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Viewed through the Lens of the Consumer

Value Creation in the Telecommunications Sector

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Executive Summary

Subject Matter

The public debate about the value provided by the telecoms services sector typically focuses on price and the ease with which consumers can switch service providers, based on inaccurate and oversimplified assumptions of how consumers perceive value in telecoms services.

- This report offers a more holistic and comprehensive view of what consumers value about their telecoms services, and its findings can turn traditional perceptions about price on their head.
- It shows that, in fact, price is only one of several factors determining whether a service is deemed to be valuable to the end user. Other factors such as coverage, network quality, speed, bundle size and contract flexibility are just as – if not more – important than price.
- By looking at telecoms services through the eyes of the consumer, this report demonstrates that all these factors need to be taken into account in order to have a fully-informed debate on the matter.

Methodology

- The research conducted for this report was structured according to three core hypotheses 1. the extent to which telecom services create value, 2. the extent to which different aspects contribute to value creation in the eyes of consumers and 3. how investment can drive future value creation in the telecoms industry.
- The hypotheses were tested using extensive market research across eight European countries, over 8,000 respondents and supplemented by desk research using publicly-available sources.
- The report focusses on understanding and appreciating the order of magnitude of various findings, as this provides sufficient guidance for informed debate and decision-making, rather than attempting to determining the exact percentage of various factors or variables that contribute to value creation for a consumer.

Key Findings

- Telecommunication services create value for both society and the individual.
- In fact, the value assigned to telecommunication services by consumers exceeds the actual price paid for these services many times over.
- While price and price-related elements, (such as number of months-for-free and promotion prices etc.) are very relevant for a consumer at the moment of purchase, they become less important to consumers when they are using the service itself.

- Viewed through the lens of the consumer, 38% of telecom service value creation comes from collective benefits (e.g. coverage, network quality, innovation), 33% from individual benefits (e.g. speed, bundle size), 29% from price (16%) and flexibility (13%).
- There is a positive relationship between price levels, investment levels and the resulting benefits to society; Telecoms providers increase (infrastructure) investments when they are able to generate and capture value, thereby creating additional benefits and value for society as well as individual consumers.
- These additional investments generate both direct benefits (e.g. increase in network speed or coverage) as well as indirect benefits (e.g. more people taking online courses, working from home, creating breeding ground for start-ups, using cloud services) for society.

Conclusions

- The results of this report indicate that other elements of value for consumers deserve a more prominent place in the framework through which developments in the telecoms market are monitored, evaluated and directed
- Price (16%) and flexibility (13%) are the traditional metrics used to assess markets, yet they relate only to approximately 30% of what is important to a consumer. To complete the picture, more medium and longer term elements such as collective and individual benefits deserve a role, given that they account for ~70% of what consumers perceive as important.

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Introduction

The importance of telecoms services to society, as well as to individuals and businesses, is well accepted and broadly understood[1]. Developments and innovation in the telecoms industry often lead to big improvements in the range and quality of services, thus creating more value for consumers and communities.

The importance of the telecoms market and the enormous impact it has on our lives means it quite rightly attracts attention from a wide range of stakeholders. Yet the complexity of the sector makes monitoring, evaluating and acting upon developments a challenging task for all. More than perhaps any other industry, telecoms is being transformed by the rise of global OTT players, the blurring of market definitions, the ever-increasing need for faster and better-quality networks and the need for seamless connectivity between fixed and mobile. Consumer behavior is also undergoing fundamental changes – with the rise of online shopping, seamless use of mobile and fixed networks to access content from any location. Also relevant are the impact of governments and regulators relating to 5G-network roll-outs, the increased complexity of spectrum auctions and other factors. The speed and interplay of these developments compound this complexity.

Most parties interested in the market have responded to these challenges by focusing on benchmarkable price levels (over time and across countries) and levels of competition – in other words, how easy it is for a consumer to switch providers if they are not happy with the service they are receiving. As a result, most parties tend to equate price reductions to improvements in social welfare, overshadowing other desirable aspects of value creation by telecom services[2].

In this report, we take a holistic and integrated view of value from the perspective of the consumer. The objective is to first identify the extent to which telecommunications services create value and then the factors that contribute most (relatively) to telecoms value creation for consumers. Lastly, the report maps the broader benefits that telecom sector investments generate for society and individuals and explores how to create an environment that stimulates such investments.

The objective is to broaden the public debate and ensure the right metrics are measured to fully appreciate all the components of value creation by telecoms providers. The focus is on understanding and appreciating the order of magnitude of various findings, so as to provide sufficient guidance for informed debate and decision-making, rather than attempting to determine the exact percentage of various factors or variables that contribute to value creation for a consumer.

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[1] *Consider e.g. the National Academies Press 'Renewing U.S. Telecommunications research' – dating back to 2006*
[2] *Consider e.g. 'A comparison of the Evolution of Telecommunication Prices in Regulated and Unregulated markets – 2014 TPRC Conference Paper*

Research structure

The research for this report is structured according to three core hypotheses. Together, these hypotheses address the value created by telecommunication services, the factors contributing to value creation, as well as linking price levels to investments and benefits for both society and the individual. The hypotheses investigated are:

1. The value that telecommunication services create for consumers exceeds the actual price paid for these services.

2. From the perspective of the consumer, societal and individual benefits of telecom services are more important than price.

3. There is a positive relationship between price levels, investment levels and the resulting benefits to society.

Extensive market research was conducted to test the first two hypotheses. The research surveyed 8,000 consumers across eight European countries, with equal representation of men and women, and covering various age groups and geographies[3].

- The first hypothesis was tested by directly asking research respondents the monetary value they would require to forgo certain products, services and activities for one year.
- A Split Adaptive Conjoint Approach (Split ACA) has been applied to test the second hypothesis. This approach compares how respondents value various factors that relate to products, services and activities. The Split ACA captured both hygiene and more typical (proposition related) factors. Box 3 contains more information on the approach.

