can have two subscriptions in different ways: services can be bundled or at the same provider but not bundled or even subscriptions with different providers. Those with bundle were tested against relative bundle price rise. If cheaper separate options arise, it rather induces only looking for a cheaper bundle, not to reject bundled offers. Customers rather search another bundle. However there is some asymmetry in reactions: if there are cheaper non-bundled alternatives (i.e. opportunity to gain with leaving the bundle) it does not induce switching, but direct bundle price rise (i.e. loss) would induce breaking up the bundle, or discard one of the services for few customers.

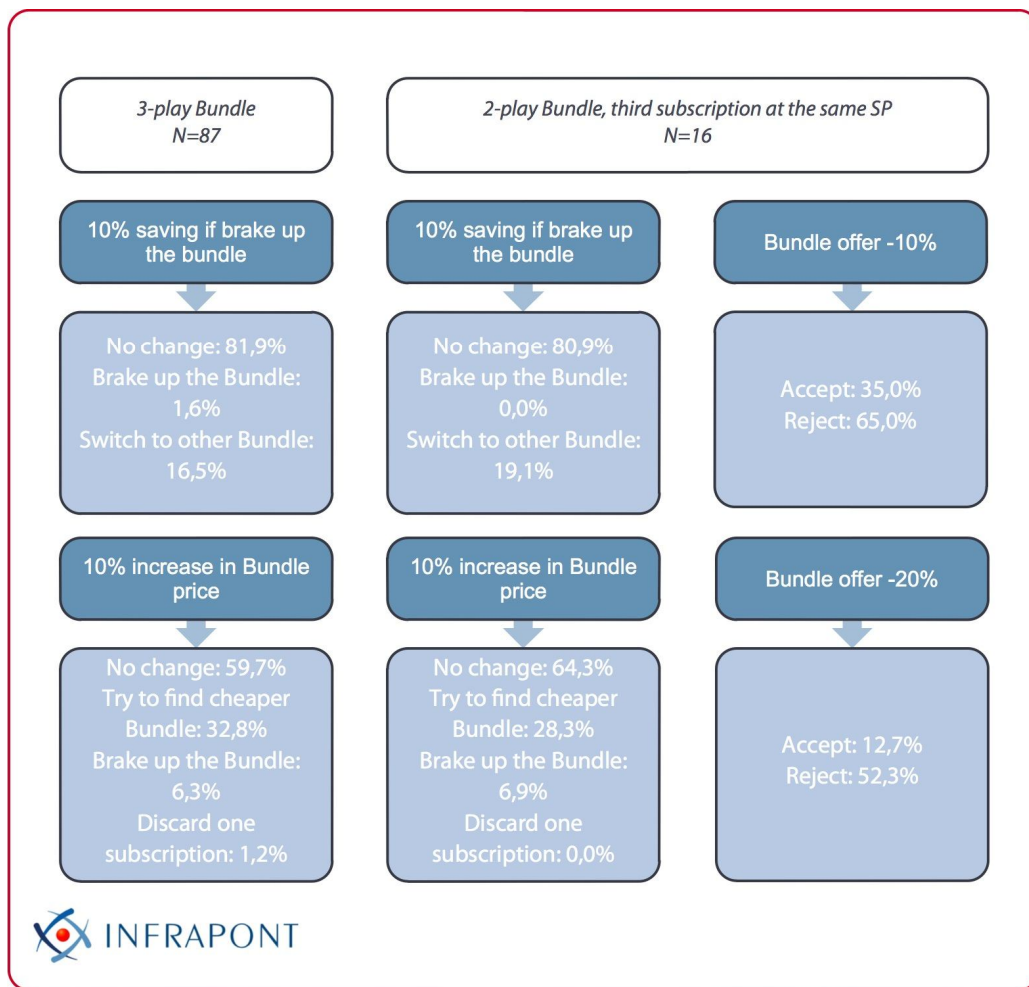
Among those with separate subscriptions around 20% would welcome the same services in bundle with normal 10% discount, and a further 4% the -20% offer. Those getting the two services from the same provider are more receptive of such an offer. Interesting is that the 2/3 who rejects an economically very attractive option. This phenomenon suggests some bundle aversion. (Figure9.)

Figure9. Reactions to a bundle offer with 10% and 20% discount and to a 10% relative price increase of a bundle; Group: households subscribing to 2 services either in a bundle or without it



Those who have a 3-play bundle are even more loyal to bundles than those with 2-play. Switching to other cheaper bundle is their first answer to the relative price rise. Cheaper unbundled opportunity on the choice horizon here also induces fewer customers searching some cheaper bundle alternative, than the perceived loss because of the 10% price rise. In case of price rise 7% would break up the bundle. (Figure10.)

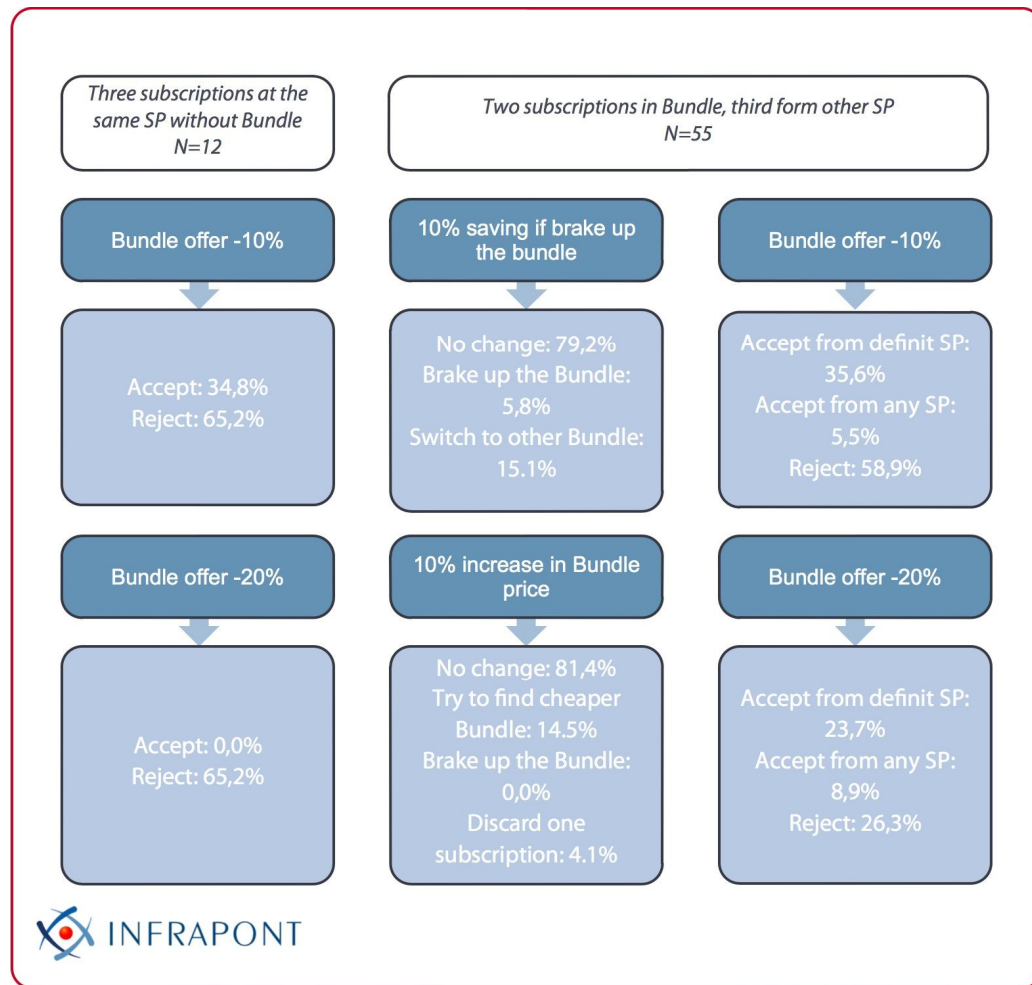
Figure10. Reactions to a 10% relative price increase of the bundle; Group: households subscribing to a 2-play or 3-play bundle



There were only a few respondents in the sample who were subscribing 3 services at the same provider, but in the form of a 2-play and a single. They answered almost exactly the same way as the 3-play customers to the relative price changes. They also insist keeping the bundle. In case they got a normal bundle offer, 35% would take it. With 20% discount it adds up to 48%. It suggests that they are very receptive toward 3-play bundles. What is against the intuition is the dismissive attitude of those who do not want to have everything bundled from the same provider. (Figure10.)