The third and last research question was explored and validated through desk research using publicly available data sources: telecom revenues & investment levels and (qualitative as well as quantitative) telecom service and societal indicators that serve as proxies for value creation and benefits. These indicators were restricted to those that allow for comparison across countries, comparison over time and were limited to public sources to allow validation by all interested parties.

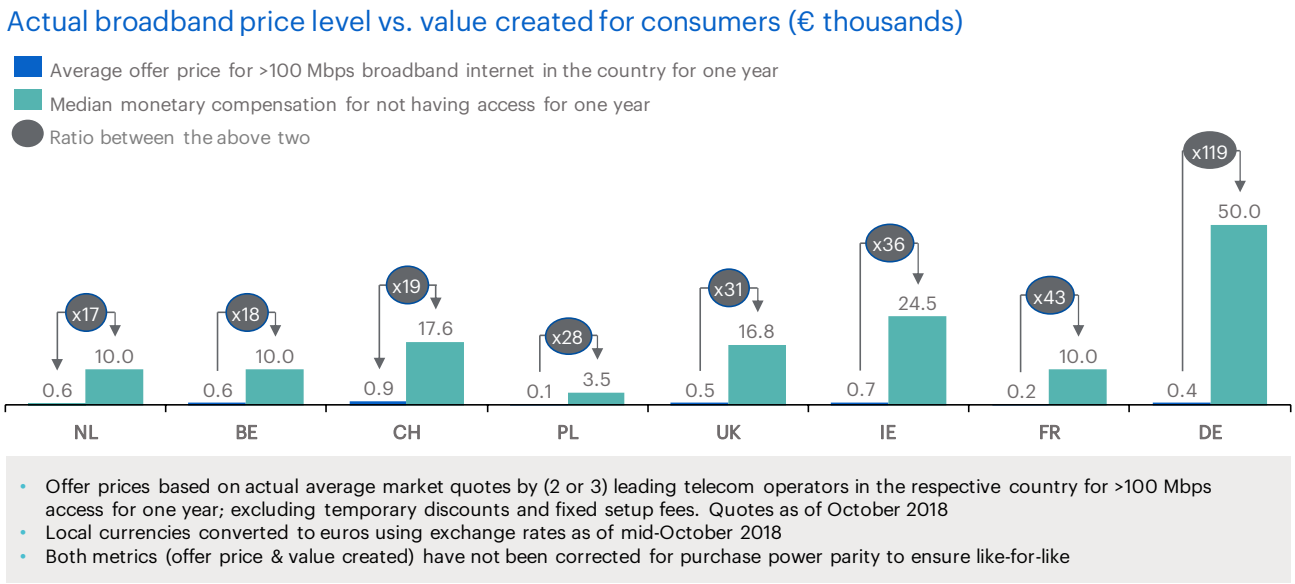
[3] *See the appendix for further details*

1. The value that telecom services create for consumers exceeds the actual price paid many times over

The importance that consumers place on telecommunications in their everyday life becomes apparent when asked to put a monetary value on the theoretical absence of products and services provided by the telecoms sector.

When indicating the compensation they would require to forgo access to home broadband & Wi-Fi, consumers are essentially aggregating all value created by the service into a single monetary value. Across countries this monetary value can be compared against what consumers actually pay for access to home broadband & Wi-Fi. Graph 1 below displays these results.