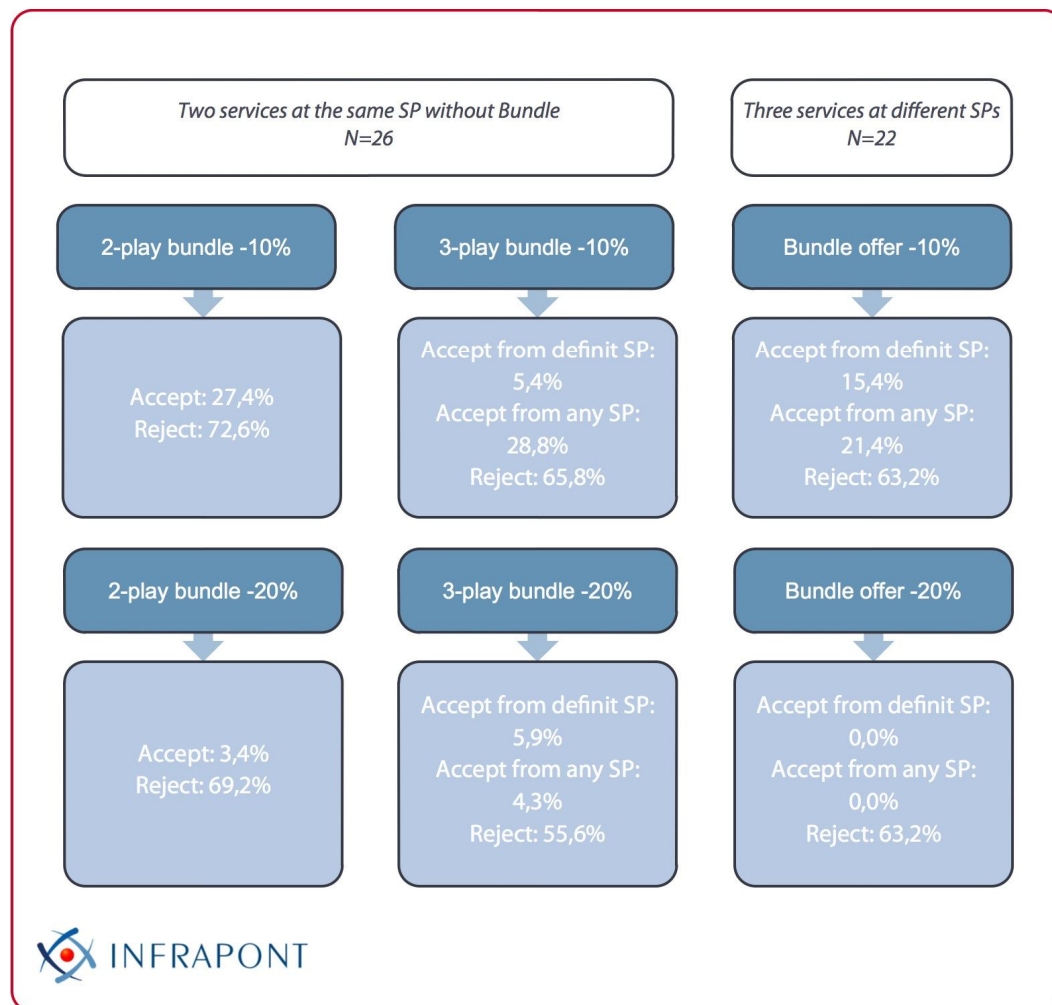
As we see on Figure11 this bundle rejection is weaker in the group where there is a 2-play bundle and the third service is bought from another provider. At least with some conditions more than would 40% accept a normal 3-play bundle, which rises to almost a 75% if the discount were 20%. The loyalty of this group to bundle is similar to other bundle customers. Price changes induce searching for a cheaper bundle and break up is rather the exception or last resort.

Figure11. Reactions to a bundle offer with 10% and 20% discount; Group: households subscribing to 3 separate services or a 2-play bundle at the same service provider



A subgroup in the Figure11 above with three separate subscriptions at the same provider, react positively to a normal bundle offer, would 35% take it. What is interesting, a more radical discount does not induce them better switching to a bundle. The aversion or hesitancy of the rejecting 65% seems to be strong, and cannot be compensated even by 20% discount to the current price. It may be the case that the current choice of those who reject the offer reveals their mere reluctance toward bundling.

Figure12. Reactions to a bundle offer with 10% and 20% discount; Group: households subscribing to 2 or 3 separate services



Another group having two subscriptions at the same provider behaves a little bit differently than those with three separate subscriptions at the same provider. Around 30% accepts the 2-play bundle with at most 20% discount, which is rather similar to those with 3 separate subscriptions. But they are more open to the offered 3-play bundle. One third of them would switch to 3-play at least with some conditions with 10% discount which goes up to 45% for a 20% discount. They seem to be a little more receptive to a 3-play bundle. However the 55 % rejection together with other group's similar rejection rates suggests that choosing a bundle is not just a question of price.

These anomalies from economic point of view require looking behind the decisions or stated preferences. We discuss these issues in the next section.

Customers' attitudes toward bundles

As we indicated in the research design section, we wanted to know the attitudes behind decisions and asked for some subjective reasoning of the revealed and stated choices of the respondents.

For reading the figures correctly it is necessary to know that:

- respondents always answered to closed questions
- in some cases they answered more than one options

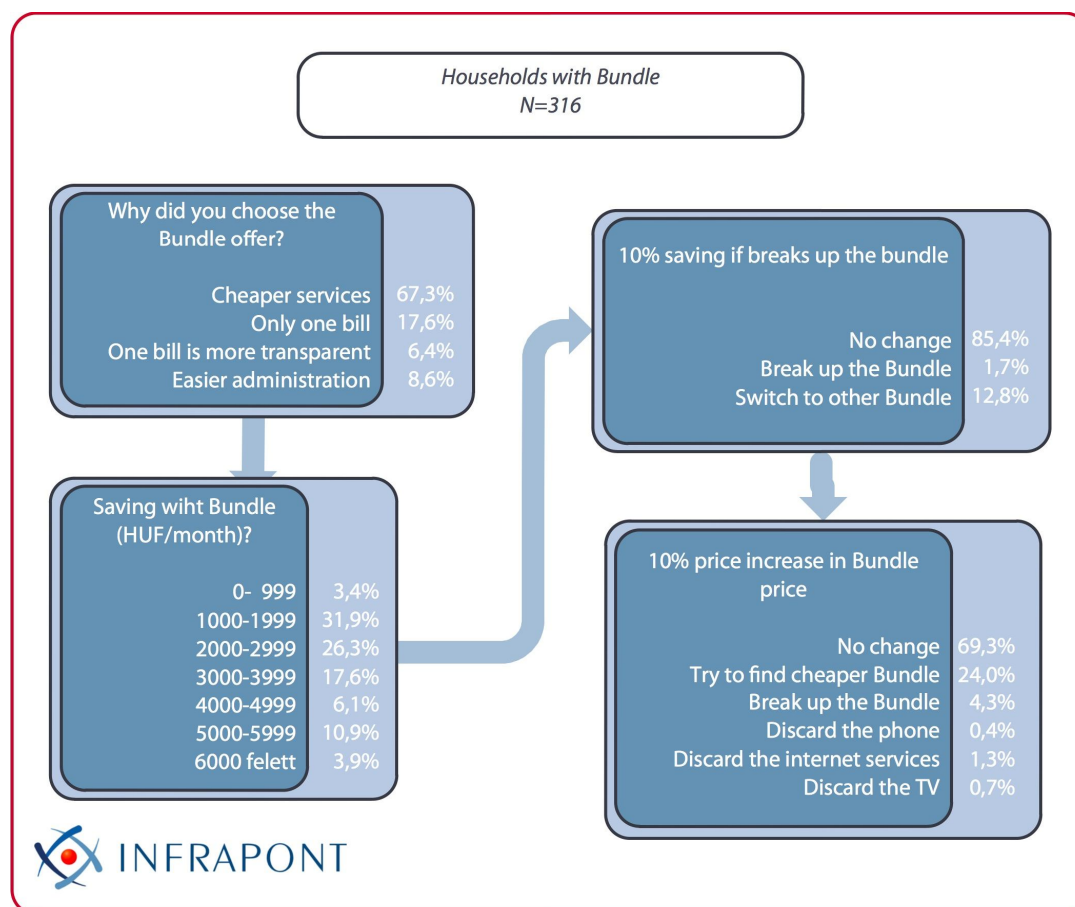
- data in the table is always for the same subgroup and N is always constant in a column
- arrows are not indicating causality, only the order of the questions