Graph 1: Value creation of telecom services vs. actual price levels

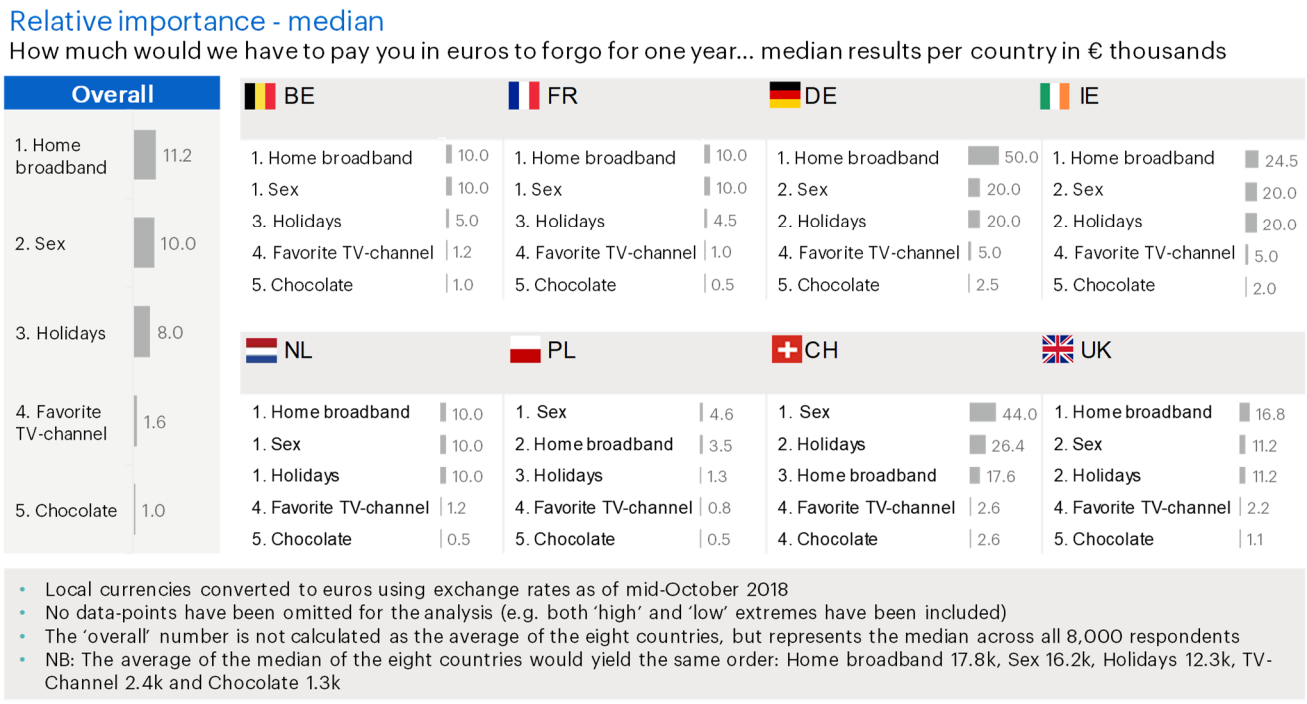


- Offer prices based on actual average market quotes by (2 or 3) leading telecom operators in the respective country for >100 Mbps access for one year; excluding temporary discounts and fixed setup fees. Quotes as of October 2018
- Local currencies converted to euros using exchange rates as of mid-October 2018
- Both metrics (offer price & value created) have not been corrected for purchase power parity to ensure like-for-like

The picture is similar across the surveyed countries: the value created for consumers (as measured by the compensation required to forgo access) exceeds actual broadband price levels many times over. The ratio fluctuates between a factor 17 and 119. The gap is smallest for the Netherlands (x17), where Germany experiences the largest positive gap (x119).

It is also interesting to understand directionally the monetary value that consumers across various countries would have to be paid to forgo a specific product, service or activity for a one-year period. Graph 2 displays the results using median values (see box 2 for the rationale for this approach).

Graph 2: Value creation telecom services – median & relative to other aspects of life

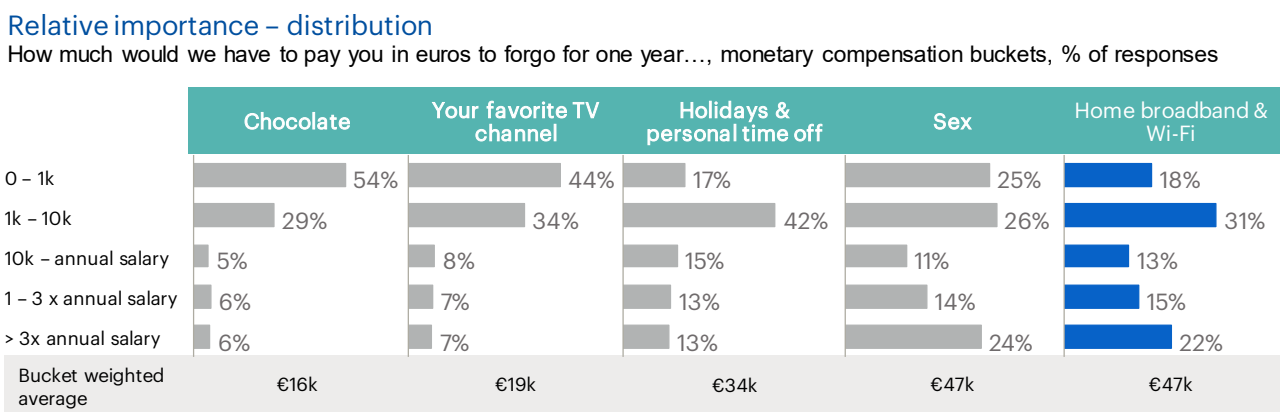


The results indicate that the majority of respondents place the highest value on access to home broadband & Wi-Fi, more so than on holidays and sex. This pattern is apparent across the sample countries: access to home broadband & Wi-Fi scores either first or joint first place in six out of eight of the surveyed countries. Some national differences stand out:

- The Germans seem to be most fond of their home broadband & Wi-Fi (from a monetary point of view) as they are apparently willing to forgo sex, holidays, their favorite TV channel and chocolate combined in order to maintain access to these telecom services.
- Only Poland and Switzerland deviate from the general picture. Poles are less willing to forgo sex (versus home broadband), while the Swiss consider both sex and holidays more valuable than home broadband & Wi-Fi

The importance of home broadband & Wi-Fi is even more apparent when studying the distribution of responses. To that end, graph 3 consolidates the responses across countries into various 'monetary compensation buckets'.

Graph 3: Value creation telecom services – distribution of responses



- Local currencies converted to euros using exchange rates as of mid-October 2018
- Results have first been calculated at the country level (taking into account local annual income) before being aggregated to the above overview
- No data-points have been omitted for the analysis (e.g. both 'high' and 'low' extremes have been included)

The 'bucket weighted average'[4] highlights that respondents require relatively high monetary compensation to forgo home broadband & Wi-Fi and sex for one year. The distribution further illustrates that:

- Just like holidays, home broadband & Wi-Fi is enjoyed by a (relatively) large set of respondents, fewer of whom are willing to forgo the provided benefits lightly. This is illustrated by the relatively low number of respondents in the '0-1k' buckets for both categories.
- Just like sex, home broadband & Wi-Fi are enjoyed by a relatively large group of respondents to whom the benefits can be considered 'substantial'. This is illustrated by the relatively high number of respondents in the '>3x annual salary' buckets for both categories.

[4] *Calculated by taking the midpoints of the various buckets (except for '>3x annual' where 3x annual is taken) and weighing according to percentage of total responses*

Box 1 of this section provides further insights on median responses per age group and gender

Box 2 of this section explains the use of median and distribution statistics (vs. the average)

Box 1: Median deep-dive by age groups and gender

This box dives deeper into consumers' responses with respect to how much they would have to be paid to forgo a product, service or activity for one year. The graph below displays median responses across age groups and gender.