We asked those with one single service whether they bought a 2-play bundle with 10% discount. From those 9% (25 respondents) asked why had not they done this before. The answer revealed lack of information, and false preconceptions of lack of such offers. If these reasons simply reflect information problems, it can be handled by more effective marketing. Major reason of rejection was that there is no demand for an additional service neither bundled nor separately. Second reason was price. The other two reflect that some respondents really disliked commitment and/or bundles.

We asked the bundle subscriber population why they had chosen the bundle (only one answer was possible). The main reason of choosing a bundle was that the services are cheaper, as we expected. One bill is also an important factor. Some reasoned his choice with one bill and easier administration. Perceived savings with the bundle are significant if we compare it with the perceived prices reported in Table3.

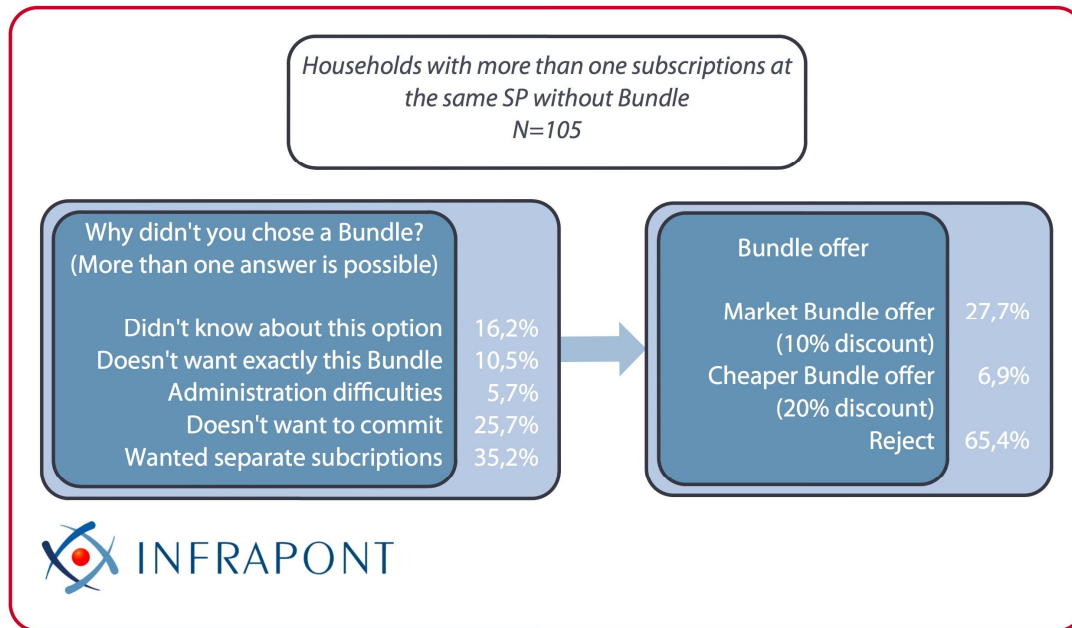
Figure12 also shows the aggregate reaction of bundle subscribers to a relative price increase, and we find that even some respondents would react, but they prefer buying some cheaper bundle. The attitude is similar in the case of a direct 10% price increase, but the group of those who react by rather searching an alternative bundle is doubled. Breaking up the bundle or even discarding one of the services is considered by a tiny minority.

Figure12. Reactions to 10% relative price increase; Group: households subscribing to any bundle



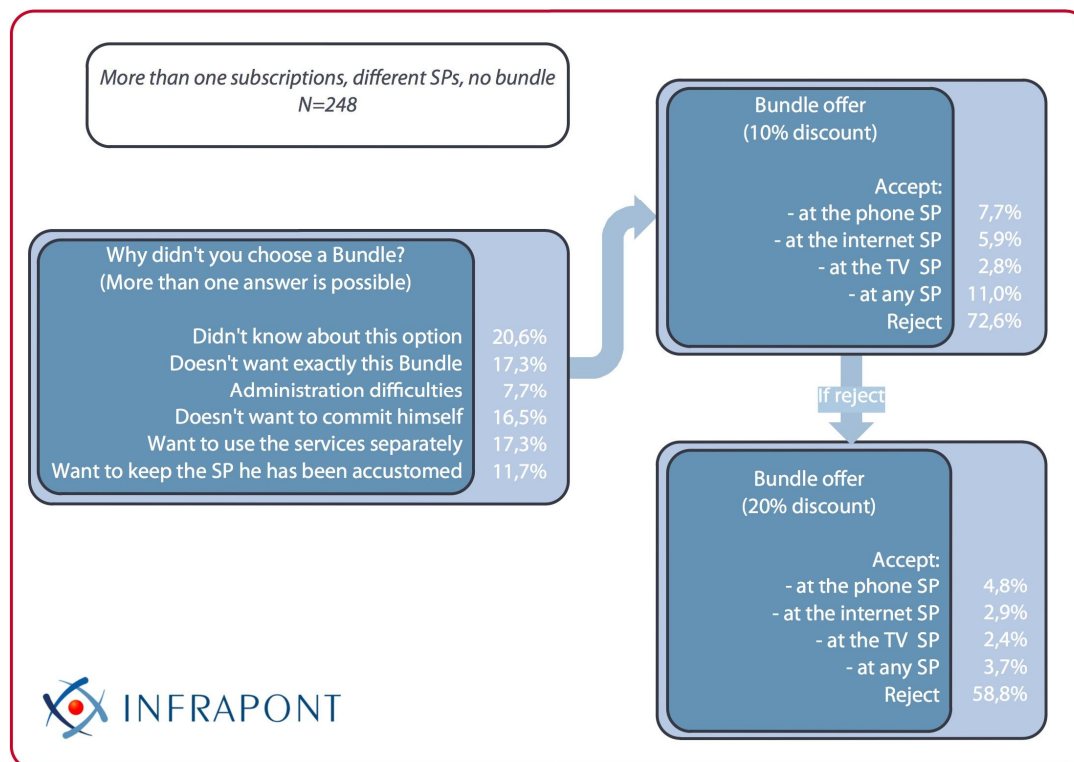
Attitudes of those who were using more than one service but not in a bundle seem characteristically different. Those who buy services from the same provider firmly reasoned by stating preference for having separate subscriptions (35%) and aversion to commitment (26%). Lack of information or matching with needs problem and administration difficulties are minor factors. On the basis of this attitudes it is not surprising that only a third of this group would accept a bundle, and 2/3 rejected even a 20% discount bundle offer. Bundle resistance as shown in Figure13 seems strong.

Figure13. Reactions to a bundle offer with 10% and 20% discount; Group: subscribing to more than one services, at the same service provider but no bundle



The group of those having more than one subscription but at different providers reacts similarly but their distaste for commitment or mere preference against bundle is weaker. They rather refer to lack of information or problem with matching the bundled offers to their needs. In this group loyalty to providers was also mentioned. This group is a little bit more receptive to bundle but not unconditionally because having some preference for a particular provider. Many of them prefer one of the providers to others. However after a 20% discount still almost 60% rejected subscribing to a bundle, as can be seen on Figure 14.

Figure14. Reactions to a bundle offer with 10% and 20% discount; Group: subscribing to more than one services but different service providers



We asked other questions about the experiences and evaluations. These well reflect the information showed above. Bundle buyers like bundle and mostly satisfied with that. They have less aversion to commitment, strictly prefer receiving a single bill, less afraid of administrative problems, are loyal, but do not afraid of switching even with a bundle. Bundle users clearly attribute the cheaper, simpler, easier for one word better qualities to bundle compared the combination of separate services. Their preference is reinforced by their experience.

Though all elements are important, bundle users consider first the television, and then internet as the most critical element of a bundle as it is shown in Table4. Lower importance of fixed telephony is evident from the answers.