Graph 4: Value creation telecom services – median per age group and gender

Relative importance – median per age group and gender

How much would we have to pay you in euros to forgo for one year...median results per country in € thousands

	Chocolate	Your favorite TV channel	Holidays & personal time off	Sex	Home broadband & Wi-Fi
Overall	1.0	1.6	8.0	10.0	11.2
Age groups					
18 – 29	1.3	1.5	9.0	11.5	35.2
30 – 39	1.1	2.0	5.6	12.0	13.2
40 – 49	1.0	1.8	8.8	11.2	10.0
50 – 65	0.6	1.3	6.4	6.0	9.0
Gender					
Male	1.0	1.2	7.0	16.8	11.2
Female	1.1	2.0	8.8	7.5	11.2

- Local currencies converted to euros using exchange rates as of mid-October 2018
- No data-points have been omitted for the analysis (e.g. both 'high' and 'low' extremes have been included)

Age group segmentation:

- In general, as consumers get older, they are more willing to forgo certain products, services and activities (as measured by monetary compensation). This effect is most pronounced for home broadband & Wi-Fi, where the youngest age group (18 – 29) requires approximately 4x more compensation to forgo home broadband & Wi-Fi compared to the oldest group (50 – 65)
- Note that even the oldest respondents are still less willing to give up on home broadband & Wi-Fi than other products, services or activities.
- Three out of four age groups are less willing to forgo home broadband & Wi-Fi compared to other products, services or activities – exception is the age-group 40 – 49.

Gender segmentation:

- There are comparable scores for both gender groups with respect to the monetary compensation required to forgo home broadband & Wi-Fi (as the median for both is €11.2k).
- Men are less willing to give up on sex than on home broadband & WI-FI; whereas women prioritize the home broadband & Wi-Fi.

Box 2: The value of the median and distribution statistics

The results of the market research can be studied and presented using various statistical metrics. Three popular metrics include:

- **Averages:** commonly used and straightforward to interpret, but (relatively) sensitive to extreme values.
- **Medians:** represent the 'actual middle' and less sensitive to extreme values, however less common than taking averages.
- **Buckets:** provides additional insights into the 'shape of the distribution' of responses, but requires interpretation of bucket sizes.

The median and buckets metrics are combined in this report due to the nature of responses. For example, some respondents entered values far above a typical annual salary when asked how much one should be paid to forgo holidays for one year;

- These respondents seem to want to indicate an unwillingness to give up on vacation time in general.
- These responses would distort average calculations when combined with other respondents whose answers were more directly related to their annual income.

The median is selected (instead of the average), as this metric is less sensitive to the aforementioned type of outliers. The bucket approach further increases understanding of consumer preferences and trade-offs (as highlighted in box 1: Median deep-dive by age groups and gender).

In interpreting the results, it is important to consider outcomes relative to one another (e.g. 'are individuals more willing to give up on chocolate versus holidays') rather than taking the absolute numbers at face value.

2. Consumers assign more importance to collective and individual benefits than price

This section investigates which factors contribute most to telecom value creation from the perspective of the consumer. It tests the hypothesis that consumers place more importance on collective and individual benefits than on price.

The market research, and more specifically Split ACA, considered three types of value-creating benefits:

- **Collective:** refers to the collective benefits and considerations of telecommunication services such as network coverage and quality for both fixed and mobile networks as well as the level of innovation in a country (e.g. introduction of new applications).

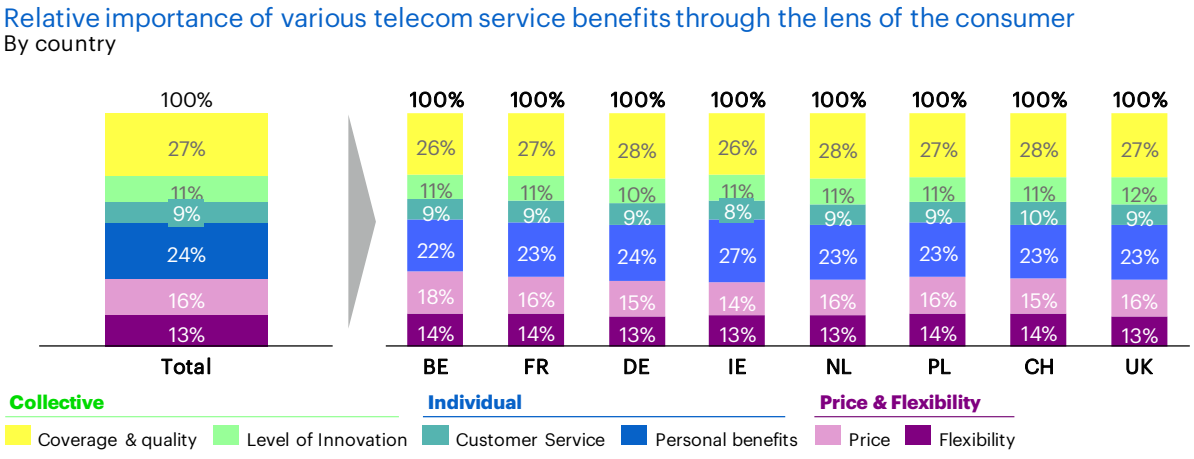
- **Individual:** the benefits individual consumers consider when choosing and engaging with telecoms services - direct personal benefits (e.g. the speed of services, bundle size for mobile) and customer service (responsiveness, speed of resolution, quality of interaction etc.).

- **Price & Flexibility:** the monetary amount consumers have to pay for telecom services and flexibility, with respect to the ease at which consumers can switch providers (contract duration, ease of switching etc.).

Price and price-related elements, (such as number of months-for-free and promotion prices etc.) are very relevant for a consumer at the moment of purchase. The importance of price typically ranges from 30% to 50% of the considerations at that point in time. However, consumers are not constantly in 'purchasing mode', but most of the time they have and are using the service itself. To get a full understanding of what is really important for a consumer, this analysis takes into account the benefits that play a role when using the service, as well as the considerations at the moment of sale.