Table4. What is the critical element of a bundle?

Subscribed to or would subscribe to a bundle N=422	Fully agree	Agree	Slightly disagree	Fully disagree	Average (fully agree=4, fully disagree=1)
It is important that the telephone in the bundle satisfy my needs	39.2	34.4	16.7	9.7	3.0
It is important that the internet in the bundle satisfy my needs	49.9	30.6	6.4	13	3.2
It is important that the television in the bundle satisfy my needs	60.4	34.4	3.6	1.6	3.5

Preference of those who rejected buying bundle is based on lack of information and beliefs they hold about against the advantages of bundles. They don't want to change because they

are satisfied with their position. Majority of them reports that they have not devoted enough time to search for a better deal.

Is bundle the relevant market?

After the detailed report of the results, we must return to the original question: what is the relevant market.

If we consider those consumers' reaction who are currently subscribed more than one to separate services and faced a bundle offer on the market even without an increase of price of any of his consumed services, enough of them would switch to a bundle. From this respect bundle is evidently a substitute for many, even if some "single" buyers are holding some aversion toward bundles.

More important is the question of what the case is from the point of a bundle. Simply minded economic approach said that a bundle price increase certainly instinct breaking up the bundle, and picking the services separately, if the difference between the aggregate price of available separate options and the new bundle price becomes positive. However this approach forgets that bundle customers clearly attribute some special value to having a bundle. The value of a bundle is more than the mere aggregate of the utilities from service elements. Responses clearly indicate that if you have bundle, a moderate relative price increase does not bother you very much or rather induce you to find a cheaper one, and not breaking up the bundle. But what happens if there is no other cheaper bundle?

The answer is not clear. We checked whether the customer had answered that he had been searching for a bundle alternative but he had the cheapest available bundle. In case of this he could decide to keep the bundle or leave it. From market definition point of view only the second option counts. A conservative approach rather considers the second options even if the bias that it may exaggerate the expected reactions.

For the evaluation of the bundle as a separate relevant market hypothesis, we chose to use a simplified critical loss test. We intentionally chose not to use some elasticity estimate directly, but only corrected reported intentions of switching.

Critical loss test uses the SSNIP test logic, to test that whether a hypothetical monopolist of the product increase the price and this small but significant non-transitory increase in price resulted in profit loss. If the outcome is loss in profit, then it is not a separate market, because consumer reactions made the price increase unprofitable, therefore the market do not worth to be monopolized.

It is easy to understand the critical loss approach if we understand the forces effect the profitability.

A price increase induces customers to buy less from the good in question, which decreases the quantity sold. The supplier sell less for higher price, and also produce less, so it saves the variable cost of units he did not produce. The profit is affected by this aggregate effect. If the sum of the cost saved and the added difference between post increased revenue minus original revenue is positive, the price increase is profitable and it is a separate relevant market. If the result is negative, the relevant market must be bigger.

The critical loss test investigates whether the loss of sales is above a critical level when the variable cost savings and the larger price cannot balance the effect of diminishing quantity.

The simple equation says that:

$$\alpha \varepsilon_s = \frac{-\alpha}{(L + \alpha)}$$

where:

α is the price increase (in decimal fraction),

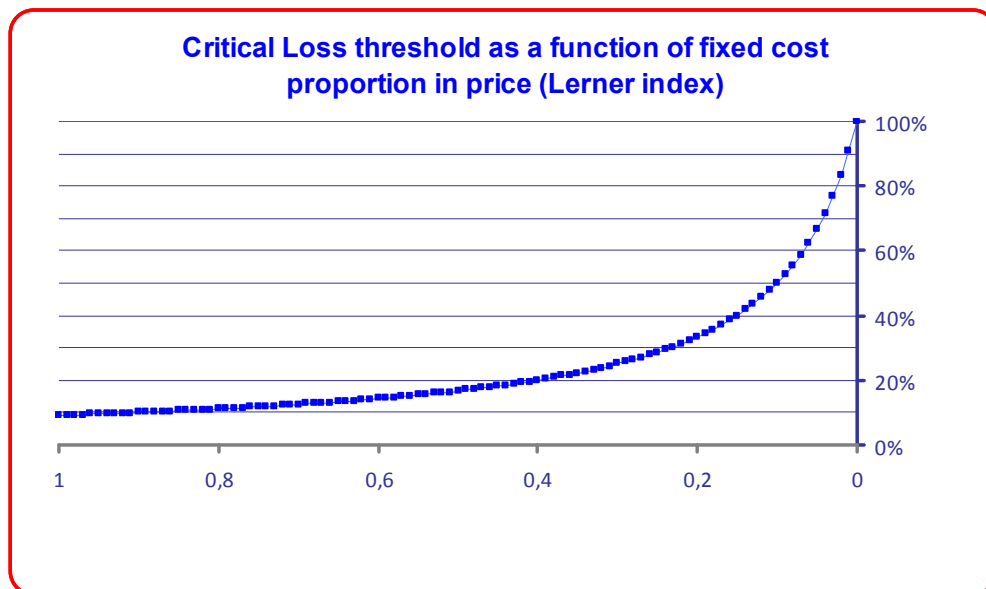
ε_s is the own-price elasticity of the product,