Graph 5 displays the result of the split conjoint analysis used to investigate exactly this point. Box 3 at the end of this section further explains the methodology.

Graph 5: Factors contributing to telecom value creation across countries

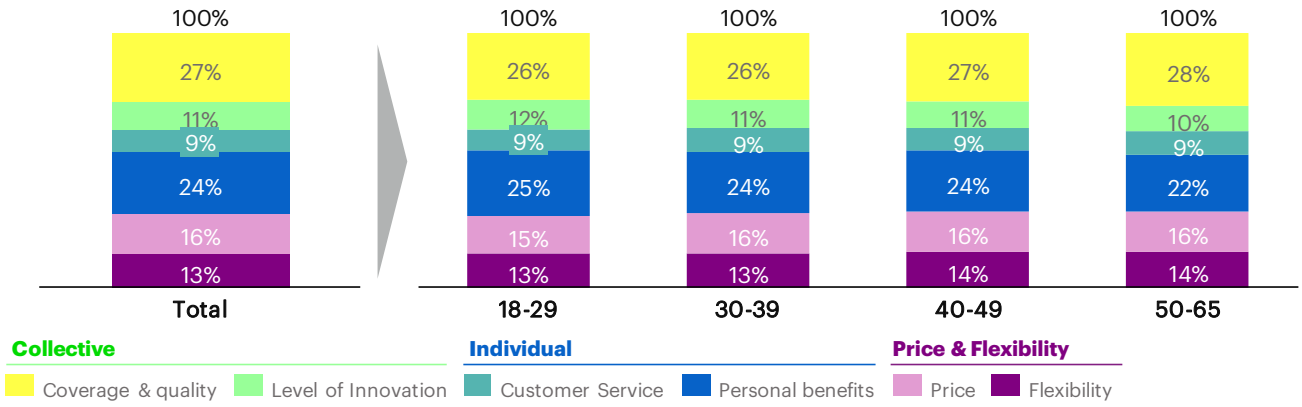


The results from the market survey indicate that price and flexibility account for ~ 30% of total value, while collective and individual benefits contribute ~ 70% of value, from a consumer perspective. More specifically:

- Consumers consider collective benefits (38%) as the most important contributor to the value created by telecoms services, with coverage & quality being the most significant components.
- Individual benefits (33%) are the second most important contributor to value creation. Personal benefits (which include speed, mobile bundle etc.) are considered more significant than customer service.
- Price and flexibility account for the remaining 29% of importance, where price is considered slightly more important than flexibility.
- Consumers demonstrate similar and consistent patterns across countries. Only in Belgium do consumers consider the combination of price & flexibility slightly more significant than personal benefits.

The relative importance of various telecom service benefits can also be considered across age groups; see graph 6.

Graph 6: Factors contributing to telecom value creation across age groups



The results shown in graph 6 indicate:

- Each age group places similar value on the collective benefits in terms of value creation; this would argue in favor of considering collective benefits as necessary and, perhaps, even required before considering the other benefits (e.g. *'what good is high speed or desirable price when network coverage or quality is below expectation'*).
- Each age group considers individual benefits to be more important than price and flexibility. However, there is a small, but significant difference between the youngest and the oldest age groups. The difference between individual benefits and price & flexibility is larger for the younger generation:
  - For age group 18–29, 34% of value is created by individual benefits vs. 28% by price & flexibility.
  - For age group 50–65, 31% of value is created by individual benefits vs. 30% by price & flexibility.

The inter-generational differences from the previous section (box 1) and the findings above can be combined. While younger generations would have to be paid up to four times more to forgo home

broadband & Wi-Fi services, they also consider price & flexibility less important than older generations and are more interested in the personal benefits (e.g. internet speed, mobile bundle size etc.).

Box 3: The Split Adaptive Conjoint Approach

Why Conjoint Measurement?

- Since the 1980s, conjoint analysis has been the preferred method to quantify how different attributes (that together, conjointly, define a product/service) influence the choice of respondents. Here is how it works:
  - Respondents choose multiple times between service offerings.
  - These offerings are cleverly designed to force specific trade-off decisions, e.g. a higher price for higher data speed.
  - Based on a series of trade-off choices by the respondent, we can calculate the relative importance of various product / service attributes.

Why Adaptive?

- Traditionally, testing a large set of different attributes would result in too many choices to be performed by the respondent, which would be tiring.

- The adaptive part of the analysis allows testing of a wide set of attributes as the interview is customized based on the individual's response to a number of initial calibration questions.

- Adaptive conjoint measurement then adjusts the choice tasks based on the respondents' previous answers through algorithms typically used in market research. As a result, the choices the participant has to make are limited to those specifically relevant to the individual's context.

Why split the choice task?

- Even when using the adaptive conjoint measurement technique, there are only so many choices a respondent can meaningfully make. Furthermore, the research was designed to include both the 'typical' attributes that consumers consider regarding telecommunication services (e.g. what is their offer / set of products, price level) as well as the collective or hygiene attributes (e.g. quality and coverage of networks, level of innovation in a country, the ease of switching providers).
  - Putting all the above in the same choice task would simply not work and hence we split the choice tasks in two conjoints (one for 'collective' and one for the 'typical, individual' factors) and assigned respondents randomly to either of the two conjoints.
  - Both conjoints contained the exact same price attribute and price-levels, which allowed both separate conjoints to be combined as one, creating an overall picture in the eyes of consumers.

3. There is a positive relationship between price levels, investment and benefits to society

This section researches and confirms the third and last hypothesis: That within the telecoms sector, one could intuitively argue for a positive (and possibly reinforcing) effect between price levels, investments and benefits to society as well as the individual:

1. Positive revenue (and price) developments create headroom for investment.

2. Increased investment levels can lead to further positive revenue developments, as new services and propositions are brought to market.