L is the Lerner index (the proportion of fixed cost in the price)

the critical loss equals $\alpha \varepsilon_s$ above which the predefined α price increase results in profit loss

The minimum of the critical loss for 10% price increase is $10/11=0.91$. This happens in the case where there are no variable costs. If the variable cost is 10% of the total, the critical loss for 10% increase is exactly 10%. The figure shows the critical loss as a function of portion of fixed cost in the price.

Figure15. Critical loss as a function of the Lerner index



Our findings concerning switching away from the bundle were the followings:

Table5. Expected loss as a reaction to 10% increase in price of the bundle

	TV+net	TV+phone	phone+net	3-play	All bundles
Do not switch	69.6%	73.6%	72.3%	59.6%	68.0%
Search for a cheaper bundle	24.9%	16.2%	18.7%	31.8%	24.5%
Break up the bundle	4.8%	3.3%	3.9%	7.4%	5.1%
Break up and discard one of the services	0.7%	6.9%	5.2%	1.1%	2.4%
	100.0%	100.0%	100.0%	100.0%	100.0%

Our results show that between 5.5% and 10.2% of the customers broke up the bundle and some of them even discard one of the services in case of a 10% price increase. Television and internet bundle seems to be the most and television and phone package is the least stable package. 3-play with its 8.5% switching is between. 2-play bundles seem less stable than 3-play except the television and internet bundle.

Since 9.1% is the minimum of the critical loss, and it applies only if every costs are fixed, our stated preference study suggest that intention to switch is below the 10% or higher critical loss threshold which should really be considered. Of course our result is rather indicative and not very robust, since we had to test its degree of confidence. However the conservative approach in handling the customers' reactions may support our confidence, but it is not quantified.

Regulators need to build their decisions on more robust estimates. Our research was constrained very much by time and budget, but the cost of a well prepared empirical study capable of providing more robust results is absolutely not in the moon.

Conclusion

We showed the results of a study wanted to be a forerunner of testing the bundle is a separate market hypothesis. In the frame of our time and budget constrain we could show that it is possible to use empirical research to test such a market hypothesis in the field of electronic communication services. Bundles are attractive and clearly gaining ground on the current telecom market. Regulators have to be well prepared to address the challenges that bundles pose from competition point of view.

Our study shows that bundles and especially 3-play bundles are indeed or are close to be separate markets. If 3-play is a separate retail market, it has to be handled accordingly.

The separate bundle market hypothesis is supported by other information beside quantified reactions. Results indicate that the direction of substitution is inside the world of bundles itself. A chain of substitution links bundles together since buying the services separately as before is not preferred by those who are happy with bundles.

Bundle as a value in itself it is more then just the sum of its parts with the discount it is sold at. Using services in bundles with their other features generate more satisfaction than the services alone. At least this is the view of bundle users. They are happy to be in, because their reported choice experience reinforces their initial preference. Those without bundle see

the world differently. They consider bundle characteristics less attractive or even deterrent, but in many cases lack of information is behind their attitude.

Bundle world is still surely connected to the world of separate services. There is no wall between them, but it does not mean that the traffic is the same in both directions. Our study suggests that it is easier and less painful, or even attractive to get into the bundle world but it is harder to relinquish it.

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