3. These additional investments generate both direct benefits (e.g. increase in network speed or coverage) as well as indirect benefits (e.g. more people taking online courses, working from home, creating breeding ground for start-ups, using cloud services) for society.

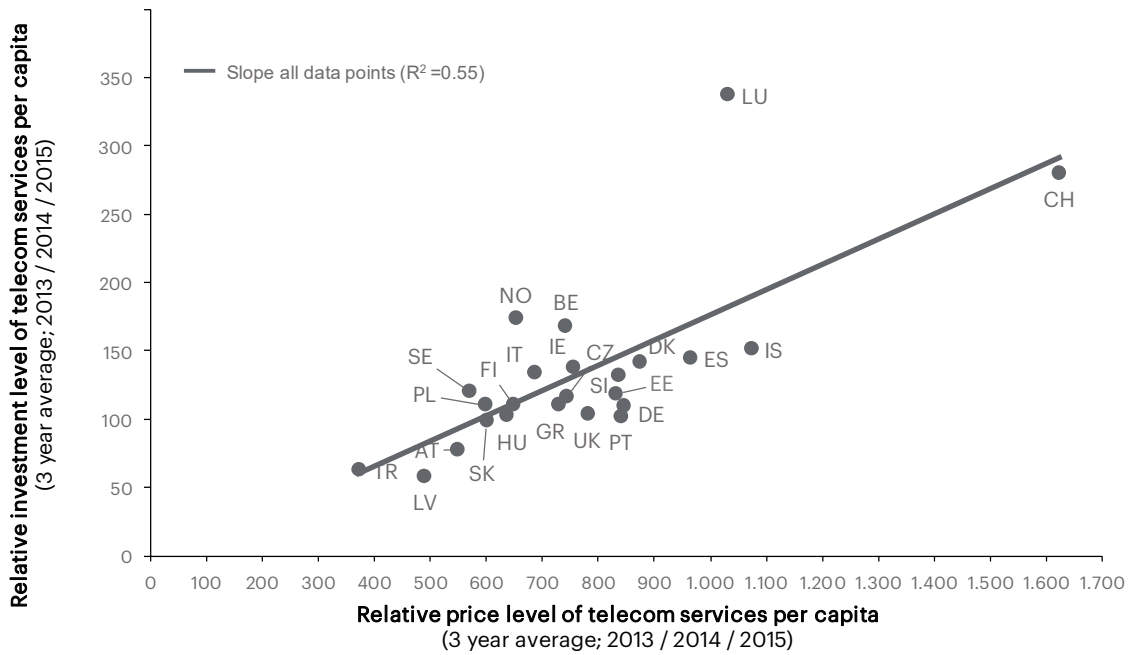
   As these benefits could allow for additional value capture by the providers, the 1, 2, 3 cycle could repeat itself.

Graph 7 displays the relationship between relative price levels of telecom services per capita (horizontal axis) and relative telecom investments per capita (vertical axis) per country over a three-year period average (2013-2015). We focused on European countries for this overview.

Graph 7: Relationship between telecom prices and investment levels

Telecom price and investment levels based on OECD data

Per country 3-year average price levels vs. investments per capita in USD



- Telecom sector investments and revenues from OECD ICT key indicators (reported in USD) – most recent data (up to 2015; updated as of October 2017). NL and FR not included as OECD did not state actuals but estimates for several years; Both axis include B2B and B2C figures as (many) telecom investments are shared between B2B and B2C
- Data adjusted by country's respective price index levels (Eurostat) and country population (World Bank)
- R-squared can be interpreted as 'the proportion of the variance in the dependent variable that can be explained by the independent variable(s)'

To make sure the relationship can be examined in a representative way, we combined the total of B2C and B2B, as significant parts of investments are very arbitrary to split (e.g.: a telecom network is by definition used by both B2C and B2B). For the other axis we hence created a proxy for the overall price level in the market by taking the combined (B2C and B2B) telecom revenues and expressed this per capita.

The graph displays a positive and significant[5] correlation between telecom relative price levels and investment levels: The R-squared indicates that relative telecom price levels are able to explain 55% of the variation in relative telecom investment levels (of course other factors influence this relationship, as a country with more mountains and more rural areas requires a different investment profile compared to a flat country with many urban areas; see also box 4).

Having concluded the positive correlation between the relative price of telecoms services and investment levels per capita, the next step is to link additional investments to societal benefits. The logic is that increased investments lead to new (and better) services and propositions (e.g. increased speeds, increased coverage) for a consumer (they get more in return). This in turn will allow a consumer to experience more indirect societal benefits (e.g. more people taking online courses, working from home, creating breeding ground for start-ups, using cloud services).

The benefits of telecom services on society have been studied in various research reports. Linking societal benefits to price levels in this research setup requires metrics or proxies to be benchmarkable over time as well as across countries and publicly available. These requirements substantially limit the available data, but the most recent publicly-available statistics from the OECD's Broadband Portal at least illustrate the point.

From the relative investment level of telecom services per capita (average 2013 – 2015; see graph 7) two groups can be identified:

- The top-10 countries with the highest relative price levels per capita.
- The bottom-10 countries with the lowest relative price levels per capita.

For each of the two groups median statistics for both B2C and B2B metrics relating to societal benefits were calculated. Graph 8 highlights the performance of the top-10 countries on both B2C and B2B metrics vs. the bottom 10 countries:

- The top-10 countries outperform the bottom-10 across all selected societal benefits; with an average outperformance of 39% across B2C and 23% across B2B-metrics.
  - For B2C, this outperformance is largest for online education; for B2B cloud computing the differences are largest.
  - Note, with regard to B2C metrics, a single percentage point increase across bottom-10 countries would imply that 2.2 million additional consumers can enjoy a specific societal benefit.

[5] *The effect is statistically significant on the 5%-level*

Graph 8: Relationship between telecom price levels and societal benefits (medians)

Societal benefits of telecom price levels based on OECD data

Compared to the bottom-10 countries in terms of relative price levels per capita, the **top 10 countries experience** (in **median**)...

B2C			
Online shopping	... 33% more consumers purchasing goods or services online	Top-10 Bottom-10	% of population 67% 50%
Online education	... 69% more individuals taking online courses	Top-10 Bottom-10	% of population 9% 5%
Online gov't services	... 36% more citizens using e-government services	Top-10 Bottom-10	% of population 74% 54%
Cloud computing	... 20% more individuals using cloud computing services	Top-10 Bottom-10	% of population 35% 29%

B2B			
Company website	... 12% more enterprises having company websites or home pages	Top-10 Bottom-10	% of enterprises 84% 75%
Cloud computing	... 29% more enterprises using cloud computing solutions	Top-10 Bottom-10	% of enterprises 23% 17%
Big data analysis	... 28% more enterprises performing big data analysis	Top-10 Bottom-10	% of enterprises 12% 9%

- Top- and bottom 10 countries based on relative price levels per capita (average over 2013/14/15; see previous chart) – top 10: Switzerland, Iceland, Luxembourg, Spain, Denmark, The Netherlands, Germany, Portugal, Slovenia, Estonia; Bottom-10: Italy, Norway, Finland, Hungary, Slovak Republic, Poland, Sweden, Austria, Latvia, Turkey
- Statistics based on most recent OECD Broadband Portal data (2016) – the 2016 data allows for a delay during which benefits can materialize
- For all shown metrics, data on all top/bottom 10 countries was available except big data analysis (14/20) and online courses (19/20)

Box 4: The use of regressions and group comparison

The third and last hypothesis regarding effects between price levels, investments and societal benefits of telecom services was tested using linear regressions and group/cluster comparisons.

For the purposes of this research, it is vital to understand and appreciate the order of importance and direction of various findings to provide guidance for further debate. The analysis for the third hypothesis was not intended to determine the exact percentage or level between various factors or variables. Neither is it the ambition to correct for all possible mediation, moderation or other types of effects.

With respect to the linear regression as depicted in graph 7:

- There are likely to be many more factors influencing telecom investment levels per capita (e.g. varying interest rates, country risk, ease of doing business, landscape complexity). However the objective of this research is to highlight the positive relationship between telecom price levels and investments per capita within a country, not to build a full econometric model.

With respect to the grouping and comparison exercise in graph 8:

- Country-specific dynamics can potentially drive a country's performance on certain societal benefit metrics (e.g. specific regulation, certain market dynamics). This idiosyncratic behavior has been accounted for, or rather 'aggregated out' by grouping countries into the 'top-10' and 'bottom-10' countries and comparing medians across these two groups.
- This approach ensures that specific behavior for one country is discounted as the observation is considered within a larger group of observations from which a median is taken.
- Note, the 'top-10' countries also outperform the 'bottom-10' on every societal benefit metric when the average, rather than the median, is considered.
- Lastly, one could justifiably argue that many other factors could serve as a proxy for societal benefits. However, the fact that they were selected does enable societal benefits to be measurable and benchmarkable over time, across countries and to be based on publicly available data. Nonetheless, the set of benchmarkable societal benefits publicly available and addressed by this report all identify similar positive relationships with in-country price levels.

Conclusions

1. Consumers highly value access to home broadband & Wi-Fi, even more so than holidays or sex. In fact, the value consumers attach to telecoms services exceeds the actual price paid for these services multiple times over.

    - This pattern is seen across the surveyed countries as access to home broadband & Wi-Fi scores either first, or is a joint first place, in six out of the eight countries.

    - Broadband & Wi-Fi is considered especially valuable to the youngest generation of respondents (age group 18–29) as they would require 4x more compensation than the oldest group of respondents (50–65) to forgo access for one year.

2. Roughly 38% of telecom service value creation comes from collective benefits (e.g. coverage, network quality, innovation), 33% from individual benefits (e.g. speed, bundle size) and 29% from price (16%) and flexibility (13%).

    - This pattern is consistent across countries as well as age groups. However, the youngest generation (age group 18–29) is slightly more likely than older age groups to favor the benefits of collective and individual benefits over price and flexibility.

3. There is a positive relationship between price levels, investment and benefits to society.

    - Positive revenue (and price) developments create headroom for investment, which in turn can impact revenue generation.

    - The top-10 EU countries in terms of relative price levels outperform the bottom-10 across all proxies for B2B and B2C societal benefits (e.g. online education, shopping, e-government services, cloud computing, big data analytics) investigated for this report.

In typical analyses of the telecoms market, the interest of the consumer is defined by parameters such as ‘price levels’ and ‘ease of switching operators’. Both are easy to measure and can be determined over a relatively short period of time. The results of this report indicate that other elements of value for consumers deserve a more prominent place in the framework through which developments in the telecoms market are monitored, evaluated and directed.

- Price (16%) and flexibility (13%) are the traditional metrics used to assess markets, yet they relate only to approximately 30% of what is important to a consumer.

- To complete the picture, more medium and longer term elements such as collective and individual benefits deserve a role, given that they account for ~70% of what consumers perceive as important.

- If the ambition is to promulgate policy regimes that create benefits for both society and consumers, governments and regulators would do well to successfully balance all prevailing factors valued by consumers – including coverage, network quality, innovation, speed, (contract) flexibility – rather than narrowly focus solely on the price of telecoms services.

Acknowledgements

In developing the hypothesis, setting up the research design and drawing conclusions, the authors would like to acknowledge that:

- As mentioned in various sections, our objective is to broaden the public debate and ensure the right metrics are measured to fully appreciate all the components of value creation by telecoms providers. The focus is on understanding and appreciating the order of magnitude of various findings, so as to provide sufficient guidance for informed debate and decision-making, rather than attempting to determining the exact percentage of various factors or variables that contribute to value creation for a consumer.

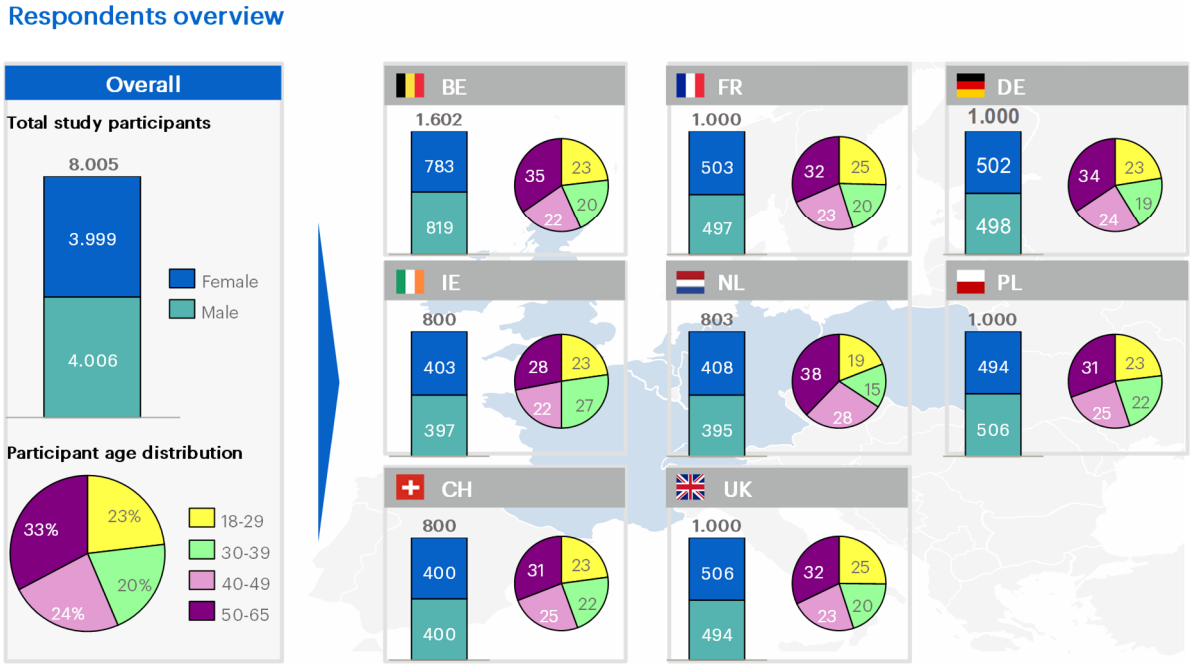
- Capturing the 'real' opinion of customers is challenging – irrespective of the selected methodology:
  - Pace of innovation makes it increasingly difficult for consumers to indicate their medium- to long-term future needs or values in terms of products and services.
  - Consumers typically undervalue the impact of innovation and technology during market research, as these are often abstract and difficult to quantify.
  - Consumers often behave differently in research vs. real-life situations; many of these differences can be mitigated, but some are likely to persist (e.g. psychological / behavioral effects).

- The research translated value creation of telecommunication services into monetary values by asking respondents to indicate their required compensation in order to forgo products or services. With respect to this exercise:
  - We are aware that 'required compensation to forgo access' does not fully equal a consumer's willingness to pay for a service. At times, the indicated required compensation to forgo a product or service exceeded the average annual salary. Logic would dictate few would be actually capable (and willing) of paying multiple annual salaries to access a product or service.
  - Rather, the results are taken as a proxy for the (perceived) value created by the service or product. By ranking various products and services the relative importance can be determined.

- The adaptive conjoint approach is explained in box 3 and further detailed in the appendix.

- Box 4 further explains the analysis and statistics selection for the third hypothesis (linking investments, price levels and societal benefits).

Appendix 1 – Respondents by region, gender and age group



Appendix 2 – Examples of the research components

Market research questions & Adaptive Conjoint Analysis: examples of elements included

Filtering	• Current internet status: broadband internet yes/no, DVR with pause function yes/no, etc.
Willingness to pay	• What would we need to pay you to forego the use of broadband internet for 1 year?[1] • What would we need to pay you to forego using your DVR with TV pause function for 1 year/3 months?[2] • Etc. • How much would you be willing to pay to forego seeing any advertisements while watching TV for 1 year? • How much would you be willing to pay to be able to skip any advertisements while watching catch-up TV for 1 year? • Etc.
Conjoint level 1: Collective factors	**"Worlds" pair-wise comparisons:** • Price (as linking factor) • Minimum base / hygiene characteristics (network coverage in rural areas, white spots, dropped calls, customer service experience, ease of switching providers etc.) • Future-proof infrastructure / innovation / enablement of other parts of society: speed of innovation compared to other countries
Conjoint level 2: Individual factors	**Typical pair-wise comparisons:** • Price (as linking factor) • Product features (e.g. speed, mobile data bundle (limited/unlimited)) & contract duration • Product innovations (e.g. pausing TV mid-view, SVOD) • Etc.
Concluding questions	• Demographics (gender, age bucket) • Current provider(s)

1. Only applies if answer to question 1 is yes. Otherwise: What would you be willing to pay (as one-off fee) to get permanent access to broadband internet?
2. Only applies if answer to question 2 is yes. Otherwise: What would you be willing to pay (as one-off fee) to get a Digital Video Recorder with function to pause TV while watching and continue the broadcast at any time of your convenience?